

PUBLIC TRANSPORT AS A SOCIAL INCLUSION TOOL IN RURAL AREAS

Sofia Maria Guerra Caldeira Martins, Associate, VTM – Consultores em Engenharia e Planeamento, sofia.martins@vtm.pt

ABSTRACT

The territory is not just a set of places. It is also, and more often, a set of movements that connect these places and determine the extent and forms of appropriation of the urban space.

The provision of Public Transport services in rural areas of small size is essential for the development of such settlements, enabling people to solve most of their problems of isolation and social exclusion. These are often associated with the lack of transport alternatives that allow them to achieve sustainable patterns of mobility.

If in urban areas the policy is to encourage the abandonment of Private Cars in support of Public Transport, in rural areas the trend has been precisely the opposite, under penalty of losing the connection with services and equipment located in nearby towns.

The introduction of an alternative mode of transport also allows rural population to increase their quality of life by providing mobility to people who are deprived of their own means, (senior citizens, youth, students, and people without car, among others).

Thus, the development of an integrated network of transport in small size rural areas can be seen as a way to improve the mobility of these people, promoting their access to several activities, not just those considered basic, such as health and education, but also to a wide range of others that make up life in society, such as cultural and sports facilities, etc....

This introduction may be linked to the process of regional development and modernization, and the creation of a new mean of Public Transport seen as an active policy of local development and redistribution of social benefits, allowing shorter distances and more accessible travel.

Taking into account the effects caused by the lack of Public Transport in areas of low population density - essentially due to the low attractiveness of the traditional Mass Transit market - these proposals are made so as to introduce innovative actions in the treatment given to the collective transport systems, either by creating services originally conceive to carry out other functions (making them more flexible), or creating new services that maximize efficiency and lower costs.

From another perspective, we can also argue about the rationalization of the existing routes according to actual demand, avoiding routes without demand.

A wide range of non-conventional means of transport, called alternative or flexible, will be introduced, using existing local services and infrastructures (school buses, taxis, etc..), new

systems based on voluntary work, on-demand services, combined services between trains and buses, among others. A combination between them is also another viable alternative. The impacts of the taken measures will always be evaluated taking into account not only the better supply of Public Transport, in terms of spatial coverage, but also in an economic and social context which is closely associated with it.

Keywords: Transportation in Rural Areas, Alternative Public Transportation, Demand responsive Transport, Collective taxi, Combined Transport, Feeders

INTRODUCTION

Mobility is not only important as it permits the increase of individual wealth through access to employment and economic cycles, but also because it promotes social contact and creates a support network vital to the security of various groups in society.

The creation of alternatives to private car is considered a measure of social integration and their benefits measured in this sphere more than on an economic perspective, so it is easy to see a positive trend in the studies of Social Impact Analysis done in integrating communities in these plans. This parallelism to the economic impact is much more difficult to obtain and maintain.

One of the main characteristics of rural areas, the very low population density, is of course the main reason why these are excluded from a regular Public Transport network. The low demand and the distance from the nearby City center makes it economically unviable itself to meet this need.

Currently, it is almost coercively or with the assurance of counterparts, that authorities can persuade private operators to perform these services.

Granting exclusivity in providing profitable routes as a way to make a cross-subsidy is the most common way to make public the private service for the Public Transport on routes with low demand.

The Rural Area in analysis

There are several types of rurality, which are defined in accordance with the purpose we want to achieve.

This is the case concerning transportation issues, thus it is very important to clarify the meaning of "Dispersed Rural Areas" to which we want to apply these practices:

Demographic Factors:

Low population (inhabitants);

Low population density/ high dispersion (inhabitants/ km ²);

Average age above the regional average (% elderly).

Socio-Economic Factors:

Low income (% of low income households);

Low Schoolarity Index (grades completed);

Absence of facilities (banks, post offices, etc.);

Lack of jobs available (jobs available in the community);

Functioning in a subsistence economy;

Agriculture as the predominant activity (breakdown of population by sector of activity);

Frequent lack of infrastructures, such as electricity, telephone, mobile, Internet (existing service).

Geographic Factors:

Remote and difficult access places, which makes travel distances greater than in urban areas;

Road network in poor condition or not easily accessible by car;

These are not central places: traveling to them requires a reason to do so.

Main Reasons for Travel:

Education (basic need);

Health (basic need);

Public Services (basic need);

Fairs and local markets (basic need).

In most cases, the need for introducing an alternative transportation service results from the combination of the following factors: low population density, lack of tertiary services (public service counters, banks, post offices, etc.), and the fact that these are remote and very often places of difficult access.

