R&D on
Telematic Systems
for Rural Areas

Background Material
- Rationale & Overview, Definition of Scope
and Task Descriptions -

March 1991

Preface

The timely and appropriate application of telematic systems will be of crucial importance for economic development, particularly in the rural areas of Europe.

Half the European population still lives outside major cities and towns, but the quality of life in rural areas in Europe is under threat. Rural areas need comparable telematic service infrastructures to those in urban centres if they are to develop more balanced economic activities with a greater diversity of employment. The introduction of such services in rural areas will be a gradual process, the investments required will be large, and the infrastructures installed will have a lifetime of some decades. It is therefore essential that the right choices are made on technologies and system configurations. There is need for pre-normative actions to harmonize the Community markets for equipment and services adapted to the needs of rural areas; for development and stimulation of specialised services and for the impacts of telematics services in rural areas to be consistently assessed.

The Framework programme for research and technology development (1990-1994) adopted by the European Council of Ministers in April 1990, provides one opportunity to address the needs of rural areas. In particular, the Specific programmes of research and technological development in the fields of Telematic Systems of General Interest and Communication Technologies allow technology and systems development for rural development to be tackled at Community level. Community action in this area will contribute to completion of the single market, to strengthening the socio-economic cohesion of Europe, to improvements in the quality-of-life in rural areas, to industrial innovation (in particular for SMEs) and to rural development. The actions will be part of a wider programme of actions strengthening rural development in the Community.

This document sets out draft specifications for research and technology development actions to be carried out in the context of the Specific programme of research and technological development in the field of Telematic Systems of General Interest (1990-1994). For completeness, it also describes related actions to be carried out in the Specific programme of research in the field of Communication Technologies (RACE II) and preserves the overall structure and coherence of the set of actions originally developed by experts during 1989, as part of the ORA planning exercise of DG XIII-F of the European Commission.

Other measures in the framework of the Community's structural policies will also play an important role in the implementation of a coherent Community policy for rural development. The R&D actions described here will be carried out in close collaboration with actions under two new Community initiative programmes: the LEADER programme which supports rural development initiatives in less favoured regions and rural areas; and the TELEMATIQUE programme which supports the development of telematic services in less favoured regions.

Following the adoption of the Specific Programme on Telematic Systems of General Interest by the Council, and adoption of a workplan by the Management Committee, a Call for Proposals will be issued for R&D actions to be undertaken by consortia of appropriate organisations.

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SECTION I

RATIONALE, OBJECTIVES AND

OVERVIEW OF THE ACTIONS

1.   RATIONALE

1.1   Background

Half the European population still lives outside major cities and towns. However, the quality of life and employment opportunities in the rural areas of Europe are under threat. Rural areas have experienced a steady decline in the younger population and in the quality of education, the provision of health-care and commercial services as people have moved to better paid and more varied jobs in towns and cities. Restraints on agricultural production coupled with continuing increases in agricultural productivity necessitate the creation of new employment opportunities in rural areas.

Decline in traditional manufacturing employment in urban areas has been partly compensated by growth in new industries, with an increased reliance on information and communications. These technologies offer the opportunity for rural areas to compete on an equal basis in these new markets, provided the necessary telecommunications infrastructure is in place. Indeed there is evidence to suggest that there can be a drift back to the countryside except, perhaps, on the periphery.

New technologies and infrastructures for advanced communications are likely to be introduced initially in major cities and industrial areas. Infrastructures which are being planned for ISDN and broadband systems are initially focused on urban centres because of the greater unity and strength of the urban market for information and communications equipment and services. Rural areas will need comparable information technology, telecommunications and broadcasting infrastructures to urban centres if they are to develop a more balanced economic activity with diversity of employment.

As with previous technological innovations, rural areas may lag behind urban areas which have built up cumulative advantages. If positive steps are not taken, the enabling telematic systems will be available only in cities and core regions and the opportunities for rural revitalisation through applications of these technologies may be delayed or lost.

Introduction of new information and communications infrastructures and services in rural areas will be a gradual process, the investments required will be large, and the systems installed will have a lifetime of some decades. It is therefore essential that the right decisions are taken on the choice of technologies and system configurations. The degree to which rural areas will be integrated into the socio-economic and cultural life of Europe in the 21st Century depends on decisions that need to be taken in the early 1990s.

It has to be recognised, however, that the infrastructure which can provide so many opportunities for rural regions can also pose a threat. A heavy reliance on communications may result in a further centralisation of activities.

It is essential that any actions undertaken to improve the prospect for rural areas recognises this background. They must take account of the potential of new technologies and the characteristics of rural applications, their similarities and differences from those of urban regions. They must ensure that specific rural requirements are met, not only in terms of the physical infrastructure but also in the services and applications that are crucial to rural development.

1.2   The Opportunities

Appropriate telematic systems incorporating new information and communication technologies can reduce the isolation of rural areas. Because these technologies facilitate communications and the processing of information, the economic constraints associated by geographical isolation can become less significant. The cycle of economic decline in many rural areas can be broken. Opportunities for diversification of employment can revitalise economic activity and lead to increased disposable incomes, more stable and balanced communities, more demand for and better health services, education facilities, social services and better and more varied cultural activities.

Telematic systems linked to better telecommunications can facilitate economic growth in rural areas by allowing new forms of employment to be located in rural communities. Jobs can be moved to people rather than rural residents having to commute to jobs in urban centres. Small firms can grow in their original locations without the need to relocate. Telematic systems can enable more cost-effective support and services to be provided to dispersed small firms, farms and households. Employment can be created or secured;

−   by the expansion of existing small enterprises in rural areas by giving them better access to markets;

- by enabling "information intensive" enterprises to re-establish in rural areas;

- by stimulating the creation of services that can be provided from rural areas through new communications media;

- by enabling smaller manufacturing units to become viable through better communications with other components in design, production and marketing organisations.

Examples of potential applications in the context of European Community actions are:-

In Administrative and Community Services

- Distributed local government administration and services; distributed access to welfare services, better access to advise and information; common access to accounting and local Government management facilities etc.

- improved access to local and community information services, public library services, and

- possibly, televoting and support of local democratic procedures.

In Rural Business Activities

Opportunities for the application of telematic systems in rural business activities are growing in significance. Use of telematic systems in accounting, wordprocessing. CAD, CAM etc. is important to all firms, but particularly to those that rely on messaging, transactional and general information services. Specific applications will probably be determined by the strength of particular industrial sectors in specific regions. Service sectors such as wholesale and retail trade and producer services such as banking, finance and insurance which are used by rural small and medium sized enterprises (SMEs) may offer the best opportunity for early applications. The use of intermediate access points like service centres, sector specific value added services, producer to customer transaction services such as EDI, and the increased use of "just-in-time" production, may be crucial to the viability of some small businesses.

The opportunities for Telework, whether from home-based offices or local community offices, may be considerable in some areas. Many social, organisational

and technical problems remain to be resolved before Teleworking can become widespread, but the social benefits in terms of reduced travel time and costs, lower office costs and "quality-of-life" advantages are such that all opportunities must be explored.

In Tourism

- Distributed access to databases for holiday planning and reservations; and improved marketing of local amenities

- distributed access to heritage and genealogical data

- provision of rural service centres for tourists who require intermittent access to the telematic services that they use in their normal work or home environment.

In the Retail and Distribution sector

There is an increasing problem in the viability of small retail outlets, which are often unable to offer the range of products available in supermarkets. Telematic systems can help by increasing the range of products on offer in remote locations and in enabling timely deliveries of products and goods.

The rural retail and distribution sector has significant potential for increasing its efficiency by use of Electronic Data Interchange systems.

In Agriculture

There are numerous opportunities for the application of telematic systems in agriculture. Applications in this sector are not a priority in this programme, unless they add value to local produce and contribute to diversification of employment. However, a significant amount of rural business activity is based on processing agriculture produce and this is relevant in the context of the rural areas action.

These developments will not appear overnight. Because of the complexity of the technologies and the diversity of the potential user communities, they require co-ordinated development of both the technologies and services, with applications tested in the environment in which they will be used.

2. OVERVIEW OF RESEARCH AND TECHNOLOGICAL DEVELOPMENT

2.1   Objectives for the Research and Technological Development

The main objectives for Community action in support of development of rural areas are summarised in the Decision by the European Council of Ministers on the Specific Programme on Telematic Systems of General Interest. The objectives are:

- to create the conditions for geographically dispersed small businesses to provide more diverse employment opportunities and a more balanced economic activity in rural areas by:

  - enhancing the performance of existing commercial activities in rural areas,

  - increasing the independence and competitiveness of small and medium-sized enterprises and local service providers by giving them better access to business services and larger markets,

  - stimulating and supporting the growth of new businesses, industries and commercial activities in rural areas,

  - adding value to rural produce and products by stimulating and supporting better interactions between industrial, food and retailing sectors.

- to establish a basis for provision of improved commercial, social, educational and health services to dispersed and isolated populations;

- to raise the level of awareness of the potential of telematic systems and to contribute to raising the level of telematic systems skills in rural areas;

- to encourage manufacturers and service providers to make equipment and services easier to use by rural communities

- to prepare the way for the harmonised planning and introduction of advanced communications infrastructures in rural areas.

- to ensure that the applications of telematic systems in rural areas do not contribute to further centralisation of business and administrative activities and a loss of the cultural and economic diversity of rural areas in Europe.

2.2   Requirements

Requirements for Community research and technology development to meet these objectives have been identified in consultation with relevant national administrations, telecommunications network operators, equipment manufacturers, rural development agencies and research organisations. Preliminary investigations have indicated that there is a willingness to collaborate in Community-wide actions. Industry has identified a need for pre-normative research and development to harmonise the Community markets for equipment and services adapted to the needs of rural areas, both to allow production economies of scale and to develop a viable "home" market as a springboard for exports to developing countries. Rural development organisations and service providers have identified a need for development of specialised services and for the impact of telematic systems applications in rural areas to be consistently assessed.

The actions undertaken will relate to rural areas in all parts of the Community and should provide a solid basis of knowledge and experience for subsequent implementation in specific rural areas, whether through private sector initiatives or with national or regional Government support.

The specific objectives of the work undertaken in a first phase of Community R&D will be to develop a better understanding of common needs and opportunities for telematic services and of the impacts of such services on rural life; to establish a common understanding of network configuration requirements and options and a common understanding of telematic service requirements, and to prepare the way for harmonised planning and introduction of telematic service infrastructures in rural areas.

The set of R&D specifications reflects a multidisciplinary "systems" approach to solving the technical, socio-economic, practical and market development problems associated with new telematic system applications in rural areas. It will reinforce the existing Community research and development actions related to telematic systems and their applications.

The actions will be co-ordinated with other initiatives sponsored by the Commission of the European Communities, national Government and regional development organisations.

2.3 Structure

In order to achieve its objectives, the actions are structured as follows:

Part I: Co-ordination and consensus development with industry and rural development agencies;
Part II: Identification of needs and opportunities for telematic services and assessment of their impacts;
Part III: Specification of applications and technology requirements;
Part IV: Research and Development on telematic systems and conduct of pilot applications, and
Part V: Research on infrastructure planning and implementation strategies.

The composition of these Parts and the main information flows between them are illustrated by Figure 2.3.0.

In a first stage, priority will be given to consensus development, identification of needs and opportunities and specification of service an technology requirements.

Within each Part, specifications have been developed for research tasks, each of which represents a coherent package of work to be undertaken by a consortium or partnership of industrial, rural development and research organisations. Tasks which are complementary are grouped together.
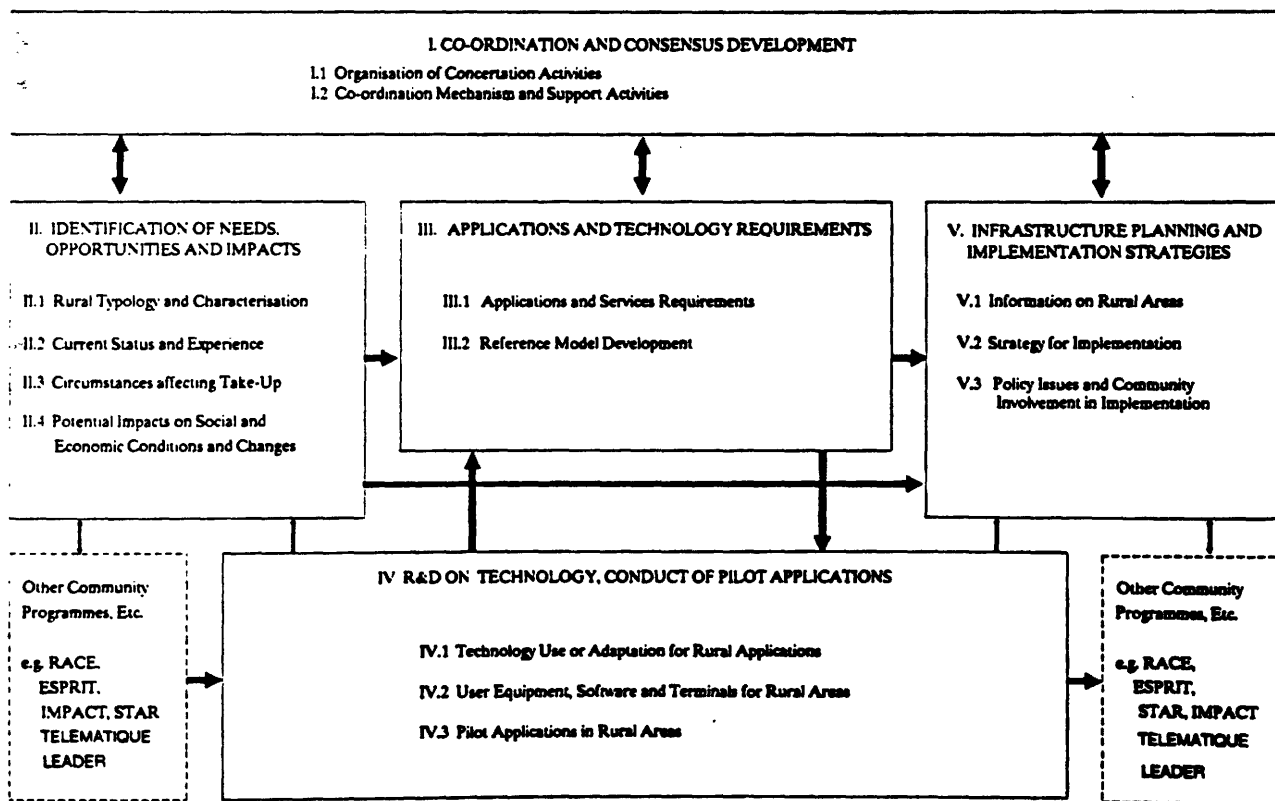
Figure 2.3.0: Overview of the Actions

2.4   Overview of the R&D

The actions are intended to benefit all the rural areas of Europe. These have wide variations in their characteristics and in their current take-up of telematic systems, and it is essential that there is as wide as possible a consensus on their needs and requirements and that there is an effective concertation of the views of users, local agencies, service suppliers, network operators and equipment suppliers. The activity in Part I would be to ensure that this concertation and consensus development takes place amongst all the relevant actors and that all the necessary dialogues are maintained.

Nevertheless, strategies for use of telematics need to be developed for specific types of rural environments, taking account of their geographic, economic, social and cultural characteristics. The current use of telematic systems will be examined in order to identify opportunities and plan realistic applications for rural areas. Equally, the potential impact of telematic systems on the social and economic conditions in rural areas must be understood and take account of the ways in which rural economic, social and cultural life might be affected. Part II provides the framework for addressing issues relating to categorisation of specific rural areas and the possible impact and effect of the use of information and communications on such areas.

The actions will be driven by the needs and requirements of potential users of rural telematic systems. Much of Part III therefore focuses on identification and specification of the needs and requirements of specific users. Identification of the opportunities for developing new services for rural inhabitants is crucial to the future success of rural development initiatives. User needs will be translated into the specifications for technologies, equipment and services, through development or adaption of Usage and Functional Reference Models for telematic systems. These will constitute a coherent and consistent set of guidelines to industry and service development organisations

The availability of such guidelines will help to guide activities on technology and applications development and aid planning of pilot implementations of telematic systems. Interaction between Parts III and IV will ensure that the understanding which has been gained of the special needs and requirements of rural users is translated into specifications for technology development, either within the appropriate EC Specific programmes or independently. Part IV includes the development of specifications for Pilot applications which will demonstrate and help evaluate the adequacy of the technologies and services and their contribution to rural development. These may be carried out in the context of the Specific Programme on Communication Technologies (RACE II), the LEADER programme, the TELEMATIQUE programme or other regional and rural development frameworks as appropriate.

In due course, Part V activities will draw on all others in order to bring together the results in a form which will assist individual regions in developing telematic system implementation plans.

2.5   Timescale

Bearing in mind the need for sequential implementation of tasks, the first phase of actions supported under the Specific Programme on Telematic Systems of General Interest (1990-1994) actions will be carried out over a two-year period commencing in January 1992. The full set of actions, including those supported through other Specific Programmes and Structural policy initiatives will extend over a four year period. An illustrative timescale for the major areas of activity is shown in Figure 2.5.0. Specifications for the Tasks which are the subject of this "call for Proposals" are given in section III. Tasks which will be co-ordinated with other initiatives or are envisaged for a later stage of the action are described in Section IV.
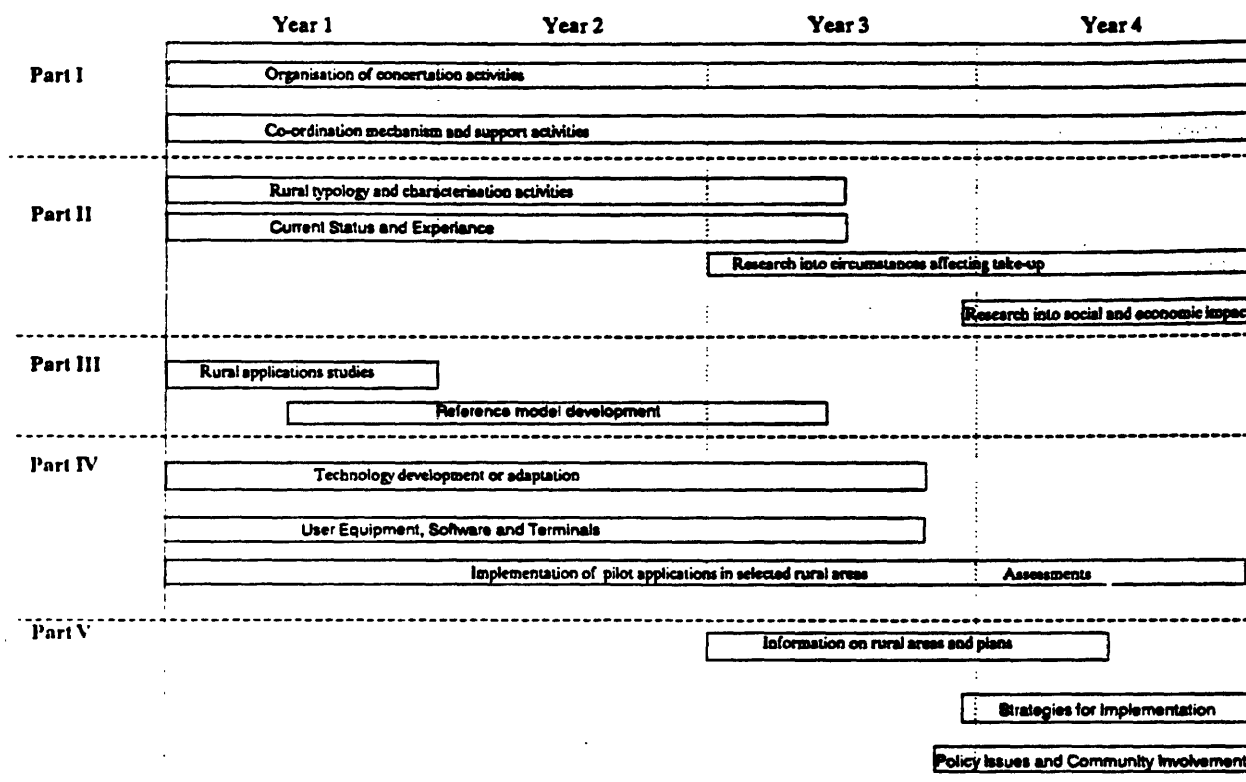
Figure 2.5.0: Major Activities and Timescales

2.6　Management

The implementation of the R&D actions will follow the rules set out in Annex III to the Council Decision on the Specific Programme on Telematic Systems.

- Research projects will be the subject of shared-cost research and technology development contracts, selected with reference to the criteria in Annex III to Decision on the Third EC Framework Programme (90/221/Euratom EEC) and the objectives of the Specific Programme. Contracts will be established following an independent evaluation of proposals submitted in response to a "call for proposals" published in the Official Journal of the European Communities. Community financial participation will not normally be more than 50%. The projects must be carried out be participants established in the European Community or EFTA countries and must involve at least two partners, independent of each other, and established in different Member States. Project management will be the responsibility of each project, and each project will be subject to an independent annual Technical Audit.

- Accompanying measures, such as the organisation of concertation activities, information exchange, project co-ordination (Part I) and Task 2.2.1 will be the subject of contracts established by the Commission with appropriate organisations.

- Overall co-ordination and management responsibilities will remain with the European Commission, assisted by a Management Committee of Member States' representatives.

Community support for specific rural development projects and pilot applications of emerging technologies or services may be possible under the European Regional Development Fund or the Social Fund in the context of the LEADER and TELEMATIQUE programmes. In rural areas ineligible for such support, European Investment Bank support may be appropriate.

SECTION II

DESCRIPTION AND SCOPE OF THE R&D WORK

Part I - Co-ordination and Consensus Development

Overview

The primary aim of the Community action is to establish the basis for the harmonised application of telematic systems in rural areas. In order to achieve this, the telematic systems action aimed at rural areas would be integrated and co-ordinated with other Community research and development programmes and with Community programmes in regional development, re-structuring agricultural activities, rural development and telecommunications development.

It would be necessary to establish a decentralised concertation mechanism amongst different groups of actors: rural communities, development agencies, the telematic systems industry, rural users groups and local administrations. This activity would facilitate collection, exchange and synthesis of information relating to specific rural area requirements. It is envisaged that this mechanism would also play a major part in raising the general level of awareness in rural populations of the opportunities which telematic systems will offer. In the later stages, it would be necessary to implement schemes for expertise transfer and training for end users, requirements for which would be identified during this Community action.

A key role in the co-ordination and concertation activities must be played by local or regional co-ordinators who have an in-depth knowledge of the rural areas and their requirements.

The Tasks which are defined in this action are highly integrated and so, in many instances, interdependent. Timely transfers of required information between Tasks are essential and must be assured if the objectives are to be achieved. There would therefore be a need within the action for co-ordination of the major deliverables between Tasks.

Issues:

Concertation amongst Local, Regional, National and Community Groups and Telematic Systems Actors

There are many types of organisations/groups involved in rural development from a local to a European level. The characteristics of these groups vary greatly. Some are statutory agencies charged with certain responsibilities while others are voluntary committees with the general aim of developing their local communities. If a policy of developing telematic systems in rural areas is to be successful, it must involve these local groups. Equally, the potential use of applications of telematic systems in a local community depends on the availability of adequate infrastructures and services which meet the needs of local users.

Consequently, a need exists to establish a concertation mechanism which includes; organisations involved at various levels of rural development, infrastructure providers, services developers (operators, services providers, equipment manufacturers) and end users. This mechanism would aim to ensure effective participation and involvement of all groups relevant to the use of telematic systems in rural areas.

Project Co-ordination Mechanism

The interdependence of Tasks means that a deliverable from one Task may provide essential information to one or more other Tasks. A failure to deliver on time, by one project can thus adversely affect several others.

