

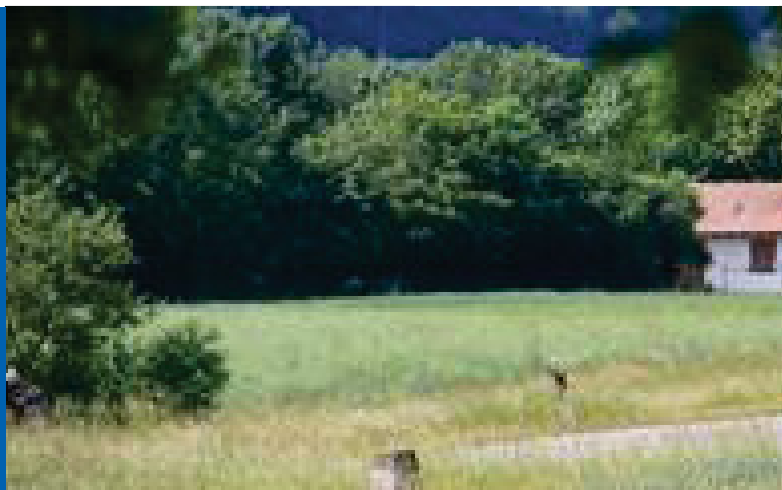
Matthias Gather (ed.)

Attila Lüttmerding (ed.)

Jörn Berding (ed.)



EUROPEAN
RURAL
FUTURES



Proceedings of the 1st EURUFU Scientific Conference:
**Transport and Mobility in
Rural Areas**



FREISTAAT THÜRINGEN
Ministerium für Bau,
Landesentwicklung und Verkehr

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INTRODUCTION

In May 2011 the EU-funded transnational cooperation project called EURUFU (European Rural Futures) started in different regions of Central Europe. EURUFU analyses the challenges of demographic change for municipalities and towns in rural areas as well as the possibilities of maintaining the level of public services and infrastructure. New strategies for

- health and social care,
- education,
- local economy and job opportunities, and
- mobility and transport

are developed in order to support local and regional competitiveness. Several pilot actions in these four topics have been developed, which are practically implemented and tested now and will be evaluated to assess their effects.

The consequences of demographic change require a fundamental review and adjustment of the public services in many places as well as a new definition of standards. It has been identified that demographic change is one of the new global issues that several countries and regions are now facing. Regions need a sufficient framework to be able to share experiences and information and to adapt to the relevant changes in order to react on the demographic changes. The overall goal of EURUFU is to promote actions for the provision of innovative solutions to restructure services and infrastructure in shrinking regions and thus support the sustainable development of rural regions by developing and adapting integrated measures and strategies for regional problems at a transnational level. A range of regional balanced services and economic and cultural opportunities should be implemented to hold and attract inhabitants, entrepreneurs and investors.¹

“The specific objectives of the project are the

- sensitization of stakeholders by creating transparency about the coming challenges of demographic changes and highlighting the possibilities and opportunities for active action,
- active framing of demographic change in close cooperation between the different partners and stakeholders (administration, politics, business, schools, associations ...) in the regions,
- mitigation of population decline and a long-term trend reversal,
- adaptation of infrastructure to the negative consequences of the changing population structure,
- initiation of pilot projects to frame and adapt to demographic change,
- transfer of knowledge at European level and initiate a long-term intensive and continuous dialogue between actors of regional development.”¹

The partnership consists of 11 different entities from 7 European countries (AT, CZ, DE, HU, IT, PL, SI), which fulfil specific functions within the project and represent regional and local authorities, regional development agencies and educational organizations. International cooperation is vital for the achievement of the expected results due to the

¹ Application Form. European Territorial Cooperation Objective. CENTRAL EUROPE Programme. European Rural Futures (2011)

complexity and transnational dimension of demographic change in Central Europe. One focus is the sensitization of regional stakeholders to the current situation and future of demographic change in their area. By the development of a benchmarking system including relevant possibilities and opportunities for active adaptation a common strategy has been elaborated. Related to that common strategy, 10 regional pilot actions has been initiated and implemented to find crosscutting solutions to deal for sustainable public service provision. Subsequently their potential for transferability and exchangeability between the regions will be evaluated and they will become part of a transnational action plan.²

Within EURUFU, the Transport and Spatial Planning Institute of the University of Applied Sciences Erfurt is mainly responsible for the part “mobility and transport” with a focus on sustainable concepts. This includes the analysis of the current transport and mobility situation in the project regions³ as well as the implementation of the pilot action “voluntary mobility consultants” and an extensive survey on mobility behaviour in rural areas. A further task of the Transport and Spatial Planning Institute is the planning and organisation of three EURUFU Scientific Conferences which give an input from researchers to the project partners and its pilot actions. Furthermore the conferences should improve the cooperation and knowledge exchange between scientists dealing with different topics related to rural areas. The first conference was held on the 14th of May 2013 in Fehérvárcsurgó, western Hungary and dealt with “Transport and Mobility in Rural Areas in the context of demographic change”. The following table gives an overview of all planned EURUFU Scientific Conferences:

No	Month	Place	Topic
1	May 2013	Fehérvárcsurgó, HU	Transport and Mobility in Rural Areas
2	Oct 2013	Asti, IT	Education and Job Opportunities in Rural Areas
3	Apr 2014	Sondershausen, DE	Social Issues and Health Care in Rural Areas

These are the proceedings of the 1st EURUFU Scientific Conference, thus it represents the collection of papers which were presented by the authors as well as further papers which could not be presented due to time constraints.

The papers are dealing with various aspects of transport and mobility in rural areas. Examples of rural transportation systems based on local communities and volunteers are presented, as well as the specific role of young people using transport systems in peri-urban areas. A further important subject dealt with in different papers is the closure of railway lines in rural areas throughout Europe, and the analysis and limitation of its negative consequences. Several papers are presenting results of studies on rural transport in exemplary rural and peripheral regions of Central Europe. A special remark should be put on the paper about finding ways to a more sustainable and less car-dependent mobility in rural areas, a topic which also runs like a common thread through most of the other papers.

The authors are from transport faculties, research institutes and transport consultancies from Austria, the Czech Republic, France, Germany, Hungary, and the United Kingdom.

² www.fh-erfurt.de/fhe/en/transport-and-spatial-planning-institute/metaprojektliste/2011/eurufu/

³ cf. : www.thueringen.de/imperia/md/content/eurufu/en/media/outputs/wp3/o3.1.6.pdf

WHICH CLUES FOR MORE SUSTAINABLE AND LESS CAR-DEPENDENT MOBILITIES IN RURAL AREAS?

Marie Huyge

Polytech'Tours - Projet MOUR (MObilité et Urbanisme Rural) - CITERES

60 rue du Plat d'Etain, BP 12050, 37020 Tours Cedex 1, France

huyghe.marie@gmail.com

ABSTRACT

Our presentation is based on the French research project MOUR (Mobility and rural planning), led by the laboratory CNRS-CITERES of the University of Tours, which studies daily mobilities in sparsely populated rural areas and aims at developing mobilities that are more sustainable (in particular, less expensive for the households) and less car-dependent. This two-years-long project, started in November 2011, already produced promising results, theoretical as well as empirical: we will present some of those.

To begin with, we developed a typology of households in terms of their mobility, which distinguishes the “mobility deprived”, who suffer from difficulties of mobility for economic, physical or cultural reasons; the “vulnerable”, households with modest incomes, forced to do long and expensive daily commuting trips, and who could suffer from the increase of energy and fuel costs; the “other mobiles”, households without (apparent) mobility difficulties, but whose mobility habits are unsustainable.

The research project analyzed different transport services available in rural areas, potential alternatives to the car: an inventory of the mobility supplies performed in the Parc naturel régional Loire-Anjou-Touraine highlighted the high number and the diversity of public transport services (regional train, buses, train stations shuttles, etc.) in the territory. It also highlighted that those transport services are sometimes unadapted to the population needs, particularly the working people. Finally, it showed that the transport services are sometimes only accessible by small parts of the territory.

This inventory was scrutinized through two methods. We interviewed 37 rural households, asking questions related to their mobility-budget, the effects of the energy prices on their habits, and their ability to adopt new mobility practices (use of other means of transport, adoption of other daily routines, etc.). We also set up a several-month-long experiment with 19 households: the objective is to follow their daily mobility practices and to accompany them in changes of their mobility habits.

1 INTRODUCTION

This article presents some results of the French research-project MOUR (Mobility and rural planning) which studies daily mobilities in sparsely populated rural areas; it aims at developing mobilities that are more sustainable and less car-dependent. This two-year-

project started in November 2011 and is co-led by the laboratory CNRS-CITERES of the University of Tours, and the Parc naturel régional⁴ Loire-Anjou-Touraine (PNR LAT).

Our choice to study mobility in rural areas is led by two phenomena, which could hinder rural populations' mobility practices in the next years: the environmental recommendations of the French law "Grenelle 2" that encourages development of the most accessible areas only; the increasing cost of energy and fuel. In this context, excessive reliance on car for mobility is not a solution anymore: poorly-served areas may have to face recessive dynamics, or even a new rural depopulation.

Nevertheless, it seems to us that it cannot be envisaged to totally abandon those territories and their populations, for territorial fairness' reasons. Which solutions could then be implemented to maintain the territory dynamics and the households' quality of life?

First, we will present theoretical views about mobility in rural areas and a typology we created to classify the mobilities of rural populations. Using this typology, we will show in which way mobilities in rural areas are problematic, on a social and environmental point of view. In order to find solutions to reduce the reliance of rural populations on cars, we have to know what mobility services already exist, and what are the mobility habits and practices of rural populations today: those two points will be addressed in parts 3 and 4. Finally, we will present the next steps of our research, based on a several-months-long experimentation, led with 19 rural households.

2 PROBLEMATIC RURAL MOBILITIES

2.1 A typology of "rural mobilities"

Based on scientific literature, we distinguished three categories of rural populations, according to their mobility practices.

a) The mobility deprived

This first category has been borrowed to the sociologists Le Breton [1] and Dupuy [2]. They considered as mobility deprived households without any access (or difficult access) to mobility, for financial (no money to get a driving license or to own a car); physical (disabled or elderly for instance); cultural reasons (psychological difficulties to be mobile within a territory or to leave it); or because of a lack of mobility abilities (ability to buy a public transport ticket on their own, or to find their own way on a map). Persons with mobility difficulties lead to narrow daily-areas (which limits access to jobs, services, shops and leisure activities) and into a strong reliance on local networks (relatives or friends).

b) The vulnerable

This second category was defined by Verry and Vanco [3] as households whose global mobility-budget (fuel, car park, toll cost, insurance, repairs, etc.) accounts for more than 18% of their total budget. In rural areas, vulnerable households are mostly households with

⁴ A Parc naturel régional is a territory formed by communes willing to set up a conservation project for their natural and cultural patrimony. The Parc naturel régional Loire-Anjou-Touraine is formed by 160 communes, located in the Centre of France, between Tours and Angers.

modest incomes, mainly workers or employees. Attracted by low land costs in rural (and peri-urban) areas, those households moved away from the urban poles, and consequently from their job area. They have to own two cars, on which they depend completely, and to sustain long and expensive daily commuting trips. Those households would be the most affected by the increase cost of fuel.

c) The rest of the mobile population

Finally, we defined a third category, which gathers the “other mobiles”, who have no apparent mobility difficulties, at least financially. As far as we know, the “other mobile” have never been a subject of research. Yet, those modest to well-off households represent an important part of the rural population (active and retired people), whose mobility practices and needs are unknown. With increasing fuel costs, the most modest “other mobiles” could potentially shift to the vulnerable category tomorrow: their mobilities then present very strong stakes.

2.2 Problematic rural mobilities, on a social and environmental point of view

All three categories of mobility described above all are problematic, on a social or environmental point of view:

- In rural areas, mobility-deprived persons have very little access to employment, shops and services (which progressively disappear from village centers), to leisure and socialization, which can lead to insecurity, isolation and even exclusion.
- In case of increasing fuel costs, the vulnerable persons could be unable to afford their daily trips, and their quality of life could suffer. They would then have to choose between three options: saving on other spendings (heating, for instance); moving away to cities, closer to jobs and services, in the only neighbourhoods which will be financially accessible; limit their mobility, and risk mobility deprivation.

Those two mobilities are, or could be in the coming years, **socially problematic**.

- The “other mobile” and the vulnerable’ mobilities present strong stakes on an **environmental** point of view: they mainly depend on cars, and are responsible for an important part of the CO₂ emissions in rural areas⁵. In order to respect the Kyoto protocol, those trips must absolutely be revisited.

In the project, we focused our researches on the two categories which are mobile, the vulnerable and the other mobile, to whom very few studies were dedicated⁶. Our objective was to know better their practices, and the options they have to be less dependent on cars. In the next sections, we consider those mobile households as car users, mostly solo drivers.

⁵ Transports are responsible for 35% of the CO₂ global emissions [6]; CO₂ emissions per person and per year are much higher in the low density areas, because of a stronger usage of the car and a low access to public transport [4].

⁶ The article being limited in length, we will not evidence the lack of literature on rural mobility, and especially on the rural population mobility practices.

The mobilities of those two categories of households can be improved (on a social and environmental point of view) while limiting the mobility costs and CO₂ emissions. We assume that those limitations can be obtained by:

- changing travel modes: using train, practicing carpooling, biking, walking, etc., instead of solo-driving;
- reorganizing daily activities, optimizing journeys and improving journeys chaining;
- limiting journey motives.

3 A LACK OF ALTERNATIVES TO THE CAR IN RURAL AREAS: A REALITY?

The assumption that the car is necessary in rural areas, and that there does not exist any alternative to it, is widely shared. Is it a reality? Regarding our hypothesis: can the mobile households swap car as solo-drivers, for other travel modes?

In this second part, we will quickly show that there are numerous and diverse transport services in our study sites, but that most of them are poorly adapted to population needs, and that the few “quality” services that exist are accessible to a very small part of the population only.

3.1 Transport services that are numerous and diverse, but incoherent

We made an inventory of all the existing transport services in the 160 communes of our study area, the PNR Loire-Anjou-Touraine. We highlighted the existence of various kinds of transport services:

- regular lines of public transport, bus or train;
- dial-a-ride schemes;
- feeder services to the train stations.

We also highlighted different types of organizing structures: “official”, such as the Regions, the Departments or local authorities; “non-official”, such as associations, enterprises or social centers. Within the 160 communes, we could identify 30 distinct transport services. The maps presented below illustrate this diversity, in terms of public transport services and dial-a-ride (DAR) schemes.

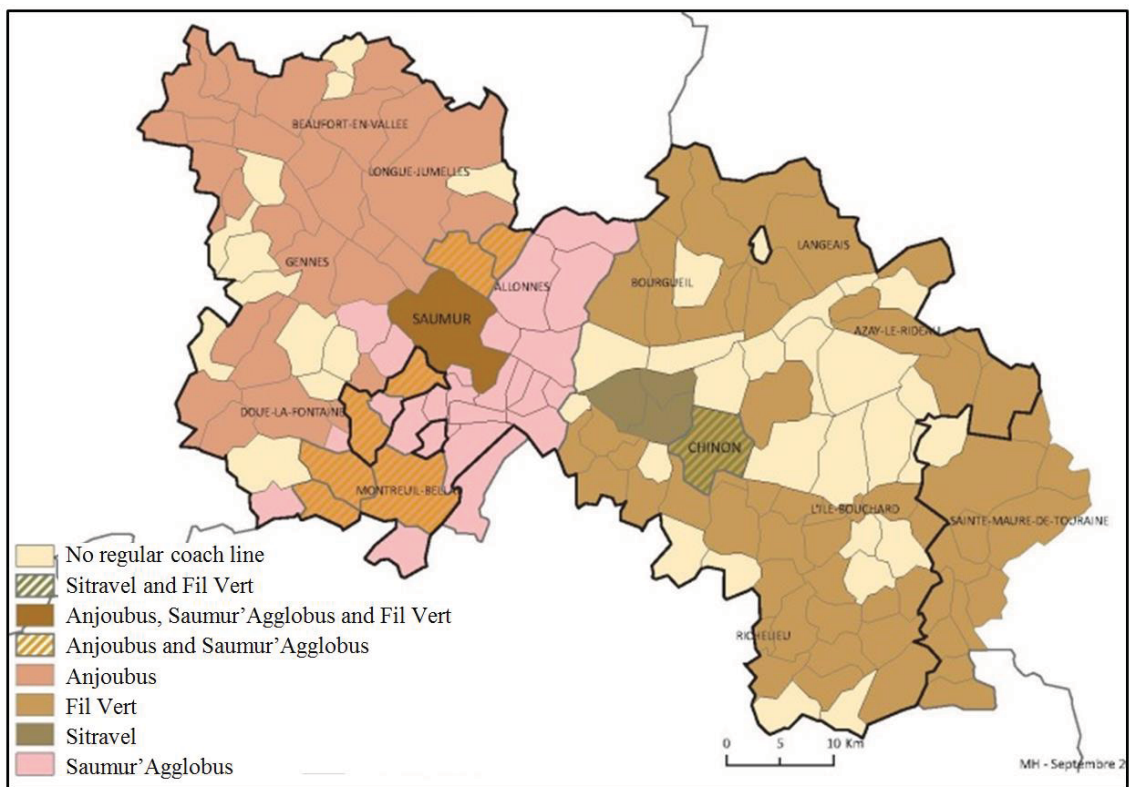


Figure 1: Number and diversity of public transport services – MH, September 2012

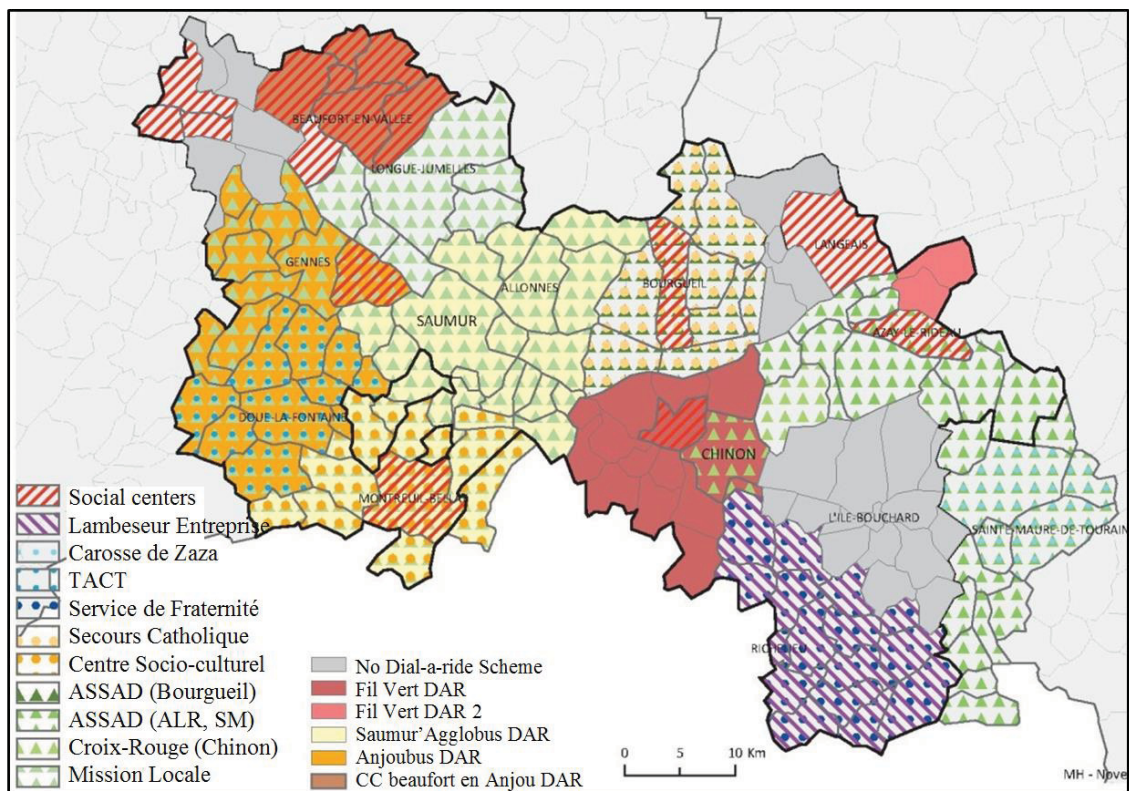


Figure 2: Number and diversity of Dial-a-Ride schemes – MH, September 2012

Those numerous services present differences in terms of public accepted, perimeters served, frequencies, fares, etc. This multiplicity and the diversity creates an important package of services, but the population may meet difficulties to understand and get familiar with it. Moreover, the multiplicity of services leads to a lack of coherence, particularly for the dial-a-ride schemes. Organized by official and non-official structures, those services are juxtaposed, without any global view. Some communes are served by 3 different DAR schemes, whereas others (25 out of 160) have no service at all. In the precedent part we highlighted the high number and the diversity of transport services in our study area, at a communal scale. But do those services really meet the needs of the population?

3.2 Transport services mostly unadapted to population needs

Those services, although numerous, are mostly poorly-adapted to population needs, in particular to the working people. In this second part, we will focus on the 12 communes of the Communauté de Communes du Pays d'Azay-le-Rideau (CCPAR). As shows the map below, the CCPAR hosts 2 railway stations served by 1 train line (grey), 1 feeder line by shuttle (light blue), 2 public regular coach lines (light and deep purple) and, 1 school transport line opened to adults (orange), and 2 dial-a-ride-schemes (not represented).

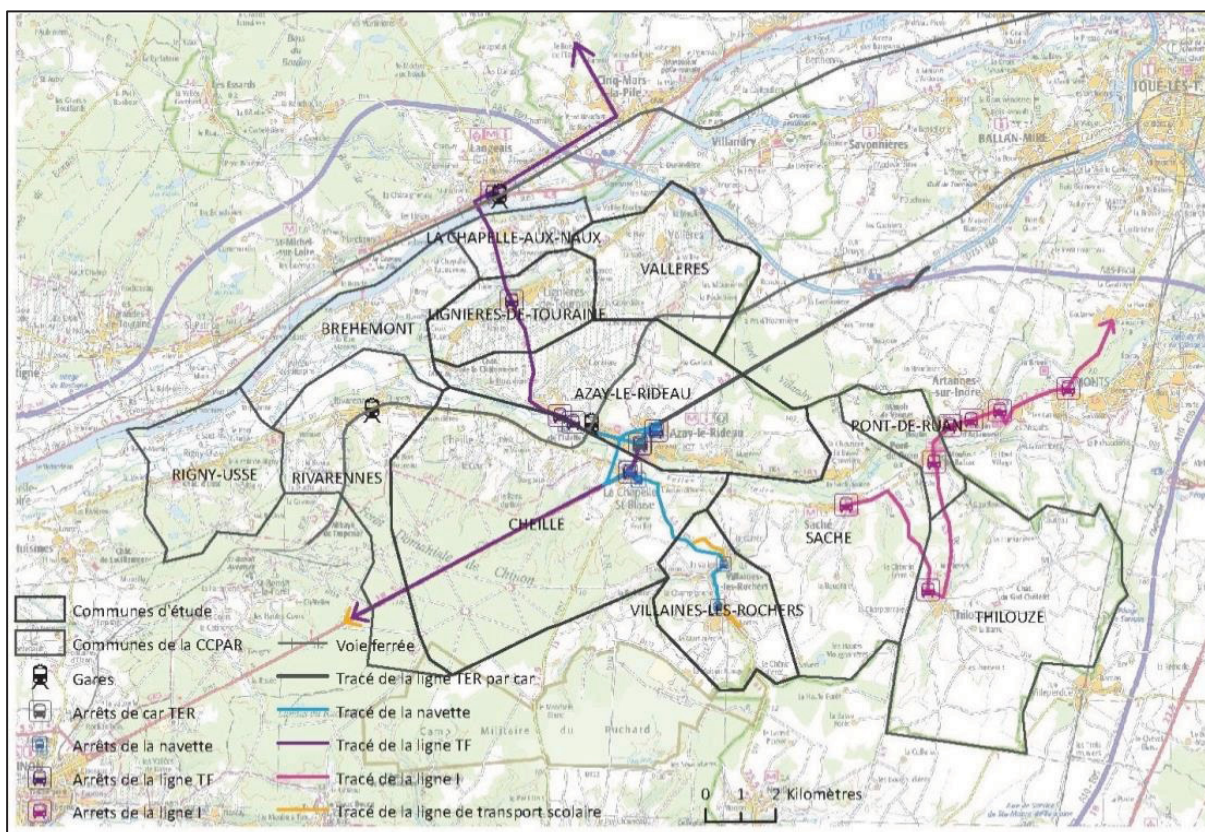


Figure 3: Transport services existing in the CCPAR – MH, May 2013

Among those 7 transport services, only a few may be regarded as “**quality**” services, in terms of frequency (not 2 or 3 servicing per day only, but several coaches in the morning and the evening), journey length (not 2 or 3 times longer than the same journey by car) and fares (similar or cheaper than the car). Other services which do not offer that quality of service are not likely to be used by the “mobile” population.