In most cases, these small clusters are served by non-daily routes. These meet the basic and adjustable needs of the population, but it doesn't take into account regular needs (medical treatments, for example) and short duration trips. Most often, the return trips are at the end of the day, because they cater to a commuting work day cycle.

The average occupancy of these routes is around 30%.

Until very recently the generalized form of addressing these needs, particularly those related to basic health care and the supply of goods (mostly food), was to take the good to the consumer, ie vans or caravans were transformed into clinics and shops that covered the clusters farthest from urban centers.

The proposal is to create alternatives by changing the direction of travel, focusing on several individual destinations in the same trip.

Benefits

There are several benefits in shortening the distance between urban (where services and equipment are concentrated) and rural areas. The feeling of closeness and non-isolation ends up being the driving force for all others.

The social development and integration indicators measure the successful introduction of an alternative Public Transportation network in rural areas, more than the economic and financial ones.

Economic

Increasing consumption in remote areas along with economic renewal;

Tourism promotion;

Increase in production capacity aimed entering commercial cycles;

Regional development subsidies;

Population settlement.

Social

Improved quality of life providing goods and services previously inaccessible or difficult to access (geographical and temporal);

Integration in a wider community life (county level);

Access to basic facilities such as education and health;

Possibility of regional connection (supra-local);

Diversification of the labor market.

PROBLEM EVALUATION VS TRANSFERENCE OF SUCCEFUL SOLUTIONS

If on one hand the application of solutions that were successfully implemented is a good bet when the time available for detailed studies is scarce and there is a need to present a set of performance indicators already tested, on the other hand this may be a more costly decision in the medium to long term if it is not the most suitable (with greater adherence to reality and more profitable/ less expensive) to meet the needs of the community.

In most cases, transferring direct measures that were successful elsewhere does not work. O contexto de aplicação é, no caso do transporte em meio rural, da maior importância. The application context is, in the case of transport in rural areas, very important.

For this reason we present a table of goals that Sector-wide should be common in the promotion of mobility, but at the local level differ according to specific needs, thus requiring tailored solutions.

Global Goals	Sector Goals	Local Goals
Economic Efficiency	PT supply in order to answer rural communities needs	Service availability
		Easy access to Transport Services
		Promote quality of service and information
		Intermodality increase
		Define acceptable fares
	Efficient PT with minimum costs to operators, organizations, sponsors and local authorities	Low costs in operation and maintenance
Reasonable occupancy Rates		
Regional Development	Quality of life in Rural Areas	Reach destinations
		Intra and inter-community integration
		Safety
		Empowerment of local economy and job opportunities

Table I – Goals to achieve in implementing an Alternative Transport System in Rural Areas

The starting point of this differentiation has to do with the existence of a mobility tradition, though scarce, as well as with the availability of social services that promote mobility to

restricted groups, such as social vans that support the elderly travel needs to/ from nursing homes or school buses. These are generally the simplest cases to solve, because they are always dependent on the political agenda and the provision of funds for its study and application.

It is important, at this point, to clarify the difference between “solutions” and “teachings”, since it is essential that there is a sharing of experiences, preferably based on successful cases, creating a shortcut so as to anticipate problems and minimize the time spent in seeking a solution.

Evaluation parameters of existing solutions

Economic capability of the population to use a service - which is paid - is another strong factor, because although it is considered a social service, and as such subject to state reimbursement, it will necessarily be charged in order to "cover" a small portion of costs associated with service operation.

These, among other parameters, vary from case to case and require different models of approach and hence the type of service to accommodate.

The evaluation can be done using pre-defined charts that allow describing the reality in a set of configurable options that subsequently will be associated to alternative transportation solutions.

This is the added value of this method, which facilitates the choice after the characterization of local needs.

In any case this "catalog" cannot be followed blindly. It demands that the whole situation is carefully characterized, and at the end of the process point to a solution, which could be presented schematically.

Following this line, a process associated with each solution is created, which allows a reassessment in the case the reality is heightened by the demand.