Because of the importance of this aspect, a separate mechanism is needed for co-ordination of the major deliverables between projects and for monitoring their timely delivery and issues relating to standardisation.

Support Activities:

These activities include expertise transfer activities, demand stimulation and user training.

Expertise transfer activities are seen as a means of minimising duplication of effort amongst the promoters who would implement the systems. Various avenues are available for the transfer of expertise. In addition to the conventional means of consultation and exchange (meetings, seminars, demonstrations), a network of involved and interested parties could be established or a specific training package for promotion could be developed.

The formulation, development and implementation of telematic systems based services or applications, combined with the provision of appropriate means of access may still not ensure uptake among the target groups for which the service is intended. It is essential to identify the factors or initiatives that should be undertaken to stimulate demand and assist adoption at user level in order to maximise the uptake potential. Such initiatives would include general awareness raising, end-user training activities, etc.

The detailed specification of the content and extent of these support activities would arise from the work in Part II and from the experience gained from the pilot applications in Parts III and IV of these specifications.

Tasks within Part I are:

1.1.1:   **Organisation of Concertation Activities**

1.1.2:   **Co-ordination Mechanism and Support Activities tasks**

These Tasks are described in more detail in Section III, indicative timescales are shown in Figure 1.1.1, below:

Task 1.1.1 would;

- help to identify the interested and committed actors in rural activities at the local, regional, national, European levels;

- define co-ordination, consensus development and concertation mechanisms;

- prepare briefs for concertation taking account of known existing and ongoing programmes;

- organise the concertation;

- collect and disseminate information with regard to the needs of the actors involved;

- disseminate in the rural areas information on ongoing and proposed rural applications of telematic systems.

Task 1.1.1 would co-ordinate the critical deliverables between projects and monitor their delivery and consequent impact on the overall action. It would also ensure that European standards, whenever they exist, are applied within all tasks and that relevant results lead to proposals for European and international standards.
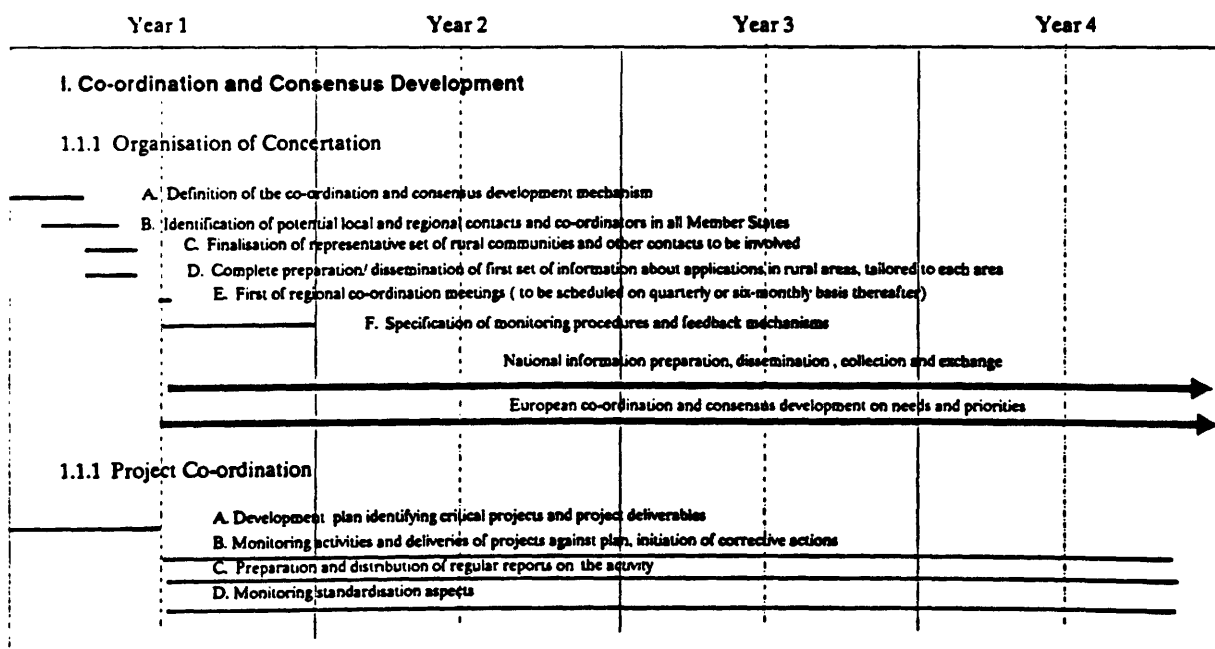
Figure 1.1.1: Timescales for Part I

Part II - Identification of Needs, Opportunities and Impacts

Overview

Research on needs and opportunities for telematic systems is a necessary foundation for decisions on the appropriate technology, systems and services for rural areas. The work specified in this part of the action is designed to provide a better insight into the relationship between rural needs for information and communications infrastructures and applications and the ways in which telematic systems may affect rural economic, social and cultural life.

The specifications for work take into account other actions being developed in the context of the Commission's rural development strategy, they have been developed in collaboration with other services of the Commission. They provide a mechanism for assessing the role of telematic systems in the context of the rapid evolution of the agricultural sector, the need to identify new areas of economic activity, the stress placed on rural communities by technological evolution and demographic change, and the consequences of geographic and cultural isolation.

Strategies for telematic systems applications need to be developed for specific rural environments. Target areas need to be defined according to a mixture of geographic, economic, social and cultural indices. These indices should be viable tools for integrated actions. For this reason, the proposed action includes the identification and description of appropriate typologies of rural areas for applications of telematic systems.

Current status and experience with applications of telematic systems has to be examined in order to identify opportunities and plan realistic applications for rural areas. Analytical tools for measuring the impact of telematic systems have to be developed. Recommendations have to be made on appropriate training schemes for end users, on methods of user demand stimulation and on "good practice" guidelines for the implementation of projects.

As conduct of pilot applications is a major component in researching and demonstrating the opportunities for applications of telematic systems in rural areas, mechanisms for monitoring and evaluating these pilot applications would also be specified in this part of the action.

The introduction of telematic systems applications in rural areas must also take cognisance of how the broader social, economic, educational and cultural factors impact on their take-up. Equally the potential effect of telematic systems on the social and economic conditions in rural areas must be understood before embarking on full implementation. These issues are addressed in this part of the action. This activity would also provide the basic benchmark data for future evaluation of Community actions related to telematic systems in rural areas.

Part II is therefore designed to address these issues and provide the specific data, typologies and models which are not currently in existence in a form which can be used by Member States and other parts of the action.

Part II is subdivided as follows:

II.1 :   Rural Typology and Characterisation Activities.

II.2 :   Current Status, Experience and Evaluation of Applications of Telematic Systems in Rural Areas

II.3 :   Research into how Social, Economic, Educational and Cultural Circumstances affect the Take-up of Telematic Systems

II.4 :   Studies of Potential Impact of Telematic Systems on the Social and Economic Conditions and Changes in Rural Areas

II.1 - Rural Typology and Characterisation Activities

Issues:

Characterisation of Rural Areas

The term "rural" can be defined in many different ways. A satisfactory and broadly acceptable working definition would have to be agreed within the context of a Community action. This would need to take into account the particular aims of the action (i.e. its concern for telematic systems applications) and of the definitions used by and within the Member States and in other programmes of the Commission.

It will be impracticable to characterise and categorise all rural areas in the Community within the resources and timescale of this action. Therefore a procedure for selection of typical rural areas must be established for detailed characterisation activities and for the development of reference models of different types of areas.

The typology, or categorisation scheme, must allow for socio-economic, cultural and physical characteristics and include the present penetration and use of telematic systems. Account needs to be taken of the existence of different types of rural area, such as the basic distinction between "pressured" (i.e. rural areas often close to urban centres or in other locations coming under increasing development pressure) and "peripheral" (i.e. rural areas often in relatively inaccessible areas suffering from decline).

Prior to the launch of an initiative, preliminary work will be undertaken to identify the characteristics of rural areas in the European Community which are likely to be relevant to telematic systems applications. This work would develop a simple and practical categorisation of rural areas, taking account of the interests of equipment manufacturers, infrastructure operators, service providers and rural development organisations. This work would also be used to select "typical" rural areas and specify the characteristics and the tools necessary for the detailed typological mapping envisaged in Task 2.1.1.

Typological Mapping of Rural Areas in the European Community

Information on the frequency of occurrence and distribution of different types of rural area in the Community is essential to the assessment of the market potential for specially adapted telematic systems equipment, systems and services. This information is also needed to assess the degree to which there could be a common Community interest in harmonised telematic systems development in specific types of rural areas, if they exist in all Member States.

Reference Models of Key Types of Rural Area

In order to provide consistent support for research and development work on equipment and services, Rural Area Reference Models need to be developed which will define the characteristics of a range of key types of rural area.

Tasks:

The main Issues would be addressed by the two Tasks listed below, which are described in detail in Section III, indicative timescales are shown in Figure 2.1.1.

2.1.1 Typological Mapping of Rural Areas in the European Community
2.1.2 Development of Reference Models of Key Types of Rural Area

Task 2.1.1 would map the occurrence of different types of rural areas throughout the Community. It would compare and contrast the occurrence of specific types of area with the occurrence of areas with different levels of telematic systems usage. It would then assess, using output from Part III.1, the potential market size for telematic systems equipment and service provision for each type of rural area in the Community.

Task 2.1.2 would develop a set of socio-economic and socio-geographic reference models for the types of rural areas widespread in the Community, using the output of Task 2.1.1, taking cognizance of early results of the pilot applications, to guide equipment, systems and service development of telematic systems applications for key types of rural area.

Year 1	Year 2	Year 3	Year 4

II.1 Rural Typology and Characterisation Activities

2.1.1 Typological Mapping of Rural Areas in the European Community

A. Report on strategy for indicative mapping and sources

B. Data-base and maps of occurrence of different types of rural areas

C. Analysis of comparison of types of rural area and usage of telematic systems

D. Assessment of market potential in each type of rural area

2.1.2 Development of Reference Models of Key Types of Rural Areas

A. Reference model requirements report

B. Selection of reference areas

C. Draft reference models

D. Stable reference models

Figure 2.1.1: Timescales in Part II.1

II.2 - Current Status, Experience and Evaluation of Applications of Telematic Systems in Rural Areas

Issues:

Collection of Information

The activities in this Part and those in Part III.1, are concerned with the collection and evaluation of information on rural areas and related telematic systems aspects. In order to use this information effectively and allow the data involved to be processed efficiently, it is important to define the methodology and tools that are to be used for the collection and analysis of data.

Prior to the launch of an initiative, preliminary work will be undertaken to define the data and categories of data to be collected on economic, and social characteristics of rural areas, and on the nature of information technologies provision and use. It will identify gaps in information supply and propose means of addressing continuing lack of information. It will propose a set of tools to standardise information collection and processing in tasks 2.2.1., 2.2.2. etc., and those in Part III.1.

Current Experience

For several years a variety of experiments and projects involving telematic systems in rural areas have been carried out in Member States of the European Community and in other countries. It will be important to answer questions such as:

- what are the main features of current initiatives for telematic systems introduction in rural areas?

- what rural development programmes related to telematic systems applications are under way?

- what can be learnt from them about the elements that influence the success of telematic systems applications initiatives?

- what are the common elements of "good practice" in telematic systems introduction programmes which help to stimulate economic activity and the diversity of employment in rural areas?

Database development

Tasks in Parts II and III will generate details on applications, technologies and rural areas. It will be important that this data is structured, updated, maintained and managed in an efficient manner throughout the duration of the action.

Evaluation of Pilot Applications

Tasks in Parts III and IV will result in pilot applications of telematic systems in rural areas. How can the output of this research be validated, in a pragmatic manner, and the opportunity for application of telematic systems in rural areas demonstrated? What performance measurement and monitoring activities need to be undertaken in order to assess the impact of the research?

Tasks:

The following Tasks, described in detail in Section III, address these issues. Indicative timescales for the main activities are shown in Figure 2.2.1.

2.2.1   Analysis of On-going Rural Development Projects Involving Telematic Systems Use
2.2.2   Rural Telematic Systems Database Development and Management
2.2.3   Evaluation of Pilot Applications

Task 2.2.1 would analyse on-going projects involving the use of telematic systems in rural areas in order to identify the elements which could influence the success or prevent the failure of future applications.

Task 2.2.2 would ensure that relevant information and case study material gathered during the various Tasks within this and other Parts would be entered into a data base and updated with the latest information. It would thus ensure that the experience drawn from case studies and other data collection activities would be available to other participants in the action.

Task 2.2.3 would evaluate, and draw generally applicable conclusions from, application pilots with regard to:

-   the ability of the application to contribute to development in rural areas;

-   the appropriate types of technologies, and the adequacy of modifications and technologies developed;

It would develop guidelines for types of performance necessary for on-going application pilot project management, and the elaboration of checks and criteria for termination procedures. This task would also provide specific feedback to other relevant Parts of the action.

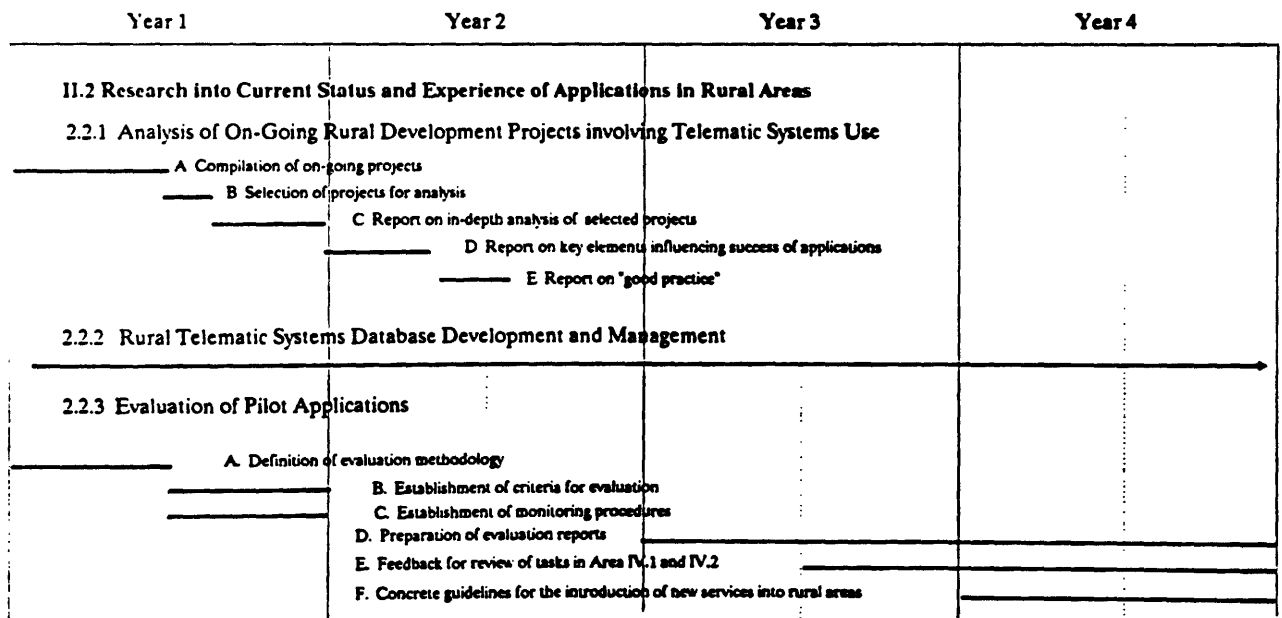| Year 1	Year 2	Year 3	Year 4
II.2 Research into Current Status and Experience of Applications in Rural Areas			
2.2.1 Analysis of On-Going Rural Development Projects involving Telematic Systems Use			
———— A Compilation of on-going projects			
——— B Selection of projects for analysis			
C Report on in-depth analysis of selected projects			
D Report on key elements influencing success of applications			
——— E Report on "good practice"			
2.2.2 Rural Telematic Systems Database Development and Management			
2.2.3 Evaluation of Pilot Applications			
A. Definition of evaluation methodology			
B. Establishment of criteria for evaluation			
C. Establishment of monitoring procedures			
D. Preparation of evaluation reports			
E. Feedback for review of tasks in Area IV.1 and IV.2			
F. Concrete guidelines for the introduction of new services into rural areas			

Figure 2.2.1: Timescales for Part II.2

II.3 - Research into how Social, Economic, Educational and Cultural Circumstances affect the Take-Up of Telematic Systems

Issues:

Effect of population structure and change

The rural areas of the EC vary considerably in their population characteristics (population density, age/sex compositions, family structures, ethnicity, household structures - notably housing and car ownership, occupational structures, qualifications and social class). Populations in some rural areas are growing at a significant rate while in other areas the population is declining and changes in the social patterns and economic activities are taking place. These trends can be expected to have a considerable effect on the take-up of telematic systems.

Effect of level of skills and of training initiatives

The availability and effectiveness of training is one of the key factors that appears to govern the use of applications of telematic systems in rural areas. Training can serve very different objectives, and can be directed at target groups with different interests and a variety of initial skills. It may also include an element of expertise transfer when targeted at applications developers. Trainers need help in defining the training needs of rural communities and the most appropriate training programmes for them.

Social and psychological barriers

Non-technological factors (unfamiliarity, incompatibility with established habits, perceived lack of education, psychological resistance) often negatively affect the use of telematic systems in rural areas. While the work in Part 2.2 may indicate a number of possible barriers to their use, in-depth analyses of the psychological factors affecting the use of telematic systems are needed in a limited number of areas (use of videotex, teleworking, etc.).

Effects of the labour market and of inward investment

The labour markets of rural areas in the Community vary greatly and depend on their economic characteristics (particularly on the importance of agriculture), the organization of production (notably the size and the ownership of the enterprises) and employment histories. Rural areas also differ in their current development status: some attract considerable new investments and show real economic growth, while others are persistently losing employment and economic activities. The structure of the labour market and the investment and potential growth rate of the rural areas directly impacts the take-up of telematic systems services and applications.

Tasks:

The above Issues are addressed by the following Tasks, which are described in Section IV. Indicative timescales for the major activities within these Tasks are shown in Figure 2.3.1.

2.3.1   Effect of Population Structure and Change on the Take-up of Telematic Systems in Rural Areas
2.3.2   Effect of Training on Users of Telematic Systems in Rural Areas
2.3.3   Identification of Social and Psychological Factors affecting the Use of Telematic Systems in Rural Areas
2.3.4   Effect of Labour Market Characteristics and Investment Growth Capacity on the Take-up of Telematic Systems

Task 2.3.1 would identify the relationships between population structure and change and the take-up of telematic systems. It would analyse the underlying social, educational and cultural impediments to successful introduction of applications of telematic systems in different types of rural areas.

Task 2.3.2 would assess the availability and quantity of telematic systems training programmes in rural areas and the impact of training on telematic systems usage. It would identify and assess strategies for improving the training situation and of promoting telematic systems training in rural areas. It would also assess and define training needs in rural areas and would identify the

components of an expertise transfer/training mechanism for services/applications promoters.

Task 2.3.3 would identify the major social and psychological factors affecting the use of telematic systems in rural regions and indicate a number of possible strategies to overcome this resistance.

Task 2.3.4 would identify the relationships between rural area labour market characteristics and trends in the take-up of telematic systems services in different types of rural area. It would also identify the investment capacity and the investment trends in key economic sectors in different types of rural areas.
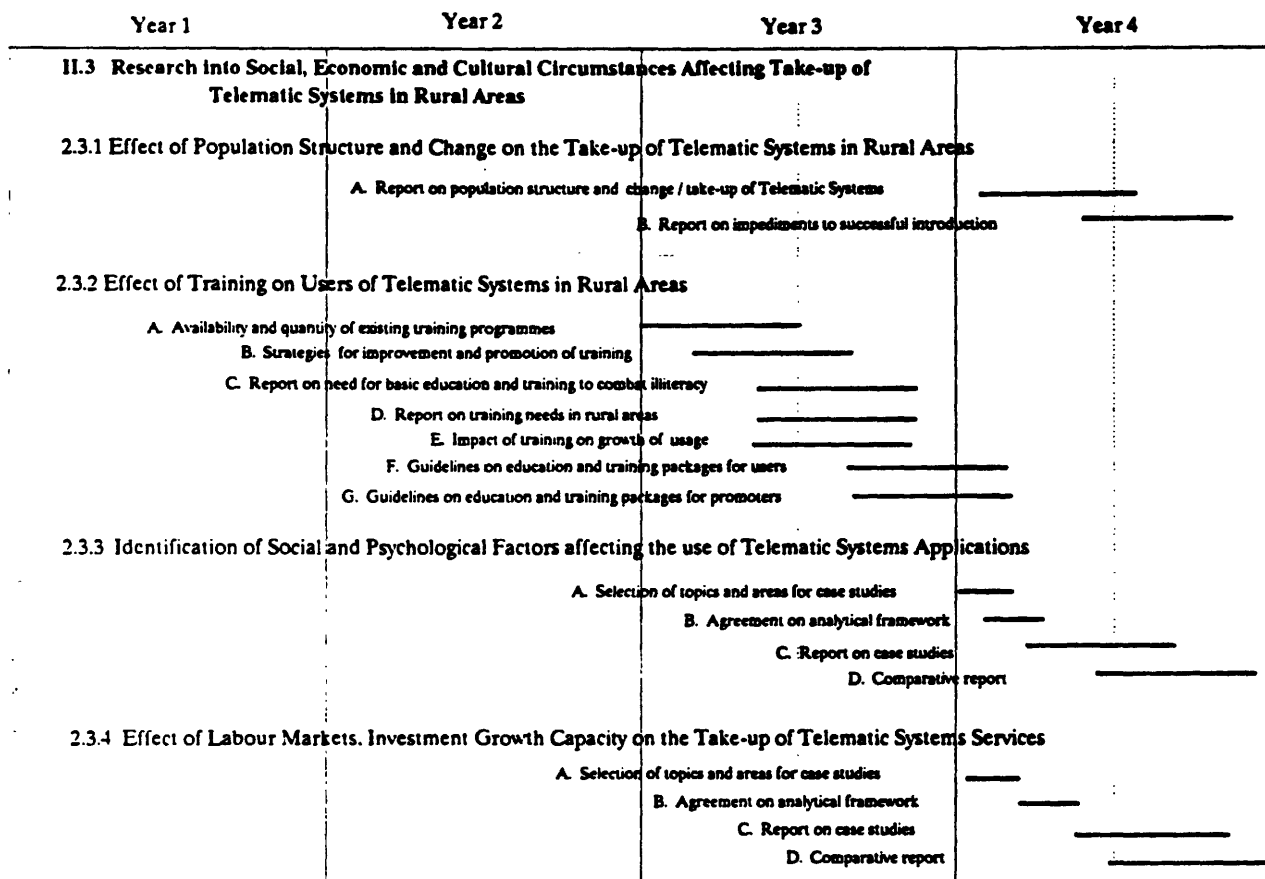
Figure 2.3.1: Timescales for Part II.3

II.4 - Studies of Potential Impacts of Telematic Systems on Social and Economic Conditions and Changes in Rural Areas

Issues:

Costs and benefits

What are the costs and benefits of the use of telematic systems in the different types of rural areas and in the various sectors of local life, e.g. in business, in the social and public services and for the individual?

Changes brought about by telematic systems

What are the changes which the introduction of telematic systems could bring about in rural areas to such aspects as:

- the social structure?
- work and employment?
- use of land and the environment?

Tasks:

The following Tasks, which are described in Section IV, address the Issues of II.4; indicative timescales are shown in Figure 2.4.1.

2.4.1   Costs and Benefits of Telematic Systems Applications in Rural Areas
2.4.2   Impact of Telematic Systems on Social Change in Rural Areas
2.4.3   Impact of Telematic Systems on Work and Employment in Rural Areas
2.4.4   Impact of Telematic Systems on Land Use and Environmental Change in Rural Areas

Task 2.4.1 would identify and analyse the economic and the social costs and benefits of investment in telematic systems infrastructures and applications in rural areas, over the range of principal types of rural area identified in Task 2.1.1.