In conclusion, only the train line, the feeder line and the 2 public regular lines can be considered as quality transport services. Indeed, the two dial-a-ride services are too expensive to be used every day, and operate a few days per week only. The school transport line operates at hours that can suit the working people (early in the morning and late in the evening), but the journeys are too long, compared with the car.

Moreover, transport services offered to households do not always meet their needs in terms of **destinations**. To illustrate this issue, we used the INSEE database listing people's job locations: we could determine that the 4 quality transport services existing in the CCPAR fulfill less than 15% of working people needs.

3.3 Quality transport services that are accessible to a very small part of the population

Those 4 quality transport services existing in the CCPAR are only accessible to a small part of the population. To highlight that fact, we focused on 5⁷ of the 12 communes of the intercommunality; those 5 communes are served by the public train line, by one regular public bus line, and by the feeder line.

Within those 5 communes, we defined two categories of territories:

- category (1), in which the population has access to the transport services (via the railway stations and the coach and shuttle stops);
- category (2), in which the population has no access to the transport services, and is totally dependent on its car.

We defined the accessibility to the transport services as follows:

- the railway stations⁸ are accessible by foot in a 800 m radius (10 minutes), and by car in a 7 km radius (10 minutes);
- the coach and shuttles stops are accessible at a 300 m walking distance⁹.

We got the following maps, showing the 1st category of territories (green hatching), for the train and feeder lines (left side), and the regular coach line (right side). At this point, we have not done a precise study of the population' settlements within the communes: this study will enable us to quantify the percentage of population living in the 1st category territories. For the moment, we will accept the results in terms of percentages of territories.

⁷ As explained below, those 5 communes have been chosen to perform semi-directive interviews.

⁸ We determined the accessibility of the 3 railway stations existing in the territory (represented on Fig. 4, left): indeed, even if 2 of them are not located on our 5 communes, they are regularly used by the 5 communes' populations.

⁹ We excluded the hypothesis of getting to the coach and shuttle stops by car, because of the breaking bulk and the increase in total journey length it would induce.

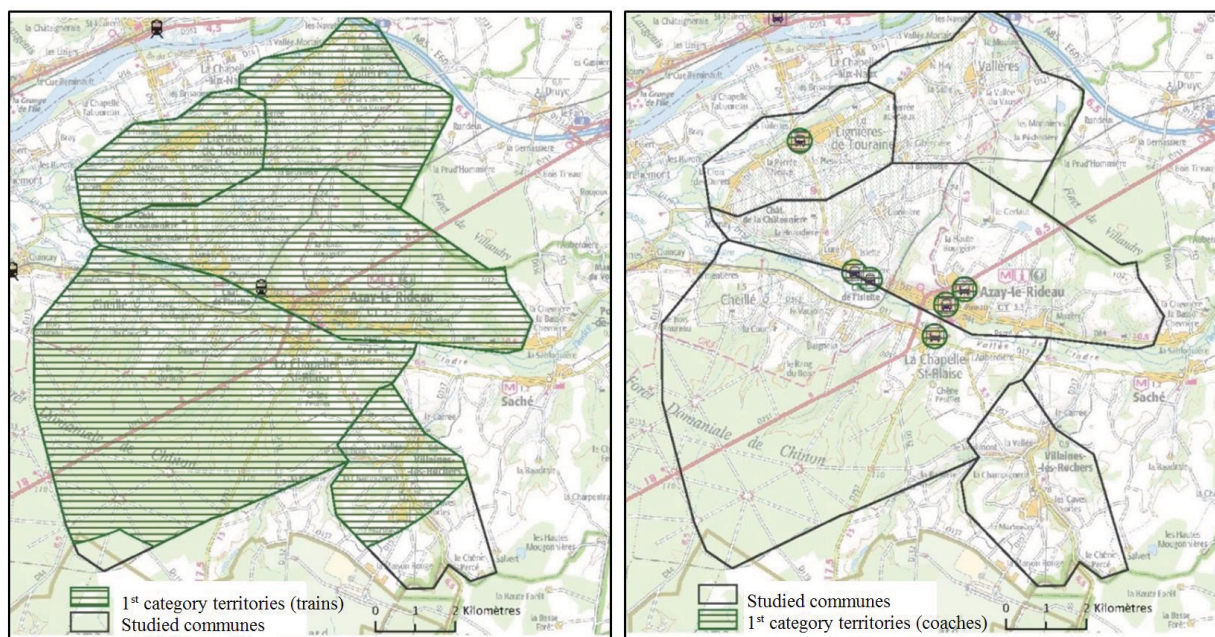


Figure 4: 1st category territories, with access to the train and feeder line (left) and the regular coach line (right) – MH, April 2013

On the left hand map we can see that 95% of the 5 communes (105 km² out of 111) have access to the train line, via the train stations and the shuttle stops; only 6 km² have no access to the train line, and are considered as totally dependent on the car. We can then conclude that the train can be an alternative to the car for the major part of the 5 communes' population; it is even truer for the populations who belong to the spheres of influence of several railway stations¹⁰, who then have access to more trains, at different hours.

On the right hand, we now see that less than 1% of the 5 communes (1.6 km² out of 111) have access to the coach lines, via the 6 stops existing on the territory; that means that 99% of the territory, without access to the coach lines, is totally dependent on the car. In general terms, all the hamlets of the 5 communes, namely the sparsely populated rural areas, are totally dependent on the car. A part of Azay-le-Rideau's center is a territory of 1st category: in terms of percentage of population, we can then suppose that more than 1% of the population has access to the coach lines.

3.4 Conclusion

Our objective was to perform an inventory of the transport services existing in our study area, in order to know the options offered to the households so that they can diminish their car dependence. Our analysis showed us that there exist numerous and diverse transport services on our study territory, which are train lines, coach lines, feeder lines, school transport lines, of dial-a-ride-schemes. Only some of them (which all are train, coach or feeder lines) can be considered "of quality", in terms of frequency, journey length and fares.

Moreover, some of those quality services serve only a very small part of the territory and its population: it is notably the case of the coach and feeder lines. In our study area, only the train lines can then constitute a good alternative to the car: they are of quality, and are accessible by a large part of the territory.

¹⁰ For simplicity we chose not to distinguish the 3 spheres of influence on the left hand side map.

As a consequence, the hypothesis that “there is no alternative to the car in rural areas” is warranted for all the transport services, except for the train lines.

We now know more about the possibility offered to the households in terms of “changing travel mode”, and swapping car for transport services. As a public transport, trains only provide a good alternative to the car. Nevertheless, decreasing solo-driving and changing travel mode do not only concern transport services: We should not forget the options offered by carpooling, and by bike and walk, for shorter trips.

4 MOBILITY PRACTICES OF THE RURAL HOUSEHOLDS: MORE VIRTUOUS MOBILITIES ARE POSSIBLE

As stated in part 2.2, we can consider three ways of improving rural populations’ mobility: changing travel mode, improving journey chaining, and limiting journey motives. Our objective is now to evaluate those three options regarding household mobility practices. Are they already accounted for? Are the households journeys already optimized, or do the households make numerous “unnecessary journeys”? Is the car used only when necessary?

4.1 Information acquisition methods

We acquired our knowledge about the households’ current practices through two methods:

- Our first method was quite traditional: we performed 37 semi-directive interviews with “vulnerable” and “other mobile” households living in 5 communes of the Communauté de Communes du Pays d’Azay-le-Rideau¹¹. Our questions were about households’ current mobility practices (weekly journeys, current practice of carpooling or use of public services, mobility-budget, etc.), and the way those practices could evolve.
- Our second method was much more original: we started a several-months-long experiment with 19 households (selected among our 37 interviewees), during which we individually accompany them and follow their mobility practices. The experiment, called “Mobility challenge”, is divided into two parts:
 - In the first one, we asked the participants and their family to fill in a “mobility notebook” during one week, in which they have to describe all their journeys, the mode used, the distance travelled and the journey length, the number of people present during the journey, etc. This information would complete the one obtained during the interviews.
 - The principle of the second part is to propose alternatives to the 19 households, which should allow them to change travel mode or to limit their journeys. Those alternatives, which are being determined thanks to the individual “mobility notebooks” and are then perfectly adapted to the habits and constraints of the participants, will then be tested during one month. Our objective is to evaluate, according to the reactions of the participants, the impact of an individual accompaniment (that takes the form of the interviews-awareness to the question-and proposition of alternatives) on the households’ mobility practices’ changes.

At this point of the research, the 2nd part has not been performed: in this article we only focus on the results of the first one.

¹¹ Those 5 communes are those we focused on in part 3.3

4.2 Main results of the interviews

The interviews have not all been analyzed so far, and the “Mobility challenge” experiment is still in progress. Nonetheless, some results are already worth discussing in this part, we will only focus on results related to the possibilities to improve mobilities, on a social and environmental point of view.

a) Changing travel mode

Not surprisingly, the main travel mode used by our interviewees is the car, used by 33 interviewees out of 37 as solo-drivers for most of their journeys, for all travel purposes (work, shopping and services, leisure, child accompaniment, etc.).

Nonetheless, it is worth noticing the “good” practices of some interviewees (or their family members) who managed to set free from the car:

- some of them use the train every day to go to work, or more occasionally, for leisure or shopping reasons;
- a few interviewees practice carpooling to go to work;
- a lot of interviewees with kids practice informal carpooling for their children’s out-of-school activities. However, those practices are rarely named as “carpooling” by the interviewees, who see this as “something logical, which would be stupid not to do”.
- eventually, some of the interviewees travel by foot (or more rarely by bike) for shorter journeys, within their village or in cities.

However, based on the mobility notebooks, we assume that some households could use other modes than car for some of their journeys (those assumptions are theoretical at that point, and will be tested in the second part of the experiment):

- many short trips (1 km on average) are still done by car, whereas they could be done by bike or by walk;
- some trips for leisure could be done by train - timetables and line frequency creating little constraints compared to the car;
- people with fixed and “typical” working hours could practice carpooling for their daily commuting trips.

The question is then: for those who use their car for all their journeys, even when another mode would be convenient¹², what is the reason?

- a lack of interest: the “other mobile”, who financially assume their mobility practices, and whose mobility habits suit them perfectly, have no need to change habits. In such a way, they do not need to search a way to set free from the car, since they do not suffer from the dependence relation they have with it.
- a lack of information: most of the households interviewed have partial knowledge of the transport services. They rarely know the timetables, stops locations or travel lengths. Nonetheless, they mostly think that the lines are incompatible with their needs and habits. Moreover, the lines’ timetables give journey length from stop to stop, or railway station to railway station: the households then need to calculate the entire door to door journey. Regarding carpooling, there is a real lack in terms of linking process. The lack of

¹² Thanks to the « mobility notebooks », we could highlight journeys that can be made with another mode than the car.

information and knowledge is a real brake to the use of those modes. This meets the conclusion of Rocci [5].

- the weight of habits and the lack of practice: as Rocci showed, the habit of car and the automatics developed over time are reassuring; using the car is often due to a quest for simplicity (no combination of travel modes, no timetables to respect, no carpooler to find, no tickets or pass to buy, etc.). Yet, changing travel mode and adopting new habits can be very stressful, even more when swapping car for transport services with fixed timetables that induces more constraints.
- nevertheless, we must add that some people have tried to change transport mode, but did not manage to find a suitable alternative. That is particularly the case for carpooling: during the interviews, several people declared to have tried to find a carpooler, but without success. A work must then be done to facilitate the linking processes.

b) Optimizing journey chaining and limiting journey motives

When asking the interviewees if they could limit their journeys (in number or distance) by optimizing their journey chaining (taking benefit of a journey for different actions, and avoiding single-motive journeys) or by limiting journey motives, they all answered no; this would then imply that their journeys are already optimized, or that the households have tried to optimize their organization but that, in view of the constraints it would induce, decided to keep their current practices.

Indeed, the mobility notebooks showed us that most of the households already have “logical” journey chaining and avoid unnecessary journeys. However, it would theoretically be possible to set up other organizations that could limit certain trips, at least in number:

- this mainly concerns the trips for grocery shopping, for which some interviewees drive specific journeys: the grocery shopping could then be done “on the way”, taking profit of another compulsory journey; they could also be simply “suppressed”, by planning more in advance; finally, they could be done in Drive shops: the grocery ordered can be picked up on the way by one or another member of the family.
- this also concerns some short trips, mainly for children accompaniment: in order to avoid long waiting times, parents make frequent return trips between home and the activity location. In the same way, several interviewees take profit of their long lunch break to go back home for lunch (which represent up to 50 km for some of them). The question of the “free time”/“wasted time” enhancement is then posed.

Another option in order to limit the number of trips is the use of the internet to do shopping, but also to develop telecommuting: among the participants of our experimentation, we identified at least one potential telecommuter.

Based on the interviewees’ discourses and their mobility notebooks, we showed that more virtuous mobilities are conceivable, thanks to changing travel modes, a better organization of the activities and/or a limitation of the journey motives.

Depending on the participants of the experimentation, those changes could reduce the cost of mobility and the CO₂ emissions. Nonetheless, living without car in rural areas remains utopic at this point.

5 CONCLUSION

The two-year-long MOUR project aims at evaluating the possibilities of developing more sustainable and virtuous mobilities in rural areas: in particular, we studied mobilities of the vulnerable and the “other mobile”, which we showed are problematic on a social and environmental point of view. The objective is to see whether, and how, the households could reduce their mobility-budget and their CO₂ emissions.

We assume that the rural populations mobility could become more virtuous via three ways: by changing travel mode (swapping car driven alone for carpooling, train or coach lines, biking or walking); by optimizing the journey chaining; by limiting the journey motives.

We showed in our second part that there are numerous and diverse transport services on our research area: train lines, coach and feeder lines, dial-a-ride schemes, school transport lines. However, they do not all meet population needs (especially working people) in terms of quality of service (frequency, journey lengths and fares) and destinations: it is particularly the case for the dial-a-ride schemes and school transport lines. Moreover, even when quality transport services do exist, some are accessible to a small part of the population only. That analysis especially concerns coach lines services. Finally, in our study area, only the train lines can be considered as potential alternatives to the car. Changing of travel mode can potentially be made by using train lines, but also by practicing carpooling and, for the shorter trips, by walking or biking.

What about the households practices? Can they really improve their mobility and make it more virtuous, or have they already optimized it as much as possible? Based on semi-directive interviews realized with 37 rural households, and on the first results of the “Mobility Challenge experimentation”, in which we individually follow 19 households, we could improve our understanding of their mobility practices. We showed that even if some households have already tried to change travel mode or limit their journeys (in number or distance), some improvements are still possible. Depending on the households, those improvements could enable to limit the cost of mobility or the CO₂ emissions. Nonetheless, living without a car in rural areas remains utopic at this point.

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COMMUNITY BASED TRANSPORTATION SYSTEMS – A WORKSHOP REPORT

Georg Hauger, Monika Wanjek, Tamara Vlk

Fachbereich für Verkehrssystemplanung, Vienna University of Technology

Erzherzog-Johann-Platz 1, 1040 Wien, Austria

georg.hauger@tuwien.ac.at, monika.wanjek@tuwien.ac.at, tamara.vlk@tuwien.ac.at

ABSTRACT

GIVE & GO develops and proves an innovative, brand new mobility service for areas with poor supply of public transportation. GIVE & GO is based on private transport, operated by honorary capacity and using both, traffic which exists anyway (pooling) and requested trips organised spontaneously, voluntarily (swap meet mechanism). Thereby GIVE & GO provides new technological solutions (web-/ smart phone tools) as well as personal assistance for its customers using social innovation also to gain a resilient additional mobility backup. In a field trial in Vorarlberg GIVE & GO intends to improve its customer friendliness with a focus on the users (user innovation) and demonstrate its capacity as a non-profit mobility solution.

1 INTRODUCTION

In areas with low traffic demand the provision of an attractive public transport reaches its limits. With a view to demographic and economic developments the number of people without an access to a car is increasing. That means that the number of those, who have an inadequate access to a transport system is going to grow. Additionally the number of environmental friendly people without an own private car is rising. So, sustainable, resilient and affordable transportation solutions are important to guarantee mobility in those areas. 2011 was the Year of Volunteering – here the project *GIVE & GO* ties on by developing, testing and proving an intelligent mobility service, which is based on a non-profit solution and designed to complement the general existing transport system.

GIVE & GO is a funded project by the *FFG – Austrian Research Promotion Agency*. Under the overall control of the IVS from the Technical University of Vienna, the project started in August 2012 and is going to last for approximately 2 years. Project partners are (1) NPO competence centre of the Vienna University of Economics and Business, which is responsible for the volunteering engagement, (2) FLUIDTIME as responsible partner for the development of the IT based solutions, (3) ROSINAK & PARTNER, responsible for the organisation of the pilot phase and its evaluation, (4) ALLMENDA and VATC as regional partners, with the function of maintaining and supporting the background operation of the project during the pilot.

The pilot of *GIVE & GO* will be held in three regions of Vorarlberg, selected through the analysis of demographic data, population density and existing supply of mobility services. The three regions are Bregenzerwald, Großes Walsertal and Feldkirch. This paper describes

the background and theoretical approach of the project idea of *GIVE & GO* as a workshop report.

2 BACKGROUND

The pace of change in modern traffic and community patterns is breath-taking. These changes are mostly driven by economic or political rational aspects. However, social issues - especially those ones, which are pointed out by the rural community - are often under-represented.

Rural areas are characterised by an inadequate public transport which is increasingly often a problem for older and younger people, especially for those ones, which are not or no longer able to drive a car. In particular, these target groups have an increasing need for mobility and decreasing resources and opportunities. This combination could be fatal for future patterns, because rural areas could easily become a poorly developed "hinterland" in which it is hard to organize everyday life.

The provision of mobility solutions in places and times of poor travel demand require flexible and short time available supplies in public transportation. During the last years, many projects with the aim to provide a regional public transport were developed. Most of these projects are based on the concept of the citizen's bus (e.g. GMOA-BUS [1], DORFMOBIL [2], MOBIKULT [3], KRÖBU [4]) and the dial-a-ride service/transport. Many of the existing or former projects only exist because of the financial support from authority. In contrast the American project *ITN America* [5] works without governmental financial support. *ITN America* finances itself from membership fees, a small financial contribution from the passengers to the drivers and donations, which come especially from enterprises. *ITN America* is focusing on seniors, families and communities. Suppliers may earn credits by volunteering to drive. The credits can be used for transportation service or other affiliates. On the other hand, seniors, which enlist a riding service, may e.g. also trade their vehicle for ride credits or may even donate their car. However, rides can also be paid by money. This shows that the concept of *ITN America* is likely more as an exchange market of mobility services than a public financed system to extend public transportation.

Regions and times of insufficient demand for transport show the challenge of providing an efficient supply of public transport for people without the possibility, skills or the will of driving their own car. Though, these people need frequent rides, or rides within a short period of time. Concomitant with the low utilization of public transportation in rural areas, the situation of the municipality's budget cause, that just a minimum of supply can be provided. Suppliers of public transportation, especially in rural areas, are confronted with inefficient cost coverage. Furthermore a large part of the supply is not attractive for frequent use from the demanders' point of view. Thus the personal car gets more attractive and the dependence on the own car at certain regions and times even higher. Compared to the public transport, the rides with the own car often seem to be more comfortable, reliable, flexible and even cheaper for its passengers, which sends up the will of driving by car instead of public transport.

To ensure mobility of people living in rural areas, it is important to understand people's needs and to use the endogenous potential of the region. The public's unity is one aspect of endogenous potentials, which should be taken into consideration in creating a new form of mobility service.

3 THEORETICAL APPROACH

It seems appropriate to develop - and prove in a pilot project – a brand new concept of mobility service which is based on private transport, operated by honorary capacity and using both, rides which exists anyway (pooling) and requested trips organised spontaneously, voluntarily (swap meet mechanism) combined with an on neighbourhood assistance based exchange market.

NEIGHBOURHOOD ASSISTANCE

The approach of the neighbourhood assistance should provide the critical mass of supporters and suppliers for requested ride services at the very beginning. Existing neighbourhood assistance services should be also involved during the implementation process for spreading the project. In small rural towns, the social cohesion is still a well-developed sense and knowing each other -especially the direct neighbours- is part of the everyday life. The incentive of exchanging skills, tools, goods and credits may also be forced by the neighbours' will of helping each other. On the other hand, the motivation of the participants appears as an important act in the run-up to the implementation of the project. Besides the motivation, also the imparting of safety and trust is necessary. Furthermore it is important to establish the cooperation with local practices and associations as well as schools.

The motivation of users represents also an essential part of the feasibility. Without the critical mass of users, the concept would not work. On one hand the critical mass of demanders is required but also the supporters or suppliers have to be activated and motivated. By including users during the implementation in the development process, incorporating user innovation is another important success factor. In the process of user innovation may include user's experiences and needs for pushing the search for new solutions which would also satisfy their needs [6] [7]. Especially early adopters, who are in close contact to the inventor team of the project may influent the project's success at the very beginning.

SHARED COMMUNITY

In 2013 a new trend of consumption exists. The new generation of costumers values the benefit of an object higher than possessing it. For this reason many people already prefer to lend, to exchange or to share objects like cars, household appliances or even accommodation for their holidays, instead of buying them. The payment occurs either monetary, through credit points or through exchanging goods with the subjectively same value. Of course, the exchange could also be done without payment. The only assumption of this new trend is, that the exchange of objects has to be done quick and simple [8]. Most of the new business models which promote the share of products or talents use social media or smartphone apps for spreading the supplier's services and demander's needs.

Nowadays people even start living in shared communities, which is named as *cohousing* [9] and share their daily life with other families or foreign people with the advantage of helping each other with child care or providing each other in times of the competitive pressure of the market and price increase of basic food. Besides these market conditions, also mobility costs increase. Considering the fact, that the population gets older

and their provisions lower, the new model of offering rides in an existing system of fluent traffic streams, or requested rides in undersupplied regions, may be a part of this trend.

Due to the fact that 470 out of 1.000 people in the EU-27 average or 514 of 1.000 people in Austria are in receipt of a car [10], which on average stands still for 22 to 23 hours a day, the philosophy of sharing instead of owning gets more and more popular and worth it, even in daily life. The problem results not of the fact of unused, still standing, parked cars, rather the inefficient cost-benefit ratio of unmoved cars, which has negative effects on the budget. The existence of car-sharing projects and car-pooling platforms is high enough, to assume, that the demand for short-time available and flexible alternatives in transport supply exists. Companies, like BlaBlaCar and Munich's carpooling.com claim more than 6 million combined users and even attract more and more investors. Zipcar, an American car-sharing company, claims 700.000 members in the United States in 2012. [11]

Compared to car-sharing models in urban agglomerations, rural areas would not guarantee the practicality of these models, because a high density of population and a wide customer structure are needed [12]. For this reason, another form of shared rides, combined with voluntary activities, will be tested in Austria.

4 PILOT PROJECT AUSTRIA

Based on the theoretical approach the idea of the pilot project *GIVE & GO* was compiled. The prior aim of *GIVE & GO* is to provide attractive mobility opportunities in areas, with a deficient public transport system, for people without access to a car. Therefore *GIVE & GO* is using the potential of the existing traffic and combines it with an exchange platform as well as providing additional demand by facilitating swap meet mechanism on non-profit basis. This leads the general traffic system to boost the efficiency and reducing car dependency. In doing so *GIVE & GO* uses modern IT-Tools (such as web-/ smart phone Apps) or analogue tools as well as, personal supports and initiating social innovation.