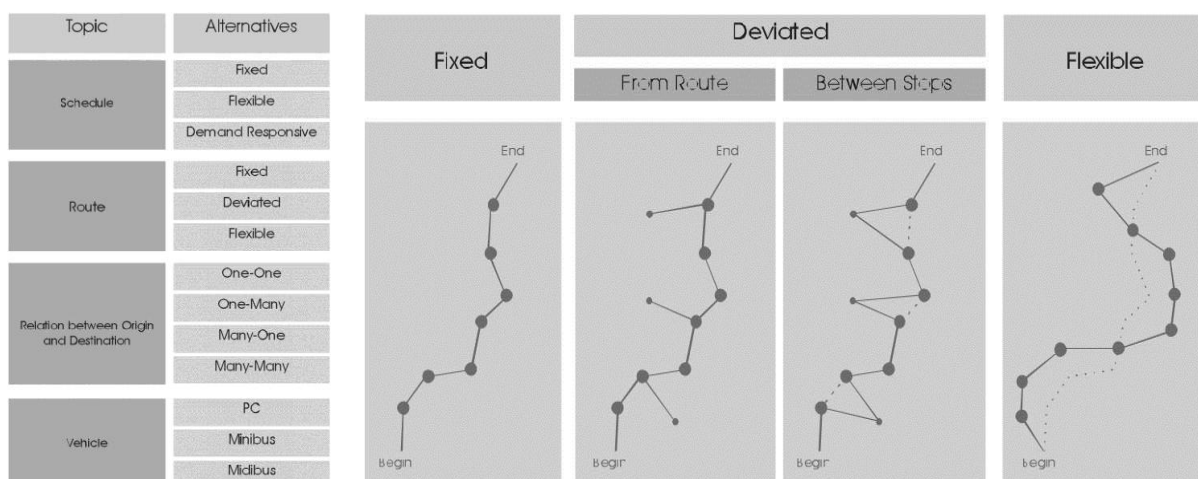


Figure 1 – Available solutions

Public Transport as a Social Inclusion tool in Rural Areas
MARTINS, Sofia

Surveys that allow characterization of travel demand are indispensable to the whole process. Sample size should be based on the analysis of basic indicators of population and mobility, presented in census data.

After analyzing the needs of the population and the physical, economic and functional conditions that will support a mobility solution, the latter becomes identified through a set of features (one from each group of alternatives) that lead to a solid solution, such as organized rides, the additional services/ combined with existing PT, the taxi-bus (collective taxis), the combined service (school transportation, social transportation, mail transportation), the *feeder* and the *on-demand*.

	Population		Demand				Begin		End		Schedules	
	Sparsely	Concentrated	Low	High	Regular	Irregular	Year	Sparsely	Year	Sparsely	Dependent	Independent
Fixed Route Fixed Stops Fixed Schedule		X		X	X		X		X		X	
Flexible Route Fixed Stops Fixed Schedule	X		X			X		X		X		
Flexible Route Fixed Stops Flexible Schedule	X		X			X	X		X		X	
Flexible Route Flexible Stops Flexible Schedule	X		X			X	X		X		X	

Table II – Evaluation Parameters

When defining a route, it is very important to understand the existing services to avoid overlapping them, which would result in a waste of resources.

The overlap issue has to be well managed with the owners of rental vehicles (taxis), which are those who usually have the monopoly of transport in these communities.

The first approach should be careful and somewhat contained in the process, focusing on meeting the needs considered essential and urgent and waiting for the market response before moving to an expansion of the service after a month of success.

It is always preferable to extend the coverage area of influence rather than reducing it. The latest measure brings always the stigma (correct or not) of failure, undermining somewhat the future of the project.

The use of GIS (Geographic Information System) for mapping the existing reality (PT routes, schedules, facilities and centers of interest, location of demand, etc ...) facilitates the design of new services, and makes more expeditious the correction of the routes, the location of (bus) stops and the identification of gaps in geographic coverage. This option represents an extra investment in *software* and technical support, but is identified as a surplus by enabling continuous monitoring (essential) by attributing characteristics to each arc (part of the route between stops) and node (stop) network, such as the amount of passengers, the quantification of boarding and alighting (by route or stop) and localized revenues, all in a route basis, depending only on the information gathered and its regular updating

Usually the update regularity as to do with the software being user friendly, so this is also a key feature in this type of project.

The comparison between the pre and post implementation is vital to determine the future operation conditions of the service.

ELECTION OF THE MOST APPROPRIATE SERVICE

The choice for the best transportation service corresponds to the one that optimizes the combination between the characteristics of demand and supply.

Whichever service is elected, it should be quick to explain, easy to understand and simple to use. These assumptions increase the degree of success expected for the new service, which corresponds in maximizing occupancy rates of available routes.

Pre-Entry into operation

Before coming up with the final solution, we must ensure that:

there are available technologies for its implementation (e.g. phone, internet, service booking software, among others);

there is legal framework for the introduction/ adaptation elected;

the bureaucratic process necessary for its implementation is clarified, especially if it is a new service;

there will be no overlap in service with, for example, hired cars (taxis), but rather a complementary fit and rewarding for both parties;

there is an economic and financial analysis in the medium to long term;

figuring out the possibility of having state benefits and/ or funds (national or EU) for its implementation and operation;

clarify the fare system.