Task 2.4.2 would identify current and potential changes in the nature of social relationships in rural areas consequent upon the changes associated with the use of telematic systems. It would identify the actual and potential effects of telematic systems on the lifestyle, identity and sense of well-being of particular categories of residents in rural communities.

Task 2.4.3 would identify the actual and potential effects of the changes associated with telematic systems on the economic prospects of rural areas in the Community. It would focus strongly on the development of

new activities, forms of work/practices and organisation, and particularly on the role of women within them.

More specifically, it would examine the changes in the relationships of work and employment which have already, or may in the future, result from the adoption of telematic systems

Task 2.4.4 would identify the impact of the changes associated with the adoption of telematic systems on:

–   the settlement system, with special reference to rural settlement;

–   rural land-use and building characteristics;

–   physical and geographical characteristics;

–   the environment.

Figure 2.4.1: Timescales in Part II.4

Year 1	Year 2	Year 3	Year 4

III.1 Applications and Technology Requirements

3.1.1 Services and Applications for Public and Community Services
- A. Identification of existing applications
- B. Identification of potential applications
- C. Identification of potential telematic systems requirements
- D. Recommendations on potential pilot applications
- E. Systems/Applications Development for Demonstration Purposes

3.1.2 Services and Applications for Tourism and Leisure
- A. Identification of existing applications
- B. Identification of potential applications
- C. Identification of potential telematic systems requirements
- D. Recommendations on potential pilot applications
- E. Systems/Applications Development for Demonstration Purposes

3.1.3 Services and Applications for Rural Business Activities
- A. Identification of existing applications
- B. Identification of potential applications
- C. Identification of potential telematic systems requirements
- D. Recommendations on potential pilot applications
- E. Systems/Applications Development for Demonstration Purposes

Year 1	Year 2	Year 3	Year 4

III.1 Applications and Technology Requirements (Continued)

3.1.4 Services and Applications for Professional and Financial Services
- A. Identification of existing applications
- B. Identification of potential applications
- C. Identification of potential telematic systems requirements
- D. Recommendations on potential pilot applications
- E. Systems/Applications Development for Demonstration Purposes

3.1.5 Services and Applications for Personal Services
- A. Identification of existing applications
- B. Identification of potential applications
- C. Identification of potential telematic systems requirements
- D. Recommendations on potential pilot applications
- E. Systems/Applications Development for Demonstration Purposes

3.1.6 Services and Applications for Distance Working
- A. Identification of existing applications
- B. Identification of potential applications
- C. Identification of potential telematic systems requirements
- D. Recommendations on potential pilot applications
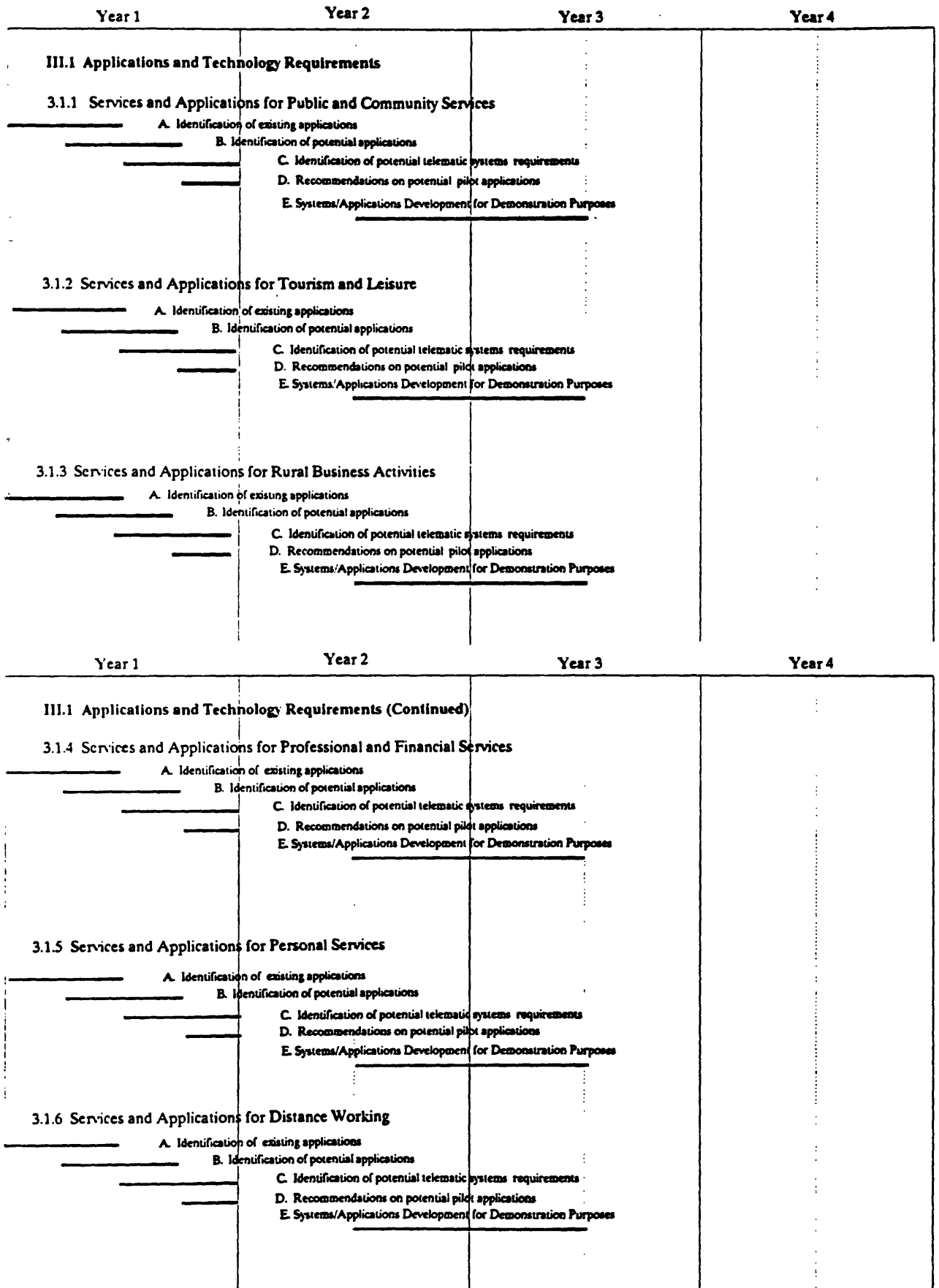- E. Systems/Applications Development for Demonstration Purposes

Figure 3.1.1: Timescales for Part III.1

Part III - Applications and Technology Requirements

Part III Overview

The work in Part III is driven primarily by the need to identify leading applications of telematic systems and how they relate to the needs of users in rural areas, rather than by technology developments.

In the context of the action, applications are viewed as the practical use of telematic systems by the end user in performing his or her tasks. Applications are supported by a group of services, each of which provides a defined set of functions. Different groups of services are offered to users, by a service provider organisation, to support different applications. The technology which enables these services is addressed in Part IV of the specifications.

Applications must satisfy real (users') needs. Understanding these needs is fundamental to understanding the opportunities for application of telematic systems in rural areas. As past experience has shown, good applications can only be developed under real life conditions.

Both users and service providers would base most of their applications on the most advanced technologies available, but with a view to moving towards ISDN and IBC, when introduced. To maximise the potential viability of these infrastructures and technologies, particularly in rural areas, it is crucial that such services have attributes that would support applications in a way that is usable and effective. Without such service specifica-

tions, markets for service providers, operators and equipment suppliers would be unnecessarily restricted.

Services may provide a set of capabilities common to a number of applications. Equally most applications will be built on an integrated combination of suitable service functions. In addition, the service functions themselves will be implemented by different types of enabling technology which are usually, but not always, telecommunications based. To plan and implement applications in a cost efficient and technology efficient manner, allowing for continuing evolution, it is necessary to:

-define a single, consistent set of user requirements, i.e. a rural usage reference model;

-identify the types of infrastructural services needed to support the applications;

-define the functional requirements of networks and equipment necessary for service delivery;

-group these functions into common sets in order to facilitate network evolution planning

These definitions are realised in detailed specifications of services and equipment requirements, in functional reference models and in reference configurations. This reference model development will primarily adapt and extend similar research conducted under the auspices of the Specific programme on Communication Technologies (RACE II).

Part III is subdivided as follows:

III.1   Applications and Services Requirements
III.2   Reference Model Development

III.1 - Applications and Services Requirements

Issues:

Identification of user needs

What are the services and applications needs of the economic and social actors and potential users of telematic systems in rural areas?

Application areas

Clearly, if a Community action is to address the needs and preferences of rural areas, and not merely those, for instance, of telecommunications operators, industry or technology, then it must be applications driven. The key question must be how specific social, economic, and other problems facing rural areas can be eased or resolved and how the potential of rural areas can be realised by the application of telematic systems. The answer to this question, the determination of appropriate application areas, is the primary focus of the set of tasks within this part of the action.

Any examination of possible target groups must also consider if there is a hierarchy of applications introduction, e.g. would mass media type applications initiate users in rural areas into telematic systems or would closed user type applications open up this market place? Would service centres, low cost terminals, etc. be an important factor in applications use?

Tasks:

The above Issues are addressed by the following Tasks, each of which relates to a specific target group of potential users. The Tasks are described in detail in Section III, indicative timescales are shown in Figure 3.1.1.

3.1.1   Services and Applications for Public and Community Services
3.1.2   Services and Applications for Tourism and Leisure
3.1.3   Services and Applications for Rural Business Activities
3.1.4   Services and Applications for Professional and Financial Services
3.1.5   Services and Applications for Personal Services
3.1.6   Services and Applications for Distance Working

These Tasks comprise a set of in-depth studies of opportunities for new services in rural settings and for rural needs. They would involve potential users of telematic systems with services providers and equipment manufacturers in order to specify as clearly as possible the needs in rural areas for telematic systems.

These studies will take cognizance of the pilot applications funded in Part IV.3 and of the early results of Task 2.2.1, both in selecting target areas and in demonstrating telematic applications in areas where discernible gaps occur either in technology use or target sector. Applications and systems which are easily transferable and portable for demonstration purposes will be developed.

Overlap with activities in related areas of the Specific Programme of R&D in the fields of Telematic Systems of General Interest, should be avoided. However need may arise for extension of specific aspects of this activity into rural areas.

The principal objectives of this set of Tasks are:

- to systematically identify a set of potential applications of telematic systems which would provide greatest advantage from the point of view of the long term development of rural areas;

- to locate areas for application pilots, including 'packages' of services, within specific sectors, and particular application types;

- to develop telematic systems for applications demonstration.

III.2 - Reference Model Development

Issues:

Services and user equipment

The Tasks of Part III.1 would identify a range of potential applications and application areas for telematic systems. These need to be analysed in detail to identify and to specify the set of services and the type of equipment which would be required by rural users.

User and functional requirements

In order that a consistent definition of user requirements is used by equipment manufacturers, service providers and PTTs, it would be necessary to establish a

Rural Usage Reference Model. This model, based on the RACE Usage Reference Model, would act as a focus for the rural user requirements that need to be realised by the elements of the ISDN and IBC system and their associated supporting technologies which are specific to rural areas.

Similarly, a Functional Reference Model would be required which would define all the major functions re-

quired in the rural networks and user terminals. Reference Configurations would also be required to enable meaningful debate on network evolution.

Evolutionary Plan

An Evolutionary Plan would be required to encapsulate a common understanding of the evolution of rural communications from a variety of initial starting-points.

Tasks:

These Issues are addressed by the set of Tasks listed below and described in detail in Section III. Indicative timescales for these tasks are shown on Figure 3.2.1.

3.2.1   Services and Equipment Requirements and Specifications
3.2.2   Adaptation of Usage and Functional Reference Models to the Needs of Rural Areas
3.2.3   Strategies for Network Evolution Planning

Task 3.2.1 would translate the set of application areas defined by the Tasks within Part III.1 into a set of services and equipment types required by users in rural areas. It would examine each of these with regard to the functional and performance specifications that are immediately implied in the applications involved. It would generate specifications for teleservices, for user terminals and applications software, which would provide basic input information for the Reference Models of Task 3.2.2

Task 3.2.2 would adapt or create a Rural Usage and Functional Reference Model(s). Contributions to the model(s) would primarily arise from the detailed examination of target applications made in Part III.1, as analysed by Task 3.2.1, and through the experience gained from the planning and implementation of practical applications in Part III.1 and the application pilots in Part IV.3. The models would draw heavily on the output of related research and development pro-

grammes. This Task also would generate, document and maintain Reference Configurations as required for the purpose of evolution planning in rural areas.

Task 3.2.3 would define strategies for Network Evolution Planning that enable key applications in rural areas to be developed smoothly and efficiently. These strategies would cover the different aspects and the basic features of the network infrastructure, such as:

– general Network Evolution

– standards evolution (HD-MAC,....)

– technico-economic criteria for evolution planning

– user and CPN interface

– support of network planning evolution

They would also need to take into account technology trends and the need for a network capability which would permit the introduction of key applications.
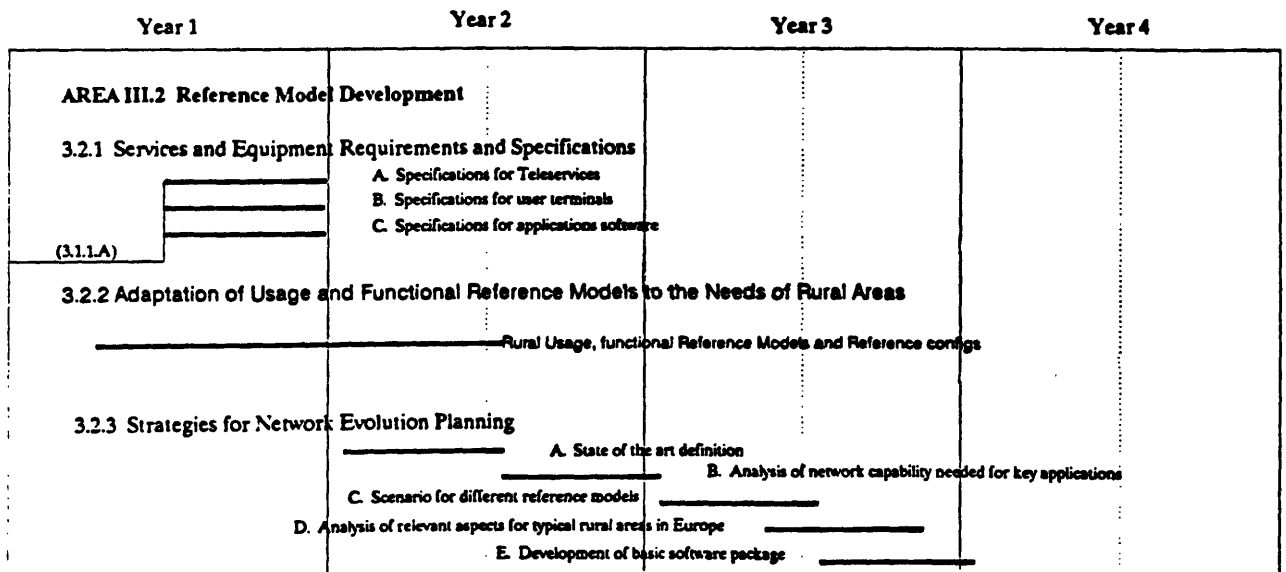
Figure 3.2.1: Timescales in Part II.2

Year 1	Year 2	Year 3	Year 4

IV.1 Technology Use or Adaptation for Rural Applications

4.1.1 Digital Switching Unit Technologies for Rural Applications
- A. Definition of technical and functional characteristics of switching unit
- B. Development of evaluation methods and algorithms
- C. Evaluation of switching technologies
- D. Adaptation or development of switching equipment

4.1.2 Digital Radio Technologies Links for Rural Applications
- A. Identification of services requirements and configurations for a number of typical rural areas in Europe
- B. Establishment of parameters for using point-to-point and point-to-multipoint radio link systems
- C. Definition and specification of suitable radio links to meet services requirements
- D. Development of key components (if needed)
- E. Pilot system for concept demonstration

4.1.3 Mobile Communications Technologies for Rural Applications
- A. Definition of the potential use of mobile technologies in rural areas
- B. Identification of best frequency bands and modulation methods for different users in the several types of areas
- C. Description of the most suitable configurations for the different types of rural areas
- D. Adaptation or development of equipment or terminals

4.1.4 Satellite Technologies for Rural Applications
- A. Identification of the technical requirements of satellite technologies for rural areas
- B. Definition of common system and technology development requirements
- C. Specification of different systems
- D. Design, build and test of prototypes for transportable/ emergency terminal etc.

Year 1	Year 2	Year 3	Year 4

IV.1 Technology Use or Adaptation for Rural Applications (Continued)

4.1.5 Rural Area Networks
- A. Identification of specific requirements in rural applications
- B. Specification of LAN architecture, including interworking components
- C. Development and demonstration where necessary

4.1.6 Optical Technologies in Rural Applications
- A. Identification of specific requirements in rural areas
- B. Specification of network functions especially suited to rural areas, including network management and QOS aspects
- C. Definition of network topology, architecture and interfaces
- D. Development, if needed, of suitable equipment
- E. Field trial selection and implementation, if necessary

4.1.7 HD-TV and Video Services Distribution in Rural Areas
- A. Review and assessment of the various technical possibilities
- B. Development of technico-economic scenarios
- C. Development or adaptation, if necessary, of required equipment

Figure 4.1.1: Timescales for Part IV.1

Part IV - Research and Development on Technology, Conduct of Pilot Applications

Part IV Overview

Part IV is concerned with the pre-normative and pre-competitive research and development activities which would be necessary to develop or test the technology requirements of rural areas. It would focus particularly on the need to provide technology, systems, networks and software to implement real life applications for users in rural areas and would concentrate on areas for which potential markets have been identified in Parts II and III.

Parts IV.1 and IV.2 lists the technologies which are perceived to be particularly relevant to rural areas requirements and where research and development may have to be undertaken. As this initiative progresses, and as early results emerge from the pilot applications and demonstrations, new technology requirements which have discernible markets may also be identified.

All pre-normative and pre-competitive research and development activities, where possible, would be undertaken under the framework of related research and development programmes such as RACE and ESPRIT.

The pilot applications envisaged in Part IV.3 will reflect the technology and systems requirements of the Specific Programme in Communications Technologies (RACE II) and will be conducted under the aegis of that programme. These pilots will further pin-point areas where unique or adapted technology is required specifically tailored to rural areas needs. The demonstrations envisaged in Part III.1 will address areas and services not directly addressed in this part.

Hence most of the tasks specified in Part IV are included *pro memoria*, both to ensure exploitation and where necessary to activate at a later stage.

Part IV is subdivided as follows:

IV.1:   Technology Use or Adaptation for Rural Applications
IV.2:   User Equipment and Software for Rural Areas
IV.3:   Pilot Applications of Telematic Systems in Rural Areas

IV.1 - Technology Use or Adaptation for Rural Applications

Issues

Suitability of available techniques and equipment

Telematic systems involve a wide range of technologies. Which of these are considered to have greatest potential

for use in rural areas? Are the existing or forthcoming techniques and equipment usable, or adaptable for use, in rural areas and what must be done to ensure this?

Tasks:

The Tasks envisaged within Part IV.1 would investigate the possibilities of using, or the need to adapt, existing or forthcoming technology for rural areas. They are described in detail in Section IV, Task 4.1.5 is described in Section III. Indicative timescales for the major activities within these Tasks are shown in Figure 4.1.1.

4.1.1   Digital Switching Unit Technologies for Rural Applications
4.1.2   Digital Radio Technologies Links for Rural Applications
4.1.3   Mobile Communications Technologies for Rural Areas
4.1.4   Satellite Technologies for Rural Applications
4.1.5   Technology Requirements for Rural Area Networks
4.1.6   Optical Technologies in Rural Applications
4.1.7   HD-TV and Video Services Distribution in Rural Areas

Task 4.1.1 would evaluate the suitability of existing and forthcoming switching equipment for applications of telematic systems in rural areas. It would define and specify, as required, features, units or modules which need to be modified or designed in order to meet the requirements of rural areas.

Task 4.1.2 would study the requirements for services in rural areas and the configurations involved in order to decide which radio systems and equipment are likely to meet the requirements of different types of rural area.

Task 4.1.3 would adapt and introduce new characteristics and performance to mobile networks and systems to facilitate the introduction of mobile communications technology in rural areas and give access to as many as possible of the services available in the core regions. This adaptation is likely to be different - not only in terms of equipment characteristics, but also in types of system configurations and services - for different types of rural area.

Task 4.1.4 would aim to extend the facilities offered by GSM (Group Special Mobile), without geographical constraints, by using mobile satellite services. These would include essential telephone communications with access to the PSTN, data channels for paging, hardcopy messages, navigation and slow-scan video for maps, photographs, X-rays, etc. It would also identify requirements for satellite systems which incorporate

knowledge data bases and expert systems to be used as a broadband communications link during disasters, etc. A further activity would be to study the extension to existing/future satellite links of the two way radio data transfer link for messages, educational purposes, transactions, etc..

Task 4.1.5 would identify technology requirements for networks that are specific to rural areas, communication properties that are specific to rural applications and interworking scenarios that are possible and probable.

Task 4.1.6 is intended to study and evaluate the possibility of using optical communications in rural areas.

The specification and implementation of solutions in various geographical, administrative and technical surroundings would be studied to evaluate the technical benefits of such an application. This would lead to identification of the required technological complexity as well as to an estimate of the associated costs. Finally, the interfaces of the rural networks with the main public network and with the user would be defined.

Task 4.1.7 would assess, propose and develop or adapt solutions which meet the needs of rural areas for the distribution of HD-TV and video services for such purposes as entertainment, education, healthcare, etc.

IV.2 - User Equipment and Software for Rural Areas

Issues:

Intelligent interfaces

User requirement specifications for various application areas would be identified in Part III. From these broad specifications more detailed studies of user and task requirements would be required in order to build interfaces to the various applications envisaged. The usability of these application interfaces will be of great importance in circumstances where the users are unfamiliar with applications of telematic systems or have special needs, require access to knowledge based systems, and particularly where they have discretion in the use or non-use of the application.

Many systems have fallen into disuse because the application interface was not easy to use and understand. A

considerable amount of information is available on the design of usable interfaces for particular applications. What interfaces, tools and techniques are available to aid the service provider in achieving product usability?

Multimedia databases

How will the emerging multimedia technologies be used in a rural context? How will they interface with or complement communications technologies? Is there requirement for technology adaptation?

Network management

What kind of management would be necessary in the decentralized network which is envisaged?

Tasks:

The above Issues would be addressed by the following Tasks which are described individually in Section IV.
Indicative timescales for these Tasks are shown in Figure 4.2.1.

4.2.1 Intelligent Interfaces for Rural Users
4.2.2 Multimedia Database Services for Rural Application
4.2.3 Network Management Tools for Rural Areas

Task 4.2.1 would define the adapted interface between the people who would use telematic systems in rural areas and the equipment envisaged. The technologies used would include voice recognition and synthesis and would allow interaction in the language of the user. The Task would cover the adaptation or development, test and evaluation of an appropriate intelligent interface for rural users of applications of telematic systems.

The task would also identify what kind of knowledge based systems are needed to support such services as distance learning, rural medical support or consulting systems for rural users.

Task 4.2.2 would study and define the use of multimedia database systems which are specifically oriented to the needs of rural areas. It would study the architectures of such systems with the aim the aim of identifying the common basic subparts. A pilot system would be adapted/developed, using the defined architecture, to support an application.