GIVE & GO operates on a voluntary non-profit basis. As the volunteers are not paid, they are rewarded for their transport service by earning credit points, which can be bartered for other transport related services for themselves or others (trips, deliveries etc.) or e.g. for neighbourly assistance (such as lawn mowing, childcare and so on) or other services. According to personal abilities and needs users can act in both roles (providers and customers). So *GIVE & GO* is not going to provide another form of car-sharing (DENZEL DRIVE [13]) or car-pooling (COMPANO [14]), it is not going to be a service for renting a car (CAR2GO [15]) and it is also not another form of an public transport which is operating on demand (ANRUFSAMMELTAXI [16]). *GIVE & GO* combines mobility-related potentials in a communication platform and adds a new component to the traffic system without being a rival to public transportation.

Furthermore the project wants to promote self-help initiatives so as group trips of association members (e.g. local sports clubs, pensioners clubs and many more) or hitch hiking, which was very common in rural areas of Vorarlberg for a long time. To ensure, that even hitch hiking can be one of many proper forms of transport, it is very important to give full consideration to safety. Therefore the project team decided, that people should have the possibility to sign in as a *GIVE & GO* drivers and/or passengers (in this context as hitch hikers) and receive an identity card, which gives the drivers and the passengers/ hitch hikers a feeling of safety. Another aspect, which is able to support safety of passengers - especially hitch hikers - and drivers is the presence of social control, which is strongly established in rural areas.

MATCHING

The most important task for the pilot is to guaranty a proper matching, so that drivers and passengers are able to find each other fast and easily. Therefore the primary tool of the pilot uses a simple and user-friendly designed smartphone-app for suppliers and demanders of mobility and other services. Since not all of the potential suppliers and demanders are well-versed in the usage of / do not have an access to smartphones a web based platform is the first and a hotline is the second fall-back level. By calling the hotline a contact person helps users in all operational issues of the platform, like finding or offering an appropriate trip or service, maintaining the users own data, submitting an evaluation and eventually other during the pilot phase identified user operations.

Before starting the pilot it is necessary to define target groups and to elaborate and adopt a communication strategy in order to reach them. In a first step *GIVE & GO* wants to reach young, open-minded and technically oriented people. For them, *GIVE & GO* offers an online matching and communication platform, which gives them the opportunity to enter via smartphones or personal computers and to take easily part in the development and innovation process. It is indispensable to cooperation with regional partners like Festival-Manager, Restaurant Manager, authorities, associated clubs or others to ensure a high degree of brand awareness.

A second step considers older people – because of the ageing population this target group grows faster than the others – which are not able to drive or do not have an access to a car. In contrast to the regional partners for reaching younger people, there are different partners needed to reach the older ones, so as medical practitioners, pharmacies, restaurants, town halls, pensioners clubs etc. In order to inform older people, additional to the web based platform local newspapers and information booklets in a doctor's waiting room are more appropriate.

During the pilot it is very important for the users to have the possibilities of giving feedback. This enables a user-innovation based development and implementation process and helps to enhance the acceptance of the service. It is particularly important to differentiate between two forms of evaluation: (1) evaluation of the usability and user satisfaction of the platform so as the pilot and (2) evaluation of the suppliers/drivers or demanders/passengers good-behaviour. Especially because the supplier /driver offers his/her services voluntarily, it is important to deal sensitively with evaluation issues. For example negative evaluations according to a person's individual way of driving are generally disliked and could be a reason for the recipient not to offer a service again. This should be avoided, because that would undermine the idea of *GIVE & GO*.

LESSONS LEARNED SO FAR

(1) Research findings:

- During the state of the art research the most important documents were reports of experiences, best practice projects and expert-interviews. To evaluate these information and to form the basis of the projects concept a criteria matrix was used to find key factors for success or failure. The analysis shows, that beside the organisational, technical and legal aspect communication was most important.

- Most of the existing solutions approaches to enhance the mobility of people in rural areas have to be financed by the authorities, because the solution approaches are usually not able to operate on a cost-covering basis.
- At the early stage of the implementation phase most of the projects are usually suffering to reach the critical mass of users (suppliers and demanders).

(2) Public transport and taxi companies:

In particular, when it comes to public transport and taxi companies they are concerned to lose passengers and consequently their reason for existence. So an **early communication and cooperation strategy** is very important.

(3) Voluntary work and legal aspects:

- When it comes to the supply of mobility services from private persons, the **legal aspects of voluntary work** are very important. For example in Austria sharing of travel costs is (strictly speaking) in the meaning of the Austrian trading law seen as a commercial service, because the defined travel cost contribution is substantially lower than actual costs are.
- Furthermore, **in case of an accident** consequences are not covered by the obligatory third-party insurance as soon as the mobility service which was offered is regarded as a commercial activity.
- Generally **passengers are covered by the obligatory insurance**. Nevertheless passengers should be asked to sign a declaration of the restriction of liability, to ensure that they are not asking for more than the obligatory insurance covers maximum.

(4) Safety and confidence:

- **Registration forms for drivers and passengers** are recommended to enhance the feeling of safety.
- Furthermore suppliers and demanders of mobility services should have the possibility to **report offences or complaints**. Thus the feeling of safety and social control could be ensured.
- Passengers (especially hitch hikers) are recommended to send the **number of the driver's car via short message** to a friend or somebody who is expecting him/her at the destination.

(5) Activation and motivation:

- The concept of giving people - who want to supply / demand a mobility service - the opportunity not to be paid / to pay, but **exchange with other services, tools, goods or credit points**, helps to activate and motivate users. In case of exchanging credit points for (mobility) services it is important to know, that these credit points are seen as a currency within the meaning of the (Austrian) trade law. Thus these services could be seen as commercial activities depending on frequency of offering services and the level of intake.
- The most promising form of activation and motivation is social recognition, like honouring somebody for his/her commitment, organising a festival/meeting for potential suppliers and demanders of mobility services and many more.

- Furthermore the changing mind in terms of **environmental awareness** – especially linked with **social ideals** – could be a good reason for people to take others with them in their car.

(6) Getting in contact:

To get in contact with potential suppliers and demanders of mobility services **regional partners** could help a lot. For using endogenous potentials it is important to cooperate with well-functioning and by the target group well-known companies, clubs or other stakeholders. However, the strategy for getting in contact with the target groups should be well-planned and well-considered.

5 NEXT STEPS

In the next step *GIVE & GO* is organising the one year lasting pilot phase in Vorarlberg. Therefore it is important to get in contact with key-players, regional partners and potential suppliers and demanders of mobility services. The pilot phase is going to be divided into two phases: (1) *GIVE & GO* is addressing young and well-versed smartphone-users and (2) tries to activate more users by using analogue tools as well. The lessons learned of the *GIVE & GO* pilot are going to be considered in a user-innovation process and a permanent implementation of the *GIVE & GO*-Idea and Tools are targeted.

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BÜRGERBUS - THE (POTENTIAL) ROLE OF CIVIL SOCIETY IN SECURING MOBILITY FOR LOW-DENSITY AREAS

Martin Schiefelbusch

nexus Institut für Kooperationsmanagement und interdisziplinäre Forschung GmbH
Otto-Suhr-Allee 59, 10585 Berlin, Germany
schiefelbusch@nexusinstitut.de

ABSTRACT

Large part of Europe will face an aging and shrinking of their populations in the coming decades. In many rural areas, the loss of inhabitants as well as their rising mean age will pose major problems to the provision of many basic services, including transport. Traditional public transport, ideal to move large numbers of people in big vehicles, will become less and less viable. New types of service and new ways of collaborating with other stakeholders are necessary. Among the strategies discussed, “community transport” has been promoted since the 1980s. In short, “community transport” means the development of small-scale, also informal ways of securing the mobility of the rural population by activating and integrating local resources and ideas. Civil society plays an important part as a resource for such schemes - citizens becoming involved as bus drivers, coordinators, ride-sharers or fundraisers in the community. This can be described as “planning from below”, complementing the traditional thinking of public transport as a hierarchical system planned “from above”. This raises the question of where and how the “above” and “below” can meet, and how they can cooperate in a useful way. It requires to understand the motivations and needs of the local population in a different, more detailed way that cannot easily be captured by traditional planning approaches. This paper discusses these issues based on experiences made in the development of a specific type of community transport, the so-called “citizens’ buses” (Bürgerbusse) in Germany. A “Bürgerbus” is a small bus driven by volunteers. Originally a British and Dutch concept, about 200 such services are currently running in Germany.

1 INTRODUCTION

This paper presents findings from a very practice-oriented project on what can be called governance of rural mobility. Readers will learn about issues in the development of “Bürgerbus” services, a type of small-scale public transport service that closes gaps in the network of traditional public transport at much lower cost, thanks to volunteers driving the vehicles and doing part of the other tasks associated with providing a public transport service.

A Bürgerbus (“citizens’ bus”, plural “Bürgerbusse”) builds upon local resources and initiatives, therefore it can be considered as one variation of “community transport”, to quote a term more widely known in the English speaking world - but there are differences to the English concept, briefly discussed in section 4. Indeed, the basic concept of volunteer-based public transport has its origins in England, and there are further variants of that basic idea also in some other countries. We will briefly look at these, but then focus on the German situation.

One might think that to set up a Bürgerbus is a planning and administrative task. This is also true, but only part of the story. It is even more a communicative challenge, requiring good knowledge of the local people, social talent, some technical know-how and last but not least a lot of patience. It seems therefore much more adequate to use the term “governance” for the development of such services than just “planning”.

By combining these skills and bringing a service to work, a valuable contribution to local community life can be made at modest cost. The Bürgerbus idea has without doubt also its limits, but there are certainly still many places in Germany - and probably also beyond - where such a service could be set up and assist in solving mobility problems. There are also locations where a Bürgerbus actually exists, but in a hidden way, known only to local “insiders” because the difficulties of bringing the service into the framework of formal public transport is deemed too complicated and out of place.

There are also many variations of the basic idea - to help others in maintaining their everyday mobility - that is behind many Bürgerbus projects. People giving lifts to neighbours or doing car-pooling respond to the same need. They do not have to follow the same rules a Bürgerbus does, but they do not get the same support either. The underlying question of all these different approaches therefore is how to “govern” this part of mobility in a way that allows these initiatives to develop and contribute their part to working communities and a (slightly more) sustainable life.

2 BÜRGERBUS - DEFINING THE CONCEPT

There is no official, generally recognised definition for the German term “Bürgerbus”. Hence some services branded as such do not meet the definition provided below; vice versa there are cases where the definition is adhered to under a different name. Considering this, and the complexities of the different formal arrangements described below it is not easy to give a precise figure for the number of implemented Bürgerbus schemes, but a reasonably good estimate is possible. Based on the far majority of applications in Germany, the following definition can be derived:

A Bürgerbus is a **public transport** service which uses unpaid **volunteers** for most or all tasks, in particular for driving the vehicles. A Bürgerbus makes use of **local resources** and close collaboration with other local stakeholders. The vehicles used are **minibuses** or large passenger cars.

This definition includes four key elements. Each of them has its own implications for the kind of service that can be offered:

Public transport service: The Bürgerbus is part of the public transport system. Its existence is published, it is accessible to the general public, it carries different passengers who do not (need to) know each other in one vehicle, it charges the same fares to all passengers, and it operates according to a pre-defined schedule. Not all of these conditions are necessarily adhered to in all cases, however. In particular, services may operate as demand-responsive, hence requiring pre-booking. Some services cater for specific groups and are thus not published widely. Nevertheless, the Bürgerbus is to be distinguished from special, “closed-door” transport tailored to a certain group’s needs, such as school buses, patients’ and disabled persons’ transport.

Volunteers: This is the key feature of a Bürgerbus service. The use of voluntary civic engagement allows substantial savings to be made compared to normal bus operations - drivers' wages and social security fees typically account for 60-70% of operating costs. For volunteers, only fees for a special driving licence and medical examinations are necessary, and even this cost item depends on the local regulations. On the contrary, volunteers need to be recruited and kept, as discussed below, based on their personal motivation, and they are not as available as a paid driver would be.

Local resources and knowledge: The reliance on volunteers - usually recruited from the community in which the bus operates - already links a Bürgerbus much closer to the local community than a traditional public transport service, which is managed by medium or large companies dealing with a large area and with drivers living somewhere else. In this way, the Bürgerbus drivers (and also other activists in the Bürgerbus associations) are close to their customers and are able to respond to specific local needs. Furthermore, the Bürgerbus depends on local cooperation and networking to secure funding and fulfil its role. Support from the local authorities, businesses and civil society organisation is therefore very important.

Vehicles: The exclusive use of small vehicles is linked to the fact that Bürgerbusse are complements to other public transport services and operate in areas of low demand, where these vehicles are sufficient. But the main reason is a practical one: holders of a normal car driving license in Germany¹³ are permitted to steer vehicles carrying up to 8 passengers. Beyond that, a full HGV/bus licence is required. To be able to get enough volunteers, it is essential to use vehicles that citizens with the normal driving license can drive.

3 THE BÜRGERBUS STORY

3.1 Evolution

There are about 200 Bürgerbus services operating in Germany (figure 1). The idea of using volunteers in the provision of public transport services is reported to have its origins in the UK already in the 1930s. It was re-discovered in England in the late 1960s, exported to the Netherlands in 1977 and first used in Germany in 1985. The first German bus in fact operated in the region of Westphalia on a route close to, and in part crossing the Dutch border. Since then, the number of services has grown steadily with only very few closing down again for lack of users or volunteers.

Even today, the geographical distribution can be said to reflect the spread of the idea from North-Western Europe towards the East: The German state of North Rhine-Westphalia has by far the highest number of services (ca. 100), followed by Lower Saxony (ca. 20) and Rhineland-Palatinate (ca. 20).¹⁴ But this is not only due to the idea spreading by communities following their neighbours, also to political decisions: The government of North Rhine-Westphalia in particular has supported Bürgerbus initiatives since the 1990s through dedicated funding and support, which has evidently had success in bringing many initiatives to life. On a lower level, the state governments in Lower Saxony and (more recently) Rhineland-Palatinate have also supported initiatives in their area. The other states offer no specific support yet, although local authorities can in part compensate for this.

¹³ Licence type B according to the current EU classification, formerly type 3 in the national system.

¹⁴ As a comparison: North Rhine-Westphalia covers about 25% of the German population and 9.5% of the territory.

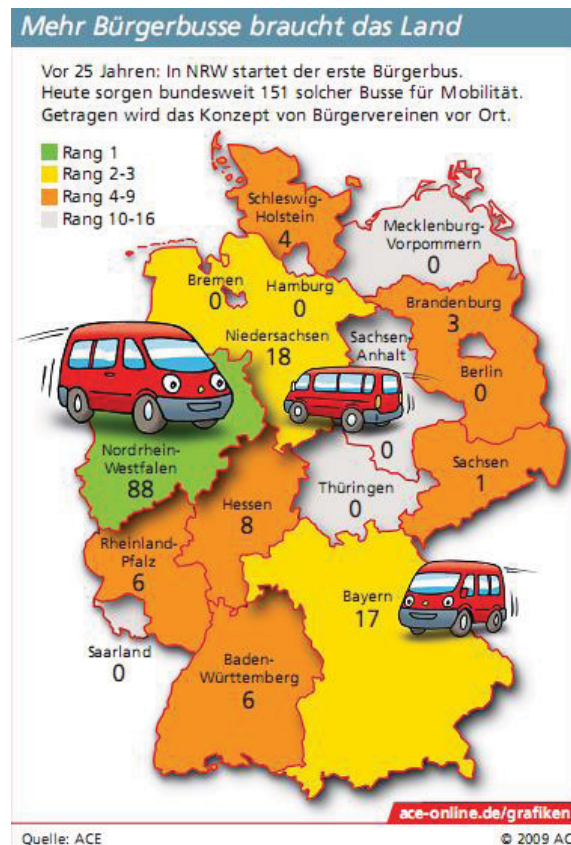


Figure 1: Distribution of Bürgerbus services across Germany - Note: Numbers show situation in 2009, furthermore counting methods in the different sources are inconsistent [1]

3.2 Service types

Based on the characteristics outlined in section 2, Bürgerbusse fulfil a complementary role in the public transport system and cater for situations of low demand. They can nevertheless be found in a variety of geographical settings and market segments. Two service concepts clearly dominate:

The “urban-rural link” connects a district centre (small or medium-sized town) with the surrounding villages at times or in areas where no other bus service operates (figure 2). The district centre is usually the main destination, but also the place where connections to other bus and train services are provided. About two thirds of the German services follow this model. The “small city bus” operates within a city or town which is too small for a traditional city bus, but still too big to be served adequately by the regional services present (figure 3). These cities often have housing estates far away from the main roads, shops, leisure establishments and other facilities are scattered over the whole area and/or have moved to the periphery in recent years. They tend to operate over shorter routes, but more frequently than the first type. About half of the Bürgerbus services in Germany follow this model (some combine both). Despite a predominance of schemes in rural settings, there are also some applications in cities, where the Bürgerbus usually provides a feeder or service in suburban locations.

on the service concept and the general framework: commuters often cannot be carried due to late start of the service, and school journeys usually require larger capacities and are thus provided by traditional buses.

4 ISSUES AND STAKEHOLDERS IN BÜRGERBUS DEVELOPMENT

Bürgerbusse are, as already mentioned, developed in partnership with other stakeholders, in particular on the local level, but also with the other public transport stakeholders (mainly transport authorities and operators), usually organised on a provincial or regional level. There are many differences in detail, but three main players are nearly always present:

- the Bürgerbus **association**, usually a registered association in which the drivers and other volunteer supporters are members
- the **transport provider** (bus company) who runs the other scheduled bus services in the region (or one of these if there are more of them)
- the **local authority** (or authorities) in which the service will operate

The allocation of tasks between these stakeholders varies between locations, but some main types can be identified, which are presented at the end of this section after the discussion of the main conceptual issues in the development of a Bürgerbus service.

4.1 Licensing

To get a small bus and set up a small transport service for the local community may seem a simple task - apart perhaps from the need to get funding for the vehicle, to be discussed in the next section. However, to do so in a regular way, for the general public and on a permanent basis a number of regulations come into play. The main areas of legislation are

- the type of service offered as such
- the professional qualifications of the operator
- health and fitness of staff (drivers)
- insurance of drivers, vehicle and operator
- status of operator regarding taxation

As a rule, a Bürgerbus service is *part of the normal transport system* and has to find its position according to these frameworks - the fact that it is run by motivated volunteers for altruistic reasons is of little relevance, and there are very few exemptions for small-scale services. Due to space limits, the following section focuses on the first issue - the formal type of service chosen also has implications for the other areas of regulation.

Public transport services in Germany are regulated by the Passenger Transport Act (Personenbeförderungsgesetz), which traditionally conceives this sector as a commercial activity - in spite of the fact that many services have for a long time been loss-making (for a discussion see e.g. [4], [5], [6]). But the market is not deregulated as in much of Britain, instead sub-divided into different functional service types (such as scheduled public services, excursions, taxis, private hire) and, for scheduled services, geographic licenses (concessions), which are usually route-based. Any public transport service, no matter how frequent, is based on such a licence granting the operator an exclusive right to run scheduled public transport over that route. This means that it is very difficult to set up a new service, even when the existing ones are very infrequent as is often the case in rural areas (where buses cater mainly for school journeys).

In this situation, the basic options for Bürgerbus initiatives are:

- to cooperate with a bus operator and run services under the “roof” of the existing licences
- to find a “niche” in the network of licences - a route or area not served
- to choose a different formal service type, such as a service only available for older people, which may be given a licence paralleling other “general public” routes
- to set up the service in a way that it does not fall under the Passenger Transport Act requirements - essentially by running it only with a passenger car and not charging fares

Most of the existing Bürgerbusse follow the first model, which has advantages in that the know-how, status and resources of the main bus operator can be used to deal with some of the other tasks such as vehicle maintenance, revenue management and customer information. On the other hand, this arrangement ties the Bürgerbus initiative to the current service pattern and typology, which may not be ideal for the community’s needs. A number of more recent foundation have therefore pursued other ways, and the fourth model in particular has found more favour with them. It remains to be seen, however, if this arrangement can work in the long run in particular regarding economic sustainability.

4.2 Funding

As mentioned in section 3, the main economic advantage of a Bürgerbus is the absence of drivers’ wages, bringing the service costs to a much lower level. But other costs remain:

In terms of **capital costs**, the vehicle is the main item - a new minibus (with some minor modifications useful for public services) costs at least 25,000 EUR. More substantial modifications such as full wheelchair accessibility can raise this figure significantly. The replacement of the bus after a service life of usually 7-8 years also needs to be considered.

Operating costs include vehicle maintenance, fuel, insurance, fees for drivers health tests and certificates, revenue management, marketing, management of the Bürgerbus association and the like. These costs typically amount to 4,000 - 8,000 EUR per year.

These figures are low compared to the costs - or subsidies - required for full-size bus services. But as Bürgerbusse operate in addition to “normal” public transport, they do not have access to the same possibilities for deficit compensation. Much of the cost therefore has to be borne by the communities served, for which an expenditure of the size required can already be difficult to manage. The popularity of the Bürgerbus concept in the state of North-Rhine Westphalia is clearly also linked to the fact that the state government pays for the vehicle as well as gives an annual management cost allowance to the Bürgerbus association. In other states, the possibilities for such funding is much more limited. Most schemes therefore have to rely on

- fares from passengers - these are in proportion evidently more important than for normal bus services, although many initiatives prefer to charge low fares out of social equity considerations
- donations from passengers - as part of the service’s links to the community, many users are happy to make donations on top or instead of fares
- sponsoring from local businesses - this is often a significant source of income, depending on the local economy and the association’s abilities in approaching potential supporters
- contributions from the local authority (which can also be in kind such as integration of the vehicle in the fleet for maintenance and insurance)

- depending on the formal status of the service, certain tax benefits available to scheduled public transport can also be used by Bürgerbus initiatives

Experience shows that, after the start-up phase, it is possible to cover the majority of operating costs from the first three sources. Some initiatives are so successful that they generate a surplus, which can be used to support social activities of the association, lower fares or help to buy the next vehicle.

Most “older” schemes operate only their scheduled service (which often employ the vehicle on at least five days of the week) and refrain from hiring their bus out or offering excursions. The recent growth of “smaller” schemes has, however, led to a greater interest in vehicle sharing arrangements, also as a means to share the costs. The bus may therefore be used for the public service on some working days, by the local authority for deliveries on others and by the church in the weekend.

4.3 Recruiting

The chances of a Bürgerbus project evidently depend to a much higher degree on local interest and engagement than in many other mobility concepts. It is essential that enough people in the community identify themselves with the project and are willing to contribute actively. The possibilities to bring people together and communicate through word-of-mouth, but also the chances to unite and share the idea are much better in small communities than in cities - probably a key reason for the dominance of rural Bürgerbus applications.

Motivations to become involved in such a project can be clustered into four main groups, as shown in figure 4. However, the relative importance of these different reasons varies from place to place, and it is essential to find out the specific interests of the people in the community to be successful in getting support. Motivation cannot be created by outside interventions, and usually also not by a mayor’s or community council’s decision to support such a project.

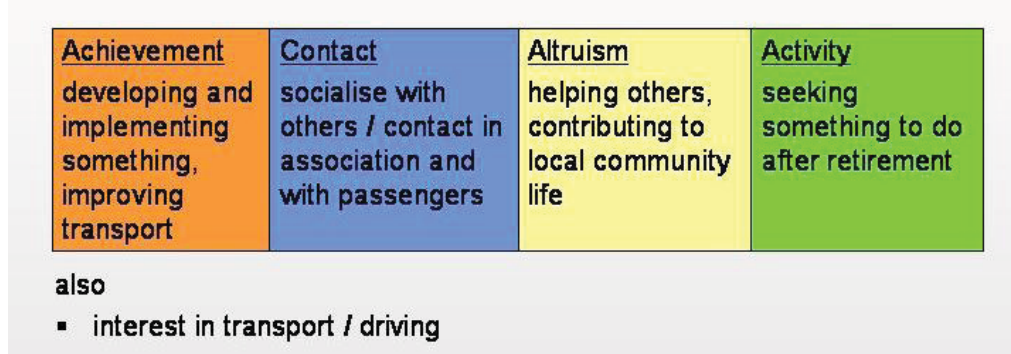


Figure 4: Main reasons for involvement in Bürgerbus activities

To find enough volunteers and to keep them on board is a particular challenge in the start-up phase before operations actually begin. The time needed to communicate, find support, fulfil the necessary administrative tasks and get approval can be significant (2 years are quite normal). During this period, there is a real risk that people lose interest because “nothing happens” or procedures are perceived as too slow. Experience shows that it is essential to identify persons willing to act as “caretakers” or “ambassadors” for the project. Two or three of them are sufficient, but they have to be convinced and dedicated, accepted in the community, able to spend time on the project, find further support and keep those interested on board.