The public presentation is very important; it should demonstrate how easy and accessible the operation of the new transportation system is. This will be the bedrock of the success of its start and its acceptance.

Operating

Once in full operation, it is essential to control (evaluate) the quality of service indicators. The reliability and ease of use are cited as the guarantees of success and continuity of a service like this.

Monitoring e Continuous Evaluation

It is essential to collect data that allow us to characterize the regular operation of the new transportation service. This enables continuous optimizations, not only to the existent service, but also in identifying new expansion markets that might be served through schedules adjustments and to the actual "routes".

This assessment is very important to maintain quality and suitability standards of the chosen service.

Changing the type of service and its geographical coverage allow it to maintain the same (good) level of service and that there are not any mismatches between supply and demand.

BARRIERS TO IMPLEMENTATION

Physical

Accessibility is often the main reason for population isolation. Geographically speaking, physical barriers imposed by topography (longer journeys in rough roads) are a constraint in providing transportation as it is more expensive to provide and maintain a service under these conditions than in urban areas.

This feature often increase the distances and travel times, with direct implications on the maintenance costs of the service.

The limits of administrative division of the territory are commonly used to differentiate funding, subsidies, service coverage, incentives and allocation of facilities and equipment, but can also act as a restraint in Public Transport routes.

This geographic split, when applied to the allocation of funds for the development of measures of social integration results in asymmetries and under use of synergies that would be mitigated if there could be a shared experience (problems and solutions). The coordination and cooperation between counties (for example) through the creation of regional transport communities would enable, in common sense and acceptance, to decrease the costs associated with planning and defining the network.

The lack of knowledge of the populations real needs, due to either the lack of studies or studies misdirected, will biased the characterization of demand, hindering the success of the measures that could be implemented.

Statistical data associated with owning a private car, the age pyramid and geographic coverage of PT are important but too broad for these projects, which are designed to target a very specific population, without much margin for induction.

For a better characterization, surveys are crucial to determine the potential demand of the new service.

The lack of coverage of mobile communications makes the access to the network of alternative Public Transport services more difficult, as well as the info-exclusion that exists

outside the major urban centers. The absence or poor coverage of the Internet undermines the possibility of booking *online* service, for example, which allows savings in operating costs.

Socio-Economical

The inability to be self-sustaining is also apparent from the fact that it will not be possible to apply standards of economic and financial evaluation that allow a balance between costs and revenues, since the cost of designing and planning a Public Transport route is the same whatever the demand.

The only way to restore the balance when the demand is low is to compensate through the fares, which represent travel costs substantially higher than those charged for the same service if operated within an area of more demand.

So, we are witnessing a double disadvantage for these communities, which acts simultaneous as a looping, since these populations are largely characterized by micro-subsistence economies, which results in a low monthly disposable income, preventing the payment of travel and reducing them to a minimum. This decoupling of society does not allow an economic development that raises their standard of living

This phenomenon ends up being the key in the adoption of alternative means of travel and an adaptation/ more rational use of existing alternatives, with operating parameters and economic returns that are more flexible and allow a greater flexibility to a change in the demand, allowing almost immediate adjustments. That is the only way this alternative systems have to “survive”.

Funds, Subsidies and Operational Programs

This financial/ legal framework works as an incentive and as a leverage to the implementation of alternative modes of transport, implying a deep understanding of community needs.

Given the specificity of each pair problem/ solution, the quantification of costs is often difficult to ascertain, and that the available resources can rarely cover more than its start-up solutions, not ensure its future.

It is very important that information on available incentives could reach all potential candidates.

Besides being more common to find funds to subsidize regular routes, the necessary funds for a more flexible service has to take into account the additional expenses associated with the particularity of each case and the innovation factor associated, which involves more than a simple study of demand.

Other costs to be considered are, for example, those associated with the implementation of additional services that are often designed from scratch, such as *call centers* providing information and booking services.

If the start-up costs are not well accounted for, it is not possible to estimate the costs of keeping the service, and this ends up being abandoned.

Another constraint relates to the time limitation associated with these economic leverages, as the stabilization of a new service, as part of the mobility chain, is more time consuming and requires time to be accepted. This implies that the growth trend and the success rate tend to be estimated after the established deadline for subsidies renewal, which means that they end up being used mainly for starting up. Uma planificação de investimento no médio-longo prazo é essencial e deverá ser assegurada à priori . Planning of investment in the medium to long term is essential and should be assured in advance.