Task 4.2.3 would investigate how the Telecommunications Management Network (TMN) concept developed in RACE for IBC management (co-ordinated by the R1003 GUIDELINE project) can best be applied or adapted in rural networks, especially with respect to cost and standardisation.

Year 1	Year 2	Year 3	Year 4

IV.2 User Equipment and Software for Rural Areas

4.2.1 Intelligent Interfaces for Rural Users
    A. Specification of basic characteristics of interfaces for rural users
    B. Development of sample interface, if necessary
    C. Evaluation report on field tests
    D. Guidelines for network operators, software and services producers and equipment manufacturers

4.2.2 Multimedia Database Services for Rural Applications
    A. Report on the state of the art and on the supported databases
    B. Analysis and specification of generic architecture
    C. Development and trial of a pilot system

4.2.3 Network Management Tools for Rural Areas
    A. Initial report on techniques, standards and architecture for rural TMN
    B. Technical analysis of TMN specifications
    C. Recommendations on architecture and interfaces for rural TMN
    D. Recommendations on techniques for rural TMN
    E. Final set of recommendations, guidelines and standards for rural TMN

Figure 4.2.1: Timescales for Part IV.2

IV.3 - Pilot Applications of Telematic Systems in Rural Areas

Issues:

Pilot Applications

Work conducted in the context of RACE has identified technologies which can be used to provide advanced communications in the rural areas of the Community. How will these advanced communications technologies be used in applications in rural areas?

Tasks:

Task 4.3.1 addresses these Issues and is described in Section IV, indicative timescales are shown on Figure 4.3.1.

Task 4.3.1 Pilot Applications

Task 4.3.1 would encompass a range of Pilot Applications, which would be selected, following a "call for proposals", conducted under the aegis of the RACE II workplan.

Each pilot application, ideally, would:

- Demonstrate and evaluate the manner in which applications of telematic systems can significantly contribute to social, economic and cultural development, and aid the resolution of problems facing different types of rural areas.

- Demonstrate and evaluate the technical and techno-economic adequacy of technologies developed

or adapted for use specifically to address characteristics of different types of rural areas - such as dispersal of users, terrain difficulties, etc.

- Identify genuine obstacles hindering the use of applications of telematic systems in rural areas.

- Test the response of rural users to telematic systems based applications.

- Determine best priorities for the introduction of applications of telematic systems in rural areas.

Year 1	Year 2	Year 3	Year 4

IV.3 Pilot Applications of Telematic Systems in Rural Areas

4.3.1 Pilot Applications

Pilot applications will provide:
   A. Concrete examples of the use of telematic systems to promote rural development
   B. Generally applicable experience concerning the use of telematic systems in rural areas.

Figure 4.3.1: Timescales for Part IV.3

Part V - Infrastructure Planning and Implementation Strategies
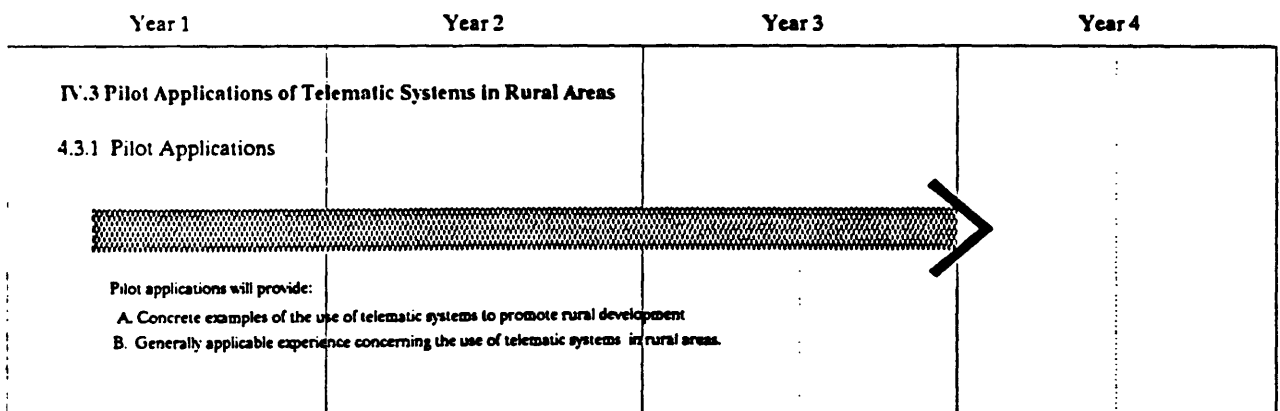
Part V Overview

Part V prepares for the subsequent implementation of telematic systems infrastructures based on experience gained during the earlier Parts. It draws on the output of Part II for source data and typologies and on the experience gained with the pilot applications in Part IV of the action.

Mechanisms for ensuring harmonised infrastructure developments and for cost sharing between the private sector, national/regional bodies, network operators and the Community need to be investigated. Work of a preparatory nature needs to address the development of implementation assessment tools and strategies for the harmonised introduction in rural areas of an telematic systems infrastructure. Criteria for priority actions need to be established.

Part V is subdivided as follows:

V.1: Information on Rural Areas and Related Telematic Systems Aspects
V.2: Strategy for Telematic Systems Implementation in Rural Areas
V.3: Policy Issues and Community Involvement in Telematic Systems Implementation in Rural Areas

V.1 - Information on Rural Areas and Related Telematic Systems Aspects

Issues:

Existing programmes

What is the current situation with regard to telematic systems in regional development programmes and development plans? How can the Community actions assist the process and benefit from the experience?

Existing infrastructure

The setting-up of infrastructure and services for telematic systems in rural areas is generally more expensive than in urban areas. The different countries of Europe have approached this situation in different ways and have developed their rural infrastructures to different extents. In developing a strategy for rural areas it will be important to know the current and planned infra-structures and services of the different countries and the reasons for the differences between them.

Structuring the information sources for strategic planning.

Part II of the action would establish the typologies and collect the basic information on developments in telematic systems relevant to rural areas. This background information and data, combined with Tasks 5.1.1 and 5.1.2, could create the information base which is necessary for planning new initiatives in rural areas. How can this be structured into a working tool for infrastructure and strategic planning?

Tasks:

The Issues identified above are addressed by the following Tasks which are described in Section IV:

    5.1.1   Existing Regional Programmes and Development Plans
    5.1.2   Existing Infrastructure, Services and Plans for Telematic Systems in Rural Areas
    5.1.3   Structuring the Information Sources for Strategic Planning

Indicative timescales for the major activities within these Tasks are shown in Figure 5.1.1.
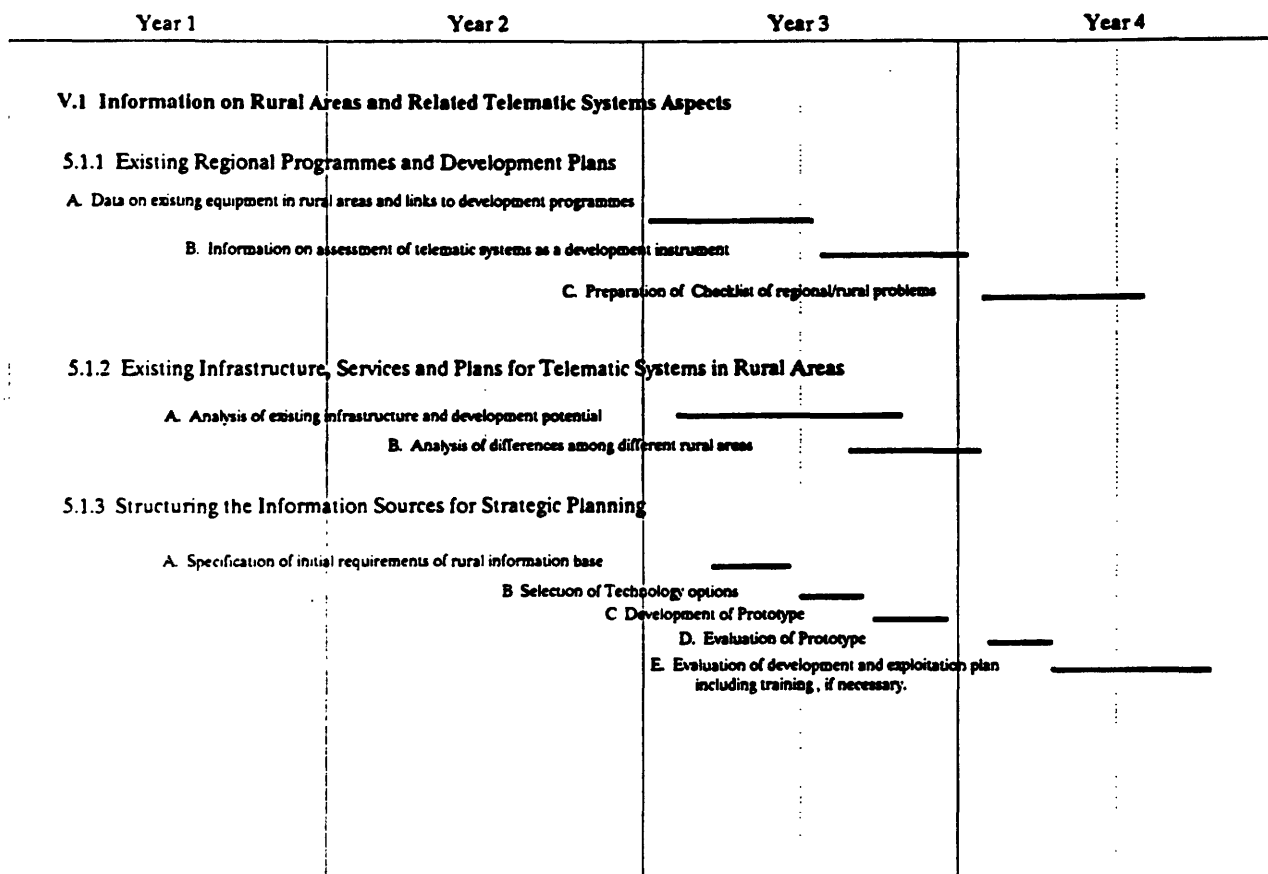
Figure 5.1.1: Timescales for Part V.1

Task 5.1.1 would collect information on whether, and to what extent, telematic systems are considered as instruments for regional development in national or regional development programmes and plans.

Task 5.1.2 would analyse the present and future infrastructure, services and plans for telematic systems in different rural areas within the Community. It would classify them so as to identify what steps are taken in each particular case, what different techniques are employed and what experience in this field and in applications exists in the different countries. It would analyse existing differences in infrastructure and services for telematic systems among rural areas with similar characteristics in order to understand the reasons for such differences.

Task 5.1.3 would develop and implement a data-base of European rural information, to contain such aspects as:

- geographical and socio-economic descriptions of rural areas;

- the telematic systems networks and services within these areas;

- maps of the various types of networks;

- lists of services and applications;

- information on service providers, network operators and equipment manufacturers;

- management information.

This information base would extend the database developed by Task 2.2.2, to include information provided by the Tasks in Part V. It would be used as the basis for the reliable and consistent source of information which is necessary for the planning of new initiatives in rural areas.

V.2 - Strategy for Telematic Systems Implementation in Rural Areas

Issues:

Decision support tools

Strategic decisions on telematic systems implementation in rural areas must take into account such aspects as the characterisation of the rural areas which resulted from the research of Part II, the applications and reference models resulting from activities in Part III and the technology choices from Part IV.

The complexity involved in correlating services with technology and optimization of the infrastructures for the geographical, demographic and socio-economic environment of rural areas would require the availability of further modelling support and strategic planning tools.

What are the tools necessary to support the decisions which would have to be made on implementing telematic systems in rural areas.

Selection of target areas

The availability of services based on telematic systems is a key factor in the economic and social development of rural areas, but is not the only one. The impact of telematic systems depends on their interaction with other activity sectors and their implementation on some basic infrastructure. There must be coordination of these factors.

One of the main issues in planning the implementation of telematic systems services to achieve maximum impact is an appraisal of the specific features of rural areas, identifying in particular their existing infrastructures and potential for development.

It would be necessary to identify which criteria are likely to be most relevant in selection of target rural areas for telematic systems services implementation.

Technology selection

A range of possible telematic systems for use in rural areas would result from the Tasks described in Part IV.

It would be necessary to identify criteria for the selection of the technologies that are most suitable for different applications and network configurations in order to focus research and to assess infrastructure proposals for rural development. That selection would obviously depend, to a large extent, on the services to be provided and on the particular conditions of the rural area.

Applications selection

Task 2.2.1 will make a synthesis of current experience of using telematic systems in rural areas, from the point of view of applications and services. It would cover the results from existing activities and the emerging conclusions from new research and development activities.

In order to select basic telematic systems infrastructures for rural development, criteria would be needed for the selection of the basic set of applications and services to be provided in a particular type of rural area.

Scenarios

A set of coherent scenarios would be required which bring together many diverse elements. Telematic systems infrastructures need to be implemented over regions of different characteristics, starting from different technological bases. They may be implemented by different institutions with different resources. The starting times may be different. Many different concurrent events and developments must be accommodated.

These scenarios would include alternatives and also particular scenarios appropriate to particular circumstances or groups or institutions. Some scenarios may suppose particular organisations being instituted for specific purposes. What scenarios should be developed with regard to the various types of rural areas ?

Tasks:

These Issues are addressed by the following Tasks, which are described in Section IV.

5.2.1   Modelling Support for Telematic Systems Strategies for Rural Areas
5.2.2   Criteria for Selecting Technologies, Rural Areas and Applications
5.2.3   Development of Scenarios and Implementation Plans

Indicative timescales for the activities within these Tasks are shown in Figure 5.2.1.

Year 1	Year 2	Year 3	Year 4

V.2 Strategy for Telematic Systems Implementation in Rural Areas

5.2.1 Modelling Support for Telematic Systems Strategies for Rural Areas

    A. Selection of models for services, technologies and rural environment

    B. Specification of initial requirements specification for the planning computer tools

    C. First prototype of the computer tools

    D. Specification of proposed interface with the rural information base

    E. First version of computer tools

    F. Agreement of conditions of exploitation

    G. Installation in relevant places

    H. Training of users

5.2.2 Criteria for Selecting Technologies, Rural Areas and Applications

    A. Selection of a set of significant technical, economic and infrastructural parameters

    B. Creation of techno-economic tools

    C. Draft definition of selection criteria

    D. Application of criteria to set of R.A.s in different countries

    E. Analysis of application of criteria using rural information base data

    F. Proposed criteria for selecting applications, technologies and target rural areas

5.2.3 Development of Scenarios and Implementation Plans

    A. Definition of initial set of scenarios

    B. Assessment of impact on industry and regional development

    C. Development of scenarios with contingent branches for each actor

    D. Preparation of mission statements and timescales for some actions

    E. Proposed set of scenarios for implementation of infrastructures in specific rural areas
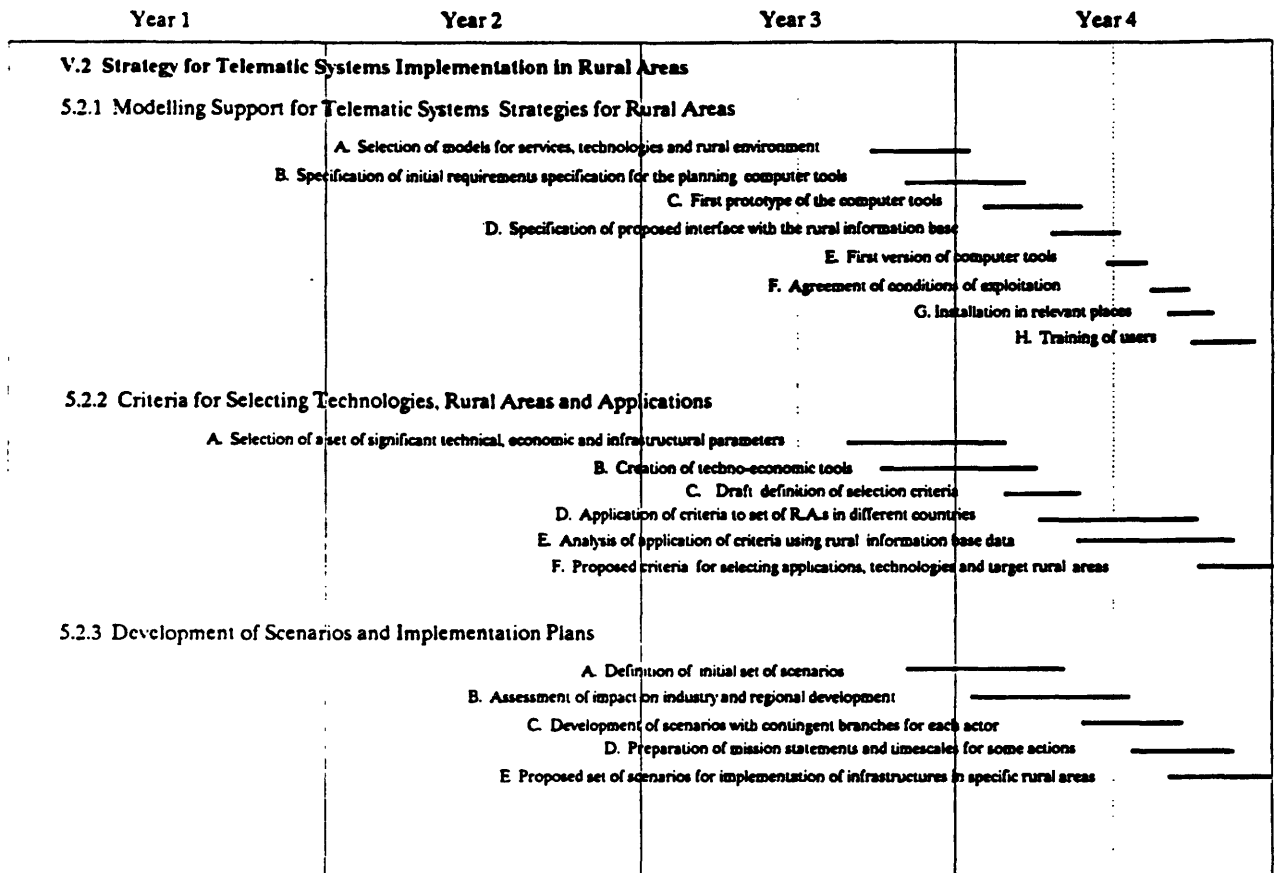
Figure 5.2.1: Timescales for Part V.2

Task 5.2.1 would create a modelling system for the significant parameters of the rural areas and develop strategic planning (computerised) tools for architectural choices, technology decision, network planning and sizing to be used in real situations.

Task 5.2.2 would identify a set of features to provide the criteria for a correct and objective selection of; target areas, relevant applications and services that should be provided in rural areas, and suitable technology for such applications and services. This would take into consideration such factors as reliability, robustness, maintainability, relevance and cost effectiveness.

Task 5.2.3 would develop suitable scenarios for the implementation of telematic systems infrastructures in the target rural areas of Europe. They would be available for use by decision makers and planners at different levels and in different circumstances. The scenarios would take into account the various criteria and integrate information on trends, policies, needs and goals.

These scenarios would include means of ensuring that services actually develop on the infrastructures. They would propose clear mission statements and timescales for the specific actors involved in the implementation.

V.3 - Policy Issues and Community Involvement in Telematic Systems Implementation in Rural Areas

Issues:

Regulatory constraints

The regulatory environment for telecommunications equipment and services within Europe is undergoing rapid change in terms of market-liberalisation, standardisation and the evolution of a common Community-wide approach.

The precise implications for rural areas, where these can be specifically identified, need to be documented and analysed in order that Community action can keep in step with changes, mitigate possible negative effects and exploit benefits. For example, restructuring of tariffs to precisely reflect the cost of service provision after 1992 has potential disadvantages for rural areas.

What are the regulatory constraints to the provision of telematic systems in rural areas and how to solve them?

Policy criteria for selecting rural areas

The term "rural" does not automatically define a fully determined set of regions, nor does it indicate the areas most open to improvement. Different action lines would require different definitions and criteria for the selection of areas of operation.

In addition to the technical criteria defined in the Tasks of Parts V.2, what other policy or criteria should be considered in selection of the target rural areas?

Scenarios and financing

The implementation of telematic systems infrastructures in rural areas poses a problem with respect to the potential return on the required investment in infrastructures. The small size of the market, the high costs of infrastructure implementation and the level of purchasing power of the population may make investment in these areas unprofitable from the financial viewpoint of PTTs and thus unattractive to service operators.

On the other hand, in most cases, national authorities are not yet sufficiently convinced of the important role that telematic systems can play in economic and social development. In their regional development plans, national governments have usually given priority to other kinds of infrastructure, such as roads, railways and energy supply and distribution.

There is a need to identify how the various scenarios defined in Task 5.2.3 could be financed.

Community involvement in the implementation phase

What should be the involvement of the Community in advanced infrastructure implementation?

If the research is successful and assuming that there would be the willingness to apply the results to a selected set of rural areas in Europe, it would be necessary to study in advance the various options and mechanisms for Community, national government, local government and private sector involvement and management in future actions.

Assessment of results

Monitoring and evaluation of the implementation of the research and development would be necessary for a number of important reasons. Because of the complex nature of the action, it is unlikely that an existing methodology for evaluation would be adequate. It is therefore expected that a method would have to be developed which would address the points which are of special significance.

Tasks:

These Issues are addressed by the following Tasks which are described in Section IV.