Once operations have started, the Bürgerbus association has to ensure a reliable service. Members have to take their obligations seriously, hence a sufficient number of drivers has to be available to cover the timetable. A typical Monday to Friday half-day service should have a pool of about 20 active drivers, so that each of them has to take a turn once or twice a month.

Beyond driving duties, the association's role as a social group is important. To the outside world, members are the "face" of the project, in regular contact with the users as well as sponsors and politicians. In this way, they also get feedback and suggestions for service development. Within the group, the activists can share their experiences and develop their own feeling of community. Social activities like the annual barbecue, funded from passengers' donations, an excursion or the annual Bürgerbus associations' meeting are important and sometimes even a reason to get involved. But again each group has to be free to develop such activities as it fits to its interests.

Once the necessary number of people to start the service has been reached, the volunteers' motivation to stay on board - and the chances to find new drivers to compensate loss of active members - seem not to have caused major problems to continue the operation. On the contrary, very few experiences were made in Germany with mixing volunteers with normal paid workers or other formal types of staff (such as people recruited for socially necessary activities) in the day-to-day running of a Bürgerbus service, and the experiences with such "melanges" were not necessarily positive (cf. [7]). While the execution of certain "specialist" tasks such as vehicle maintenance to an operator's paid staff seems to work well, it seems also necessary to leave the volunteers an area of activity where everybody shares the same motivation.

4.4 Liaising

The previous remarks have already alluded to the need for communication and networking in the development of a Bürgerbus project. Many of the tasks mentioned can only be solved by getting in touch with others, looking for the right persons to give information and support, by developing a feeling for the specific circumstances of the situation and putting together the various bits and pieces.

In all these tasks, the local activist's point of view is of key importance, as their motivation decides about the future of the project. Community building and the support of "third sector" activities can therefore help to develop the necessary competencies. But the ease with which such initiatives can be developed also depends on the interplay between the voluntary sector and the "world" of administration and "official" public transport planning, where the awareness for the citizens' perspective and way of thinking is not always well developed.

This can be illustrated by the image of "top down" vs. "bottom up" planning in public transport. Although its base are individual travel patterns, professional planning is used to working with aggregate patterns of movement and hierarchical systems of central places, infrastructures and services. In public transport, an integrated system from the long-distance train to the regional bus where the former set the framework for the "lower" levels is a powerful image and ideal. On the contrary, the local citizens and initiatives have specific local knowledge, which may not be present in the professional circles. Both views are legitimate and can in principle complement each other, but to do this, mutual understanding and the right interface have to be developed (cf. [4]:308).

5 DISCUSSION - STRENGTHS AND LIMITS

The main and most fundamental criticism of the Bürgerbus concept focuses on its core – the use of volunteers for tasks that are otherwise provided by professionals who get properly paid. Three arguments are put forward in this respect:

- the public sector should not be allowed to get out of its obligations to provide public transport by devolving this task to civil society organisations
- volunteer-based services are used to save public expenditure – a Bürgerbus may just replace a more costly normal bus service
- these services threaten existing businesses and thus “normal” jobs, not only in scheduled public transport, but also among taxi drivers in the region
- furthermore, it is feared that volunteers cannot provide the same standard of service and maintain their involvement over time in the required way

On a general level, these arguments may have some appeal, but there are so far few indications that these risks exist in practice. Some policy decisions and coordination are nevertheless necessary to ensure that such problems can be avoided.

Even when basic accessibility is maintained, public transport systems outside the big cities usually have times and areas where services can be improved. Bürgerbusse are normally used to close such gaps. Considering the limited customer base and the cost level of traditional public transport, but also that of taxi-based demand-responsive solutions makes closing these gaps by other means a very costly and therefore not realistic ambition (cf. [8]). The framework for Bürgerbus development (cf. section 3), in particular the limitations in vehicle size and number of volunteers, also would make it very difficult to replace existing services. The evolution of the services so far shows that, through cooperation with operators and authorities and suitable training, volunteers can fulfil the required tasks reliably. Only few schemes had to close due to lack of drivers (13 so far according to [9], of which some also closed due to lack of customers).

Already today, the deficits of rural public transport are compensated also by informal lift-giving among neighbours, family members and sometimes also on community level with a more or less formalised organisation. This “hidden public transport” is, however, of no use for those not aware of it, requires high levels of coordination and negotiation and is thus less efficient and effective than a more transparent solution. In the future, aging and shrinking populations will put all kinds of services under increasing financial and human resource pressure. It will therefore be inevitable to use voluntary civic engagement where this is available, and to use it in the most productive way.

On the whole, the evolution of Bürgerbus schemes in Germany has so far been positive, and these services make a meaningful contribution to mobility in the communities where they operate. But it is worth noting that the variety of approaches in this field has grown, especially in the more recent years and in the regions outside North-Rhine Westphalia: There is a growing need for low-cost arrangements, flexible services, carpooling with private vehicles and resource-sharing with other organisations. It may also be necessary to find new ways of linking “genuine” volunteering with other kinds of involvement. Such concepts are not necessarily well addressed with the instruments that have governed the Bürgerbus development in the past.

There is no doubt that in each of the four areas discussed in section 5, measures can be taken to facilitate these processes. The current administrative and regulatory framework in particular is not too well suited. The typology of services laid down in the Passenger Transport Act and the license system are not flexible enough to develop the variety of

concepts needed for rural settings and specific needs. Funding is too often tied to established solutions and not enough certainty is given to new approaches and intelligent use of resources (such as the shared use of vehicles). Recruitment and liaising possibilities can be supported especially through openness and assistance on the local level. All in all, while Bürgerbus initiatives - by definition - emerge “from below”, there is much that planning and policy can do to support such development as one part of future mobility.

Acknowledgements

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YOUNG COMMUTERS IN THE PERI-URBAN ENVIRONMENT: ARE THEY SPECIFIC USERS OF PUBLIC TRANSPORTATION?

Catherine Didier-Fèvre

University of Paris Ouest Nanterre La Défense
Laboratory Research LAVUE UMR 7218
200 Avenue République, 92000 Nanterre, France
catherine.didier-fevre@wanadoo.fr

ABSTRACT

Around Greater Paris, in the Basin parisienne, urban sprawl is now getting into the rural areas. People have moved there to get some housing property. Most of them are families with children. Some of them are teenagers. They live in a periurban environment, an intermediary zone between rural and urban areas and have to go to high school every day. Most of the pupils commute to and from their suburban home, to and from school by the public transportation, which is the only means of transport they can afford.

They think about this way as a good way of commuting for them. It is a space which is out of reach of parents. It's the opportunity for young people to design their own teenage world. They are definitely not prisoners in suburban areas. If some of them do not feel like moving, most of them have the impression they control their way of commuting. They walk a lot once they have arrived in Sens and when they are off school. Going downtown with friends is the way of feeling free. They cope with the territory and network they live in and they juggle and mix with different means of transport. They are a resourceful category of people.

1 INTRODUCTION

Around the Great Paris, in the Basin parisienne, urban sprawl is now getting into the rural areas. People have moved there to get some housing property. Most of them are families with children. Some of them are teenagers and they are in a three way state of „*space-in-between*“ because they are in a stage in life when childhood milestones tend to disappear and new adult specificities take over. They live in a peri-urban environment, an intermediary zone between rural and urban areas. Besides, their parents belong to the middle class („*Les petits moyens*“ [1]). Most of them have continued to commute to Paris area or to medium-sized around such as Sens.

Yet as the peri-urban space is still a youth space amidst an ageing society: statistically it takes three youth for two elderly. Surprisingly, very few papers have been written on peri-urban youth.

Hence, the theme of mobility as far as young people are concerned is a new one. The importance of age is a key to understand the ties the inhabitants have with their homes. These young people live in the peri-urban space of Sens (East of Ile-de-France, 68 miles from Paris) and have to go to high school every day. They live in a lot of little villages (from 300 up to 4000 inhabitants), far from the nearest town, which is 15 miles away. A lot of them

are what we call new countrymen. The Conseil Général de l'Yonne is in charge of the school runs mobility in the suburban area.

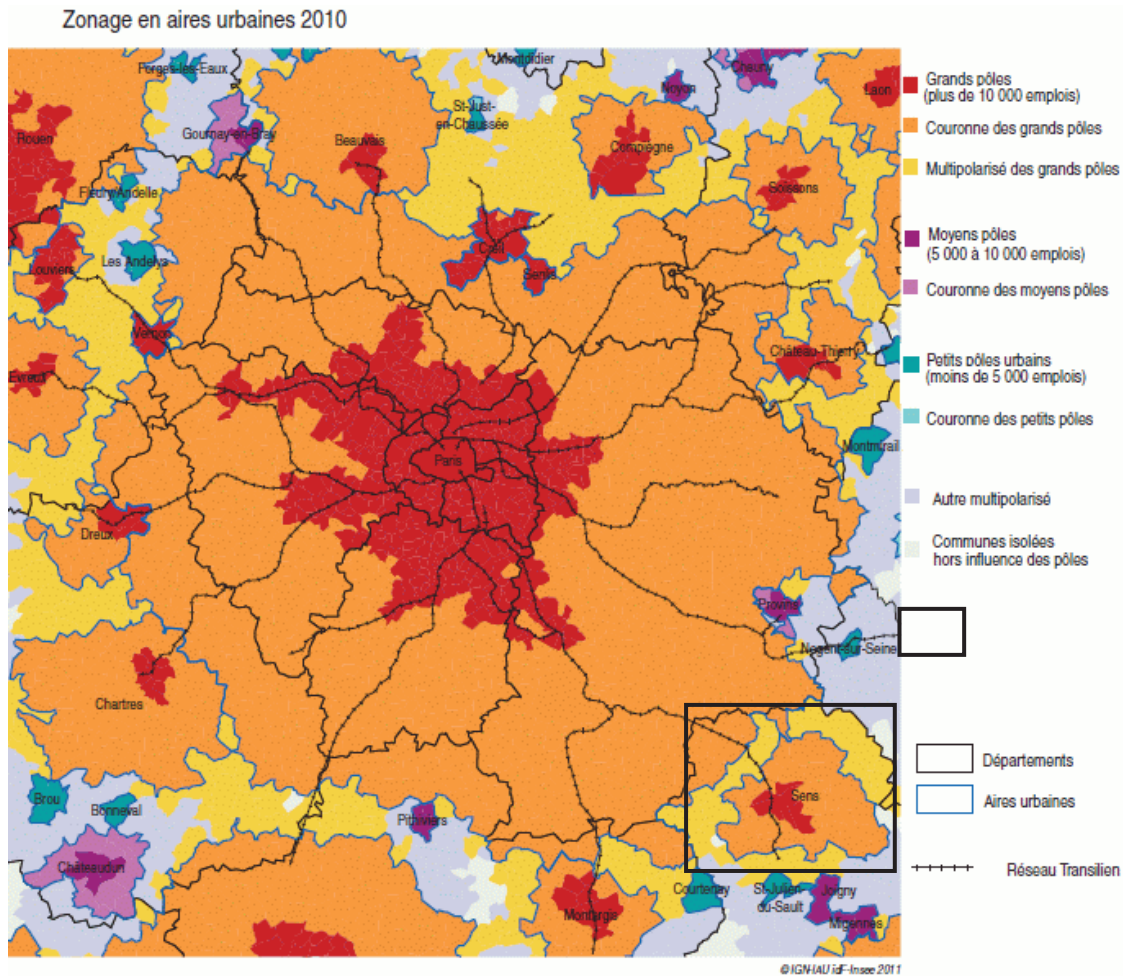


Figure 1 : The periurban field work

Most of the pupils commute to and from their suburban home, to and from school by the public transportation, which is the only means of transport they can afford.

Are they specific users of public transport? Can the time they spend on transports be considered as a space of freedom for them? What do they do while commuting? Do they feel prisoners of the suburban areas they live in?

In order to tackle these questions in depth, I have been working on data provided by both the Lycée Janot of Sens and the Conseil Général de l'Yonne. I have also conducted a series of interviews with about fifty pupils attending the Lycée Janot.

2 THE PUBLIC TRANSPORTATION SPECIALLY ORGANISED FOR THEM

2.1 A network which serves especially the high school

The lycée Janot is the only public secondary school in the north of the department of Yonne. So, half of the pupils who attend this school live in many villages (from 300 up to 4000 inhabitants), distant from Sens, the nearest town, which is 15 miles away. Sens is a little town of the East of the Bassin parisien, 68 miles away from Paris. 35000 inhabitants live

in this town. Most of the pupils commute to and from their suburban home, to and from school by the public transport, which is the only means of transport they can afford.



Figure 2 : The town of Sens and the peri-urban villages in the open field

The Conseil Général de l'Yonne is the local council in charge of the school runs mobility in the suburban area. Every year it draws specific routes for students. „*Planning and providing transport in rural areas present particular challenges, a function of often large geographic areas and low population densities.*“ [2] The pupils arrive at 8 a.m. for the first lesson and they leave school at 6 p.m. So the bus tables are adapted to the lycée timetables. Although the bus routes and services are specifically scheduled for the students, everybody is allowed to take the bus to commute to their job, for example. However, bus services are not so practical for people who have a job. Only two bus lines have a stop at the place where the students live: a very early bus goes to the lycée, and a late one takes students back home at 7 p.m. Consequently, the rural areas (the peri-urban environment) tend to be poorly served by public transport.

2.2 A specific rate for some of them



Figure 3 : Carte de Transport Scolaire [3]

Any pupil attending the lycée whose at least one parent live in the Yonne department is allowed to take the bus to go to school in the department. They need a bus pass. The cost is totally endorsed by the Conseil Général de l'Yonne, the local council. This bus pass costs 750€ per pupil a year.

Youths who would like to take the bus without the pass (because the parent the teenager lives with doesn't have full rights to custody or because the youth goes to a private school) have to pay a two-euro fare. They can't buy a pass. They have to pay for each ride, which is quite costly eventually. The Conseil Général de l'Yonne doesn't incite them to pay the 750€ pass. So, most of them tend to dodge the fare. They tell the bus driver they have forgotten their pass or that they will get one soon. The students who still attend the lycée after the bachelor degree (students of BTS) can't have a free pass, so they have to pay or to use another way to go to school (car, train if possible, car-sharing, scooter). When I commuted on the school bus to go to my job (I had to pay a two-euro single fare), I could hear two or three students, on average, lying to the bus driver about their pass. Eventually, the bus driver often allowed them on the bus, without paying, until early December. For three months, they managed to take the bus for free. It's resourcefulness, a first step to manage on their life!

3 THE IMPORTANCE PLACE TAKEN BY THE COMMUNTING IN THE DAY OF THE LYCEE JANOT'S PUPILS

3.1 A large part of the day

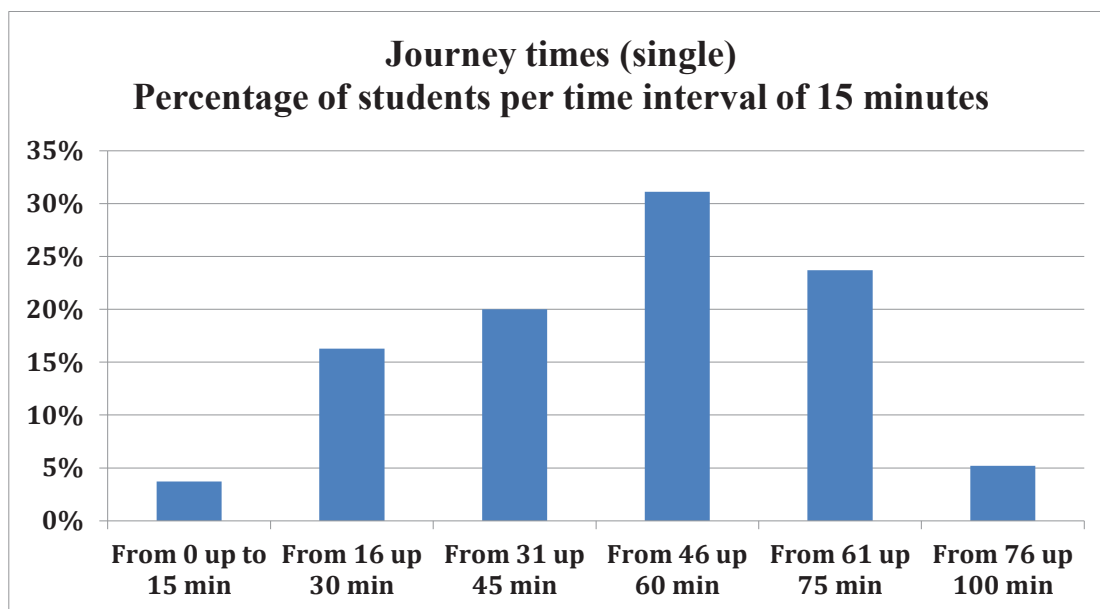


Figure 4 : database of the sample

The time spent in commuting is very long. Every day 30% of the pupils spend more than one and a half hour on public transport. Some of them live in villages nearby but the bus route is rather long. So they have to wake up early to take the bus, most of the buses start their service before 6 am. The pupils who commute for about 100 minutes to the lycée could choose to sleep at the boarding school. But, most of them don't want to leave home, they are very attached to their family and they prefer spending much time on the bus every day. They are afraid of living in community. „I don't like the boarding school (though she has never been). I need to see my parents every day“ Olivia, Egriselles-Le-Bocage, 17.

3.2 How pupils spend their time during commuting?

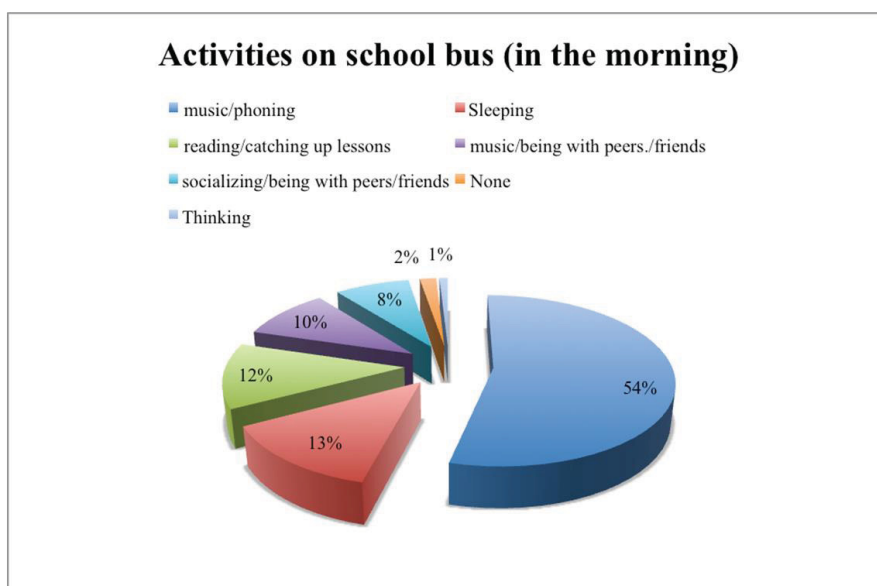


Figure 5 : database of the sample I

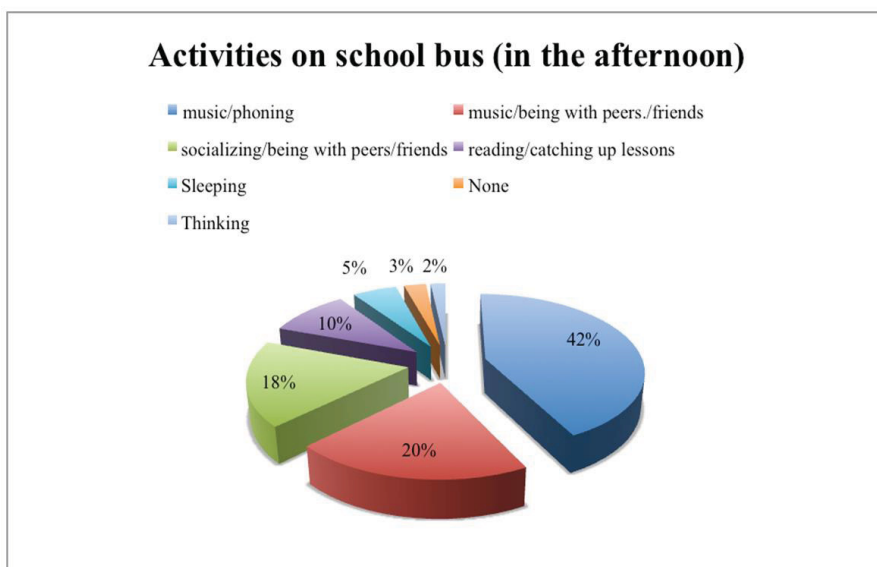


Figure 6 : database of the sample II

As the time of commuting is long, pupils have time to do a lot of things. With the help of a paper questionnaire filled in by my own pupils from the lycée (where I teach History and Geography), I have asked them about their activities during the journey. I learn much about their activities. Morning activities are different from the ones they have in the evening.

They spend a lot of time using the mobile phone and listening to music both in the morning and in the evening. Some of them need some sleep on the bus and get some more rest! It's usual to hear them snoring on the bus in the morning! At the end of the day, they mostly talk with one another. Only a few of them do their homework, around 10%. But there is no light on the bus, reading is quite difficult. Using a phone is easy. Some of them play video games or watch films on their phone screens.

The way they allocate time for the activities in the morning is different from the way they do it in the evening. In the morning it is more about being with oneself. More than 75%

of the students have solitary activities at this time of the day. 54% admit they use their mobile phone. This allows them to listen to music or text friends. Again this is something they do on their own. In an article about mobile phones, Pascal Lardellier [4] shows how important the relationship with this object can be to teenagers. The mobile phone is described as „an intimate shelter“ It is a real expansion of the self. It is the very centre of intimacy (where texts, photos, videos, directories, music are stored). It is quite normal that teenage activities should be connected to the use of mobile phone when it comes to commuting on buses.

4 THE TIME OF COMMUTING: A TIME FOR THEMSELVES, AN ENCHANTED EPISODE?

4.1 Those who enjoy this time of commuting

Those who like this time of commuting say: „*It is convenient, and it doesn't take any longer than if I went by car.*“ (Océane, Gisy Les Nobles, 17 years), „*because it's free!*“ (Walter, Gisy les Nobles, 15 years). The importance of the transport is showed by Sophie (Pont sur Yonne, 15 years): „*It's essential for me to get to school as my mother can't give me a lift. If I miss the bus, I miss the whole day at school basically. However, I find the journey a bit long.*“ These young people often have no other alternative means of transport. The school bus is the link between their home and their friends. Attending the lycée is the best way to see friends. Being with peers is central in teenage life.

The bus is a place where friendship is at stake. „*I rather like it as you stay with your friends*“ (Pauline, Armeau, 15 years). „*The journey is not that long and it makes you feel good when you're on the bus, you can listen to music and in the evening, it's better, it's more fun.*“ Tracy, Pont-sur-Yonne, 17 years. Agathe (Chaumont, 15 years) likes the bus because it embodies her own territory. „*I don't like my parents giving me a lift to school.*“ To her, going to school is a time where she could be free to do what she wants. The time of commuting helps the teenager build up his/her personality. Young people are then out of reach of their parents.