Most of the dividends that derive from this type of service are associated with an improvement of social conditions of life; therefore it is reasonable to involve social support organizations and similar ones by their help in the new mode of transportation.

Cross Subsidization

Another way of reaching this demand will be by using the economic tool of cross subsidization, allowing the operator to fund the social service in rural areas (deficient or unprofitable) by creating/ operating highly profitable service routes.

In this case, the authorities must, through its proper channels, and license these routes to facilitate their entry into operation and ensure their market, either by social benefits or inhibition of direct competition.

Public-Private Partnerships

The difficulties associated with the availability of public funds for use in small projects (compared to the estimate potential users) by public organizations lead to the possibility of exploring public-private partnerships. This model would allow the adoption of efficiency indicators that would not depend on number of Passangers/ Km travelled or generated revenues, but on social benefits.

This model allows an association of the dynamics (essential) of private parties with the social obligation of the Public Sector, since from the standpoint of private (commercial) there is no interest in keeping routes/ services unprofitable.

A privatization of these alternative transportation services must be accompanied by the same benefits granted to public operators (differential cost of fuel, social sharing, etc. ...), which leads to a mixed situation of exploitation.

In the case of rural areas the fairest way to subsidize the service, unlike the urban environment, is attributing funds/ benefits directly to the operator, because the demand has a homogeneous socio-economic profile. It makes more sense to benefit the service as a whole rather than benefit the users in a direct differentiate way, like social passes in urban areas, for example.

The short duration that is imposed on contracts hinders the service maintenance in a medium to long term.

Tax Burden

The non-recognition/ legal framework for alternative modes of transport in the market of Public Transport means that its fiscal framework is penalized because it is considered that these are not included in public services, therefore, they are taxed as private economic activities of occasional transportation.

Legal Framework

It is the state that regulates the licensing system in the market of Public Transport, limiting their flexibility to introduce alternative services and referring them to "exceptions" (tourist transport, special transport for the disabled, etc. ..).

Fixed routes, non-flexible boarding points, predetermined schedules, pre-set capabilities are critical barriers to the development of alternative transportation services; its success depends on their flexibility to adapt to the volume and location of demand. Its adaptability allows optimal routes and schedules, maximizing revenues and containing operating costs.

The concessions are offered for transportation services with a defined set of essential attributes of that license, like the route, capacity, stops location, schedule and fare system, among others.

Legally, a service adapted to the rural areas may not have an easy framework because it is not suitable to strictly ensure these impositions.

Upon the characteristics that are implied it may not be considered a bus service - service irregular in time and driven by the demand – nor a hire car service (taxi). The sharing of the vehicle by several passengers, the imposition of fixed routes (fixed start and end points) and the existence of several boarding points do not fit the philosophy imposed for a "taxi" service. Thus, the entire structure (type of license to be allocated to the operator, type of license to be allocated to the vehicle, registration of routes/ services to be explored, accreditation of the driver, etc ...) has to be taken into account, in light of the objectives that they want to achieve with this type of flexible service, so that it allows for an optimization of existing resources. For the user it is more important their mobility rather than the classification assigned to the vehicle.

The support and maintenance of operating license indicators should also be adapted to the volume of demand and its geographic density, for this kind of service.

Organizacional

Public Institutions

The difficult integration between state and public institutions affect the issue of transport and its provision. And even between different public institutions with the capacity to promote and

support the introduction of alternative Public Transport services there are barriers to its implementation.

A coordinated effort among the various entities (transportation, social security, education, labour, etc ...) allows for a synergy of action and a shared experience that reduce partial, even the total, investment - when the decision to create a new Public Transport service is taken.

Also in the decision making level, the training of qualified people is important, in order to deal with the specifics of alternative transportation. This becomes vital for the viability of the projects and their correct assessment.

These measures are slowly implemented because the alternative transport services are not high in the political agenda and also do not have a prominent position that ensures the necessary attention to its success.

This restricts not only its implementation, but also a deeper search for the best solutions, that are often tailored to the problem.

Public Transport Operators

In the case of Public Transport operators it is the competitiveness of the sector that imposes an unwanted policy of noncooperation.

This competition is counterproductive and should be avoided at all cost. It is desirable and more profitable, both for users and investors (even public) that there is an existence of complementarity, in terms of type of service, schedules, and routes.

The best example of complementarity at the level of Public Transport in rural areas is the *Feeder* service. It makes it possible to extend mobility to a regional and supra-regional level at the same time.