5.3.1	Regulatory Constraints on the Provision of Telematic Systems in Rural Areas
5.3.2	Policy Considerations in Selecting Target Rural Areas
5.3.3	Financing Scenarios for Implementation
5.3.4	Management Scheme for Community Involvement
5.3.5	Development of Assessment Criteria and Mechanisms

Indicative timescales and the major activities within these Tasks are shown in Figure 5.3.1

Year 1	Year 2	Year 3	Year 4

V.3 Policy Issues and Community Involvement in Implementation in Rural Areas

5.3.1 Regulatory Constraints on Provision of Telematic Systems in Rural Areas

    A. Evaluation of impact of regulatory constraints on the provision of facilities in R.A.s

    B. Proposed set of alternatives according to different regulatory situations in Europe

    C. Suggestions for Community action

5.3.2 Policy Considerations in Selecting Target Rural Areas

    A. List of considerations (CEC, National, Regional and Local)

    B. Draft definition of selection considerations

    C. Application of the considerations to set of rural areas in different countries

    D. Proposed policy considerations

5.3.3 Financing Scenarios for Implementation

    A - B. Draft definitions of financing methodology, scenarios and criteria

    C. Application of financing criteria to set of R.A.s in different countries

    D. Proposed set of scenarios and criteria for financing in R.A.s

5.3.4 Management Scheme for Community Involvement

    A. Development of overall management framework

    B. Testing of systems for assessment and evaluation

    C. Selection of project management support software

    D. Establishment of financial control system

    E. Proposal for management scheme for Community involvement in implementation in specific R.A.s

5.3.5 Development of Assessment Criteria and Mechanisms

    A. Identification of criteria for assessment

    B. Identification of information requirements and sources

    C. Development of organisational structure
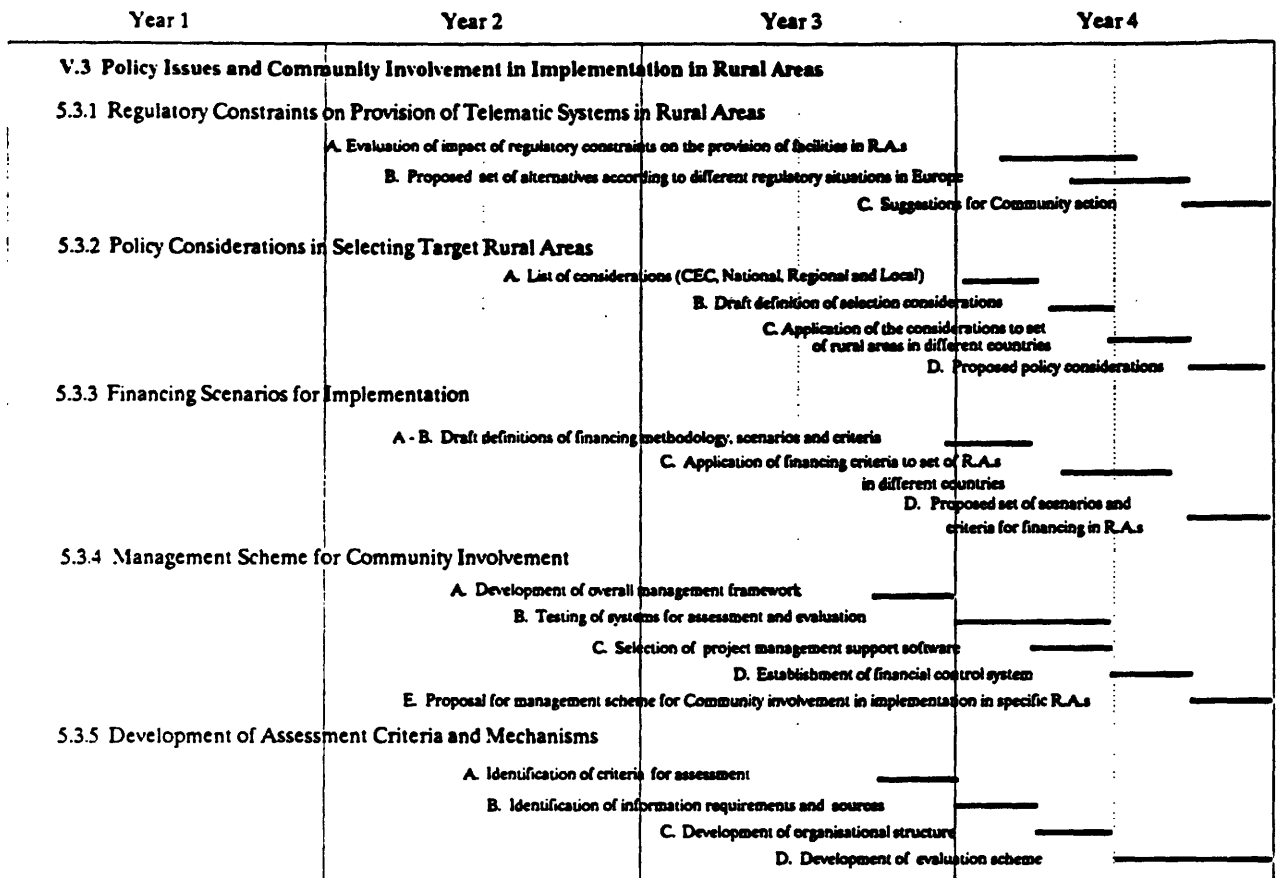
    D. Development of evaluation scheme

Figure 5.3.1: Timescales for Part V.3

Task 5.3.1 would investigate the regulatory regimes (both national and international) governing the provision of telematic systems in rural areas and study possible solutions to overcome the present regulatory constraints.

Task 5.3.2 would propose policy criteria for selection of the target rural areas and ensure that the proposed criteria reflect the major Community related policies in other areas such as agriculture, social, employment and SME's.

Task 5.3.3 would propose financing scenarios that are based both on market pricing or cost and on possible forms of subsidy in order to prevent rural areas being disadvantaged compared with urban areas.

Task 5.3.4 would establish a management scheme which would support harmonious infrastructural development of telematic systems in rural areas. It would develop a system for continuous review and revision of the criteria for Community support particularly in the context of the Single Market. It would define a system for the continuous evaluation of Community actions and develop the tools and instruments to assess the technological models and means employed.

Task 5.3.5 would develop a method for monitoring and evaluating the subsequent implementation of telematic systems infrastructures.

SECTION III

TASK DESCRIPTIONS

(Priority Tasks)

Task No. 1.1.1: Organisation of Concertation

Related Tasks or other work:

Inputs from: All Tasks in Parts II and V;

All Tasks in Parts III.1, IV.2, IV.3

Rural development organisations; Rural communities; Consumer groups; Regional and National government organisations; other Community programmes; PTTs; Service providers; Equipment manufacturers; Etc..

Results to: All Tasks in Parts II and V;

All Tasks in Parts III.1, IV.2, IV.3

Rural development organisations; Rural communities; Consumer groups; Regional and National government organisations; other Community programmes; PTTs; Service providers; Equipment manufacturers; Etc.

Background:

The telematic systems needs of different rural users vary enormously; from those of the small farmer, or one-person business, to those of the large corporation with an international dimension. Rural areas need better health care and better educational, shopping, banking, entertainment and transport facilities.

In the context of a rural telecommunications infrastructure, Europe-wide standards which are compatible across sectoral boundaries are becoming more important and necessary with technology evolution. Changes in technology continue at a rapid rate and make a range of network options available. However choice of different technology options will be influenced by the demand for specific services and applications and will depend ultimately on the nature and scope of different user needs in specific rural areas. It is important that future communications infrastructures in rural areas should support the needs of end users and that the services which they deliver should have flexibility, choice and value for money. Equally, it may be necessary to encourage the collaborative use of technologies and services within the local community, in order to justify investment in infrastructure.

If telematic systems are to play a major support to the development of rural areas, a mechanism must be provided for involving a diversity of groups and organisations active in rural development, from the local to the European level, in a concertation process with telecommunications authorities, equipment manufacturers, service providers and user groups, in order to exchange views and agree on general requirements and priorities. Only in this way will there be a coherence of European effort and a proper focusing of technology and service developments in telematic systems for rural areas.

Examples of relevant groups may extend from statutory development agencies to local voluntary associations, co-operatives etc. Existing organisations in the economic, social and administrative sectors can provide a basis for setting up a mechanism for worthwhile interaction between rural communities and regions with

similar telematic systems needs from the local to the European level.

The management and organisation of a co-ordination and consensus development mechanism will need careful planning to incorporate a multiplicity of groups/organisations as well as a diversity of languages and cultures. Consequently a de-centralised approach to consensus development and information exchange will be required.

Objectives:

- To develop and manage in a de-centralised way, where possible using telematic systems, a consultation and consensus development mechanism which links the contribution of telematic systems to rural development.

- To provide opportunities for rural communities and users to talk directly to decision-makers in the information and communications industry, PTTs and service providing organisations; in order to encourage the evolution of rural communications infrastructures which will satisfy users demands and needs and improve the provision of services e.g. home working, distance learning, social services, etc. through such co-ordination and concertation.

- To develop a consensus on general requirements and priorities in relation to telematic systems.

- To organise the collection, exchange, and synthesis of information from rural communities on their needs and experiences in relation to telematic systems.

- To organise the dissemination to rural communities of information on on-going and proposed rural applications of telematic systems.

- To undertake promotional activities related to telematic systems for selected target groups in rural areas.

Technical approach:

Provide a de-centralised consultative mechanism whereby representatives of existing social, economic and administrative authorities, end users and other target groups can discuss their views and needs with service providers, with the ultimate objective of improving telematic systems services to rural areas.

In the development of a consensus and co-ordination mechanism existing organisations - administrative, economic, social and cultural - should be used wherever practicable to ensure efficient and effective use of resources.

The co-ordination and consensus development mechanism must involve a high degree of de-centralisation. Meetings at various levels must be held to take account of the local and regional diversity within the Community. It will be necessary to ensure that co-ordination between similar rural areas in different Member States takes place.

Information must be collected and disseminated, to a range of users, in the appropriate language of the regions involved and with due regard to their level of awareness and knowledge of telematic systems. This may eventually require the establishment of information centres, help desks or observatories in Member States or specific rural areas.

Multilingual communication may be necessary to ensure the coherence and consistency of Community action.

Key Results and Milestones:

A. Definition of the co-ordination and concertation mechanism for development of and over-seeing the Task (Month 3).

B. Identification of potential local and regional contacts and co-ordinators in all Member States (Month 5).

C. Finalisation of the representative set of rural communities, organisations and other contacts to be involved (Month 6).

D. Complete preparation and dissemination of a first set of information about telematic systems applications in rural areas, tailored to each area (Month 6).

E. First of the regional co-ordination meetings (Month 6), to be scheduled on a quarterly or six-monthly basis thereafter.

F. Specification of monitoring procedures and feedback mechanisms (Month 12).

Timing Constraints:

A prompt start is essential.

The mechanism must operate throughout the Community action with participation of all Member States in a consistent and continuous way.

Mode of Implementation:

Accompanying measure.

Task No. 1.2.1: Project Co-ordination

Related Tasks or other work:

Inputs from: All projects in the Community action.

Results to: All participants in the Community action.

Standardisation bodies

Background:

The primary aim of the Community action is to establish a Europe-wide consensus on the technological basis for harmonised applications of telematic systems in rural areas.

In order to achieve this, a series of Tasks are proposed aimed at identifying the rural needs and potential applications and at specifying the infrastructure and services requirements. Many of the Tasks are closely integrated and interdependent. Critical deliverables which are not delivered on time to other Tasks may adversely affect the overall effort. This gives rise to the need for co-ordination of deliverables and schedules with information requirements and for monitoring the achievement of these throughout the action.

During the execution of the action there is also a need to identify apparent gaps or overlaps in the research and development activities which may result from the emergence of unforeseen requirements or the occurrence of unexpected events.

Resolution of difficulties which may arise from non attainment of project timescales or from unforeseen causes may require the achievement of a consensus not only of the project managers most directly concerned but also involving local/regional co-ordinators, local users, infrastructural and service providers, etc.

Each of the foregoing situations requires that appropriate and co-ordinated actions are agreed between the project managers of two or more projects.

In addition standardisation is of major concern in all European programmes. Systems and equipment developed or adapted under the Community action must work together in appropriate system architectures. Common interworking standards are essential for integrated networks.

Objectives:

- To co-ordinate and monitor the production and use of critical deliverables from each of the projects;

- To identify apparent gaps and overlaps which may arise;

- To achieve a consensus on the appropriate actions to be taken to overcome problems which arise together with the necessary commitments to their implementation by the projects involved.

- To ensure that European standards, whenever they exist, are applied within all tasks related to the Community action.

- To ensure that, where relevant, results from the Community action are converted into a form which is suitable for proposals leading to European and international standards.

Technical Approach:

It is envisaged that this Task will be undertaken by a project co-ordination team which is independent of any other project consortium and which will work in close collaboration with the European Commission.

It is expected to use relevant telematic systems in co-ordination and to provide a high degree of visibility to activities within the Community action. In particular, it will implement effective procedures for "flagging" problem projects.

Tasks that lead to the definition of pre-standards have to be put forward and discussed with European and International Standardization bodies (ETSI, CEN/CENELEC, EBU, CCITT, CCIR).

Key Results and Milestones:

A. Development and maintenance of a research and development plan identifying critical projects and project deliverables.

B. Monitoring activities and deliveries of projects against this plan and initiating actions aimed at correction of any potential or actual divergence from that plan.

C. Preparation and distribution of regular reports on status of the action, based on regular reports from the individual projects.

D. Monitoring standardization aspects on an on-going basis.

Timing Constraints

Must start at beginning of the action and continue throughout.

Mode of Implementation:

Accompanying measure.

Task No. 2.1.1: Typological Mapping of Rural Areas in the European Community

Related Tasks or other work:

Inputs from: Tasks in Part III.1.

Regional, National and other sources, e.g. ESA.

Results to: Tasks in Parts IV and V

Background:

Information on the frequency of occurrence and distribution of different types of rural area in the Community is essential to the assessment of the market for specially adapted equipment or systems and services. This information is also needed to assess the degree to which there could be a common Community interest in harmonised development of telematic systems in specific types of rural areas, if they exist in all Member States.

Objectives :

- To map the occurrence of different types of rural areas throughout the Community.

- To compare and contrast the occurrence of specific types of area with the occurrence of areas with different levels of telematic systems usage.

- To assess aggregate parameters for each type of rural area in the Community and to estimate potential market size for equipment and service provision in telematic systems in each type of area.

Technical Approach :

Develop a strategy for indicative mapping that makes maximum use of existing sources of information (e.g. census reports, satellite images) from national, regional and other bodies.

Establish good working relations with national population census offices, with national and regional cartographic organisations and with the regional planning offices of telecommunications network operators.

The typology, or categorisation scheme, developed as part of the preliminary work in Part II.1 should be used as the basis for mapping.

Prepare maps in digest form for computer analysis and in convenient and attractive hard-copy form for wide dissemination.

Assess market potential within the Community for specially adapted equipment and services for different types of rural area, in close consultation with appropriate industrial associations, service provider groups, drawing on the information gathered in Task 2.2.1 and the work of Part III.1.

Key Results and Milestones :

A. A report on the strategy for indicative mapping, identifying information sources that will be used (Month 3).

B. A database and maps of the occurrence of different types of rural area (Month 12).

C. A critical analysis of the comparison between the occurrence of different types of rural area and the different levels of usage of telematic systems (Month 15).

D. A report of an assessment of the market potential in each type of rural area for specially adapted telematic systems equipment, services and selected applications (Month 18).

Timing constraints :

Start of the work is dependent on the timely completion of certain aspects of the preliminary work on characterisation of rural areas.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 2.1.2: Development of Reference Models of Key Types of Rural Areas

Related Tasks or other work:

Inputs from: Task 2.1.1., RACE programme

Results to: Tasks in Parts I, III and IV

Background:

The development of special equipment and services for different types of rural areas will need stable reference models which match the typology developed and which cover the range of types of rural areas widespread in the European Community.

A reference model may need to include information about:

- Geographical features;

- Population distribution patterns;

- The distribution and type of economic, social and cultural activity;

- Patterns of usage of telematic systems and trends for the future.

Objective:

• To develop a set of socio-economic and socio-geographic reference models for the types of rural areas widespread in the Community, using the categorisation scheme used in Task 2.1.1, to guide equipment, system and service development of applications of telematic systems for key types of rural area.

Technical Approach:

Consultation with rural development agencies, PTTs, equipment manufacturers and service providers about what needs to be included in a practical reference model, particularly the level of illustrative detail.

Preparation of drafts in an easily usable form, with clear indications of how the models relate to the categorisation scheme.

Organisation of review and consensus development of drafts.

Production of easily usable, stable, versions of Reference Models, in close collaboration with on-going work in the RACE programme.

Key Results and Milestones

A. A report on the requirements of all interested organisations for reference models (Month 6).

B. A report on the selection of appropriate reference areas and the development of hypothetical reference specifications if necessary (Month 9).

C. Draft reference models (Month 12).

D. Stable reference models (Month 18).

Timing constraints:

Depends on input from Task 2.1.1.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 2.2.1: Analysis of On-going Rural Development Projects involving Telematic Systems Use

Related Tasks or other work:

Inputs from:

Rural development organisations; Regional and National government organisations; other Community programmes, e.g. STAR, TELEMATIQUE, IMPACT, LEADER; Equipment manufacturers, PTT's; Etc.

Results to: Tasks in Parts III.2, IV.3, V;

Other Commission Services, e.g. DG VI, DG V-A, Task Force on Human Resources; Rural development organisations; Rural communities; Consumer groups; Regional and National government organisations; PTT's; Service providers; Equipment manufacturers;

Background :

A variety of experiments and projects involving telematic systems use in rural areas have been undertaken in Member States of the Community and in other countries. The scope of such experiments has covered distance-learning, distance-working, tele-shopping and the use of shared telecommunications in "telecottages". The success of some of these initiatives has depended on factors such as the availability of; low-cost end-user terminals, intelligent interfaces, integrated network infrastructures or simplified billing (KIOSK) facilities etc. Other non-technical factors such as the emergence of closed user groups, of "trigger products", of suites of related services (applications) or the motivation of local opinion leaders or entrepreneurs may also be relevant.

An analysis of the effects, failures or successes, of these experiments and initiatives will be of value in identifying the elements or characteristics of the services and the common elements of "good practice" that have the potential to ensure the success of future telematic systems applications in rural areas.

Objectives:

- To analyse on-going projects involving the use of telematic systems in rural areas in order to:

    - identify the elements or characteristics which could influence the success or failure of future applications of telematic systems

    - identify the characteristics of "trigger" products, envelopes of services or closed user groups, that could initiate the use of applications of telematic systems in rural areas.

- To identify the common elements of "good practice" necessary for the introduction of telematic systems applications within rural communities by the major public and private-sector organisations involved with telematic systems in rural development.

Technical Approach :

A comprehensive compilation of information about both public sector and private-sector projects and programmes should be made, using national government, regional and industry contacts.

A representative set of projects relevant to the Community action should be selected for in-depth review. An analytical framework should be set up for assessment of the success of projects, both in the context of technical performance and in the context of their contribution to rural development. The tools, methodology and indicators identified in preliminary work in this area will also be relevant.

The analyses must take into account a variety and diversity of projects in different types of rural areas in order to provide a sufficiently broad overview of the barriers to use and the elements that could influence the success of telematic systems applications in rural areas.

Empirical field research should be carried out in selected areas in order to provide a basis for comparison of different approaches to the introduction of telematic systems services and applications.

The elements that influence the success of applications of telematic systems should be identified from the comparison of initiatives which have had differing degrees of success. It will be important to focus on unintended and unexpected benefits and detriments, as well as on benefits which have been planned.

The work must also address "good practice" issues related to public policy initiatives and to commercial and market development.

A wide range of examples of current good practice in the application of telematic systems in rural areas should be collected and compiled together with the opinions and views of rural communities, administrators, service providers and users in specifically targeted contexts and areas. A structured comparison and assessment of common aspects regarded as good practice should be produced. It should highlight innovatory

approaches where appropriate comparisons are not possible.

An important output of this research will be the details on projects, market development issues etc., which will be made available to actual and potential funders, users, producers and consumers of advanced telematic systems services in rural areas. Consensus development on different issues if necessary, should be managed in close collaboration with the work of Part 1 of this action.

Key Results and Milestones:

A. A compilation of on-going projects (month 6).

B. Selection of the projects to be analysed (month 8).

C. Report on the in-depth analysis of selected projects (month 12).

D. A report on the key elements influencing the success of telematic systems applications (month 15). This report to include where relevant:

- functional characteristics of service centres,

- suggestions on the likely role or impact of low-cost terminals, simplified billing systems etc.,

- identification of characteristics of "trigger" products, closed user groups etc., necessary for initiating applications of telematic systems in rural areas,

- identification of elements of good practice.

E. Recommendations on "good practice" (month 20).

Key Results and Milestones :

An early start is essential.

Mode of Implementation:

Accompanying measure.

Task No. 2.2.2: Rural Telematics Systems Database and Management

Related Tasks or other work:

Inputs from: All case studies in Part II

Results to: All Tasks

Rural development organisations; Regional and National government organisations; other Community programmes; PTTs; Equipment manufacturers; Etc.

Background :

It is essential that the research and development activities within the Community action are kept closely in touch with what is happening in rural areas throughout the lifetime of the action. The provision of appropriate database facilities will ensure that information can be continuously updated and the results which are produced made fully available to those who may be able to use them, in Member States and in the Commission. It is especially important that case studies of the rural applications can be revised, updated, and checked against new facts and circumstances. It may be necessary to distribute or network the database amongst the participating organisations.

Objectives :

- To ensure consistent selection and construction of case studies.

- To assist with the production of transferable models and other information for inclusion within the database and to help relate these to the results of other projects and of research carried out by other services of the Commission in its rural development activities.

- To ensure the availability of models of experience, drawn from case studies, for reference and assessment by and, as appropriate, transfer to other participants in the Community action.

- To ensure the updating of case study material throughout the duration of the Community action.

- To advise on inter-regional and inter-sector transfer of information.

Technical Approach :

Creation and maintenance of a database for rural telematic systems. The format and method of construction of the database will be specified in the preliminary work for Part II.2. It will use material generated in task 2.2.1 and related Tasks. The structure of the database should also allow for its eventual extension into the planning tool envisaged by Task 5.1.3. The database should be on-line and available to relevant participants in the Community action.

Key Results and Milestones :

A. Development and application of database.

Timing Constraints:

Throughout the action.

Mode of Implementation:

Accompanying measure.

Task No. 2.2.3: Evaluation of Pilot Applications

Related Tasks or other work:

Inputs from: Tasks in Parts II, III, IV.

Results to: PTTs, Equipment manufacturers, rural development organisations.

Background:

Telematic systems and their future evolution may allow the development of new lifestyles, new social and local economic patterns and new forms of work organisation. Large companies or administrations may be organised through small autonomous units, which could have their base in a local resource centre.

Apart from cost or technical barriers, some of which will disappear due to technical evolution, there will also be psychological barriers to use in individuals, in companies and in administrations.

Many valuable lessons that could have been learned from applications and pilot applications in the past have been lost to the Community action due to the fact that no formal review and evaluation of these was undertaken. The lessons to be learned and the experience to be gained from applications pilots are an important component of this Community action.

In order to assess the effectiveness or performance of individual applications and services, it will be necessary to undertake quantitative measurements of the developments at periodic intervals. These performance parameters will provide decision making data necessary for the evaluation of the Community action as a whole.

Objectives :

● To evaluate, and to draw generally applicable conclusions from, the application pilots with regard to:

  − the ability of the application to contribute to development in rural areas;

  − the appropriate types of technologies;

  − the adequacy of the technologies developed or modified for use in rural areas;

  − the potential financial viability of the application.

● To develop guidelines on performance evaluation to assist project management of on-going application pilots.

● To define checks and criteria for termination procedures.

● To provide specific feedback to Tasks within Parts I, III, IV and V as well as the generally applicable experience.

Technical Approach :

The means and criteria for assessment should be drawn up before the commencement of the application pilots, to ensure that they are structured in such a way as to facilitate evaluation. The evaluation will be ongoing during the conduct of the application pilots, producing several interim results. Follow-up evaluation will be undertaken thereafter.

Key Results and Milestones

A. Evaluation Methodology.

B. Criteria for Evaluation.

C. Monitoring Procedures.

D. Evaluation Reports.

E. Feedback for review of Tasks in Parts III and IV.

F. Concrete guidelines for the introduction of new services into rural areas.

Timing constraints:

Deliverables A, B and C must be completed prior to the launch of the pilot applications.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 3.1.1: Services and Applications for Public and Community Services

Related Tasks or other work:

Inputs from: Tasks 1.1.1, Administrations programme.   Results to: Task 3.2.1, Part IV.3

Background:

This task is concerned with non-commercial activities associated with public administration and related fields. Telematic systems offer some unique possibilities for improving communication with remote rural communities. Such communication can be bi-directional, allowing not only easier dissemination of official information, but also enabling greater participation in local decision making processes.

Cultural activities and those concerned with social services for the community are also included in this task

Examples could include:

- Health;

- Security;

- Public information dissemination (e.g planning applications);

- Televoting;

- Remote issue of official documents (e.g licences);

- Social services and Community activities;

- Cultural and artistic services, public library facilities;

- Transport (e.g car pooling, greater coordination of buses etc...);

Objectives:

● To identify potential applications of telematic systems in public and community Services that are most likely to have a significant impact on rural development.

Technical Approach:

The approach will involve:

- an investigation of the current pattern of diffusion of applications of telematic systems in the public and community services sectors of Member States;

- identification of potential applications of telematic systems, within the public and community services sector, which would provide the greatest advantage for both, the long-term development of rural areas and for the use of telematic systems in rural areas;

- identification of the telematic systems required to facilitate these applications;

- development of services and applications with a view to pilot applications in specific rural areas.