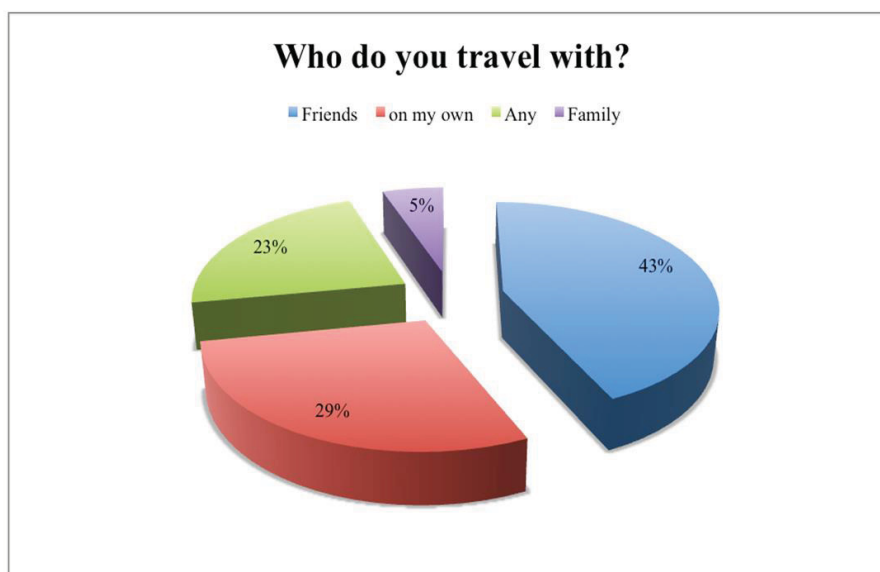


Figure 7 : database of the sample

Taking the bus to the lycée is different as Amélie (Vinneuf, 17) says. She describes commuting as a quite quiet moment: *„I feel fine and I can be on my own then.“* She compares her current experience with the bus transporting younger teenagers (from 11 up to 15) when she used to go to the collège. It was a noisy place. She prefers going on a bus to the lycée. *„I feel this is different from then even if it is now a longer distance“.*

4.2 Those who think this time is lost time

Pupils using the bus think about this way as a good way of commuting for them. Some of them would like to be given a lift by car (57% of the bus passengers) if they could. 24% of the users think that taking the bus is the best way to get to school and they don't want to use any other way to get there. Véronique Mondou [5] considers the pupils as *„prisoners of the transport“*. They are too young to drive and few of them have a scooter. V. Mondou thinks when they are adults, they will drive a car but won't take the bus any more.

For people living in the peri-urban environment, driving is faster and more convenient than taking the bus. So as soon as teenagers get the driving licence, they prefer to use a car if they have one. For them, being an adult also means you don't have to stick to some rules such as bus tables, routes.... Most of them think taking the bus is a waste of time, as Malo says (Champigny-sur-Yonne) : *„It takes me almost one more hour every day, but it's a waste of time because you learn nothing“*. Students often discuss the bus tables : *„School buses rounds are badly organized. I arrive 30 min before the first lesson and I leave 20 min after the last one ! “* (Clément, Villeneuve/Yonne, 15).

If they could, they would use the car. Objective and psychological reasons explain their choice. *„Because I'm with my parents, so a car lift is more quiet and private.“*(Cassandra, Cerisiers, 17 years). For Samantha (Maillot, 17 years), *„In the car, you get heating and air-conditioning, it would take longer if I went by bus. So I can leave home later and wake up later“*.

The car „cocoon“ is often favoured. *„As soon as I get my driving licence, I'll buy a car because when you're in a car, you don't have to put the headphones on to listen to the music I like“* (Marion, Michery, 17). The way bus transport is organised is seen as a problem. *„The coach comes too early“*, (Cindy, Foissy-sur-Vanne, 15). The bus stop is too far away from home : *„I have to walk to the bus stop which is 1 km away from home.“* (Jason, Cuy, 18 ans). Missing the bus is yet another issue. *„Driving means, you can't miss the bus!“* (Caroline, Nailly, 17). Catherine (Sergines, 19), who has had her driving licence since February, says she drives to school more regularly: *„I am so lazy! I can get up later. It spares me half an hour“*. She considers that public transport is a waste of time. By car, the journey lasts quarter of an hour whereas by coach/bus, it takes 35 minutes.

So, some of them try to juggle with several means of transports. They ask their family for a lift to school. They sometimes ask their friends too. They experience car-sharing with others students. A few of them hitchhike to go back home and they walk a lot. *„Walking was destination-oriented, generally regarded a functional mode of transport, and shaped by economics choices and constraints.“*[6]

Students cannot be considered as „prisoners“ of suburban areas. They cope with the territory and network they live in and they juggle and mix with different means of transport. They are a resourceful category of people.

5 CONCLUSION

Lionel Rougé [7] showed in his study about people living in the peri-urban environment of Toulouse (South West of France) in 2006, that these people can be compared to prisoners of the peri-urban space. They have moved there to get some housing property and in some cases one of the parents (mothers mainly) has stopped to work. Housewives or retired people who live in the suburban area can't afford to move and they feel prisoners of their own way of life. For years they are busy bringing up children or doing the housework. They don't own a car (it would be too costly), so they can't move.

To my surprise, I realised that these pupils are not that imprisoned in suburban areas. They have to commute every day, unlike housewives or retired people. One has to keep in mind that pupils are a specific part of customers commuting every day.

These pupils ride to school by bus, which is the only means of transport they can afford. They think about this way as a good way of commuting for them. Guillaume Macher [8], in the study about teenagers and the town, showed that the time they spend on means of transports is a space of freedom. I agree with him. It is a space which is out of reach of parents. It's the opportunity for young people to design their own teenage world. During the interviews, I discovered that even if the parents might be strict about some aspects of commuting, most pupils do not respect the parents' rules. For example, Mélissa (Jouy, 17)'s parents forbade her to go to her boyfriend's home (in the town of Sens, near the lycée). However, Mélissa visits him every day in the morning before her first lesson at school. She is used to lying to her parents when in the evening they ask her about what she did in the morning.

They are definitely not prisoners. If some of them do not feel like moving, most of them have the impression they control their way of commuting. They walk a lot once they have arrived in Sens and when they are off school. Going downtown with friends is the way of feeling free.

Victoria (Pont-sur-Yonne, 15) has sent me a lot of photos about her week activities. She had to fill in a „transport booklet“ providing all the information about the way she used urban transport. She recorded her notes about what the activities she likes doing the most after school. She mentions the opportunity to go to downtown and have a break at Pat'à Pain (a fast food chain) near the lycée. During the week, except on Fridays, she leaves school and walks to a fast food restaurant with her friends or goes shopping downtown (after she has bought some pastry at Pat'à Pain). When you have a look at her pictures, no doubt she can feel free and is in no way a prisoner.

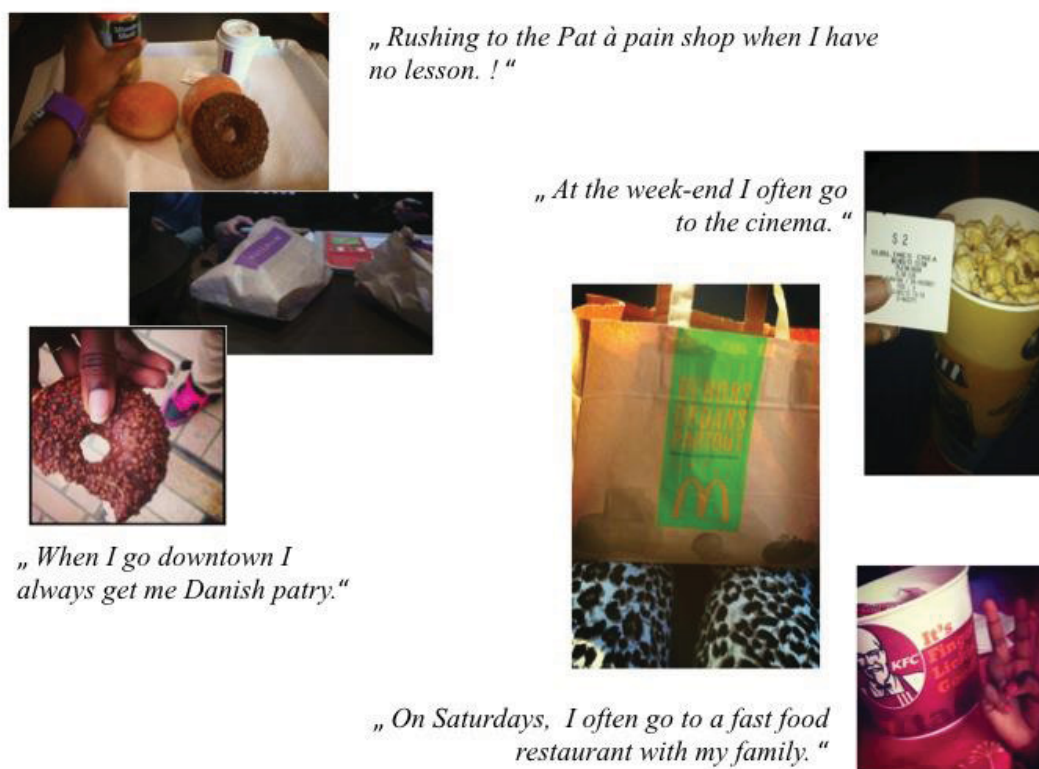


Figure 8 : The Victoria's week, photos made by Victoria

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RETHINKING THE DEATH OF THE RAILWAY IN THE PORTUGUESE COUNTRYSIDE

Paulo Rui Anciães

Independent Scholar

p.r.anciaes@gmail.com

ABSTRACT

Two waves of line closures (1988-92 and 2008-12) have left the Portuguese countryside largely deprived of railway services. This paper assesses rail accessibility and potential demand in the areas served by the lines closed. The study contributes to existing literature by taking into account the availability of rail services and public transport access to stations, considering separate types of destinations, trip frequencies and departure times for different population segments. The population potentially served by rail is first mapped at the level of the civil parish and aggregated to rail stations. In a second stage, the effects of providing extra rail connections and bus feeder routes are estimated, identifying the parts of the country and railway network with the highest potential improvements. The findings show that despite low levels of demand in absolute terms, rail services still had the potential for serving a significant part of the population in the areas around some of the lines closed.

1 INTRODUCTION

The restructuring of national rail networks often involves the withdrawal of some passenger services in the rural areas, with potential effects on local economic, social and demographic conditions [1]. While these policies are sometimes justified with technical or geographical reasons, their main determinant is economic, as the services affected tend to have low demand. Major waves of closures have in fact responded to specific economic objectives, such as the renewal of ageing infrastructure (England and Wales, 1960s) [2], rationalization of resources in dispersed areas (Australia, 1980s) [3] and overall economic restructuring (Eastern Europe, post 1990s) [4].

Although passenger service withdrawals are often subject to public discussion, the information used by railway companies, governments, and groups of activists is usually specific to each line and does not consider network effects and overall losses in accessibility and demand. In addition, academic studies approaching this question tend to focus on complete closures of railway lines. However, rail accessibility and demand are also affected by measures such as closures of individual stations, reduction in the availability and frequency of connections, and withdrawal of public transport access to stations. In practice, the services in the lines closed may no longer be considered by the population as a viable transport alternative. The study of this question can then benefit from the use of general measures of rail accessibility (such as time to nearest station [5] or number of connections [6] at each place) but of detailed information on the extent to which rail services meet the mobility needs of the populations. A few studies have looked at factors such as departure times [7] and frequency of bus services [8], but there is still little knowledge on their role in rail accessibility.

This paper contributes to this literature by mapping the services provided by railways in the periods before line closures, taking into account actual rail schedules and local public transport options to access the stations. The services are matched with the destinations, trip frequencies and departure times of different segments of the population. The objectives are to study the geographic distribution of levels of rail accessibility and potential demand and to evaluate the benefits of policies such as the creation of new rail connections and new bus feeder routes.

The analysis focuses on two major waves of railway closures in Portugal. The next section is an overview of the evolution of the Portuguese passenger rail network. Section 3 maps rail accessibility and potential demand before the two waves of closures and Section 4 estimates the benefits of additional connections and bus feeder routes. Section 5 sums up the results and suggests points for discussion.

2 THE TWO WAVES OF RAILWAY CLOSURES IN PORTUGAL

Figure 1 shows the railway lines in operation and the lines closed to passenger services in Portugal, revealing two major periods of closures: 1988-1993 and 2008-2013.

The first wave of closures occurred within a period of relatively high economic growth and influx of funds from the European Union. The restructuring of the railway sector was laid out in the 1988-1994 Railways Modernisation Plan [9]. The objective of this plan was to make "selective investments" [10], giving priority to suburban passenger transport in the two main cities (Lisbon and Porto), medium and long distance transport in the Lisbon-Porto axis, international links and freight transport. The lines classified as "secondary network" (29% of the network length) received only 0.13 % of the investment. The emphasis was therefore on the economic viability of the railway sector, supported on the belief that railways are not a "means to transport almost everything almost everywhere" [10, p.147]. As a result, 790 km of railway lines were closed, mainly in the most isolated parts of the Portuguese hinterland: the Northeast (*Trás-os-Montes*) and South (*Alentejo*) regions. The largest city in the central part of the hinterland provinces (*Viseu*) was also deprived of all rail connections. Some lines were replaced by bus services, which were also withdrawn a few years later.

Despite the efforts of economic rationalization and the separation from the infrastructure provider in 1997, the financial results of the Portuguese Railways company did not improve. After a steady reduction of rail services, the ongoing economic crisis triggered a new wave of line closures, justified in the Strategic Plan for the Transport Sector [11] as an essential part of the restructuring of the Portuguese public sector. Since 2009, a total of 490km of railway were closed, including most of the remaining lines in the Northeast and Southern regions and all the remaining narrow-gauge lines in other parts of the country. While some lines were initially closed for refurbishment and replaced by bus services, plans for reactivation of the lines were later abandoned and eventually, bus services were also withdrawn. The future of a few other lines remains uncertain and projects for new infrastructure such as the high-speed rail and light urban railways have also been shelved.

In 2013, the Portuguese railway network includes only a third of the stations that once served the hinterland provinces, and reach only 11 of the 44 cities and towns in these provinces. The reduction of accessibility in this region is of special social and political concern, given its traditionally lagging economy and rapidly ageing population.

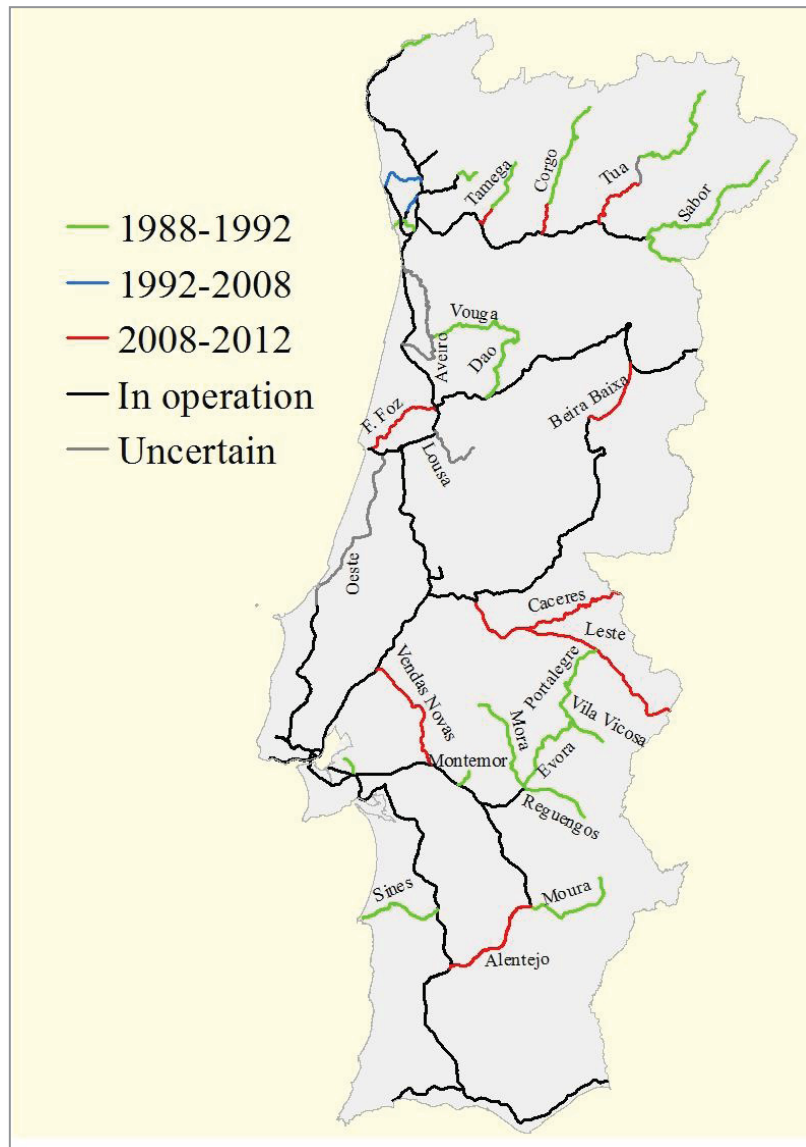


Figure 1: Railway lines in operation and lines closed in Portugal, by period of closure

3 ACCESSIBILITY AND POTENTIAL DEMAND BEFORE THE CLOSURES

This section analyses rail accessibility and potential demand in the period immediately before each wave of railway closures in Portugal, that is, in 1987 and 2007. The analysis is conducted at the level of the 4037 civil parishes in continental Portugal and assumes that individuals potentially travel to the capitals of one of the 278 municipalities. The calculations are relative to the central points of both types of areas, given by the Portuguese official administrative map. The population is segmented in two groups (workers/students and remaining population) who have distinct mobility needs, requiring daily or weekly round trips to specific destinations and imposing certain restrictions on departure and arrival times, possibility and time to access stations by public transport and total travel time. The main hypothesis is that rail is only considered as an option if these needs are met by the origins, destinations, frequency of trains and trip duration of existing rail services and by the public transport options to access rail stations at both origins and destinations.

The analysis is based on the official rail schedules for each year and includes all inter-city, inter-regional and regional rail services but not international services. The services of

private railway operators and underground, light railways and buses and ferries connecting stations in Lisbon and Porto are also included. A small number of bus feeder routes provided by the railway company in 1987 are treated as a part of the railway network itself and not of public transport access to stations.

The estimation of accessibility of workers and students considers their place of residence and work, given by census data. The census results used are 1991 (for 1987) and 2001 (for 2007) and give the number of people living in each civil parish and working in the same civil parish and in each municipality in the country. It is assumed that the first of these groups walk to work, and the second group works at municipal capitals. People living in the municipal capital and working in the same municipality also walk to work. The remaining workers and students travels daily or weekly by motorised transport to their places of work.

Rail services are identified as a possible option for daily return trips of workers and students if they allow the possibility to arrive at the place of work or study between 8:00 and 9:30 and leave between 17:30 and 19:30 in any given weekday, restricting the rail section of the trip to a maximum of 1 hour. The place of work or study is accessed from the nearest station by walking or by bus, restricting this section of the trip to a maximum of 15 minutes. The existence of connecting bus services is identified for each station, based on the existence of local bus networks operating in the relevant municipality. It is assumed that at the places of residence, connecting bus services only exist in the case of municipal capitals. In the other civil parishes, stations are accessed only by walking. In practical terms, this assumption means that rail services at a given station serve only the population in the village around or near that station.

Weekly return trips to places of work and study are possible if the rail schedules allow individuals to depart from the place of work on Friday after 17:30 and arrive at the place of residence before 24:00, returning on Sunday after 14:00. A restriction of a maximum 30 minutes is put on the waiting time at any intermediate station within the best route. This restriction is imposed in order to account for the hypothesis that individuals will choose to take alternative public transport options (such as coach) if the rail alternative implies long waiting times. The same restrictions regarding access bus access to stations made for daily trips also apply.

It is assumed that the remaining (non-working or studying) population needs to access a set of services and facilities located in municipal capitals (such as shops and public offices) and that individuals make daily return trips to these places on a weekly basis. In each civil parish, the set of possible places is the one including municipal capitals at a maximum of 90 minutes time, measured on the road network. Each place is assessed with a probability proportional to the population working in that place, which is obtained by aggregating the census data described above. This assumption means that the level of employment is a proxy for the location of services and facilities.

Rail services are an option for day trips of non-working people if they allow for the possibility to arrive at the destination between 8:00 and 14:00 and return between 14:00 and 19:30 in any weekday, allowing a minimum of 2 hours at the destination. Restrictions on bus access also apply.

The following maps show the proportion of the population resident in each civil parish in 1987 and 2007 potentially served by rail services for each type of trip frequency. Figure 2 gives the proportion of workers and students served by rail for daily trips in relation to the total number of workers and students travelling from each civil parish to destinations within 90 minutes distance, measured on the road network. Figure 3 gives the proportion of workers and students served by rail for weekend return trips in relation to total number of workers and

students travelling to destinations more than 90 minutes distant. Figure 4 gives the proportion of non-workers served by rail for daily return trips to destinations within 90 minutes distance.