The "creation" of a local transport authority would enable the integration and coordination between different operators, allowing a global management at the regional level and not merely at the institutional level in a single transportation company.

The good overall management implies, naturally, the knowledge of the local reality and the existing problems.

It becomes easier, in a first stage, to adapt an existing service, or even creating a new model within a company that already operates in the territory rather than introduce a new provider, which initially would be seen as another competitor.

Promotion and Marketing

Whenever an element of change is introduced in the life of a community, whatever it is and whatever the community size is, there should always be a preliminary presentation and promotion of the way this will work and how it will influence their reality.

Seamlessly, this plan should be updated (and kept current), in order to properly serve those who use it.

This involvement allows users to familiarize themselves with the service, and at the same time, help shaping it according to their needs, particularly with regard to timetables, routes and stopping locations.

The lack of information may jeopardize the success of the service, especially because this depends on the population it serves, and their existence is justified only if they can capture the users and keep them satisfied.

This interaction provider/ user is crucial to the acceptance of the new mode of transportation.

Cultural

Public Transportation is often seen as part of a modest lifestyle, and its users are those who cannot afford to travel by car, as students, elderly and disabled people.

The lack of Public Transport in rural areas leads to an increase of motorization growth rates, as a response to travel needs.

This makes it harder for the subsequent start of the service, since the modal shift from Private Car to Public Transportation is not accepted voluntarily without being accompanied by various constraints, such as the physical impossibility of driving or the existence of financial difficulties.

It becomes more difficult to succeed in a modal shift to Public Transport service when unconditional use of Private Car is considered a *status* statement.

In terms of combined transportation, there are concerns associated with the mixture between the school population and regular passengers. This tends not to be well accepted by parents, for safety related reasons.

Cultural barriers are considered the most difficult to overcome in the whole process, because of its variety, roots and easy dissemination.

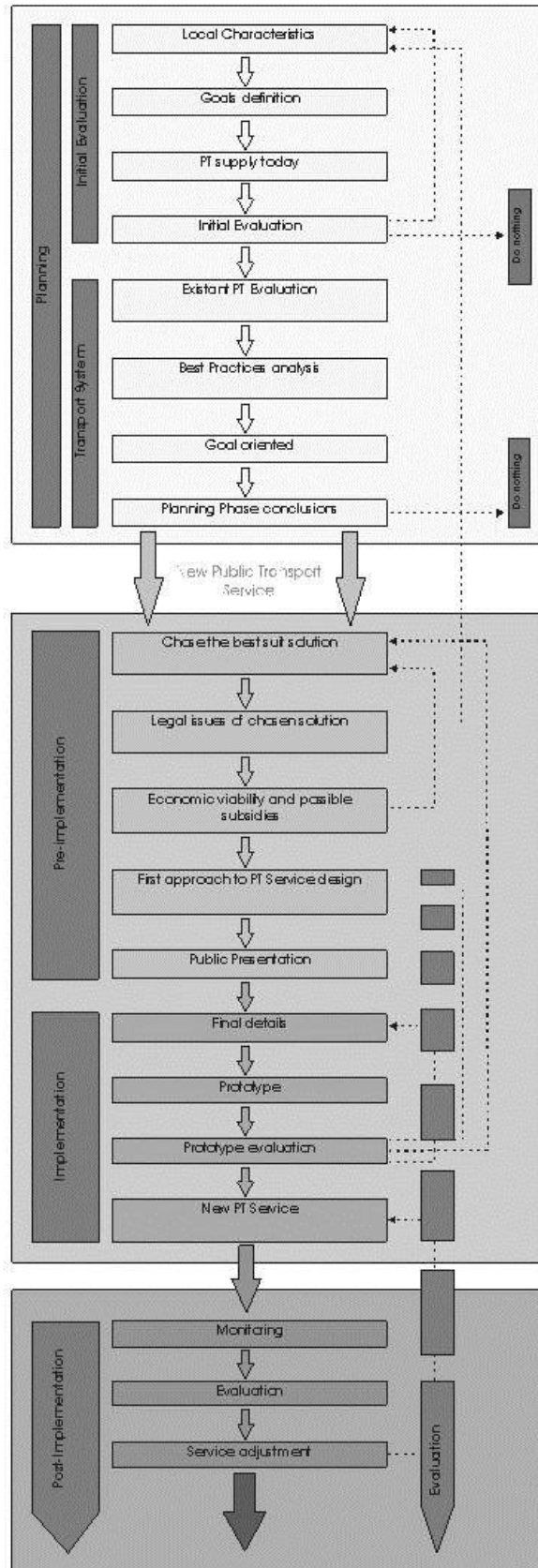


Figure 2 – Implementation process for Public Transport in Rural areas

EXAMPLES

Collective Taxis in Beja, Portugal

TÁXIS COLECTIVOS

O Serviço de Táxi Colectivo é uma alternativa de transporte, por recurso aos veículos afectos normalmente ao serviço de táxi. Os passageiros partilharão estes veículos até à lotação máxima, com preços próximos dos praticados pelas carreiras de autocarro. Este serviço está disponível, no concelho de Beja, aos fins de semana, em três circuitos.