Key Results and Milestones

A. Identification of existing applications

B. Identification of potential applications

C. Identification of potential telematic systems requirements.

D. Recommendations on potential pilot applications.

E. Systems/applications development for demonstration purposes.

Timing constraints:

Deliverables A to D to be completed within first year. Deliverable E for follow-through.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 3.1.2: Services and Applications for Tourism and Leisure

Related Tasks or other work:

Inputs from: Tasks 1.1.1, LEADER   Results to: Task 3.2.1, Part IV.3

Background:

Tourism and the provision of facilities for recreation and leisure are important functions of rural areas which together form an expanding area of economic activity. There are, however, a number of threats such as overcrowding which threatens the attractiveness of beauty spots and leads to traffic bottlenecks arising at peak times which are reminiscent of an urban commuter area. Telematic systems can assist small units to offer services and accommodation by providing booking services and integrating them into information services.

Objectives:

To identify potential applications of telematic systems in Tourism and Leisure that are most likely to have a significant impact on rural development.

Technical Approach:

The approach will involve:

- an investigation of the current pattern of diffusion of applications of telematic systems in the tourism sectors of Member States;

- identification of potential applications of telematic systems, within the tourism sectors, which would provide the greatest advantage for both, the long-term development of rural areas and for the use of telematic systems in rural areas;

- identification of the telematic systems required to facilitate these applications;

- development of services and applications with a view to pilot applications in specific rural areas.

The approach should address the telematic systems needs of both sides of the tourism industry in rural areas, i.e., of the providers of tourism and leisure services (e.g. accommodation, travel, wardenship, leisure centre management, etc.) and of the consumers, the tourists. In addition, the task should address telematic systems assistance in coping with the problems of conservation of the environment and of the attractiveness of tourist areas.

Key Results and Milestones

A. Identification of existing applications

B. Identification of potential applications

C. Identification of potential telematic systems requirements.

D. Recommendations on potential pilot applications.

E. Systems/applications development for demonstration purposes.

Timing constraints:

Deliverables A to D to be completed within first year. Deliverable E for follow-through.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 3.1.3: Services and Applications for Rural Business Activities

Related Tasks or other work:

Inputs from: Tasks 1.1.1, LEADER, TELE-MATIQUE.

Results to: Task 3.2.1, Part IV.3

Background:

This Task covers a range of types of goods production and processing activities which are particularly common in rural areas of the Community and are important to rural economies.

Activities in this group include:

- food and drink processing;
- textiles and clothing;
- leather and leather goods;
- paper and other wood products;
- building materials;
- handicraft and traditional industries.

Objectives:

- To identify potential applications of telematic systems in rural business activities that are most likely to have a significant impact on rural development.

Technical Approach:

The approach will involve:

- an investigation of the current pattern of diffusion of applications of telematic systems in the rural businesses of Member States;
- identification of potential applications of telematic systems, within rural businesses, which would pro-

vide the greatest advantage for both, the long-term development of rural areas and for the use of telematic systems in rural areas;

- identification of the telematic systems required to facilitate these applications;
- development of services and applications with a view to pilot applications in specific rural areas.

Key Results and Milestones

A. Identification of existing applications

B. Identification of potential applications

C. Identification of potential telematic systems requirements.

D. Recommendations on potential pilot applications.

E. Systems/applications development for demonstration purposes.

Timing constraints:

Deliverables A to D to be completed within first year. Deliverable E for follow-through.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 3.1.4: Services and Applications for Professional and Financial Services

Related Tasks or other work:

Inputs from: Tasks 1.1.1,

Results to: Task 3.2.1, Part IV.3

Background:

Services provided by third parties to producer organisations are increasingly important to the effectiveness and viability of their clients.

Important producer services include:

- financial and insurance services;
- building and architecture services;
- training services.

Also of importance are services which are more closely bound in with the everyday operations of the target business. e.g., services in support of such operations as planning and scheduling.

Professional, financial and other producer services can be expected to exhibit distinctive needs for telecommunications support when service provision takes place from, or service delivery is to, rural areas. For instance, access to expertise for investment advice, insurance risk assessment, arrangement of finance is essential to many businesses but the cost of on-site expert visits is particularly high in thinly populated regions.

Objectives:

- To identify potential applications of telematic systems in professional and financial services that are most likely to have a significant impact on rural development.

Technical Approach:

The approach will involve:

- an investigation of the current pattern of diffusion of applications of telematic systems in the producer services sectors of Member States;

- identification of potential applications of telematic systems, within the producer services sectors, which would provide the greatest advantage for both, the long-term development of rural areas and for the use of telematic systems in rural areas;

- identification of the telematic systems required to facilitate these applications;

- development of services and applications with a view to pilot applications in specific rural areas.

The approach will in particular elicit requirements of users in rural businesses for interactive access to information and expertise and to identify the appropriate specific mix of machine support and human mediation.

Transactions requiring authentication and security will also be relevant.

Key Results and Milestones

A. Identification of existing applications

B. Identification of potential applications

C. Identification of potential telematic systems requirements.

D. Recommendations on potential pilot applications.

E. Systems/applications development for demonstration purposes.

Timing constraints:

Deliverables A to D to be completed within first year. Deliverable E for follow-through.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 3.1.5: Services and Applications for Personal Services

Related Tasks or other work:

Inputs from: Tasks 1.1.1,

Results to: Task 3.2.1, Part IV.3

Background:

This group of activities has, in rural areas, the common logistic problem of delivering services to individual consumers at locations which are widely dispersed. Some services are provided by large organisations to large numbers of users each with low frequencies of usage, others are provided by small businesses on a highly individual basis. There is need to encourage the emergence of services with a high local content, especially in the area of culture.

Objectives:

* To identify potential applications of telematic systems in personal services that are most likely to have a significant impact on rural development.

Technical Approach:

The following sectors/activities would be relevant to projects addressing this Task:

- media, entertainment services;

- access to and retailing of goods and services;

- personal communication.

The approach will involve:

- an investigation of the current pattern of diffusion of applications of telematic systems in the personal services sectors of Member States;

- identification of potential applications of telematic systems, within the personal services sectors, which would provide the greatest advantage for both, the

long-term development of rural areas and for the use of telematic systems in rural areas;

- identification of the telematic systems required to facilitate these applications;

- development of services and applications with a view to pilot applications in specific rural areas.

In respect of transport, coordination and support of personal transport services such as taxis, car pools, etc., should be examined. Telematic systems support in terms of vehicle location, registration and scheduling will have a particularly important role in such systems.

Key Results and Milestones

A. Identification of existing applications

B. Identification of potential applications

C. Identification of potential telematic systems requirements.

D. Recommendations on potential pilot applications.

E. Systems/applications development for demonstration purposes.

Timing constraints:

Deliverables A to D to be completed within first year. Deliverable E for follow-through.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 3.1.6: Services and Applications for Distance Working

Related Tasks or other work:

Inputs from: Tasks 1.1.1.   Results to: Task 3.2.1, Part IV.3

Background:

Telematic systems can have the effect of reducing the dependence of work on location. Telework has the advantage of allowing work to be brought to people instead of vice versa. These characteristics are particularly relevant to rural areas in Europe. Telework can reduce the social and economic gap between urban and rural, central and peripheral regions.

Demand for telework is highly variable and the pattern in rural areas is unknown. Barriers to uptake in rural areas probably include high telecommunications costs and skills distribution.

In promoting the development of telework in rural areas there is a need to move away from concentrating attention on the individual teleworker to encompassing the working group and the wider organization or market. This work is relevant to small business development and its telematic systems support.

Objectives:

● To identify potential applications of telematic systems in Distance Working that are most likely to have a significant impact on rural development.

Technical Approach:

The approach will involve:

- investigation of the current pattern of diffusion of telework in rural areas and of the use of telematic systems in telework;

- study of different organisational models of teleworking for their suitability and likely uptake. These will include not only home-based working but also group work arrangements, public workplace

provision and small business based on telematic systems;

- focus on requirements for telematic systems provision and support;

- examination of services to support individual employment, work group collaboration and remote management;

- examination of ways of fostering skills improvement while continuing productive teleworking;

- investigation of the role of person-person and person-machine communication in maintaining the viability and value of work processes with potential for telework.

- development of services and applications with a view to pilot applications in specific rural areas.

Key Results and Milestones

A. Identification of existing applications

B. Identification of potential applications

C. Identification of potential telematic systems requirements.

D. Recommendations on potential pilot applications.

E. Systems/applications development for demonstration purposes.

Timing constraints:

Deliverables A to D to be completed within first year. Deliverable E for follow-through.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 3.2.1: Services and Equipment Requirements and Specifications

Related Tasks or other work:

Inputs from: Task 3.1.1 to 3.1.6   Results to: Task 3.2.2

Background:

Most existing technologies and those in development, in networks and in customer premises equipment and software, have been conceived with urban, usually business, users in mind. Many will require modification for applications in the rural environment. Indeed in some cases significant new products may arise. The unique demographic, topographic, geographic, social and economic characteristics of different types of rural areas, by contrast with those of metropolitan, urban and suburban areas, will determine the shape and extent of these modifications and new products.

Objectives:

- To translate the set of application areas defined by the Tasks within Part III.1 into a set of services and equipment types required by users in rural areas.

- To identify the functional and performance requirements which must be met in the development or adaptation of these services and equipments.

- To generate specifications for the teleservices, and for the user terminals and applications software, which will provide basic input information for the Rural Usage Reference Model of Task 3.2.2

Technical Approach:

The set of application areas defined by Tasks 3.1.1 to 3.1.6, will be translated into a set of required services and equipment types. Each of these will be examined with regard to the functional and performance require-

ments that are implied by the applications involved. These may include such aspects as required response times, extent of interactivity, "user friendliness", degree of graphic definition needed, dialogue design.

Special interests must also be addressed. For instance, the language requirements of all the different rural regions must be taken into consideration in trans-Community services and in the development of user interfaces, both hardware and software. These may include the lesser used languages as well as the official languages of the Community.

Specifications generated by this Task for the set of teleservices will provide a major input to the Usage and Functional Reference Model(s) of Task 3.2.2.

Key Results and Milestones

A. Service, network and equipment requirement specifications.

Timing Constraints:

Task 3.2.1 will rely on the availability of application information from Tasks 3.1.1 to 3.1.6.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 3.2.2: Adaptation of Usage and Functional Reference Models to the Needs of Rural Areas

Related Tasks or other work:

Inputs from: Task 3.2.1, Part IV.3

Other programmes such as RACE, DELTA, DRIVE, AIM

Results to: Tasks 3.2.3, 3.2.4, 3.2.5

Tasks within Part IV.

Background:

In RACE the Usage Reference Model acts as a focus for the usage requirements that need to be realized by elements of the IBC system and their associated supporting technologies. It provides a vehicle for converting between the descriptive, application oriented user environment and the technically specific, service oriented system and network environments.

A Functional Reference Model (FRM) is defined as a set of functions structured into a logical hierarchy and their logical interfaces. It is intended to cater for the enduring, stable, system functions required in communications networks and is developed "top-down". The model provides a stable frame of reference, a firm foundation for evolution planning and ensures a common definition and understanding of the major network functions, leading to common functional specifications.

Functional Reference Model(s) define the major enduring functions required in the network. These functions can be distributed in many ways, Reference Configurations are used to indicate the chosen arrangements.

Objectives:

- To adapt and maintain a Rural Usage Reference Model to act as a focus for the usage requirements that need to be realized by telematic systems in rural areas. This will provide the basic groundwork for the most of the other research and development work undertaken within the Community action.

- To establish a Functional Reference Model which is representative of rural zone equipment. The model must highlight the system functional modules, characterise these modules and define the interfaces between modules.

- To generate, document and maintain reference configurations as required for the purpose of evolution planning in rural areas.

Technical Approach:

Collection and analysis of Usage Reference Model, Functional Reference Model(s) relevant to rural areas from existing Community programmes such as RACE, DELTA, DRIVE and AIM.

Integration into these the requirements and specifications for services and for user equipments and software generated by Task 3.2.1.

Key Results and Milestones:

A. The main output will be the availability of; a Rural Usage Reference Model (RURM) and a Functional Reference Model(s) which will provide the link between the descriptive, application oriented rural user environment and the technically specific, service oriented rural system, different types of rural areas and network environments.

Timing Constraints:

To be useful, it is desirable that this Task be completed within 18 months of the launching date of the Community action.

Timing constraints :

18 months.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 3.2.3: Strategies for Network Evolution Planning

Related Tasks or other work:

Inputs from: Task 3.2.1, 3.2.2; Part IV.3

Results to: Tasks within Parts IV, V.

Other programmes such as RACE, DELTA, DRIVE, AIM

Background :

Technology development is opening up new opportunities for the provision of communications in rural areas through satellite links, local area network technologies, mobile and cellular radio links, microwave links and optical fibres. New needs for business activities, such as electronic data interchange, image transmission and HDTV access will impose new requirements on networks. Aspects of network layout and integration which are specific to rural areas include the following:

- distances are greater;

- topography has a greater influence on network lay- out;

- user population may vary (tourist, harvest, etc.);

- maintenance is more complex.

In these circumstances, careful planning of rural net- work evolution is essential.

Objectives :

- To list the aspects that should be taken into consideration when planning the lay-out and integration of rural telematic systems networks.

- To define strategies for Network Evolution Planning that enable key applications in rural areas to be developed smoothly and efficiently. Strategies must cover such aspects as:

  - general network evolution (switching and broad-casting);

  - standards evolution (HD-MAC,....);

  - techno-economic criteria for evolution planning;

  - user and CPN interface;

  - support to network planning evolution.

Technical Approach :

Integration aspects of the various networks identified in the Reference Configurations will be considered. Special attention will be focused on the complexity resulting from integration and on the manner of handling this.

The task should take into account the integration aspects resulting from step-by-step growth in requirements for bandwidth as a function of time, and the anticipated increase in the number of services that will be implemented.

The technical approach should be based on the following:

- definition of the state of the art based on an analysis of existing national and European projects;

- identification of technology trends and known net-work evolution;

- identification of typical key reference applications;

- analysis of network capability needed for key applications;

- definition of a simple techno-economic model for research of evolution strategies which, in the network implementations for different typical reference models, will allow optimisation of investment in applications.

Key Results and Milestones :

A. A list of integration aspects and a short analysis of each.

B. A broad analysis of the total complex aspects.

C. Scenario for different reference models.

D. A short analysis of the relevant aspects for some typical rural areas in Europe.

E. Basic software package which will assist the choice of evolution strategy for a particular situation.

Timing constraints :

2 year project, although preliminary inputs should be available one year after start of the project.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 4.1.5: Rural Area Networks

Related Tasks or other work:

Inputs from: Task 2.1.1

PTTs, Equipment manufacturers, RACE, ESPRIT programmes.

Results to: Task 4.3.1

PTTs, Equipment manufacturers.

Background:

In recent years, there has been a considerable growth in the installation of local area networks, within companies and administrations. The need for these networks has grown out of the demand for interconnection of computers and terminals and has been particularly associated with the rapid growth in the use of PCs. The convergence of telematic systems now means that these networks can provide a variety of new services of potential value to rural communities.

The development of specific rural area networks to address special needs and requirements in rural applications is, therefore, an important aspect of networking strategies for rural areas.

Rural area networks typology and transmission medium requirements are related to the overall infrastructure planning strategies. A study will be required to determine whether a single specific rural area network type or a class of network is necessary.

Objectives :

- To identify requirements specific to rural areas that could be met by rural area network technologies.
- To identify what technology adaptation would be useful for rural community applications.
- To demonstrate the technical capability of possible network systems for rural community use.

- To identify rural area network interworking scenarios that are possible and probable.

Technical Approach:

The development of pilot applications may require the integration of different rural services in a rural network. Local area network communication concepts in computer aided design and integrated manufacturing should be considered for their applicability in rural industries. Network management, in particular remote diagnostic for ease of network maintenance, can be vital in rural areas.

Key Results and Milestones:

A. Identification of specific requirements in rural applications.

B. Specification of technical requirements.

Timing constraints

2 years.

Mode of Implementation:

Research project: shared-cost R&D contract.

SECTION IV

TASK DESCRIPTIONS

(Follow-through and Related Tasks)

Task No. 2.3.1: Effect of Population Structure and Change on the Take-up of Telematic Systems in Rural Areas

Related Tasks or other work:

Inputs from: Task 2.2.1

PTTs; Rural development organisations; National and regional agencies, e.g. Census offices;

Results to: Tasks in Part V

Background :

The rural areas of the European Community vary considerably in their population characteristics (population density and geographical characteristics, age/sex compositions, gender relations, ethnicity, family and household structures - notably housing and car ownership - occupational structures, qualifications and social class). Furthermore, these characteristics do not remain constant; populations in some rural areas are growing at a significant rate while in other areas the population is declining. Even without a change in the size of the populations of rural areas, changes in the social patterns and economic activities take place. These trends can be expected to have a considerable effect upon the take-up of telematic systems.

Objectives :

● To identify the relationships between population structure and change and the take-up of telematic systems.

● To analyse the underlying social, educational and cultural impediments to successful introduction of telematic systems applications in different types of rural areas.

Technical Approach :

The work should be based on quantitative analysis of the relationships between population characteristics and use of telematic systems in different types of rural communities. Analyses will need to cover all the principal demographic variables included in the national

populations census and equivalent surveys and all the key types of rural area in the Community.

Consultations with PTTs, rural development agencies and other relevant organizations will be needed to draw upon their experience of the differential effects of population structures and growth rates in rural telematic systems take-up.

Use should be made of existing case studies where available.

Key Results and Milestones :

A. A report on relationships between population structure and change and the take-up of telematic systems, including the outcome of the consultation exercise (after 6 months).

B. A report on the underlying social, educational and cultural impediments to successful introduction of telematic systems applications in different types of rural areas (after 9 months).

Timing Constraints :

Main effort in year 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 2.3.2: Effect of Training on Users of Telematic Systems in Rural Areas

Related Tasks or other work:

Inputs from: Tasks in Parts II.1, II.2

Rural development organisations; National and regional organisations; other Community programmes;

Study and Conference Reports.

Results to: Tasks in Parts I, V;

Other services of the Commission, e.g. DG V

Other Community programmes, e.g. DELTA, CO-METT, Etc.

Background :

The availability and effectiveness of training is one of the key factors that governs the success of applications of telematic systems in rural areas. Training can serve very different objectives, and can be directed at target groups with different interests and a variety of initial skills. Trainers need help in defining the training needs of rural communities and the most appropriate training programmes for them.

In addition, promoters of applications and services for rural areas in different regions across Europe will face similar problems in start-up of operations. Initial unfamiliarity with systems could lead to long learning curves and to a slow take-up of the product. The expertise required by service developers and promoters of rural applications can however be categorised and packaged. The preparation of training packages, based on the experience of others, prevents wasteful duplication of effort by promoters and helps ensure the rapid implementation of applications.

Objectives :

- To assess the availability and quantity of telematic systems training programmes in rural areas.

- To assess the impact of training on telematic systems usage in rural areas.

- To assess and define training needs in rural areas for target groups of rural users.

- To identify the components of an expertise transfer/training programme for the services/applications promoters who will implement rural developments under a possible Community action.

Technical Approach :

Collection of the relevant information from existing or planned schemes in individual Member States.

Synthesis of the information, preparation of case studies, development of scenarios on the likely impact of similar initiatives in rural areas.

Development of sample education and training packages for users and promoters of applications.

Maximum use should be made of studies and the results of conferences which have already been undertaken.

Key Results and Milestones :

A. A report on the availability and quantity of telematic systems training programmes in different types of rural areas (month 6).

B. A report on strategies for improving the telematic systems training situation and of promoting that training in rural areas (month 8).

C. A report on the need for basic education and training to combat illiteracy as a pre-condition to the successful growth of telematic systems (Month 9).

D. A report on training needs in rural areas (Month 9).

E. A report on the impact of training on the use of telematic systems in rural areas (Month 9).

F. Guidelines for the development of education and training packages for users (Month 12).

G. Guidelines for the development of education and training packages for promoters (Month 12).

Timing Constraints:

Main effort in year 3, 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 2.3.3: Identification of Social and Psychological Factors Affecting the Use of Telematic Systems in Rural Areas

Related Tasks or other work:

Inputs from: Task 2.1.1.

Results to: Tasks in Part V.

Background :

Non-technological factors (unfamiliarity, incompatibility with established habits, perceived lack of education, psychological resistance) often negatively affect the use of telematic systems in rural areas. Whilst work in the Tasks of Part II.2 will have indicated a number of possible barriers to the use of telematic systems, in-depth analyses of the psychological factors negatively affecting its use are needed in a limited number of areas (use of videotex, teleworking, etc.).

Objectives :

- To identify the major social and psychological factors negatively affecting the use of telematic systems in rural regions.

- To indicate a number of possible strategies to overcome resistance to the use of telematic systems in rural areas.

Technical Approach :

Empirical analyses of a restricted number of rural areas (5-10) within a few service topics (2-4)

Evaluation of strategies already used to surmount barriers.

Key Results and Milestones :

A. Review of relevant literature, selection of the specific topics and the specific areas for case studies (month 2) and elaboration of an appropriate analytical framework.

B. Agreement on the analytical framework for the case studies in order to make comparative studies possible (month 3).

C. Reports on the case studies (month 9).

D. Comparative report based on the case studies (month 12).

Timing constraints:

Main effort in year 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 2.3.4: Effect of Labour Markets, Investment Growth Capacity on the Take-up of Telematic Systems

Related Tasks or other work:

Inputs from: Task 2.1.1.

Rural development organisations; National and regional organisations; other Community programmes;

Results to: Tasks in Part V.

Background :

The labour markets of rural areas in the Community vary greatly and depend on their economic characteristics (particularly on the importance of agriculture), the organisation of production (notably the size and the ownership of the enterprises) and employment histories. Rural areas also differ in their current development status; some attract considerable new investments and show real economic growth, while others are persistently losing employment and economic activities.

The structure of the labour market and the investment and potential growth rate of the rural areas directly impacts the take-up of telematic systems services and applications.

Objectives :

- To identify the relationships between rural area labour market characteristics and trends in the take-up of telematic systems services in different types of rural area.

- To identify the investment capacity and the investment trends in key economic sectors in different types of rural areas.

Technical Approach :

The work should make use of existing Community, national and regional sources of information on the labour market and the potential for investment in rural areas.

Case studies will need to be carried out in certain typical rural areas and analysed against an appropriate analytical framework.

Key Results and Milestones :

A. Review of the relevant literature, selection of the specific topics and the specific areas for case studies (month 2) and elaboration of an appropriate analytical framework.

B. Agreement on the analytical framework for the case studies in order to make comparative studies possible (month 3).

C. Reports on the case studies (month 9).

D. Comparative report based on the case studies (month 12).

Timing constraints:

Main effort in year 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 2.4.1: Costs and Benefits of Telematic Systems Applications in Rural Areas

Related Tasks or other work:

Inputs from: Tasks in Parts II.1, II.2, II.3.

Results to: Tasks in Part V.2

Rural development organisations; Regional and National government organisations; other Community programmes; PTTs; Equipment manufacturers; Etc.

Background:

This study will consider both the economic and the social costs and benefits of applications of telematic systems in different types of rural areas. It will extend the series of studies clarifying the relationship between telematic systems investment and applications and the needs of rural communities. It will ensure that within the scope of its activities the main categories of rural areas described in the Communication "The Future of Rural Society" are included. It will address the impact of telematic systems in a range of contexts and sectors in specific case studies. It will take particular account of circumstances where social costs are experienced by some whilst economic benefits are realised by others.

Objectives :

● To identify and analyse the economic and social costs and benefits of investment in information and communications infrastructures and applications in rural areas.

Technical Approach :

The technical approach should include:

- Setting up criteria for analysis of costs and benefits;

- The selection of case study areas and activities (business activities, social and public services, individual and collective social activities);

- A systematic assessment and comparative analysis of case studies.

The study must cover all principal types of rural areas indicated in Task 2.1.1. It must also reflect the infrastructure and applications to be found in isolated rural regions, as well as in agricultural and urban shadow regions. All Member States should be reflected in some way.