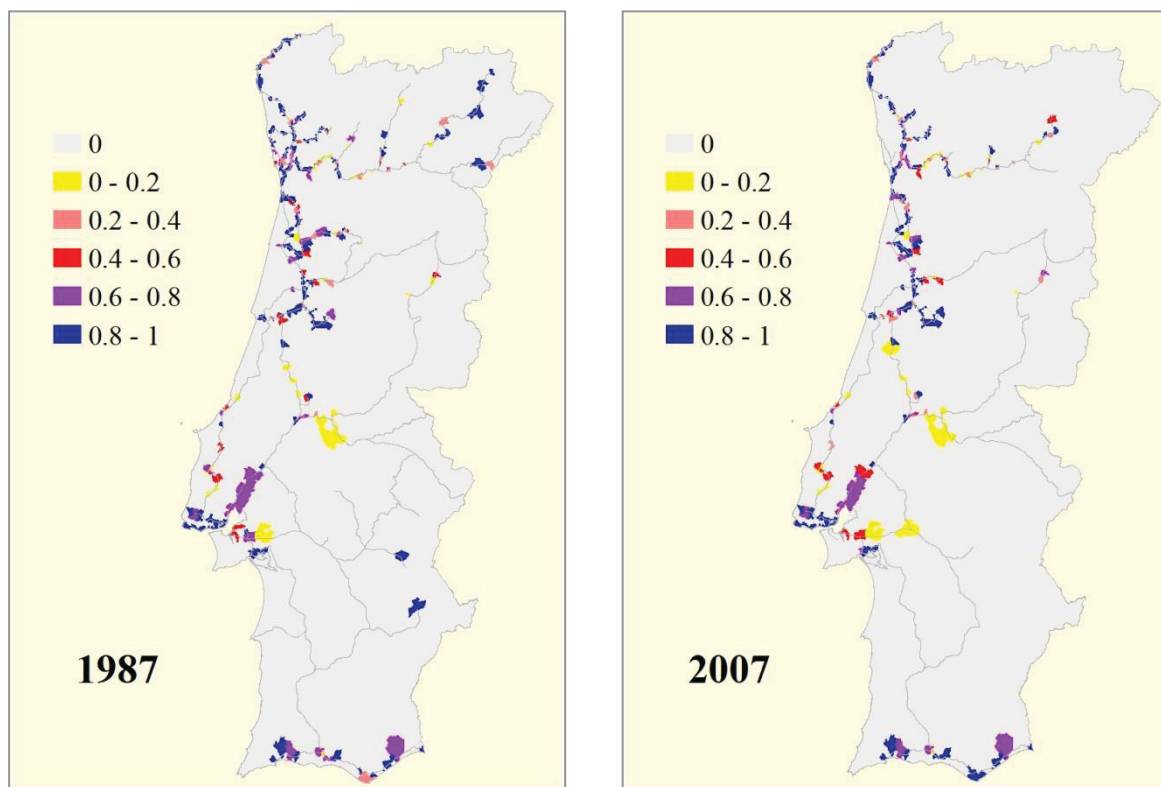


Figure 2: Proportion of workers and students served by rail (daily trips)

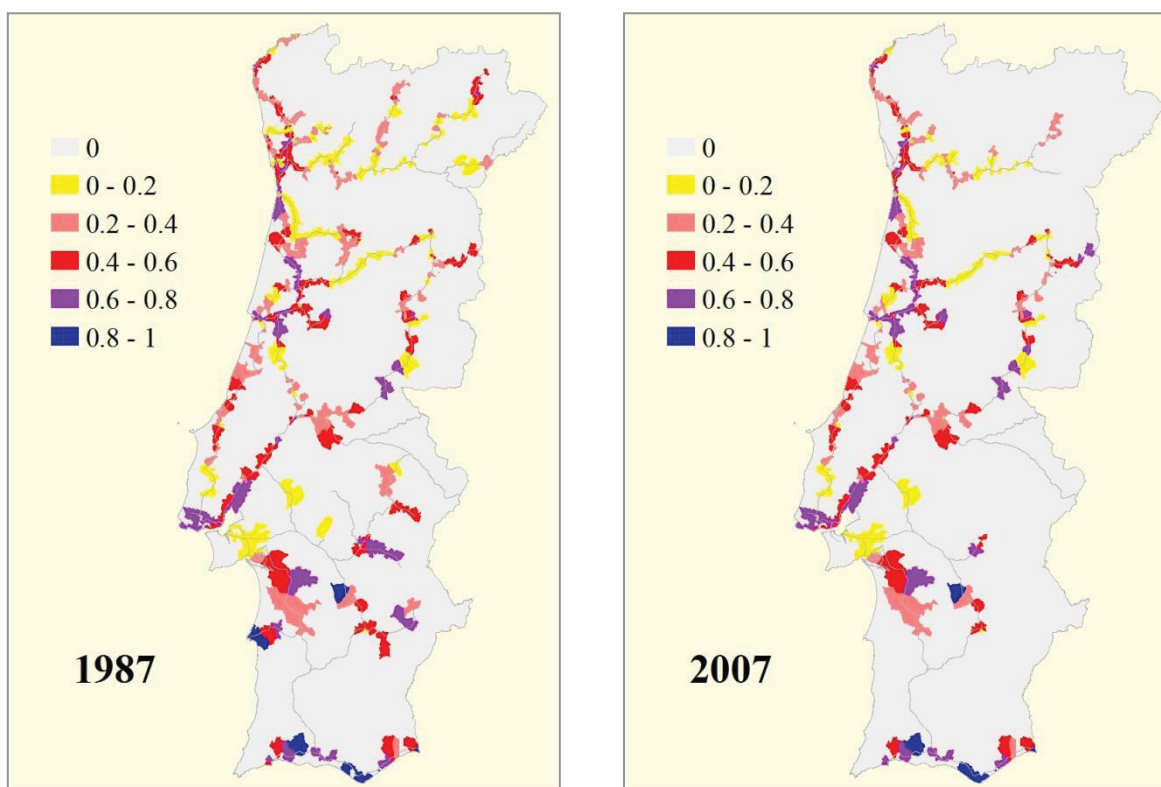


Figure 3: Proportion of workers and students served by rail (weekly trips)

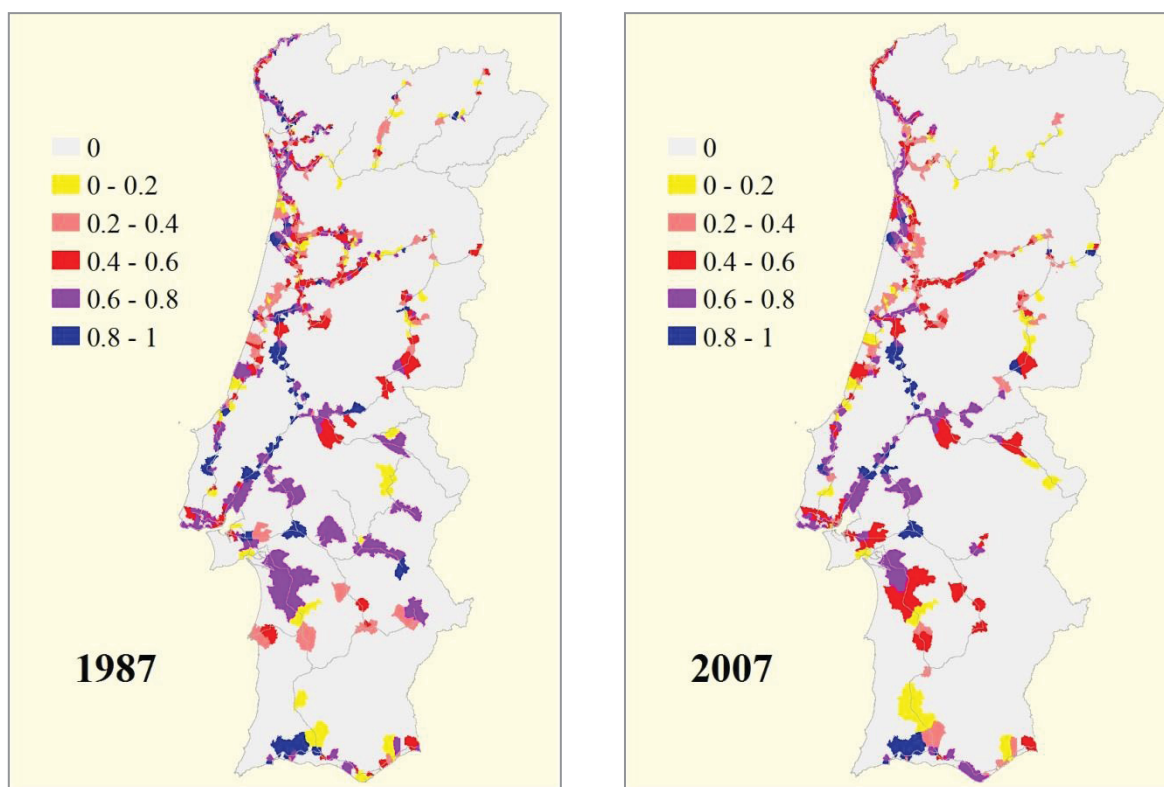


Figure 4: Proportion of non-workers and students served by rail

The analysis of the distribution of the proportion of daily trips of workers and students show that a substantial part of the areas around the railway network were not served by suitable rail services either in 1987 or 2007 (proportion=0). These areas include almost all the civil parishes in the central and southern hinterland provinces, both those located around the lines that were subsequently closed and the ones located around the lines that were not closed. In contrast, the majority of the areas in the strip between Lisbon and Porto and in the south coast have proportions above 80%. Only one line in these regions was not served by railway (*Linha do Oeste*). This line is also planned to close in the future. The most important result is however the evidence that some of the lines closed in the period 1988-2003 in the hinterland provinces served relatively high proportions of workers and students, including one of the lines in the Northeast (*Linha do Tua*) and one part of the line in the central part of the country (*Linha do Vouga*). All the lines closed in the period 2008-2013 served very small proportions of workers and students. Finally, proportions tend to be stable from 1987 to 2007 in the areas around the lines which did not close.

The proportion of weekly trips of workers and students potentially served by rail is more evenly distributed across the country than in the previous case, with most areas showing a value between 0.2 and 0.6 in both years. Proportions also tend to be stable from 1987 to 2007 in the areas around the lines which did not close. Only a few sections of the some lines in the Northeast and Southern provinces had a proportion of 0. However, some of these lines are not in the set that was subsequently closed. Many of the lines closed show proportions of population served that are comparable with the remaining lines, both in the hinterland and in the coastal parts of the country. There is also a higher variability within each line than in the previous case, with higher proportions usually found in the areas around major cities. It is worth noticing that in some of the cases where only a section of the line was closed, this

section was the one with higher proportions of workers and students served. This is the case of two of the lines in the Northeast in 1987.

The proportions of non-workers and students served ranges from 0.2 to 0.8 in most areas. When comparing with the two previous cases, a larger number of areas were served by rail in the Southern regions and a smaller number were served in the northeast regions. However, some lines and sections lines in both regions show proportions equal to 0. There is no clear relationship between the set of lines closed and the proportions of population served in the period before the closures. In particular, the lines closed in the central part of the country (*Linha do Vouga* and *Linha do Dão*) in 1983 serve relatively high proportions of the populations living along their whole extensions. As in the previous cases, proportions remain stable in the two years of analysis.

The aggregation of the population potentially served by rail in each civil parish can be used to estimate the potential demand for the rail services offered at each station in the network in each of the years of analysis, given the schedules of services in those years. This is done by assigning the population making the three types of trips to the stations used at the origins and summing the results for each station.

Figure 5 gives the potential demand for trips starting at each station in 1987 and 2007, measured by the number of trips per week. The maps show that despite the relatively high proportions of population served by some lines in the hinterland provinces, the demand for rail services tends to be concentrated in the coastal strip linking Lisbon and Porto and in the south coast. In fact, the large majority of the stations in the hinterland have a potential demand of less than 1000 trips per week. The only exceptions correspond to some of the largest cities and towns in this region. In contrast, all the stations in the metropolitan areas of Lisbon and Porto have a potential demand of more than 10000 trips per week. The only lines in the coastal region with a small potential demand are the ones that were closed in the 2008-2013 period or are probably closing in the near future (*Linha da Figueira da Foz* and *Linha do Oeste*). In the case of the latter, the demand is small in the whole extension of the line, including the sections of the line that will not close, despite the fact that these sections are within a potential commuting zone to Lisbon.

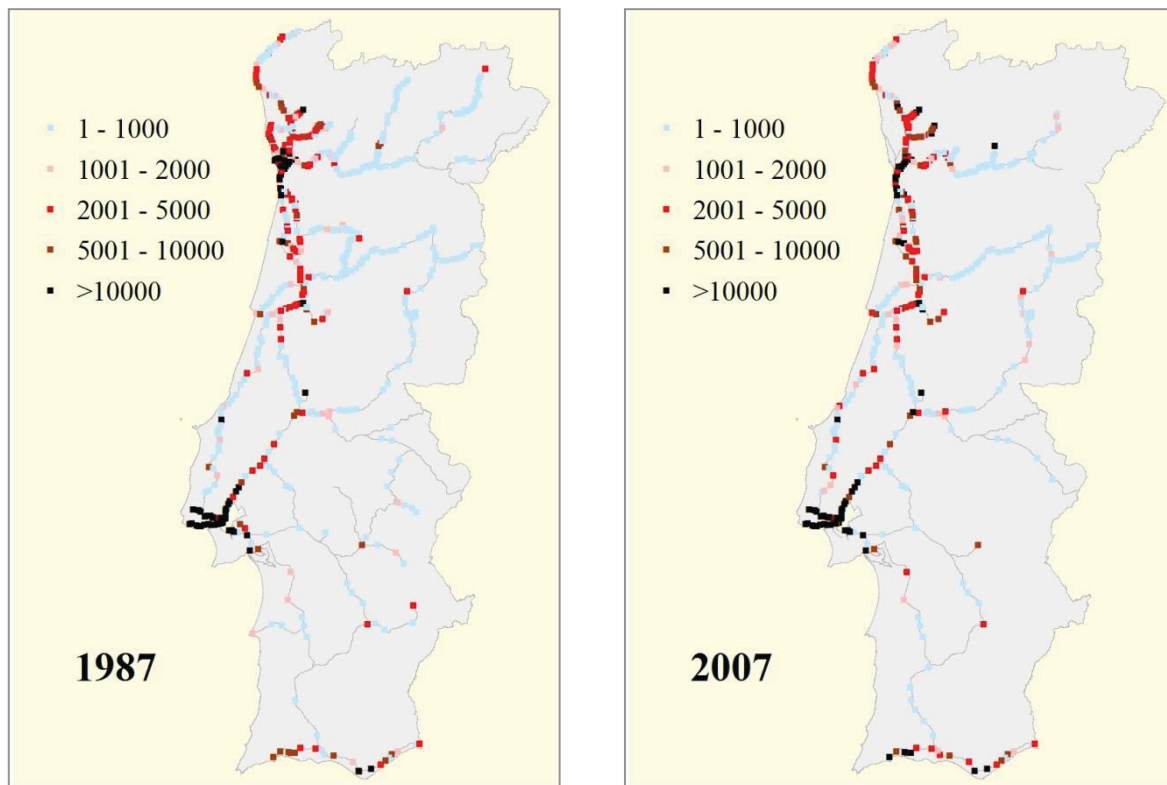


Figure 5: Number of weekly potential rail trips starting at each station

4 THE BENEFITS OF NEW RAIL CONNECTIONS AND BUS FEEDER LINES

The arguments stated in the Strategic Plan for the Transport Sector for closing railway lines in the Portuguese countryside have not been universally accepted and academics and activists have proposed solutions for increasing the attractiveness of services in these lines and generate the demand needed to ensure their economic viability.

Changes in origins and destinations of trains are one of these solutions. The hypothesis advanced by its proponents is that existing services are outdated and incompatible with current geographic patterns of residence and work of the population living around the stations closed. That is especially the case of the above mentioned *Linha do Oeste*, which crosses densely populated areas but where train services do not directly link these areas with major centres of employment either in the central part of the country and Lisbon [12].

An alternative solution is to increase the number of places connected by the rail network. This involves the creation of new rail branch lines or the provision of a greater supply of public transport options (such as bus feeder lines) to access stations, in order to connect existing stations with major towns. Some authors suggest that the implementation of these measures could provide the base for a successful re-operation of most of the lines closed in the Southern provinces [13].

This section analyses these two proposals in the case of the current wave of railway closures (2008-2013), focusing on daily return trips of workers and students. The method used is to re-estimate the two variables described in the last section (proportion of population served and potential demand at each station) based on hypothetical improvements leading to the creation of new connections between origins and destinations, that is, changes in rail

schedules creating new connections on the existing rail network and provision of new bus connections to the network itself. The objective is to determine the size of the potential gains from this measure and identify the parts of the country and the stations receiving the highest gain.

The provision of new rail connections is modelled by assuming that all destinations within 90 minutes time on the road network from an origin are attained using rail services, considering the existing conditions regarding availability of public transport from and to stations. In other words, the restrictions applied in the previous section to the time of departure and arrival of trips no longer apply, but the restrictions to the existence of public transport to access the stations at origins and destinations still apply. The provision of new bus feeder lines is modelled by assuming that all destinations within 90 minutes on the road network from an origin have bus connections from the nearest station, considering the existing conditions regarding the availability of rail connections between the stations at the origin and at the destination.

Figure 6 shows the changes in the proportion of workers and students served by rail in each civil parish in 2003, considering daily return trips.

The changes associated with the provision of rail connections are extensive, especially in the lines crossing the central part of the country, where the gains are above 50% in many civil parishes. There are also considerable gains in some sections of the lines crossing the Southern region. However, the areas covered by the lines which have subsequently closed show only minimal potential gains, including all the lines in the Northeast and in the Southern regions and the section of *Linha Beira Baixa* in the central region. The section of the *Linha do Oeste* scheduled to close in the future also does not show many potential benefits. The same can be said of the other lines scheduled to close. This result suggests that the provision of new rail connections is not a viable solution for the increase of attractiveness of rail services in these areas as the increase in the population served by rail services is minimal.

The changes associated with the provision of new bus feeder routes are smaller, with improvements limited to small sections of some lines. Some of these sections also belong to the set of sections with the highest potential improvements following the provision of new rail connections (especially in the central part of the country), while one of the sections belongs to the set of sections closed in the period 2008-2013 (*Linha da Beira Baixa*).

Figure 7 maps the changes in potential demand for rail services starting at each station following the two types of hypothetical improvements.

In the case of new rail connections, changes in demand are relatively widespread throughout the network. The highest increases (above 2000 additional trips per week) occur in the metropolitan areas of Lisbon and Porto, reflecting the high population densities in these regions. However, the stations in some sections of the lines crossing the central part of the country also derive substantial benefits from the improvement in rail connections. There are also benefits in some stations in the Southern provinces. In contrast, the increases in potential demand in stations in the Northeast are in almost all cases below 100.

In the case of new bus feeder routes, gains are relatively modest but also evenly dispersed among several lines. The highest gains seem to be on the southern part of the *Linha do Oeste* and on the lines serving the south coast and the southern corridors of access to Lisbon. None of these sections are in the set of lines and sections closed in the period 2008-2013 or scheduled to close in the near future.

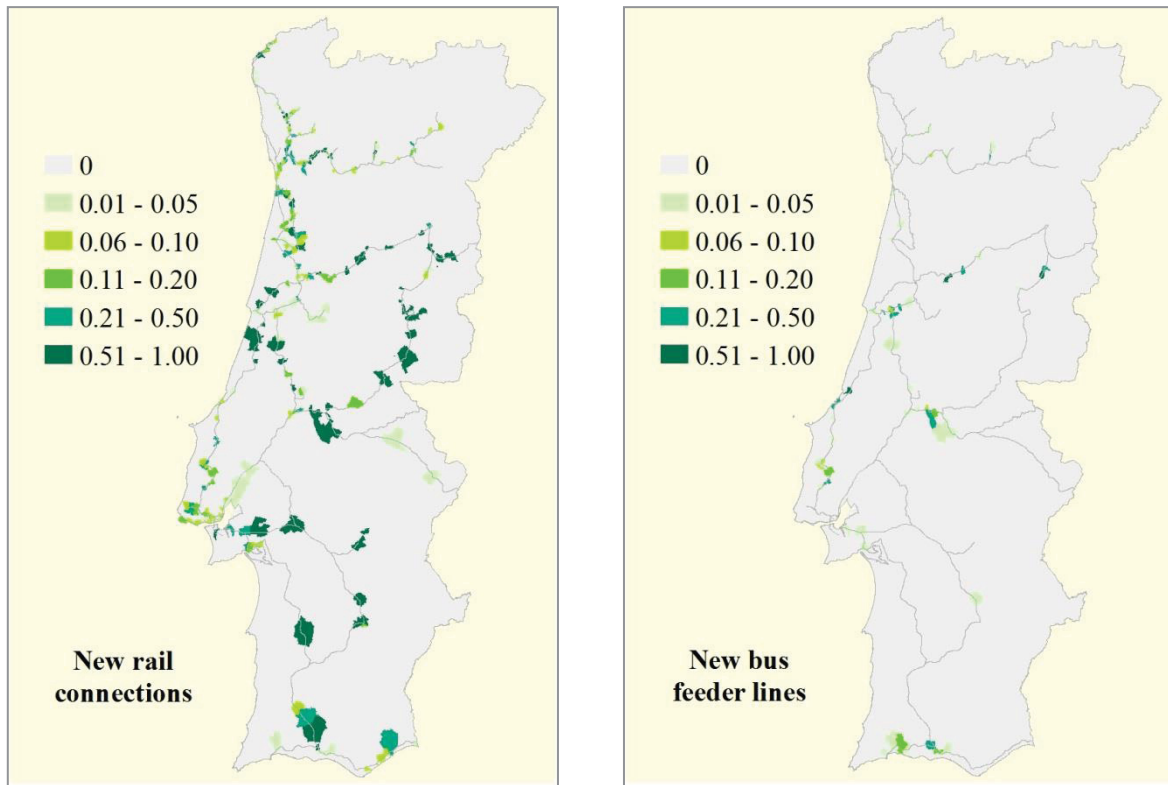


Figure 6: Changes in the proportion of workers and students served by rail (daily trips)

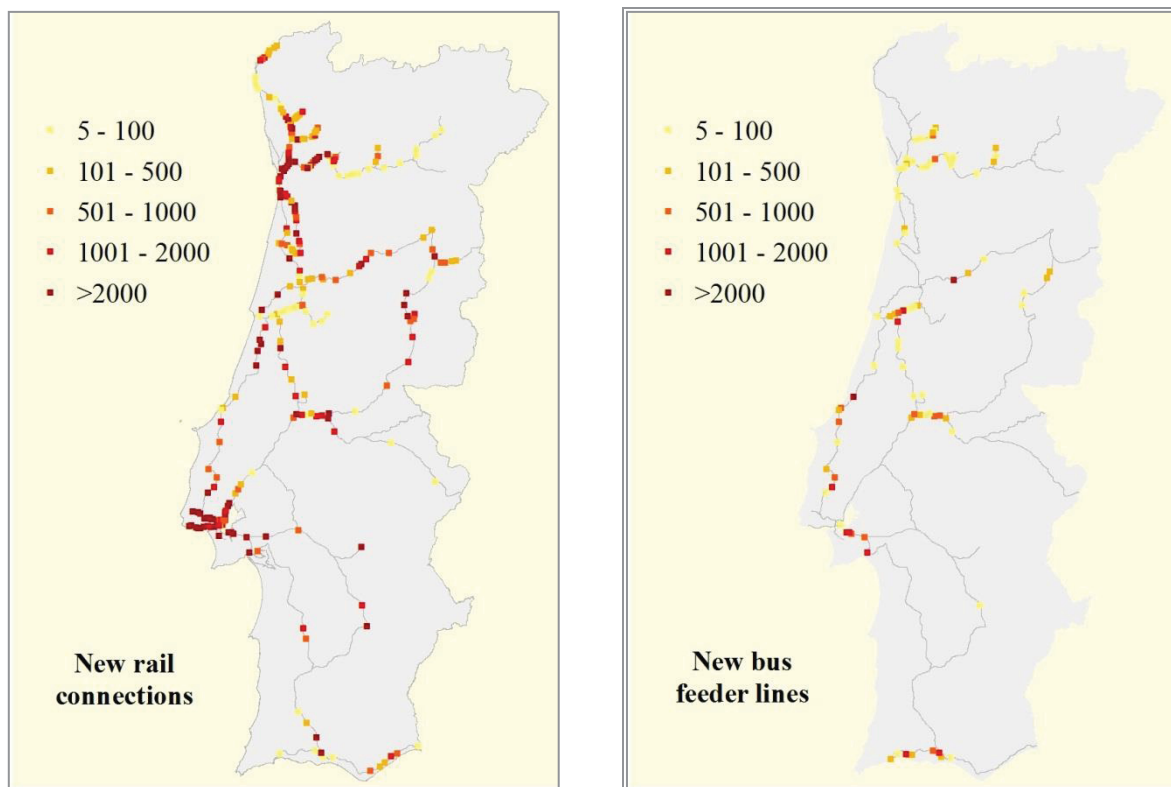


Figure 7: Changes in the number of weekly potential rail trips starting at each station

5 DISCUSSION AND CONCLUSIONS

The results of this paper suggest that instead of focusing public discussion and academic research exclusively on the consequences of the closure of whole lines, more attention should be given to the insufficiencies in rail scheduling and local access to stations before the closure. Improvements in these factors can increase the economic viability of parts of the lines closed, while simultaneously addressing the accessibility of the local populations, especially in the most peripheral areas.

Looking at the problem in purely economic terms, the closure of some lines seems unavoidable nevertheless, as the investment needed to improve the service in these lines is too high comparing with a small and shrinking demand. In fact, Portugal is the only country in Western Europe that lost railway passengers in the last decades, with a reduction of 1 million trips (43%) from 1988 and 2009 [14]. The reduction is not only related to insufficiencies in the service provided by rail but also to the priority given to public investment in the road and motorway infrastructure throughout the country. The share of railways in passenger travel decreased from 66% to 4.4% between 1990 and 2008 [14]. This study showed that some of the lines closed still had the potential to attract a fair share of the market, especially when more rail connections and bus feeder routes are created. However, previous experiences of reopening of lines have always failed (cases of *Linha de Vendas Novas*, *Linha de Leixões* and *Metro de Mirandela*). Bus replacements to lines closed have proved to be short-lived, and recent projects for reconverting some of the lines for tourism have also been cancelled. The possibility of salvaging some lines is also undermined by the poor financial situation of the Portuguese Railways and the fact that only the metropolitan areas of Lisbon and Porto provide realistic market opportunities for private operators or local governments.

The importance of the closed railway lines only becomes clear when considering societal objectives such as equity and regional cohesion. The analysis in this paper shows that some of the lines closed in the countryside served a potentially high proportion of the local populations, despite their small number in absolute terms. The withdrawal of rail services is socially and politically relevant as it can increase social and economic exclusion in a region where population is ageing at a faster rate than in the rest of the country. The provision of public transport alternatives for this population or the decentralization of some services and facilities can compensate the loss in mobility associated with rail service withdrawal.