- As tomadas e largadas de passageiros far-se-ão preferencialmente nas paragens dos autocarros, permitindo no entanto a entrada e saída, a sinal, ao longo dos três itinerários.
- Ao Domingo à tarde, todos os táxis passam na paragem do Hospital, no horário aproximado de saída da Gare.
- As tarifas a cobrar dizem respeito a uma viagem simples (ida ou volta) e por passageiro transportado.
- O bilhete pode ser adquirido directamente ao motorista de táxi ou previamente na Gare Rodoviária de Beja.
- Caso a lotação do veículo esteja completa, será solicitado, via rádio ou telefone um reforço de veículo(s), devendo o bilhete correspondente, ser pago (ou invalidado no caso dos previamente comprados) ao motorista do táxi que fez a chamada para o reforço.
- As pessoas com deficiência, cujo grau de locomoção seja compatível com este serviço, podem garantir o seu transporte a partir (e dentro da localidade) do local de origem, desde que façam uma marcação prévia para a Rodoviária, até 30 minutos antes do horário da partida de Beja. No destino (e dentro da localidade) será conduzido até ao local pretendido.

Para mais informações contacte:
Durante a semana: Câmara Municipal de Beja, Praça da República 7800-427 BEJA
Tel: 281 211 800 - Fax: 284 313 873/222 200 - e-mail: transport@cm-beja.pt
No fim de semana: Gare Rodoviária de Beja - Tel: 284 313 8204 - Fax: 284 328 457



TÁXIS COLECTIVOS



Beja *Petra*
Câmara Municipal

IGIT *rodoviária*
de Beja

TÁXIS COLECTIVOS

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Figure 3 – Collective Taxis in Beja, Portugal