Economic and social costs and benefits should be assessed in selected employment sectors, for example agriculture, tourism, transport, in small and medium-sized enterprises, and amongst self-employed and tele-workers, in social and public services, in domestic settings, and in the context of identifiable localities selected for integrated approaches to development.

Key Results and Milestones :

A. Agreement on the selection of case studies (Month 3).

B. Interim reports from studies (Month 9).

C. Comparative reports from studies (Month 12).

Timing Constraints:

Main effort in year 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 2.4.2: Impact of Telematic Systems on Social Change in Rural Areas

Related Tasks or other work:

Inputs from: Tasks in Parts II.1, II.2.

Results to: Tasks in Part V.2

Rural development organisations; Regional and National government organisations; other Community programmes; PTTs; Equipment manufacturers; Etc.

Background:

The changes which accompany the adoption and use of telematic systems may have important effects on people's lifestyles, their sense of identity, their social and political values and their relationships with others. Many of these are associated with changes in the use of space and time, for example through the substitution of telecommunications for face-to-face contact in distance working.

These changes are perhaps of particular significance in rural areas where "place consciousness" is said to be especially strong, and where social relationships are thought to be typically of a "community" (Gemeinschaft) nature rather than of a society (Gesellschaft) nature.

Objectives:

- To identify current and potential changes in the nature of social relationships in rural areas consequent upon the changes associated with the use of telematic systems.

- To identify the actual and potential effects of telematic systems on the lifestyle, identity and sense of well-being of residents in rural communities. This will pay particular regard to the influence of telematic systems on the young and unskilled in rural populations and on colonization by the retired, by commuters and by owners of second homes.

Technical Approach :

The technical approach should include:

- identification of relationships between the use of telematic systems and recent social changes (for example, changes in population size and structure);

- case studies of changes in outlook and lifestyle consequent upon the use of telematic systems.

Key Results and Milestones :

A. Report on the quantitative/aggregate analysis (after 9 months).

B. Report on the case studies (after 12 months).

Timing Constraints :

Main effort in year 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 2.4.3: Impact of Telematic Systems on Work and Employment in Rural Areas

Related Tasks or other work:

Inputs from: Tasks in Parts II.1, II.2.

Results to: Tasks in Part V.2

Rural development organisations; Regional and National government organisations; other Community programmes; PTTs; Equipment manufacturers; Etc.

Background:

It is undoubtedly in the area of work and employment in rural areas that the effect of the use of telematic systems will be most acutely felt. Telematic systems can both facilitate new forms of work, and improve existing forms. There is a rapidly expanding literature on "flexible specialisation", "production decentralisation" and "disorganised capitalism", but very little reliable information on the impact these changes, associated with the use of telematic systems, might have on specific rural areas.

Objectives:

- To identify the actual and potential effects of the changes associated with telematic systems on the economic prospects of rural areas in the E.C. This will focus strongly on the development of new activities and forms of work practices and on organisation, particularly on the role of women within them.

- More specifically, to examine the changes in the relationships of work and employment which are already or may, in the future, result from the adoption of telematic systems (e.g. organisation of production, industrial relations, skill levels, incomes, development of part-time employment, self-employment and risks of unemployment or underemployment).

Technical Approach:

The project should make an aggregate analysis to identify the correlation of employment with the adoption and use of telematic systems in rural areas.

It should also involve detailed case studies of the effects of telematic systems on work organisation.

Key Results and Milestones :

A. Report on the quantitative/aggregate analysis (after 9 months).

B. Report on the case studies (after 12 months).

Timing Constraints :

Main effort in year 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 2.4.4: Impact of Telematic Systems on Land-use and Environmental Change in Rural Areas

Related Tasks or other work:

Inputs from: Tasks in Parts II.1, II.2.

Results to: Tasks in Part V.2

Rural development organisations; Regional and National government organisations; other Community programmes; PTTs; Equipment manufacturers; Etc.

Background :

Despite a number of useful speculative studies, little is known about the actual and potential impact of telematic systems on modern society as a whole (notably the balance between large towns, smaller settlements and rural areas), the land-use and building characteristics of rural areas and the rural environment.

Objectives :

- To identify the impact of the changes associated with the adoption of telematic systems on the settlement system, with special reference to rural settlement.

- To identify the effects of telematic systems on rural land-use and building characteristics.

- To identify the actual and potential environmental impact of the use of telematic systems.

Technical Approach :

The technical approach should include:

- An aggregate study of the association between settlement and land use change and the use of telematic systems;

- Case studies of the changes in the land use, building and environmental characteristics of rural areas and in their physical and geographical characteristics' brought about by the use of telematic systems;

Key Results and Milestones :

A. Quantitative analysis of these relationships.

B. Case studies.

Timing Constraints :

Main effort in years 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 4.1.1: Digital Switching Unit Technologies for Rural Applications

Related Tasks or other work:

Inputs from: Task 2.1.1

PTTs, Equipment manufacturers, RACE Programme.

Results to: Task 4.3.1

PTTs, Equipment manufacturers.

Background :

Major differences exist between rural and urban areas, particularly with regard to:

- geographical dispersion;

- dimension and density of each population nucleus;

- availability of technical support (training, installation, maintenance);

- availability, quality and reliability of power supply;

- seasonal fluctuation of population;

- low telematic systems usage.

Voice, data, image, GSM (Groupe Special Mobile) switching requirements and the possible future transition from Synchronous Transfer Mode (STM) to Asynchronous Transfer Mode (ATM), will have to be considered.

Switching equipment must be carefully examined in the context of the above .

Objectives :

- To evaluate the suitability of existing and forthcoming switching equipment for applications of telematic systems in rural areas.

- To analyse the transition from STM to ATM as it effects rural applications.

- To define and specify, as required, features, units or modules needed to meet the requirements of rural areas.

Technical Approach :

Define the technical characteristics imposed on the switching unit as a result of the differences between urban and different types of rural areas.

The scope of the task should embrace solutions to reduce power, size, weight and cost of existing equipment, to improve cost/bandwidth relationships, to improve environmental control, to facilitate tests, installations, commissioning and maintenance of equipment etc.

Use an evaluation algorithm for the existing or forthcoming switching technologies based on relevant technical characteristics.

Key Results and Milestones :

A. Definitions of technical and functional characteristics of the switching unit.

B. Evaluation methods and algorithms.

C. Evaluation of results.

D. Prototype development or adaptation, if necessary, of switching equipment for pilot applications.

Timing constraints :

3 years.

Mode of Implementation:

RACE II, Tasks

Task No. 4.1.2: Digital Radio Technologies Links for Rural Applications

Related Tasks or other work:

Inputs from: Task 2.1.1

PTTs, Equipment manufacturers, RACE Programme,
DG XIII-D.

Results to: Task 4.3.1

PTTs, Equipment manufacturers.

Background :

Isolated users, distant communities etc. have to be connected to the new services and networks. A major goal will be to find cost-effective solutions which take into account specific user needs and the characteristics of the environment.

In difficult terrain, cable connections are very costly. On the other hand, using RF links could cut costs. Radio technology is likely to be widely used because of its characteristics and potential to meet the problems of rural areas.

Depending on how and where users are located and which services they require, different architectural solutions are likely to be used. Both point-to-point and point-to-multipoint radio link configurations are considered suitable to cope with the problems envisaged.

Main issues are radio frequency bands, different bit-rate requirements, special components to be used, power supply, ease of installation and maintenance, cost, demand assignment, traffic and grade of service, share of resources, etc.

Objectives :

● To identify how current and future radio-based communications technologies can contribute to the provision of a comprehensive communication system for use in rural areas.

● To determine the required services and configurations involved and identify appropriate systems and equipment to meet those requirements.

Technical Approach :

After receiving inputs on the needs which must be met, the main actions should be :

–   identification of common frequency requirements, modulation schemes, group delays, interfaces, capacity; (the frequency bands to be used will need to take into account the distances required, propagation conditions, technology costs, etc.);

–   definition of suitable configurations;

–   definition and development, if necessary, of suitable low cost technologies;

Key Results and Milestones :

A. Identification of services requirements and configurations for a number of typical rural areas in Europe.

B. Establishment of parameters for using point-to-point (pp) and point-to-multipoint (pmp) radio link systems to cope with different needs and configurations in rural areas, taking into account what maintenance and operation facilities should be provided.

C. Definition and specification of suitable microwave links and systems (pp/pmp, frequency band, modulation schemes, access method, capacity, solar energy, etc.).

D. Development of key components (if needed).

E. Development, implementation and evaluation of a pilot linking system for concept demonstration, if necessary.

Timing constraints :

3 years.

Mode of Implementation:

RACE II, Tasks T806, T807

Task No. 4.1.3: Mobile Communications Technologies for Rural Areas

Related Tasks or other work:

Inputs from: Task 2.1.1

PTTs, Equipment manufacturers, RACE Programme, DG XIII-D.

Results to: Task 4.3.1

PTTs, Equipment manufacturers.

Background :

Future integrated communications will include not only fixed services but also mobile communications, which are expected to expand in volume and quality with new technologies and techniques such as those developed in the GSM (Groupe Special Mobile) and the RACE programme. This will give increasing numbers of users access to a large number of telecommunications, ISDN and IBC services regardless of whether they are fixed or mobile.

Due to the potential economy in network infrastructures, the integration of mobile services (including paging) and networks is envisaged as an appropriate technology to cope with the problems inherent in rural areas. Much progress remains to. be made, however, towards reduction in costs, which would help reduce the disparity between rural and urban areas.

Progress is being made in the field of mobile technology towards maximising the effectiveness of frequencies allocated to mobile communications, which will thus allow better exploitation of mobile radio channels.

Objectives :

● To identify what new characteristics and features of mobile networks and systems will meet the needs of rural areas.

Technical Approach :

The necessary development or adaptation is likely to be different - not only in terms of equipment characteristics, but also in types of system configurations and services - for different types of rural areas.

Technico-economic analyses of the options must be performed for different types of rural area, taking into account the on-going evolution of both terrestrial and mobile networks. Such analyses will probably include aspects like the following:

− Consideration of configurations and features in less urban and rural areas. As an example, cellular radio

with its sophisticated roaming option, and hence higher cost, leaves a market for a lower-cost, local-area, hand-portable, radio-telephone. At the same time, the user does not expect a telepoint restricted service if the equipment is this portable phone;

− Consideration of the use of other radio frequencies for this service; goals should be the control of UHF spectrum and the use of expertise in cordless switches. A cordless telephone, fitting in between a VHF/UHF domestic only and a UHF telepoint - citizen centres only, could be considered. Such a product would require greater range, low consumption and power, simple PSTN interface and good spectrum behaviour, low cost, etc, but would not warrant encryption.

A project addressing this Task would aim at demonstration of technological capabilities, determination of the likely number of subscribers versus spectrum allocation and definition of product specifications, etc.

Key Results and Milestones:

A. The definition of the potential use of mobile technologies in rural areas.

B. The identification of the best frequency bands and modulation methods for the different users in the several types of areas.

C. The description of the most suitable configurations, for the different kinds of rural areas.

D. The development, if necessary, or adaptation from other programmes, of the appropriate equipment and terminals to be used in pilot applications.

Timing constraints :

3 years.

Mode of Implementation:

RACE II, Tasks T732, T733

Task No. 4.1.4: Satellite Technologies for Rural Applications

Related Tasks or other work:

Inputs from: Task 2.1.1

PTTs, Equipment manufacturers, RACE Programme, DG XIII-D.

Results to: Task 4.3.1

PTTs, Equipment manufacturers.

Background:

Several European countries are already operating satellite telecommunications networks. The European Telecommunication Administrations have created EU-TELSAT, which provides satellite capacity to its participants. INTELSAT satellites carry over 60% of international telephone traffic with countries outside Europe, and provide transatlantic video and high-rate data transfer. INMARSAT satellites provide mobile satellite communications to all European countries.

The study should give attention to satellite systems which incorporate knowledge data bases and expert systems which could be used as a broadband communications link during disasters or other emergencies.

Initiation of appropriate research and development activities to meet needs of rural areas.

Objectives :

*   To identify the technical requirements for satellite systems in rural areas.

*   To study the use of existing/future satellite links as data transfer links for messages, educational purposes, transactions, document delivery, etc..

*   To extend the mobile facilities currently envisaged, without geographical constraints, by using satellite services. These will include essential telephone communications with access to the PSTN, data channels for paging, hardcopy messages, navigation and slow-scan video for maps, photographs, X-rays, etc..

Key Results and Milestones :

A. Identification of the technical requirements of satellite technologies for rural areas.

B. Definition of common system and technology development requirements.

C. Specification of different systems.

D. Design, build and test of prototypes for transportable/emergency terminal and others, if necessary.

Timing constraints :

3 years.

Mode of Implementation:

RACE II

Technical Approach:

Identification of critical aspects (e.g. power supplies, power amplifier, antenna, protocols).

Task No. 4.1.6: Optical Technologies in Rural Applications

Related Tasks or other work:

Inputs from: Task 2.1.1

PTTs, Equipment manufacturers, RACE Programme.

Results to: Task 4.3.1

PTTs, Equipment manufacturers.

Background :

There is increasing use of optical carrier systems in telecommunications and depending on demand or applications, optical technologies will be used in different types of rural telecommunications infrastructure. It is envisaged that broadband and narrowband services will reach users in different ways e.g. by radio link, mobile radio, satellite, electronic or optical carrier, or in combinations of these conduits. Optical technologies may be used in localised applications, such as, providing access to medical facilities, HDTV or multi media type database applications etc. The evolution towards offering sophisticated narrowband and broadband services in rural areas has major implications for the user interface and subscriber premises equipment. Because of these developments and opportunities, it will be necessary to study the potential use of optical technologies in the developing rural areas infrastructures and the means whereby rural users access them.

Objectives :

- To study and evaluate the possibility of using optical communications in rural areas.

- To study and evaluate the technical benefits of applications specified and implemented in various geographical, administrative and technical surroundings.

- To identify the required technological complexity.

- To estimate the associated costs.

- To define the interfaces of the rural networks with the main public network and with the user.

Technical Approach :

Analysis and definition of application areas for optical communications and customer access in rural areas.

Specifications of appropriate optical infrastructure to support the identified narrowband and broadband services.

Formation of rural network architecture and interfaces.

Key Results and Milestones:

A. Identification of specific requirements in rural areas.

B. Specification of network functions especially suited to rural applications including network management and quality of service (Q.O.S.) aspects.

C. Definition of network typology-architecture and interfaces.

D. Development, if needed, of suitable equipment.

E. Field trial selection and implementation, if necessary.

Timing constraints :

3 years.

Mode of Implementation:

RACE II

Task No. 4.1.7: HD-TV and Video Services Distribution in Rural Areas

Related Tasks or other work:

Inputs from: Task 2.1.1

PTTs, Equipment manufacturers, RACE Programme, DG XIII-D.

Results to: Task 4.3.1

PTTs, Equipment manufacturers.

Background :

At present, TV is a major entertainment source to which rural populations have access. In the future, TV will give rural areas greater access to the outside world through foreign TV programmes, education programmes, etc.

It is expected that High Definition TV, (HD-TV) will bring an improvement in the provision of entertainment. It is crucial for residents of rural areas to have comparable opportunities to benefit from that improvement so that life in rural areas is perceived to be as attractive as living in the urban centres. This is particularly important if young people are to be encouraged to remain in rural areas.

Objectives :

● To assess, propose and develop solutions which will meet the needs of rural areas for the distribution of HD-TV and other video services for such purposes as entertainment, education, healthcare, etc..

Technical Approach :

The main thrust of this task is first to examine and assess the existing and emerging technologies which will enable HD-TV and other video services distribution in rural areas, taking into account the technical and cost-effectiveness of the potential solutions.

Non-interactive and interactive distribution solutions will be considered, such as the following:

– Non-interactive distribution of HD-TV:

– Direct reception by normal broadcasting;

– Direct satellite reception by the customer;

– HD-TV distribution through a local area network with a centralized direct satellite reception.

– Interactive distribution:

– HD-TV distribution through IBCN;

– VSAT system (shared links through satellite).

Development and adaptation of equipment will be carried out, if necessary, and a set of technico-economical scenarios will be set up.

Key Results and Milestones :

A. Review and assessment of the various technical possibilities.

B. Development of technico-economic scenarios.

C Development or adaptation, if necessary, of the required equipment.

Timing Constraints :

3 years.

Mode of Implementation:

RACE II

Task No. 4.2.1: Intelligent Interfaces for Rural Users

Related Tasks or other work:

Inputs from: Task 2.1.1, Tasks in Part III.1, Task 4.2.4.

PTTs, Equipment manufacturers, RACE, ESPRIT, IMPACT programmes.

Results to: Task 4.3.1

PTTs, Equipment manufacturers.

Background :

Rural populations, in general, have little knowledge of telematic systems applications.

Due to the remote location of many rural areas, support for applications use will be limited or non-existent.

In certain instances, some telematic systems services will be used through a public point of access.

Often services will only be used on an intermittent basis, interfaces have to be provided for non-expert, intermediate expert and expert users. There will be specific language requirements in certain rural areas. There may be a necessity to adapt interfaces to reflect the cognitive processes of specific users.

Equally certain services and applications for rural areas will be based on knowledge based systems. These may occur, for example, in:

- distance learning;

- rural medical support;

- agricultural, fishing, farming consulting systems.

Intelligent interfaces can be distributed at the users terminal, centralised at the network level or customised with individual applications.

Objectives :

- To identify types, levels and characteristics of intelligent interfaces that are needed in rural applications.

- To identify the most efficient and cost effective means of supplying such interfaces.

- To define the interfaces between the person who will use telematic systems in rural areas and the equipment and applications envisaged.

- If necessary, to design, develop, test and evaluate an optimised application.

Technical Approach :

Technology used will include voice recognition and synthesis, WIMP techniques, intelligent interfaces, etc.. The interface should allow interaction in the language of the user.

Field tests may have to be carried out and any required enhancement or tuning performed.

Key Results and Milestones :

A. Specification of the basic characteristics of interfaces for rural users.

B. Development of sample interface, if necessary.

C. Evaluation report on field tests.

D. Guidelines for network operators, software and services producers, and equipment manufacturers.

Timing constraints :

2 years.

Mode of Implementation:

RACE II

Task No. 4.2.2: Multimedia Database Services for Rural Applications

Related Tasks or other work:

Inputs from: Tasks 4.2.1, 4.2.3, 4.2.4, 4.2.5

PTTs, Equipment manufacturers, ESPRIT, IMPACT programmes.

Results to: Task 4.3.1

PTTs, Equipment manufacturers.

Background:

There has been major technical and technological progress in the domains of processing power, mass storage capacity and video signal processing (digitalisation, compression, transmission, etc.) together with promising developments in artificial intelligence. These advances make it possible to envisage the development of multimedia/hypermedia databases for rural applications at economically acceptable costs.

The possibility of simultaneous use of still or moving images, text, graphics and sound, speech or music - will permit the development of data bases which have varied content and which would provide end users with a very efficient and high performance capability. Good presentation will improve clarity of information enabling accurate and rapid assimilation and understanding by users. Such a system must be complemented with a friendly man-machine interface which is optimised to take care of end users' worries and their culture.

Such a data base has to be considered as a complete system including multimedia terminals with appropriate characteristics and devices for system management (data introduction, modification, etc.) The special conditions of rural applications mean that different configurations must be taken into account, such as stand-alone systems or systems with remote terminals.

Objectives:

- To define and study a data base system architecture, specifically oriented to the needs of rural areas. The defined architecture should allow small systems to be built from common basic subparts.

- To develop a system using the defined architecture and supporting a simple application for a pilot experimentation.

The study and development should use the results of the other tasks within Part IV.2.

Technical Approach:

This will include:

- Review of the state-of-the-art of multimedia data bases;

- Analysis of the data bases which have to be supported;

- Definition and study of a generic architecture in coordination with the others tasks in Part IV.2, ESPRIT, etc.;

- Development, if necessary, of a system supporting a simple application for pilot experimentation.

Key Results and Milestones:

A. Report on the state of the art and on the supported data bases.

B. Analysis and specifications of a generic architecture.

C. Development and trial of a pilot system.

Timing constraints:

3 years.

Mode of Implementation:

RACE II

Task No. 4.2.3: Network Management Tools for Rural Areas

Related Tasks or other work:

Inputs from: Projects in RACE Programme.

Results to: PTTs, Equipment manufacturers.

Background :

Network Management is considered to be a critical issue to achieve some of the major objectives of the RACE programme. In particular, the commercial introduction of IBC, the achievement of favourable cost-performance, the availability of services at an acceptable cost to the final user, and the ability of European network operators to face the technological and service challenges will depend strongly on the network management facilities of IBC.

The provision of those facilities needs to be taken into account during services definition and in the design of the architecture both for the network as well as the overall system.

TMN - Telecommunications Management Network - is the concept used in RACE to address the management of IBC. This concept, being developed by CEPT and CCITT for narrowband networks, covers a range of functions implemented above a set of support systems needed to operate, control and maintain the future IBC.

RACE takes a two-fold approach to the TMN area:

A top down approach which defines the TMN functions and the logical interfaces between them, as well as the TMN Reference Configurations to implement these functions. The Evolution scenarios to a future Pan-European TMN are also addressed.

A bottom up approach which studies techniques for the implementation of TMN functions such as:

- Knowledge Based Systems (Expert Systems);
- Real Time Knowledge Based Systems;
- Knowledge Bases;
- Distributed Systems;
- Distributed Data Base Systems;
- CAD; techniques;
- Man Machine Interface techniques; e.g.:
  - Graphics
  - Multi-Window
  - Natural Languages and dialogue
  - Help facilities
- Modelling techniques.

In rural areas it will be most important that there is effective network management. It will be essential to take into account the results of the various tasks undertaken on TMN within the RACE programme.

Objectives :

To establish a set of recommendations on the functional specifications and standards for a rural TMN and on the tools to be used to support the TMN functions of:

- Maintenance;
- Network Administration;
- Users/Services Management;
- Traffic and QOS (quality of service) Management.

Technical Approach :

Evaluation of the results from related RACE projects to identify those aspects relevant and applicable to rural area network management.

Development or adaptation of appropriate network management tools to meet the requirements of rural networks.

Key Results and Milestones :

A. Initial report on techniques, standards and architectures for rural TMN.

B. Technical analysis of TMN specifications.

C. Recommendations on architecture and interface for rural TMN.

D. Recommendations on techniques for rural TMN.

E. Final set of recommendations, guidelines and standards for rural TMN.

Timing constraints :

4 years.

Mode of Implementation:

RACE II

Task No. 4.3.1: Pilot Applications of Telematic Systems in Rural Areas

Related Tasks or other work:

Inputs from: Tasks of Parts II, III.1, IV.1, IV.2.

Results to: Task 4.3.2

PTTs, Equipment Manufacturers, rural development organisations.

Background:

Implementation of applications and beneficial use of telematic systems in rural areas is accompanied by problems not encountered when considering their use in urban areas. These problems relate to different requirements, and to different social, cultural and economic conditions. Application pilots will be an invaluable means of evaluating all aspects of telematic systems development, application and take-up in rural areas. They will also make a significant direct contribution in the regions chosen for implementation.

Objectives:

- To demonstrate and evaluate the manner in which applications of telematic systems can significantly contribute to social, economic and cultural development, and to aid the resolution of problems facing different types of rural areas.

- To demonstrate and evaluate the technical and techno-economic adequacy of technologies developed or adapted for use specifically to address characteristics of different types of rural areas - such as dispersal of users, terrain difficulties, etc.

- To identify genuine obstacles hindering the use of applications of telematic systems in rural areas.

- To test the response of rural users to telematic systems based applications.

- To determine best priorities for the introduction of applications of telematic systems in rural areas.

Pilot applications need not necessarily contribute to all these objectives, although ideally they would.