The measurement of the opportunity costs in the lines closed and the identification of the lines with highest potential for reopening also supports the idea that line closures should be reversible and that the removal of services from existing lines should not imply the physical removal of the infrastructure, which has been the case of most of the lines closed in Portugal.

A few extensions to the analysis could also bring further insights into the study of rail passenger service withdrawal. The attractiveness of the rail service in the closed lines depends for example on further aspects of the schedules, such as the number of different possibilities for daily or weekly round trips, while the competitiveness of rail versus alternative modes (coach or private car) is dependent on the total time and financial costs of the journey. The withdrawal of services from some individual stations could also create faster services and decreasing the time disadvantage of rail travel in some lines. While this study provides an overview of rail accessibility and demand in the closed lines in comparison with the remaining network, an assessment of the accessibility and demand of specific lines requires further and more detailed analysis, provided for example by surveys to the

population living and working in the areas surrounding the line. In overall terms, the effects of the disinvestment in the rail network are also wider than the lost accessibility and demand in the lines closed, as regional feeder lines provide a relevant part of the demand of the main lines. In addition, services are often reduced in some of the lines that are not closed, contributing to the overall loss in attractiveness of the network. Finally, the decisions for closing lines and withdrawing services are political, and may diverge from economic or social equity principles [15, 16].

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ECONOMIC RATIONALIZATION OF REGIONAL RAILWAYS

Márk Háy, Tibor Princz-Jakovics

Department of Environmental Economics,
Budapest University of Technology and Economics
Magyar tudósok ring road 2, 1111 Budapest, Hungary
hary.andras.mark@gmail.com, tprincz@kornygazdeu.bme.hu

ABSTRACT

Regional railway lines play significant **role in rural economies**. Not only the main lines, but regional lines can also be operated efficiently. In this paper we would highlight some solutions which could help to make **rationalization**. There are several key factors as the periodic timetable, common tariff system, coordinated modal split or simplified operation. **Demographic changes** have significant impacts on transport.

There are some rural railway lines and regional railway networks, which have survived the wave of closures after the Second World War successfully. Some of those serve the daily and leisure transport and have cross-border facilities as well. We propose a viable solution considering the efficient operation, a passenger-oriented price and distribution policy applicable to Hungarian circumstances. Our case study is **Ipoly Valley Railway** with cross-border transport between Hungary and Slovakia.

1 INTRODUCTION

Mobility plays a significant role in socio-economic life because people change their places quite often. Despite of the financial crisis the number of households owning a car increased steadily (nearly half of the adult population in has his own car in Hungary), there is a good number of people who has to use **public transport for their daily movements** and for recreational trips as well. It is important to emphasise that this kind of mobility could also be competitive and environmentally friendly alternative compared to individual transport.

In Hungary, **commuter traffic** mainly concentrates in the agglomeration of Budapest. But there are some other centres in the country without sufficient access to surrounding areas. However, in such regions **regional railway lines** could also be operated efficiently. In this paper we highlight some solutions which could help to implement rationalization. There are several **key factors** as the periodic timetable, common tariff system, coordinated modal split or simplified operation.

Demographic changes in population also have a huge impact on the demand for transport. We put forward a proposal concerning possible new elements of strategic documents.

This paper is primarily based on empirical research. The available literature background and the various measurements, schedules and tariff data were the basis for this analysis.

2 BACKGROUND

2.1 Demographic data and other features

“Approximately 59% of the EU27 population live in rural regions” [1]. “In Eastern countries the **exodus from rural to urban areas** (especially the capital city) is at present a significant phenomenon (**Figure 1**); moreover, **migration abroad** – notably of young people and women – risks to lead to a general impoverishment of rural areas” [1].

Therefore, exodus has a very negative impact on rural settlements and this impact can cause the reduction of certain services. Transport is one of the basic services whose main victims are the rural railway lines.

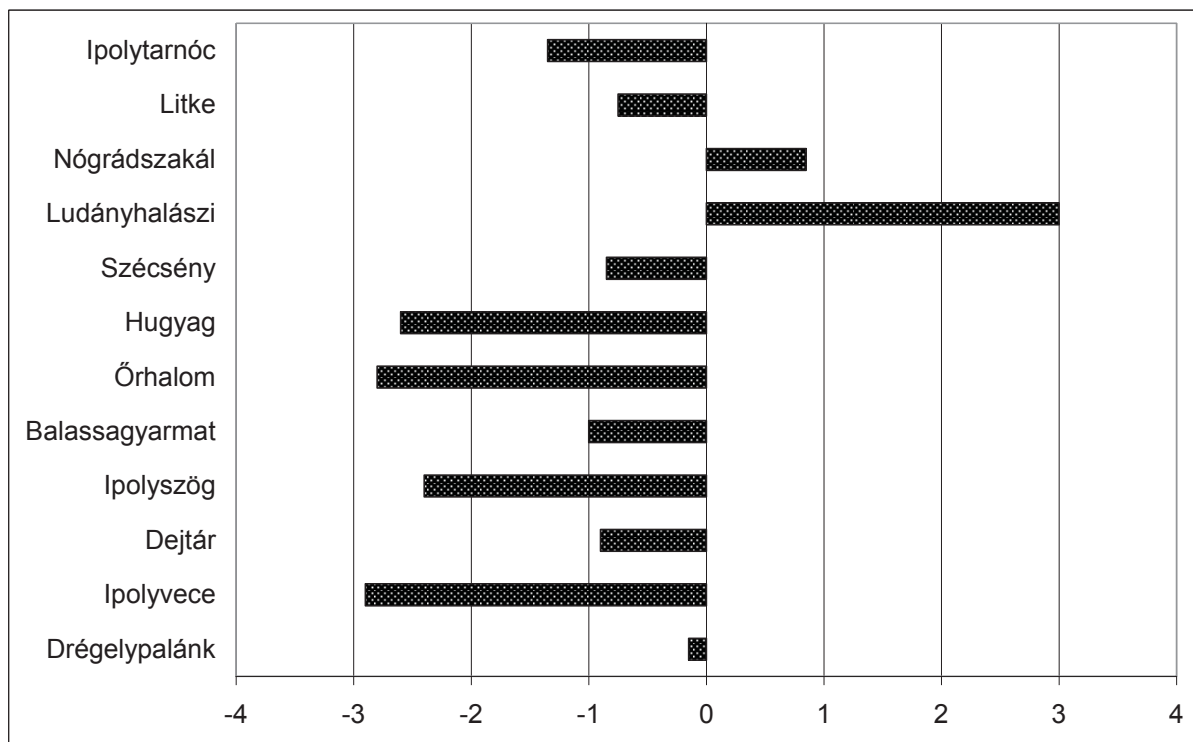


Figure 1. Net migration rate per 100 inhabitants of settlements covered by the railway line along the valley of The River Ipoly (Source: own edition based on [2])

Railway transport in Hungary on many branch-lines (and narrow gauge lines) has come to an end when the transport concept of the year 1968 came into operation. The major reason was the low price of oil. However, oil price shock of the 1970's hit the country showing the results of this unsuitable decision as well. The former socialist planned economy did not respond to changes. Re-opening of these lines is not likely to happen now due to many reasons:

- rails were picked up or carried away
- stations and signalling are abandoned or not existing
- costs are high, almost impossible to cover.

It must be admitted that closing a railway line is very simple but re-opening has great expenses. Nevertheless, in March 2007, passenger transport started suspend the operation of 14 inland branch-lines. Decision makers planned to interrupt the operation of 38 additional lines, although this plan did not take place, ultimately. The end of 2009 brought a new wave of closures but 2010 showed new horizons for regional transportation, as several railway

lines were reactivated, although mostly only with 2-3 pair of trains. In September of the same year the number of departures has increased but the standard of 2009 has not changed [3]. The unexpected turn occurred in April 2012, when due to efficiency reasons drastic reductions have been achieved. Unfortunately, effective savings could not be detected.

2.2 Subsidies and fees for rail and road transport

The special economic structure of rail transport can be characterized especially with the long-lasting railway infrastructure which has high fixed costs, low variable and marginal costs. All of them are aggravated by the **deforming effect of road subsidies** (Antal 2004). Not only that, but the disproportionately **high infrastructure-access charges** can make the dubious belief of effectiveness.

The main elements of fixed costs are the following:

- maintenance costs of rail infrastructure and vehicles, which are independent from staff and performance
- management and real estate costs.

Variable costs are surprisingly low. They are no more than 2-3% of total costs and they depend on the distance run by trains. Variable costs are primarily the following:

- electricity and fuel consumption
- deterioration due to movement which is negligible.

Beside a given network, vehicle and personnel it is subservient to scale capacity to the peak. If trains operate continuously and are **periodically scheduled**, “we will have the same number of trains but more trains will run” [4]. It is possible if existing vehicles operate even when fewer people are travelling. The essence of this process is that only the variable costs must be taken into consideration.

The Hungarian Railway’s Company (MÁV) probably “produces” under the shutdown point in microeconomic sense. If this hypothesis is true, then branch-lines with lower variable costs seem to be more efficient than main lines. This can be a **breakthrough opportunity** for branch-lines considering the **structural transformation** [5].

The **infrastructure-access charges** – similar in principle to the toll – is intended to cover the railway maintenance costs. As a result, with the cost of track maintenance is mainly charged the railway company, while the majority of infrastructure is not maintained at the appropriate level.

The national railway companies – including MÁV-START passenger transport company – are obliged to pay one of the **highest network-access fee on an international level**. The main victim of this is the regional transport, as it is disproportionately burdened by high network-access fee. On a branch-line the same amount is payable as on a main line. While due to low speed and greater physical activity variable costs are higher, effectively the main lines **cross-subsidize** the branch lines and the railway authority.

Perhaps the biggest winner of the railway closures is MÁV-START as a public company who pays in this case less network-access fee. However, **railway tracks do not disappear**, – they have to be maintained partly for freight transport – expenses of the state-owned railway infrastructure company are not reduced substantially but its revenues will be less. If the costs of MÁV-START and the other railway companies rise in the subsistent network, the **competitiveness of rail will deteriorate** further [4].

Network-access fee in Hungary is the most significant item among the costs of rail operation. While **costs of infrastructure have to be exploited by the railway transport operators**, road transport and bus companies basically pay only through fuel tax. The state

handles railway infrastructure as **private good**, roads as **public good**, even if the discrimination could not be justified economically [5]. When using public roads would also be turnpike, conditions of public good cannot be met in this case. It is not sure that maintaining of roads should be supported from public taxes while rails are financed only by railway operators.

Railway closures cause:

- less revenues (also on the connecting main lines)
- loss for the railway infrastructure services
- run-down conditions.

Beside the same infrastructure, workforce and organization, **reduction of the service** due to closures:

- does not result in savings
- extinguishes revenues of certain lines
- reduces efficiency of the whole network
- increases expenditure compared to performance.

2.3 Methodology

The main question is: how regional railway lines can be sustained and efficiently operated. This paper contains the results of an empirical study: more than 4000 km of railway line were tested by travelling in 3 phases. The first trip was in November 2009, before the wave of closure. In the summer of 2010, a similar journey was done to examine tourism destinations by rail. Possibilities to travelling with bicycles on board were tested at that time also. In 2012, the examination of railway border relationships was the focus. Emphasis on border traffic operations in cases of four of the five neighbouring countries were analyzed, including such places, where lines were closed over the past years, of the international passenger transport were stopped. The detailed proposals are illustrated with a case study: the **Ipoly Valley** rail connections.

Test trips, experiences of regional railways traffic management solutions, pricing and other features create a good basis for further researches. The economic rationalization of the Hungarian regional railways is a complex problem from all sides.

2.4 Objectives

What can be the objectives of the improvement of regional railway lines? How development of railway traffic can be a part of a complex set of traffic measures? ARTS was a European funded research with a relevant structure of such objectives [6]:

- Objective 1: To improve the availability of transport services in rural areas.
- Objective 2: To improve access to essential facilities and services for rural inhabitants.
- Objective 3: To improve physical access to transport services.
- Objective 3a: Door-to-door.
- Objective 3b: Low-floor vehicles.
- Objective 4: To make more efficient use of existing transport services via integration with other services.
- Objective 5: To provide an improved level of service to users, based on high quality information.
- Objective 6: To provide integrated services at a reasonable cost to users.

- Objective 7: To provide cost effectiveness through the integration of public transport services.

In addition to the above mentioned objectives this structure can be expanded with environmental and safety objectives to match sustainability principles [7].

3 CASE STUDY

3.1 Description of current conditions

Having established the Schengen Area, the **international rail traffic could be greatly simplified**, as border revision has ceased to function. Rail connection would generate considerable tourist traffic from neighbouring countries, as well as the population of our country would have the possibility to visit the frequented hinterlands beyond the state borders.

Approximately 2-4 trains a day do not provide **flexible services** in addition international rail traffic is often difficult and has quite high tariffs which can inhibit even the experiment of potential passengers.

Setting fares of international rail traffic has a **multi-step process**. Railway companies do not apply the local prices and discount system but the general international rate (TCV, Tarif Commun pour le transport international des Voyageurs) is determined. Participating countries fix their own **distance-based fares** and discounts can be given.

The Ipoly Valley Railway which is examined in this paper has more facilities.

- It is a closed unit which is **easily separable** from the core network.
- It has **survived all** of the **closure** initiatives.
- It has **cross-border connections** where daily freight rail transport operates between two Slovakian towns via Hungary (peage-transport). This connection would be suitable for passenger transport as well.
- It has a **potential connection** between Drégelypalánk and Šahy. Re-building and modernizing this line could play a strategic role considering long-distance east-west railway transport.

In order to assess the travel needs of cross-border transport there was a two-weeklong experimental passenger service between Balassagyarmat and Lučenec during the autumn parliament election in 2005. However, this initiative was barely advertised and news published in the press was also not clean-cut. Due to the unreasonable schedule only 32 paying passengers used this connection during the two weeks. Important to know that the Slovakian railway operator has to pay 60 million Forints per year for the use of Hungarian infrastructure by passing through the country. During the last 35 years no rail development has seen supported in the Nógrád region.



Figure 2.: Dream that never comes through? Free border without passenger transport. A special train is crossing the border at the Slovakian-Hungarian railway celebration day

People who live on both sides of the border have a desire to revive Ipoly Valley Railway. After entering the Schengen Area in 2008, every 1 May a celebration takes place with special trains to pay attention to the **importance of relationships (Figure 2.)**. However, the last event was in 2011. That is the irony of fate that international passenger transport ended on the same day between Somoskőújfalu and Filákovo. This means that cross-border public transport entirely stopped in the region [8]. But considering the common history, traditions and Hungarians who live beyond the borders, the region has enormous possibilities in **cross-border cooperation** and programs. International railway connections could play a **key role** in the implementation of these targets [9].

3.2 Proposals for improvement

The Ipoly Valley Railway currently has two crossing points (Nógrádszakál–Bušince and Ipolytarnóc–Kalonda) and has a high potential in tourism. A feasibility study which appeared in 2010 presents more alternatives for restoring international traffic:

- service based on the current state
- chary developments with regular interval timetables in order to ensure adequate frequency
- full track development with an overview of further services

In this paper we wish to demonstrate that **ensuring international passenger traffic** at the above-mentioned crossing points is even **possible beside the current track conditions**. These are proved by the daily freight trains and the different special passenger

trains on the celebrations. The potential for cost rationalization process (eg, track reconstruction) - which leads to more efficiency - has been described previously. In our proposal we do not deal with the missing Drégelypalánk–Hont–Šahy section but we have to count on it in future developments. Until the **resumption of international rail traffic**, bus connection is suggested. Currently, regional buses run between the railway station Drégelypalánk and the former road border station Parassapuszta, but the timetable does not allow them to turn back in the neighbouring Šahy. According to assessing the travel needs in the feasibility study **it is necessary to create a connection**, practically on the Balassagyarmat–Šahy relation.

Towards Lučenec the rail connection is preferred, however, we outline the possible **combinations of different modes of transport** (railway and bus) as well.

The Urban and Suburban Transport Association (VEKE) developed the entire Hungarian railway timetable based on modern principles, taking into account connections, technology and vehicle management, in 2009. It has been demonstrated that under the present conditions regular interval timetable **can be applied** while a 14% reduction of the total fleet is also possible [10]. This would lead to significant savings. On the examined line a **two-hour schedule** is suggested, which must be changed around 6, 14 and 22 hours due to shift work of Szécsény. The table below shows that trains spend more than an hour in Ipolytarnóc and during this period there is enough time for a turn to Lučenec and back.

The proposal of international timetable is:

- based on the schedule of VEKE
- showing possible cross-border connections according to the timetable of special trains at the Slovak-Hungarian railway celebration
- suitable for daily and leisure traffic as well

The daily four trains would run according to a **four-hour** regular interval and in compliance with-demand. It could be expanded by additional two pairs of trains in the morning and in the afternoon. In this form, the Slovak regional bus service can be replaced, or other bus lines could contribute to the frequency by serving the village Trebeľovce. (Currently there are only four departures from Balassagyarmat to Ipolytarnóc daily, at 4:53, 9:50, 14:45 and 17:30.)

The MÁV-START estimates that the planned annual traffic costs on the Slovakian side would be 2.8 million euros and the domestic costs is about 60 million Hungarian forints [11].

Encouraging of railway definitely has long-term benefits for the environment. Modal shift can significantly reduce carbon dioxide emissions. For these reasons all relevant transport strategy will prioritize rail transport. [12] [13]

Table 1: Proposal of international timetable on the railway line Balassagyarmat (H)–Lučenec (SK)
(Source: [10] and own calculation (2011))

km	station	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
0	Balassagyarmat	3 40	5 38	7 40	9 40	11 40	13 38	15 40	17 40	19 40	21 38
9	Órhalom	3 52	5 50	7 52	9 52	11 52	13 50	15 52	17 52	19 52	21 50
11	Hugyag	3 57	5 55	7 57	9 57	11 57	13 55	15 57	17 57	19 57	21 55
19	Szécsény (arriv.)	4 10	6 08	8 10	10 10	12 10	14 08	16 10	18 10	20 10	22 08
19	Szécsény (depart.)	4 11	6 13	8 11	10 11	12 11	14 13	16 11	18 11	20 11	22 13
23	Ludányhalászi	4 19	6 21	8 19	10 19	12 19	14 21	16 19	18 19	20 19	22 21
28	Nógrádszakál	4 28	6 30	8 28	10 28	12 28	14 30	16 28	18 28	20 28	22 30
33	Rárópuszta	4 35	6 37	8 35	10 35	12 35	14 37	16 35	18 35	20 35	22 37
38	Litke	4 44	6 46	8 44	10 44	12 44	14 46	16 44	18 44	20 44	22 46
41	Ipolytarnóc (arriv.)	4 49	6 51	8 49	10 49	12 49	14 51	16 49	18 49	20 49	22 51 ¹⁵
41	Ipolytarnóc (depart.)	...	6 53	...	10 53	...	14 53	...	18 53	...	...
45	Kalonda	...	7 00	...	11 00	...	15 00	...	19 00	...	...
47	Rapovce	...	7 07	...	11 07	...	15 07	...	19 07	...	...
54	Lučenec	...	7 21	...	11 21	...	15 21	...	19 21	...	...
km	station										
0	Lučenec	...	7 30	...	11 30	...	15 30	...	19 30	...	...
7	Rapovce	...	7 44	...	11 44	...	15 44	...	19 44	...	...
9	Kalonda	...	7 51	...	11 51	...	15 51	...	19 51	...	...
13	Ipolytarnóc (arriv.)	...	7 58	...	11 58	...	15 58	...	19 58	...	...
13	Ipolytarnóc (depart.)	5 30	8 03	10 03	12 03	13 30	16 03	18 03	20 03	21 30	
16	Litke	5 36	8 09	10 09	12 09	13 36	16 09	18 09	20 09	21 36	
21	Rárópuszta	5 45	8 18	10 18	12 18	13 45	16 18	18 18	20 18	21 45	
26	Nógrádszakál	5 53	8 33	10 33	12 33	13 53	16 33	18 33	20 33	21 53	
31	Ludányhalászi	6 02	8 42	10 42	12 42	14 02	16 42	18 42	20 42	22 02	
35	Szécsény (arriv.)	6 09	8 49	10 49	12 49	14 09	16 49	18 49	20 49	22 09	
35	Szécsény (depart.)	6 10	8 50	10 50	12 50	14 10	16 50	18 50	20 50	22 10	
43	Hugyag	6 22	9 02	11 02	13 02	14 22	16 02	19 02	21 02	22 22	
45	Órhalom	6 26	9 06	11 06	13 06	14 26	16 06	19 06	21 06	22 26	
54	Balassagyarmat	6 39	9 19	11 19	13 19	14 39	16 19	19 19	21 19	22 39	

4 CONCLUSIONS

Transport services in rural areas can be operated effectively. In this paper we proposed a viable solution considering the efficient operation, a passenger-oriented price and distribution policy applicable to Hungarian circumstances. We also illustrated some additional extra features.

European Union and the Schengen Area allow easier transport **connections between countries** so it has no real problems to cross the border by certain transport modes. But in practice, the inadequate infrastructure (or very limited public transport services) creates obstacle to the cross-border cooperation.

¹⁵ Return to Balassagyarmat next day at 4:03.

Demographic changes have had a huge impact on transport. Examples of tourism-frequented lines could show for instance the role of leisure traffic. One of the aims was to provide a comprehensive overview from the high potential of regional rail transport due to new economic mechanisms.

A **comparison with road transport** was also an essential element of this work. Concerning road transport the smaller fee of infrastructure usage seems to be correct only from business perspective. However, tolls do not include the real cost of road damages and other **external effects** which are mostly caused by heavy trucks or buses. Neglecting of rail transport development and the disadvantageous structure of railway, subsidies do not contribute to any pillars of sustainability. The non-suitable regulatory system will result in the further growth of road transport.

As a conclusion we can outline that the **effectiveness of rural railway lines** or network does not only depend on financing issues. The right attitude and better exploiting of potentialities can only increase their potential. Vice versa, lack of developments or disuse has only disadvantages without any positive financial effects.

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TOWARDS THE PRESERVATION OF A REGIONAL RAILWAY IN A PERIPHERAL AREA – THE DECISION MAKING PROCESS IN THE CASE OF THE NEUSTRELITZ - MIROW RAILWAY SERVICE, GERMANY

Axel Stein

KCW GmbH

Bernburger Str. 27, 10963 Berlin, Germany

stein@kcw-online.de

ABSTRACT

With a continuously declining population and a regressive financial scope of public authorities, in peripheral areas the provision of both infrastructures and services is at stake. In Germany, the state of Mecklenburg-Vorpommern is facing such a situation. In reaction to this, the Ministry of Transport decided to cut down the regional railway supply, thereby shutting down some lines completely. Replacement bus services at considerably lower costs shall be operated instead. In one particular case the local authority (district) was offered to overtake the responsibility to organise a railway service, using the replacement funds. This paper deals with the resulting challenges of a threatened railway service and the responsibility transfer. Until then the district was only responsible for road-bound public transport. Therefore, the offer of the Ministry of Transport took the district by surprise. At the same time, public pressure to preserve the railway service arose.

As a result, a process was initiated, in which the transfer of responsibility from the state to the district is organised and in which further stakeholders are involved. Among these stakeholders whose interests are affected by both the existence and the quality of the railway service, are the local bus operators, the mayors of the three cities, a local citizens' initiative and both private and administrative tourism developers. At the start of the process, its participants agreed upon the definition of the future service, their specific responsibilities regarding the support of the railway service and those criteria, which eventually will be used to evaluate the process and decide on its continuation. Since the 9th of December 2012 the new service is running. This paper gives an insight into this process and the interim results. It concludes with a general assessment whether both the process of decision making and the results of this specific case can serve as a model for other cases.