Synergy with Postal Distribution in Switzerland

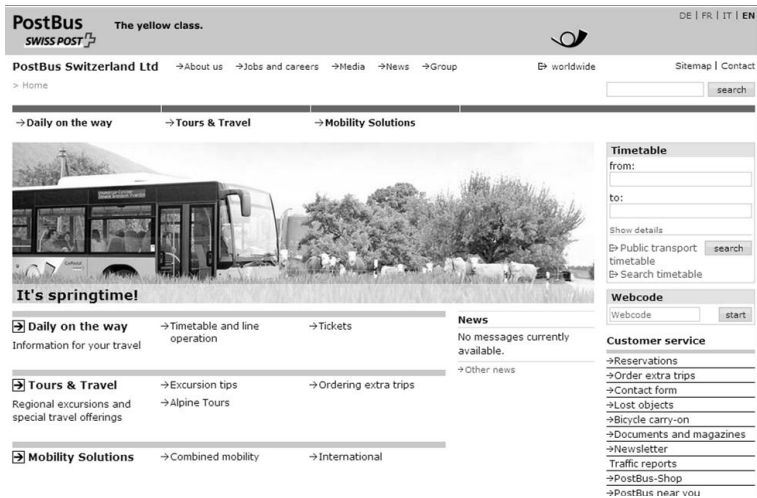


Figure 4 – Synergy with Postal Distribution in Switzerland

TreinTaxi in Netherlands

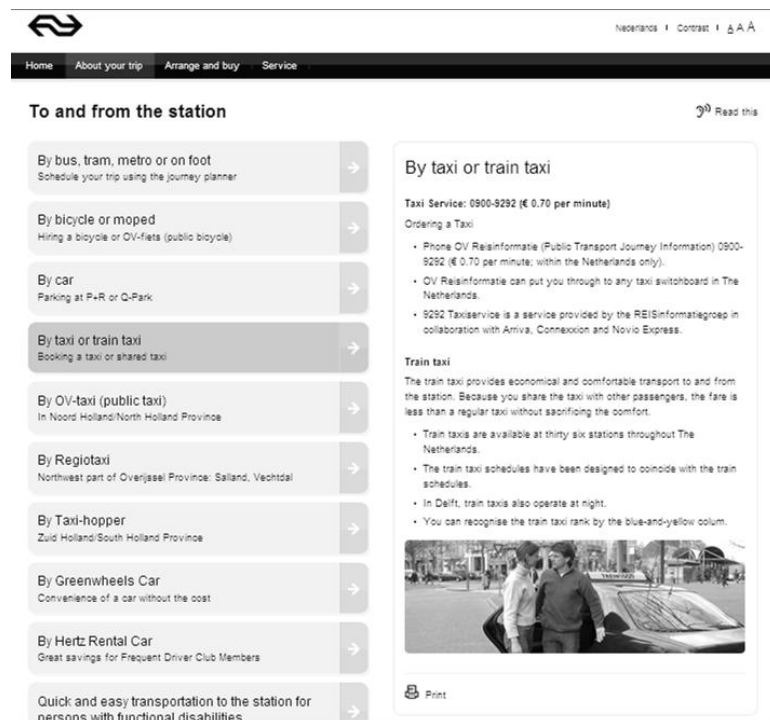


Figura 5 – TreinTaxi in Netherlands

Feeder in Gotland, Sweden

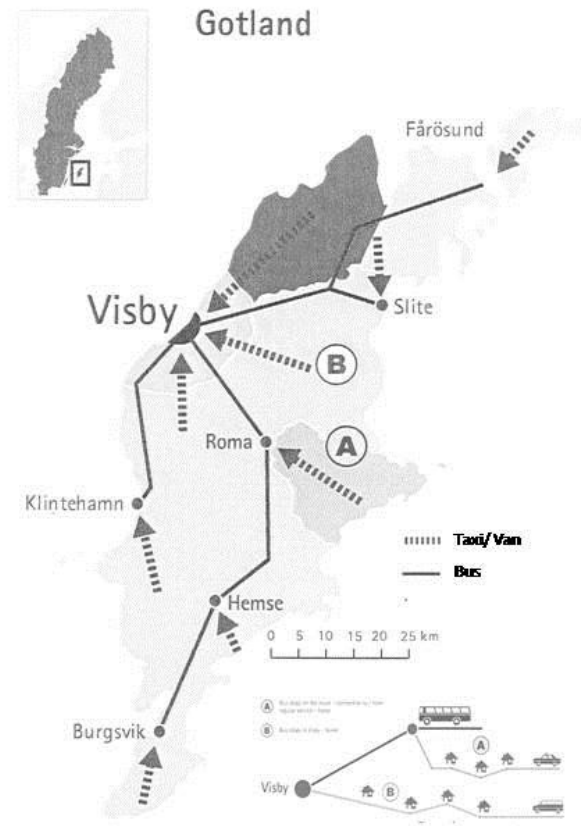


Figure 8 – Feeder in Gotland, Sweden

REFERENCES:

- MARTINS, Sofia (2006). Transportes Colectivos em Meios Rurais de Pequena Dimensão (A carência de Transporte Colectivo como factor de exclusão social). IST, Lisbon ADETEC; 2004 – Services à la demande et Transports innovants en milieu rural: de l’inventaire à la valorisation de experiences, DATAR/DTT/ADEME
- ARTS-Actions on the integration of Rural Transport Service (Vários); 2003 – Rural Transport Newsletter no. 1: Public Transport in Low Density Rural Areas
- ARTS-Actions on the integration of Rural Transport Service (vários); Setembro 2003 – Deliverable 3 – Demonstrations Design and Implementation. Case Descriptions; Project funded by the European Community under the “Competitiev and Sustable Growth” Programme (1998-2002)

- BURKHARDT, Jon E.; 2004 – Executive Summary of REPORT 101: Toolkit for Rural Community Coordinated Transportation Services; Transit Cooperative Research Program, Transportation Research Board, National Academy Press, Washington, D.C.
- Direcção Geral de Transportes Terrestres, 1988 – Manual de Planeamento e Gestão de Transportes; Lisboa
- SCHOFER, Joseph L., NELSON, Barry L., EASH, Ronald, DASKIN, Mark, YANG, Ying, WAN, Hong, YAN, Jingfeng, MEDGYESY, Laszlo; 2003 – REPORT 98: Resource Requirements for Demand-Responsive Transportation Services; Transit Cooperative Research Program, Transportation Research Board, National Academy Press, Washington, D.C.
- SOLOMON, Juliet; 2000 – Social Exclusion and the Provision of Public Transport – Main Report; Commission for Integrated Transport, Reino Unido
- VIRGIL-Verifying and strengthening rural access to transport services, VERKEER, Langzaam et al; Novembro 2000 – Deliverable 5. Final Report; The VIRGIL Consortium