Technical Approach:

The scale and nature of pilot applications must reflect these objectives. For instance, they should:

- use technologies or services specifically developed or adapted for rural areas (although this may include already existing technologies and technological infrastructure);

- be of sufficient size and duration to have a determinable impact on specific economic or social problems or issues;

- include an evaluation mechanism and enable transfer of experience.

The choice of case studies will reflect the requirements of RACE II, but the readiness of relevant bodies to participate, and other issues, such as; the needs of vulnerable groups, industrial competitativeness aspects, the potential of the pilot to stimulate user demand, and factors which will be identified in the research in Part II and III, will also be relevant.

Pilot applications would be selected after the use of a "call for proposals" procedure.

Criteria:

Proposals for pilot applications would be judged against a number of criteria of a qualitative nature. It would not be necessary for each proposal to satisfy all of these criteria, but the degree to which each is met would be taken into account in the selection of proposals.

Each pilot application should, as far as possible, be:

- **Rural community based.**
  Pilot applications should have a significant activity in a rural area, with both use and provision of services in the rural communities

- **User-oriented.**
  In order to ensure a real interaction between users in rural areas and equipment manufacturers, services providers or telecommunication operators, pilot applications should involve end-users (SME's, farmers, companies with distributed activities in rural areas, local authorities, local health-care or training providers, local commercial service providers such as banks, retailers, TV distribution companies etc).

- **Distributed in the rural area.**
  In order to stimulate distributed use of information and communication technologies in rural areas, pilot applications should involve some local or regional networking, in addition to interconnection with national and international telecommunication systems. Proposals for independent telecentres,

linked only to national telecommunication services will be given a low priority because of the variety of other commercial and public supports now available for such developments.

- Multi-service oriented.
  The viability of investment in new rural infrastructures will depend on the common use of such infrastructures by a number of different groups of users and service providers. Priority will therefore be given to pilot applications involving experimentation with, and use of, several different types of services, but with common use of equipment or network infrastructures.

Key Results and Milestones:

A. Concrete examples of the use of telematic systems to promote rural development.

B. Generally applicable experience concerning issues of technologies, applications and support/take-up.

Timing Constraints:

Early implementation.

Mode of Implementation:

RACE II, Task T940A

Task No. 5.1.1: Existing Regional Programmes and Development Plans

Related Tasks or other work:

Inputs from: Tasks 2.1.1.

Results to: Task 5.1.3

Background:

The communications infrastructure is part of the overall infrastructure of a region and is considered one of the determinants of regional development potential.

The development of an telematic systems strategy for rural areas requires the collection of information on regional development programmes and plans in order to find out whether and to what extent telematic systems are considered as part of regional development. In addition, information needs to be collected on regional/rural problems in order to assess the possibility of contributing to their solution with a rural telematic systems strategy.

Objectives:

- To collect information on whether and to what extent telematic systems are considered as a support for regional development in the respective national or regional development programmes and plans.

- To collect information on regional/rural problems that could be resolved through the use of telematic systems.

Technical Approach:

Information on regional development programmes or plans should be obtained from Member States Governments or other bodies that participate in preparing these programmes.

Successful information collection depends on comparable definitions of "rural areas" in the member countries and in their development programmes. These definitions and the methodology to collect the information will be provided by Task 2.1.1.

This information combined with that from Tasks 2.2.1 and 5.1.2 will be a major input to Task 5.1.3.

Key Results and Milestones

A. Data on telematic systems equipment in rural areas and their links with development aims and programmes.

B. Information as to the assessment, as far as available, of telematic systems as an appropriate development instrument.

C. Checklist of regional/rural problems that will be resolved by using telematic systems

Timing constraints :

Main effort during years 3, 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 5.1.2: Existing Infrastructure, Services and Plans for Telematic Systems in Rural Areas

Related Tasks or other work:

Inputs from: PTTs

Results to: Task 5.1.3

Background :

Providing infrastructure and services for telematic systems in rural areas requires technical solutions that are different to those that are normally used in other areas.

Due to the population dispersion in rural areas, the extension of telematic systems services requires strategies:

- to reduce, as far as possible the high cost of installations and their low profitability;

- to simplify managing and maintenance services which will allow reduction of costs, which are higher than in urban areas.

In order to reduce the cost of installation and simplify network management and maintenance different approaches are followed in different European countries.

Objectives :

- to analyse the present and future infrastructure, services and plans for telematic systems in different EEC rural areas.

- to classify them so as to determine what steps have to be taken in each particular case and to know other countries techniques, experience in this field and applications.

- to highlight the reasons for the existing differences in infrastructure and services for telematic systems among EEC rural areas with similar characteristics.

Technical Approach :

To contact the main actors in the provision of infrastructure and services in the rural areas in particular PTT's, cable network operators, broadcasting operators and service providers.

To design a questionnaire to gather knowledge on existing infrastructure services and plans for telematic systems in different EEC rural areas.

Using the methodology and tools defined by Part II the information should be collected and prepared so that it can be used in building up a rural information base as well as in the definition of the strategy for telematic systems implementation in rural areas.

Key Results and Milestones

A. Analysis of existing infrastructure and development potential of the different EEC rural areas.

B. Analysis of differences between existing infrastructures in the different rural areas.

Timing constraints:

Main effort in years 3, 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 5.1.3: Structuring the Information Sources for Strategic Planning

Related Tasks or other work:

Inputs from: Tasks in Part II and Part V.

Results to: Task 5.2.5.

Background:

The previous two Tasks and output from Part II, especially Task 2.2.1, and Part IV will supply the necessary information for informed decision making on the appropriate follow through to the Community action. This information is needed by national governments and rural development agencies, in a structured and consistent format, for planning new initiatives. The co-ordinators in Part I will both use and contribute to the information.

Objective:

⃰● The aim of the task is to develop and implement a rural information base for Europe and provide the means to update it.

Technical Approach:

The task is viewed as an extension to the database developed in Task 2.2.2 and will be used for planning any follow through implementation to the Community action.

It is expected that the information base should contain at least:

- the geographical description of the rural area;

- the socio-economic description of the rural area;

- the telematic systems networks and services available or which will be available for use in the rural area;

- maps of mobile, ISDN, IBCN, professional or dedicated networks;

- maps of teledistribution and radio networks;

- list of telecommunication services (domestic, TV and HDTV, multimedia, professional...);

- list of existing applications;

- the potential service providers, telematic systems operators and equipment manufacturers;

- management information.

The proposed method of information processing and implementation of the database should be specified. The information base may need to be networked and offer multi-lingual access facilities.

A prototype should then be built and submitted for evaluation as well as a detailed plan for the development of the complete system. Conditions for the future exploitation of the information base should be specified.

The information base should then be developed and loaded with the available data provided by the research and development Tasks.

The last stage will be the installation or networking of the information base in relevant places under the framework of the Community action.

Key Results and Milestones

A. Initial requirements of the rural information base.

B. Selection of technology options to implement the database.

C. Evaluation of the development and exploitation plan, including training if necessary.

Timing constraints:

Main effort in years 3, 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 5.2.1: Modelling Support for Telematic Systems Strategies for Rural Areas

Related Tasks or other work:

Inputs from: Parts II, III, IV.

Results to: Task 5.2.5

Background

Characterisation of rural areas as to their geographical and demographic and socio-economic aspects is made in Task 2.1.1.

Studies on telematic systems and services for rural areas are carried out in tasks specified in Parts III and IV.

Part III will also develop reference models, reference configurations and network evolution strategies with the aim of providing a framework for the development or adaptation of technologies for the rural environment. The pilot applications carried out in Part IV will also contribute to these options.

Taking into account this work, further modelling support and strategic planning tools will be needed to correlate services with technology. The model and tools will allow optimisation of the infrastructures for the concrete geographical, demographic and socio-economic environment of a rural area. They will be used for planning the telematic systems infrastructure for specific rural areas.

Objective

- To create a modelling system for the significant parameters of the rural areas and to realise strategic planning (computerised) tools for architectural choices, technology decision, network planning and sizing to be used in real situations.

Technical Approach

The technical approach will include:

- Analysis of leading characteristics of services and technologies;

- Correlation of services with technologies (eg. by a matrix system);

- Selection of target functions to be optimised, such as flexibility vs. uncertain forecasts, cost-effectiveness, reliability, maintainability;

- Setting up of models (eg. in the form of functional blocks) for services and technologies, as well as for geographical and demographic parameters such as distances, density of users etc.

- Realisation of planning computer tools;

- Transformation of usage parameters such as traffic, throughput, etc. into parameters to be used for network sizing;

- Realisation of network sizing computer tools, possibly with graphic aids. The tools should be able to study the different financial alternatives for a particular rural area implementation. The computer tools should be interfaced with the rural information base (Task 5.1.3) which contains the basic information about the rural areas and related telematic systems data.

Output of Tasks 3.2.2 and 3.2.3 are relevant to this task.

Key Results and Milestones

A. Selection of models for services, technologies and rural environment.

B. Initial requirements for the planning computer tools.

C. First prototype of the computer tools.

D. Proposed interface with the rural information base.

E. First version of the computer tools.

F. Conditions of exploitation under the Community action framework.

G. Installation in relevant places.

H. Training of users.

Timing constraints:

Main effort in years 3, 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 5.2.2: Criteria for Selecting Technologies, Rural Areas and Applications

Related Tasks or other work:

Inputs from: Tasks of Parts II, III and IV.

Results to:

Rural development organisations; Regional and National government organisations; other Community programmes; PTTs; Equipment Manufacturers; etc.

Background:

Studies on possible technologies for use in rural areas are described in Part IV. Task 2.2.1 is expected to make a synthesis of the current experience of using telematic systems in rural areas from the point of view of applications and services. It will cover the existing actions, results from STAR and from RACE projects like RE-VOLVE. In addition, results from the pilot demonstration projects in Part IV will become available.

Certain of the tasks in Part II will have identified relevant features which have to be considered in planning telematic systems services implementation.

It will be necessary to establish criteria for the selection of the technologies, leading applications and target rural areas, to enable follow-through implementation to this initiative.

Objective:

• To identify a set of indicators, measurements or features which could be used as criteria in the selection of rural areas likely to benefit most from the introduction of applications of telematic systems.

• To define the general and specific criteria for selection of the most suitable technologies for different applications/services for use in a rural environment.

• To develop criteria to define the basic applications and services that should be provided in different types of rural areas.

Technical Approach:

Identify the basic infrastructures needed for implementation of telematic systems services (mainly telecommunications).

Identify the economic activities which can support the use of telematic systems services in rural areas.

– Identify a set of technical parameters that can be used to assess technology to be used in a rural

environment. Technical parameters such as reliability, robustness, maintainability, cost effectiveness have to be considered;

– Characterisation of technologies according to the selected technical parameters, applications and services to be provided;

– Develop tools to assess techno-economic application areas for different technologies, for terminals and for network systems;

This initial criteria should then be applied to a set of rural areas of different types and in different countries.

As the criteria will impact on the specific development infrastructure required in each rural area, the criteria should be tested and used in conjunction with the data stored in the rural information base.

Key Results And Milestones

A Selection of a set of significant technical, economic and infrastructural parameters.

B. Creation of techno-economic tools.

C. Draft definition of selection criteria.

D. Application of the criteria to a set of rural areas in different countries.

E. Analysis of the criteria application based on the information contained in the rural information base.

F. Proposed criteria for selecting applications, telematic systems and target rural areas.

Timing Constraints:

Main effort in years 3,4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 5.2.3: Development of Scenarios and Implementation Plans

Related Tasks or other work:

Inputs from: Tasks 2.1.2, 5.2.1

Results to:

Rural development organisations; Regional and National government organisations; other Community programmes; PTTs; Equipment Manufacturers; etc.

Background:

A Community action will need to be implemented over regions of different characteristics, with different technological strengths. The action may be implemented by different institutions with different resources. Starting times may be different. Many different concurrent events and developments must be accommodated. These are the subject of other tasks, and include technology, existing programmes, policies and interest groups. All these diverse elements must be brought together into a set of coherent scenarios. These scenarios will include alternatives appropriate to particular circumstances or groups or institutions.

Some scenarios may suppose particular organisations being instituted for specific purposes. In the case of these organisations, their draft mission statements and timescales will be required.

As a telematic systems infrastructure does not guarantee its use, particularly in rural areas, scenarios and plans should encourage use as well as installation of infrastructure.

Objective:

- To develop suitable scenarios for the implementation of telematic systems infrastructures in the different rural areas of Europe. These scenarios will be available for use by decision makers and planners at different levels and in different circumstances. They will take into account the various criteria and integrate information on trends, policies, needs and goals in rural areas.

- To include in these scenarios the means to ensure that services and applications are actually developed.

Technical Approach:

The Task starts with the key types of rural areas identified by Task 2.1.2. For each type of rural area, scena-

rios are developed dealing with the policies, constraints, technologies and trends identified by the Community action. Resources and timescales, as well as supporting or interfering conditions, are identified. The specific requirements of each region or group are taken into account. Where specific new organizations are required, mission statements and proposed timescales are developed.

The studies concerning use are brought to bear on possible actions to ensure proper uptake of use and the addition of services in rural areas.

The existing and forecast Community policies and those of Member States with regard to rural, or developing, areas are taken into account. Available models are developed to embody the scenarios.

This task should use the tools provided by Task 5.2.1

Key Results and Milestones

A. Initial set of scenarios for each country and major player.

B. Impact on industry and regional development.

C. Scenarios with contingent branches for each actor.

D. Mission statements and timescales for some actions.

E. Proposed set of scenarios for implementation of telematic systems infrastructures in specific rural areas..

Timing Constraints:

Main effort in years 3, 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 5.3.1: Regulatory Constraints on the Provision of Telematic Systems in Rural Areas

Related Tasks or other work:

Inputs from: Member States

Results to: Rural development organisations; Regional and National government organisations; other Community programmes; PTTs; Equipment Manufacturers; etc.

Background:

The regulatory environment for telecommunications equipment and services within Europe is undergoing rapid change in terms of market liberalization, standardization and the evolution of a common Community-wide approach.

The precise implications for rural areas, where these can be specifically identified, need to be documented and analysed in order that rural area applications of telematic systems can keep in step with changes, mitigate possible negative effects and exploit benefits. For example, the Commission aim of restructuring tariffs to precisely reflect the cost of service provision by 1992 has potential disadvantages for rural areas in so far as infrastructure costs will always be higher and demand lower in these areas.

Objectives:

● To investigate the regulatory regimes (both national and international) governing the provision of telematic systems in rural areas;

● To study possible regulatory approaches which might favour the provision of telematic systems in rural areas.

Technical Approach:

The following steps should be included :

– identification of status quo and anticipated regulatory changes in the provision of telematic systems

over the lifetime of a Community action, particularly those which are specifically intended for rural areas and those which have a greater or lesser impact on rural areas;

– analysis of the detailed effects of regulatory policies on rural areas, both generally as well as in the context of the Community action;

– development of flexibility or special features which need to be built into a Community action to assist rural areas and exploit regulatory opportunities.

Key Results and Milestones

A. Impact of regulatory constraints in the provision of telematic systems facilities in rural areas.

B. Proposed set of alternatives according to the different regulatory situations in Europe.

C. Suggestions for Community action.

Timing Constraints:

Main effort in year 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 5.3.2: Policy Considerations in Selecting Target Rural Areas

Related Tasks or other work:

Inputs from: Tasks of Part II.1, Task 5.1.3

Results to:

Rural development organisations; Regional and National government organisations; other Community programmes; PTTs; Equipment Manufacturers; etc.

Background:

The term "rural" does not automatically define a fully determined set of regions, nor does it indicate the areas most open to improvement in line with the aims of a possible Community action.

Different action lines will require different definitions and criteria for the selection of areas of operation.

In addition to the reference models of key types of rural areas in Task 2.1.2 and the technical criteria defined in the Part V.2 Tasks, consideration should be given to other Community or Member States policies.

Objectives:

- To identify policy considerations relevant to the implementation of information and communications infrastructures in specific rural areas.

- To ensure that these considerations reflect the major Community related policies such as agriculture, social, employment and SME's.

Technical Approach:

The existing policy considerations of each section of the Commission, and of Member States and their Departments with regards to rural or developing areas will be listed. Together with existing and proposed policies of these groups, these will be arranged in a coherent set of relevant considerations. This arrangement will differentiate between the different considerations applicable at

the different levels of EC, Member State and Department.

Specific additions will be made to the list to achieve the aims of a rural action. Further additions will reflect major concerns of the significant groupings in the rural areas themselves.

The final considerations should be applied to a set of rural areas of different types and in different countries.

This work will draw on Part II.1 and will be used in conjunction with the structured information base to be developed in Task 5.1.3.

Key Results and Milestones

A. Initial list of considerations (CEC, National, Regional and local).

B. Draft definition of selection considerations.

C. Application of the considerations to a set of rural areas in different countries.

E. Proposed policy considerations.

Timing Constraints:

Main effort in year 4

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 5.3.3: Financing Scenarios for Implementation

Related Tasks or other work:

Inputs from:Tasks 5.3.1, 5.3.4.

Results to:

Rural development organisations; Regional and National government organisations; other Community programmes; PTTs; Equipment Manufacturers; etc.

Background:

Investment in telematic systems infrastructures in rural areas has particular problems with respect to the return on capital employed.

The small size of the market, the high costs of infrastructure implementation, the dispersed nature and level of purchasing power of the population make investment in these areas less profitable. This also impacts on the commercial viability of the service providers.

Most national authorities are not yet convinced of the role that telematic systems can play in economic and social development. In almost all countries telecommunication services are not offered free of charge as a "public" service, but against prices or fees. Some countries have privatised telecommunications or intend to do so in the future.

If the investment decision as to where to locate telematic systems facilities, and how to finance them, is based on profitability or rate of return criteria, there will be a risk that urbanised and agglomerated areas will the first to be equipped with these services so that rural areas will be disadvantaged. It is therefore necessary to investigate how this possibility can be avoided. To this effect, a number of financing scenarios should be developed that take into account these differences between urbanised and rural areas.

Objective:

● To compare market pricing or cost with the potential effect of subsidies to infrastructure operators, service providers or users.

● To define a methodology that, considering the interests of the different actors involved - users, local organisations, service providers, national governments and the Community - could objectively identify for each type of project the most appropriate form of financing.

Technical Approach:

The Task should start with the definition of a methodology or approach that can separate the financial resources requested into two parts, for each type of project. For example:

- The share of investment to be financed by service providers and network operators. For this part of the investment a "fair" and adequate Internal Rate of Profitability must be indicated, taking into consideration the conditions of the market and the tariff policy to be followed;

- The share of investment that can be considered as "social investment" because, from a strictly financial point of view, it is not profitable. This part of the investment must be financed "free of charge" by the other actors involved and with no direct financial return. The definition of the criteria for the financing of "social investment" should be set up in cooperation with local authorities, national governments, Community funds, etc.

Taking into account this methodology:

- Invite national telecommunication companies to present their positions on financing telematic systems facilities in rural areas compared with urban areas;

- Invite private companies that are not identical with national telecommunication companies to do the same.

- Invite experts to develop alternative scenarios for financing telematic systems in rural areas with the assumption that the density of users and therefore the degree of capacity utilisation is low.

The role of all Community funding mechanisms should be investigated in relationship with the proposed financing scenarios.

Participation of Community funds in the financing of projects in a Community action must take into consideration the different stages of development of Member States, especially the aspects concerning the existing telematic systems infrastructures.

Furthermore, Task 5.3.1 may be important, as regulatory constraints in some Member States may prevent the use of one or the other of the possible scenarios. If Community funds are involved, there will also exist a link with Task 5.3.4, i.e. Management Scheme for Community Involvement.

These financing scenarios should then be applied to a set of rural areas of different types and in different countries, using the rural information base of Task 5.1.3.

Key Results and Milestones

A. Draft definition of the financing methodology.

B. Draft definition of the financing scenarios and criteria.

C. Application of the financing criteria to a set of rural areas in different countries.

D. Proposed set of scenarios and criteria for financing telematic systems facilities in rural areas.

Timing Constraints :

Main effort in year 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 5.3.4: Management Scheme for Community Involvement

Related Tasks or other work:

Inputs from:

Task 1.1.1.

Results to:

Rural development organisations; Regional and National government organisations; other Community programmes; PTTs; Equipment Manufacturers; etc.

Background:

If the research in a Community action is successful, and assuming that there will be a willingness to apply the results to a selected set of rural areas in Europe, it will be necessary to study in advance the mechanisms for Community involvement and management in future actions.

There is a fundamental requirement for a management scheme for any Community involvement particularly in the context of progress marking, control of budgets, dissemination of results and giving effect to the value added/multiplier effect of transfer and exchange actions.

In addition, the Commission is being held more accountable by the Council and as such must ensure that suitable structures are in place for the proper management of Community wide programmes.

Objectives:

● To identify possible dynamic management schemes which could:

- give the appropriate support for the harmonious infrastructural development in the telematic systems fields ;

- develop a system for continuous review and revision of the criteria for Community support particularly in the Single Market ;

- give a system for the continuous evaluation of the action particularly in formative and summation terms;

- arrange for the development of tools and instruments to assess the technological models and means employed;

- monitor expenditure (payments and appropriations) against budgets.

Technical Approach:

The approach should be based on the current experience on other related programmes and in particular on the results from Part I tasks.

Regarding implementation the most effective use of technological applications should take place, viz :

- Computerised project management eg. MAPPS;

- Electronic mail;

- Teleconferencing;

- Computerized financial accounting and management systems;

- In the context of suitable evaluation and assessment schemes relevant approaches will need to be developed and tested;

- In addition to the establishment of the technical instruments, the concept of national correspondents, animators or coordinators should also be considered or any other such mechanism resulting from Part I.

Key Results and Milestones

A. Development of overall management framework.

B. Testing of systems for assessment and evaluation.

C. Selection of project management support software.

D. Establishment of financial control system.

E. Proposal for a management scheme concerning the Community involvement in the implementation of follow through development in specific rural areas.

Timing Constraints:

Main effort in year 4.

Mode of Implementation:

Research project: shared-cost R&D.

Task No. 5.3.5: Development of Assessment Criteria and Mechanisms

Related Tasks or other work:

Inputs from: Tasks 2.2.3, 5.3.4

Results to:

Rural development organisations; Regional and National government organisations; other Community programmes; PTTs; Equipment Manufacturers; etc.

Background:

Monitoring and evaluation of the implementation of a Community action is necessary for a number of reasons:

- to assist in the management of the action, by providing timely reporting on the status of the implementation ;

- to contribute to the selection of areas, technologies, applications and users who will participate in the action;

- to evaluate the impact which the action has in the rural areas, in terms of its quantitative effect on the existence and use of telematic systems, and its qualitative benefits ;

- to ensure that best use is being made of available finance.

Because of the complex nature of the action, it is unlikely that an existing methodology for evaluation will be adequate.

Objective:

- To develop a possible methodology for monitoring and evaluating the implementation of rural infrastructures resulting from any Community action.

Technical Approach:

It is important that the methodology for monitoring and evaluating the action is developed before follow-through implementation begins. Development of a method should include the following steps :

- identification of criteria for evaluating the action. The criteria should relate to all stated objectives of the action and should reflect the experience gained through evaluation of the individual pilot projects in Task 2.2.3;

- identification of information requirements for meeting the criteria. It is likely that these will include a mix of statistical and qualitative data;

- development of an organisational structure for undertaking the evaluation ;

- development of a scheme for undertaking the evaluation. This should include a timetable, schedule of outputs, definition of target audience, etc.

This task should be done in close relationship with Task 5.3.4.

Key Results and Milestones

Proposal for an assessment criteria to evaluate the follow through implementation of rural information and communications infrastructures and applications.

Timing Constraints:

Main effort in year 4.

Mode of Implementation:

Research project: shared-cost R&D.