1 BACKGROUND OF THE CHALLENGES

In Germany each of the 16 states (Bundesländer) is responsible for the provision of regional railway services in their territory. The state of Mecklenburg-Vorpommern in the North-East of Germany is confronted with a declining population and the lowest density of population in Germany. Currently (October 2012), 1.63 million people live in Mecklenburg-Vorpommern, resulting in a density of 70 inhabitants per km² (German average: 229 inhabitants per km²). Within the previous eight years the population declined by 6 % [1]. In the next twenty years a further population decline of about 10 % is expected. With 1.48 million inhabitants in 2030 the population density will be as low as 64 inhabitants per km² [2, p. 11]. The highest population decline is expected to happen in the *Mecklenburg Lake District*¹⁶ from 273,000 in 2010 to 213,000 in 2030 (-22 %) [2, p. 11], resulting in a drop of

¹⁶ in German: "Mecklenburgische Seenplatte"

population density from 50 to 39 inhabitants per km². Not surprisingly, the Ministry of Transport is witnessing a correspondingly declining number of passengers on quite a lot of railway lines. One of these connects Neustrelitz (20,000 inh.) with Wesenberg and Mirow (3,000 inh. each).



Figure 1: Train network of North East Germany [own design]

This railway line (cf. fig. 1) is 21 km long; the train trip takes less than 30 min. Until December 2012 the railway service was operated on a two-hour-basis with eight trips per day and direction on weekdays and even on an almost one-hour-basis on weekends. Within the public transport network of the whole region the train served as the backbone. Among the ten different bus lines none was operated on a comparably regular basis (cf. fig. 2-4), as their main purpose was (and still is) to provide the transfer of pupils to and from school.

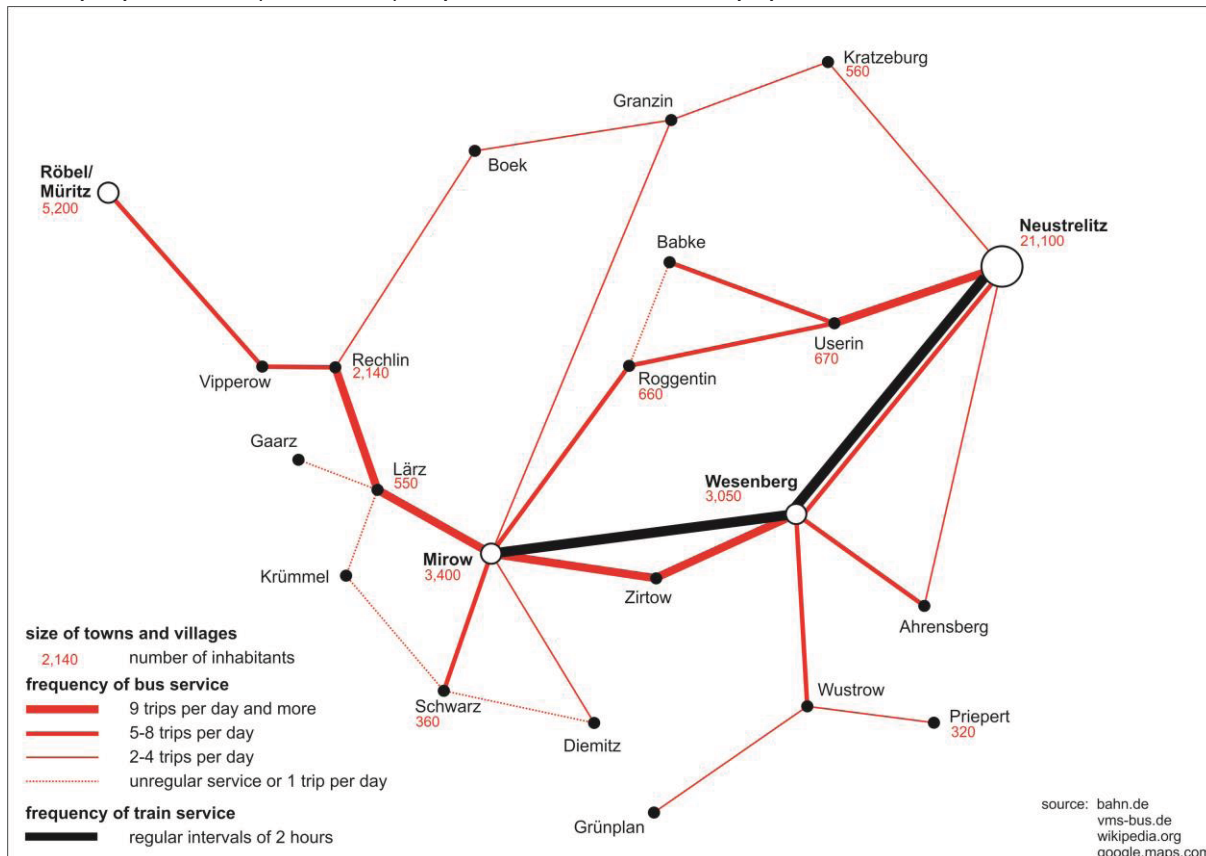


Figure 2: Frequency of public transport services around Mirow and Neustrelitz on school days before December 2012 [own design]

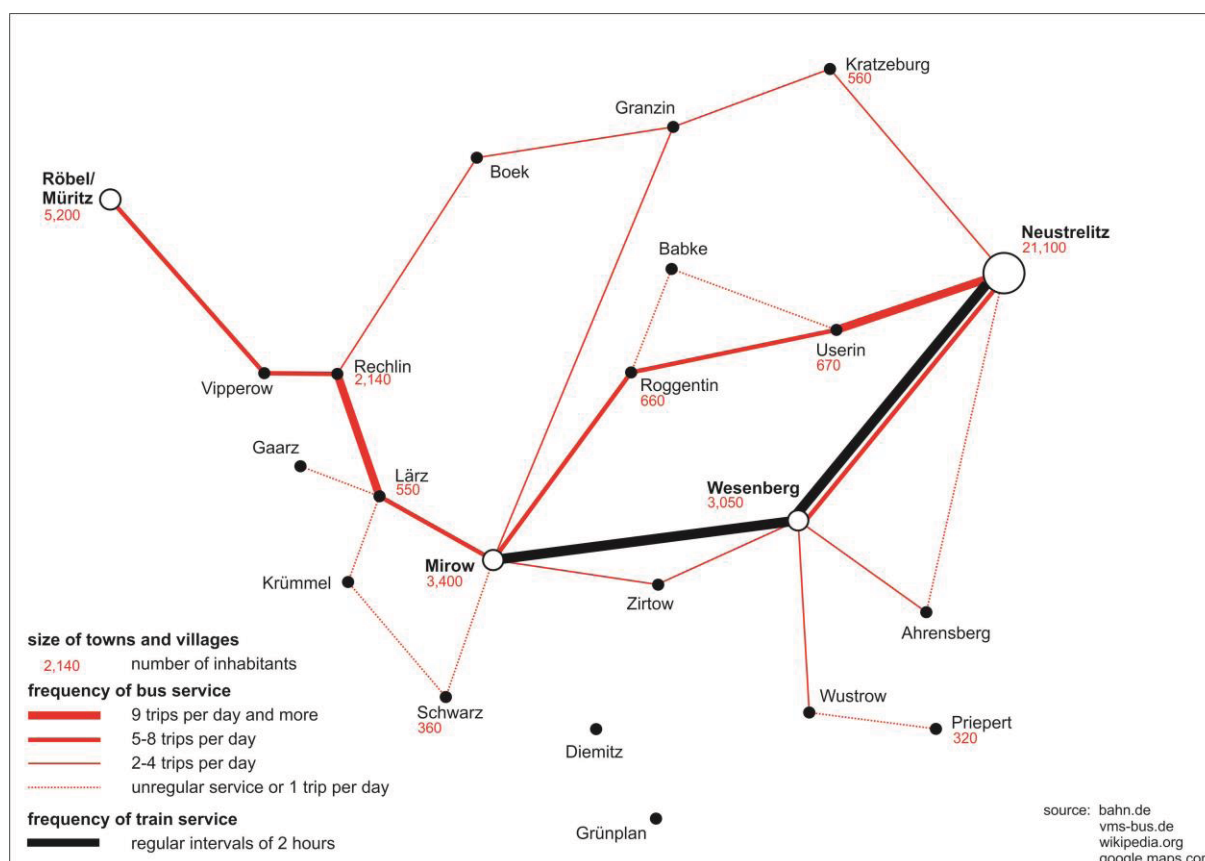


Figure 4: Frequency of public transport services around Mirow and Neustrelitz on weekends before December 2012 [own design]

The comparatively short railway line operates only in the territory of the Mecklenburg Lake District.¹⁷ Therefore, the Ministry decided to offer the responsibility to coordinate and finance the railway service on this line to the district authority, which is part of the local level of administration in Germany. This action went along with a handover of the budget, but only slightly higher than the amount regarded necessary for the funding of a bus replacement service. This sum covers only a quarter of the amount with which the railway service was run until December 2012. Due to its limited financial capacity the district decided to give no extra funds on top of the budget awarded by the Ministry in support of the service.

The open questions therefore were:

1. Is it possible to run a railway service with a convincing quality on such a dramatically reduced budget?
2. Which organisational provisions should be undertaken to implement the transfer of responsibilities regarding the authority?

With these questions remaining open for some time, public awareness of the uncertain future of the railway service grew. A citizens' initiative promoting the continuation of the railway service was founded [3]. Most people involved in this initiative are working in the tourism sector, which is of prime importance to the Mecklenburg Lake District.¹⁸ Basically, this initiative uttered its severe concern that a shutdown railway service would cut the public

¹⁷ Normally, railway services cross two or more districts.

¹⁸ The Mecklenburg Lake District and the adjacent "Mecklenburgische Schweiz" have a share of 15 % of all overnight stays in the state, compared to 18 % on the island of Usedom and 23 % on the islands of Rügen and Hiddensee [4, p. 15].

transport link to the visitors' home areas, mainly Berlin. A replacement bus service was not considered to compensate for the loss of the train connection, as the regions the Mecklenburg Lake District is competing with still are integrated in the train network feeding Berlin.

With the exception of the Ministry of Transport, which is the state of Mecklenburg-Vorpommern in charge of local and regional railway services, all other stakeholders in this process – in particular the local administration and the citizens' initiative – were confronted with challenges they were not familiar with:

1. a transfer of responsibilities,
2. a new circle of stakeholders, which feel involved in the decision making process,
3. a complete revision of contractual relations which result from the transfer of responsibilities.

To make matters worse, the time left to gain the knowledge required to handle the challenges was very short: the acclamation of the offered responsibility transfer of the railway service was launched half a year before its realisation and the political discussion of its consequences among local politicians consumed most of the time left.

At this stage, ministry and district called for expert advice, which was provided by a consultancy specialised in public transport strategies and management. A decision making process was initiated by the Ministry and the district authority with the following objectives:

- to agree on a concept for the integration of train and bus services – including touristic services,
- to utilise comprehensively financial resources, which usually are provided by different departments and different organisations,
- to merge responsibilities for train (former state level) and bus transport (local level),
- to coordinate closely all public transport operations,
- to consider the demands of all relevant customer groups,
- to optimise the allocation of customer groups to differentiated transport operations – with no regard to backdated solutions,
- to provide an attractive railway service which should be operated at least seasonally,
- to include all relevant stakeholders in a transparent decision process.

2 DEALING WITH THE CHALLENGES

To meet the three challenges and to achieve the objectives mentioned in the previous section, it was necessary to organise an assistance of the local administration and the citizens' initiative, which particularly represents the interests of touristic businesses. Due to the complexity of the challenges, the time pressure and the contrary positions amongst the stakeholders, the assistance was given by the independent consultancy:

1. The transfer of responsibilities called for a revision of positions and new activities. They were clarified in bilateral, confidential consultations with the consultancy.
2. To involve the new circle of stakeholders into the decision making process, three round table discussions, each chaired by the consultancy, were held.
3. The revision of contractual relations mainly related to the organisation of the tender of the railway service and the preparation of the contract between local administration and train

operator for the operation of the service over the following two years. Again, these tasks were taken over by the consultancy.

These activities will be explained in section 2.2, following the brief description of the parameters of the railway service after the transfer of authority.

2.1 Technical responses

Technically, the Ministry of Transport set as the effective date for the transfer of responsibility the last day of the existing railway service contract. The transfer responsibility required, therefore, a new public service contract between the new public authority (Mecklenburg Lake District) and a train operator. For this reason a public tender was carried out – due to the short time in form of an emergency measure –, which was won by a different train operator. The new public service contract settles the relevant technical responses to the challenges mentioned in the introductory section:

The train runs now at least four times a day per direction; service frequency has thus been halved. Additionally, the type of vehicles, which are employed here, has changed: vehicles of the 40 years old series VT 772 [5] instead of the more modern region shuttle-cars are running on this line. Insofar, comfort on the journey is now considerably lower – e.g. with regard to access for disabled – and the capacity is lower, as well.

But, these are minimum standards. The contract between local administration and train operator allows for an extension of the service. Fare revenues are allocated to the operator. Therefore, there is an incentive to raise ridership.

The train operator has been assigned a considerable freedom to design the service parameters. Furthermore, the operator is obliged to stay in close contact to administration, bus operation and representatives of the tourism sector to allow for a better coordination of public transport supply and demand. This concerns in particular the following: coordination activities regarding integrated tariffs and services between train and bus, prevention of train and bus services running on parallel routes, preservation of the districts' bus service budget, launch of common activities and regular consultations of train operator and district.

Time for the introduction of this decision making process was short. Therefore some crucial technical decisions (cf. the list of responsibilities in section 2.2.3) could not be made yet. As a consequence, all stakeholders of the process agreed to set up working groups with specific focuses. This will be dealt with in the following section, which describes the procedural responses to the challenges.

2.2 Procedural responses

The procedural responses cover bilateral and multilateral considerations to clarify the specific positions of some of the stakeholders (section 2.2.1) and – with regard to the widened circle of stakeholders – to bring about an agreement on the understanding of the challenge (section 2.2.2). This includes a specification of responsibilities and future activities (section 2.2.3).

2.2.1 Clarification of positions (to tackle the new responsibilities)

The clarification of the positions of local administration and citizens' initiative happened in bilateral communication via telephone and e-mail and face to face in confidential meetings.

In both cases it was important that the stakeholders became aware of the chances and the restrictions of the initiated process. The local administration had to be made familiar with the jurisdictional responsibilities which have to be met by a local authority not only managing public transport by bus but also by train. The schedule and the strategy for the tendering of the railway service had to be discussed and fixed.

With regard to the citizens' initiative it was important to clarify its ambitions and objectives. The persons involved in this initiative prove to be very professional, but this professionalism relates especially to their affiliation to the tourism business and to matters of local and regional development. There can be a strong link between these issues and the issue of public transport: the tourism business in this area relies heavily on private, non-organised transportation. The vast majority of tourists come from Berlin, which is renowned for its low rate of private motorisation. Therefore, many people from Berlin travel to the Mecklenburg Lake District by public transport, sometimes taking along their bicycles, which is certainly much easier in trains than in ordinary buses.

It is an open question, what would happen to the region's accessibility, if the railway service were to be replaced by a bus. Until recently, not much marketing has been undertaken to make traveling the region by train particularly popular in Berlin or in other places. Therefore, considerations with the citizens' initiative covered the question: "What efforts could be undertaken by local tourism entrepreneurs to advertise an integrated concept of access by public transport and holidays in the Lake District?" This, of course, could contribute to the efforts of regional development, which lies in the responsibility of the district and the small cities in the vicinity of the railway track.

2.2.2 Common understanding of the challenge (to give consideration to the widened circle of stakeholders)

The circle of stakeholders involved in this process exceeds local administration (school and transportation department; tourism and regional development department) and the citizens' initiative. Included are also the local bus operators (who are operating on behalf of the district), the owner of the rail track and the new train operator (this happens to be the same), the mayors of the adjacent three cities on the route (including their administrative tourism experts) and local politicians.

All of them so far had not been directly involved in the organisation of railway services in the Mecklenburg Lake District. Although many of them know each other from other discussions (esp. on local / regional development issues), they had to start a new debate on the importance of the railway service, to show their willingness to support it co-ordinately and sustainably and to agree on criteria which are necessary to monitor and control the according activities.

To enable this, three round table meetings were held. The negotiations were safeguarded by the independent consultancy, which is trained in chairing round table meetings and could contribute its expertise in regional transportation issues in answering occurring technical questions. Towards the end of this process, the district took over as coordinating body; approaching thereby more and more its future responsibility.

2.2.3 Specification of responsibilities (to tackle the specific tasks)

Two milestones were achieved to date: first, the decision to continue the railway service and, second, the agreement on activities and responsibilities of each stakeholder supporting the railway service.

These responsibilities are defined as follows:

- Organisation of school transport: the district's department for school administration takes care of regional conferences on public transport schedules and coordinated school opening hours.
- Revitalisation of station buildings and station environment: site surveys are initiated by the citizens' initiative; measures are coordinated by the cities.
- Information on bus services: measures with regard to local bus management will be taken by the transport association "Verkehrsgesellschaft Mecklenburg-Strelitz" (VMS), which is working on behalf of the district, whereas the integration in Mecklenburg-Vorpommern-wide information systems will be carried out by the transport association "Verkehrsgesellschaft Mecklenburg-Vorpommern" (VMV), which is working on behalf of the state.
- Marketing and tourism: activities with regard to regional marketing will be initiated by the citizens' initiative. Support is expected by transport operators, city-owned tourism associations and single entrepreneurs in the tourism sector.
- Touristic events and arrangements: the citizens' initiative coordinates activities in this field of action, in particular supported by the train operator.
- General coordination of activities: as the responsibility for public transport rests with the school development department within the district administration, this department coordinates all activities with regard to the future of the railway line. It is supported by the department for tourism and regional development.
- Finance of investments: the Ministry of Transport is willing to support the process by financing specific track investments, e.g. realising an automation of level crossing barriers.

These responsibilities were assigned in an agreed document. This included a paper outlining the subsequent evaluation process, which will start by the end of 2013 as the transport contract expires after two years' time (end of 2014). For two reasons, the evaluation will be based on qualitative data and experiences regarding processes of decision making and routines of transport planning. First, within such a short time, it will be impossible to gain significant quantitative data which could help to find out to what extent the continuation of the railway service has been successful. Second, the process to be evaluated is not only a case of transport planning and its effectiveness, but rather a more general and complex issue of transferring responsibilities from state to district level. Therefore, the specific evaluation criteria, which the stakeholders agreed upon, concern the following main issues:

First, a careful look has to be taken on the structures of the decision making. After the transfer of responsibilities for the railway services to the local and regional level, the newly established structures will have to be refined. The regional organisation of school opening

times is a suitable example for this: it is a complicated matter insofar as there are twelve schools located in the three cities adjacent to the railway line, ten of them beginning lessons at 7:30 a.m., one of them at 7:15 a.m. and one of them at 7:45 a.m. Staggering the opening times of these schools and a coordination with train arrivals and departures at the regionally significant train station of Neustrelitz¹⁹ would help setting free bus transportation resources (for additional services targeting tourists or employees) and reducing travel times for pupils. If such round tables or similar institutions are set up in the process and prove to be helpful, this would strengthen the impression that the train operation has regional benefits.

Second, the routines of public transport in the region have to be taken into consideration. This regards the issue of school transport, and it extends to the coordinated organisation of bus and train operations, a reduction of parallel transport services and the introduction of feeder services to higher ranked services of an integrated transportation system. Special services for tourists and regular services, both of them fitting in the regularly-scheduled services at the neighbouring Müritzer Lake and centred at the central station of Neustrelitz, are regarded to be important.

Third, the specific travel behaviour of public transport users, their use of trains and buses, will have to be looked at. This includes counting passengers and interviewing hotel managers about the transport modes their guests arrive with and travel around. Of course, the measures undertaken within the first year of operation will not show effects immediately, therefore traffic counting is regarded a subordinated issue in the first evaluation round.

3 RESULTS AND DISCUSSION

At this juncture, no conclusive assessment of the future of this railway line can be given, but it is possible to reflect on the challenges of the decision making process. Reviewing the process and its debates and negotiations, the general challenges can be looked at more systematically.²⁰

If these challenges were to be described in a very general way, it should be described as the task to coordinate different activities. All four identified activities are dealt with in the following four sections. Each of these activities is – if looked at independently – not too specific and demanding, the single matters arising seem manageable and can easily be allocated to the relevant stakeholders. What makes this task of coordination a very complex one, is the mutual dependency of these coordination activities: the coordination of train and bus (3.1) will not work without collaboration between different departments in the district administration or between the district and the state (3.2). The latter, again, requires a comprehensive handling of public transport supply and demand (3.3), which, finally, is dependent on a participation of representatives of the civil society (3.4).

3.1 Coordination of rail- and road-bound public transport

In pursuance of an effective public transport network, it seems obvious to integrate rail- and road-bound public transport. But, this case study makes it clear that the routine of transport planning which has been established in Germany rather results in a non-

¹⁹ Neustrelitz central station has been developed to an interval knot in the public transport system: trains from all three major directions – Berlin, Rostock and Stralsund – arrive and depart on the hour.

²⁰ This is not to deny that a transfer of responsibilities, a widened circle of stakeholders and a complete revision of contractual relations challenged both capabilities and resources of those who were eager to preserve the railway line in this specific case.

coordinated coexistence of both systems. Breaking this routine is a challenging task itself. It requires to put into question framing conditions and standards of public transport, such as:

- Do railways really have no function in school transport?
- What function can buses have in a tourism-based public transport system?
- How can a region with poorly developed public transport standards be integrated into ambitious systems of neighbouring regions?

3.2 Coordination of different departments in the local administration

Transport planning is related to the competences of different public administration departments on different levels. To meet the goal of comprehensive networks, the activities of these departments have to be coordinated. It is no surprise that this is subject to rivalry and conflicts, as departments feel the risk of losing their specific competences or even resources. To give an integration of rail- and road-bound public transport a chance, the following questions must be answered:

- How can interests of the departments for tourism and regional development on the one hand and public transport and schools on the other hand be aligned?
- Locally run schools insist on their independence in defining the start and end of school days whereas a coordinated, staggered start and end of school days could lead to a more cost efficient public transport. How can the interests of the school authorities be brought into agreement with the interests of the public transport authorities?
- Since public transport in Germany is a service of general public interest, as a basic principle, local public transport is supported in funding it by the federal states. In cases like this one, the system of subsidies is disrupted when formerly state run railway lines are taken over by local administrations. How are these disruptions compensated for?

3.3 Coordination of public transport supply and public transport demands

Public transport supply and public transport demand are to be balanced. Established practical experience shows that usually public transport supply is conformed to its demand – particularly to that of the so called captive riders – and to the distribution of its origins and destinations. In such cases, where this practice does not leave any options and scope for anything else than a minimum supply, stakeholders are forced to rethink their attitude of expectations towards public transport:

- To what extent can the organisation of schools increase effectiveness of public transport?²¹
- Is it possible to create products in the tourism sector with public transport as an integral element?

3.4 Coordination of public administration and civil society

Railway and bus services serve the public. Therefore, it is no surprise that “the” public raises its voice, when it comes to strategic questions of public transport supply. Politico-

²¹ This question differs from the second question of the previous section insofar, as it does not relate to the rivalry of authorities responsible for the issues of school organisation and public transport, but to the general requirement to match the demand of school transportation and the resource of public transportation.

administrative stakeholders are not used to deal with citizens' initiatives or single persons committed to the issue of public transport. But, it is to be expected that in the future more and more issues similar to this case study will be dealt with not only in local parliaments or offices of the administration. Discussions with the public – via newspapers, workshops or new media – will become an integral part of administrative work. This development should not be viewed as a threat, but instead as a chance to increase effectiveness and acceptance of local politics and local administration. This leads to the following questions:

- How can politics and administration make use of activities of the public such as citizens' initiatives as a resource and integrate them into their day to day practices?
- How can politics and administration make use of activities of single stakeholders such as hoteliers or event managers in the tourism sector as a resource and integrate them into their day to day practices?

4 CONCLUSIONS

This case study deals with the decision making process regarding the transfer of responsibility for the provision of regional railway services from the state to the district level, thereby questioning established routines in public transport planning. This brought forth coordination activities on different levels, which can be expected to be relevant to other cases in peripheral areas – regardless of the specificity of this case.

For different reasons, the odds for a successful decision making process were not good in the beginning. Against this background, it is a success to have the process started and to have the train running for the following two years. The decision making process has led to a new focus of the regional development on the issue of public transport access. This is a first success in a region which so far has not put much attention to this matter.

The decisive factors of the current success are:

1. The case goes back to a strong incentive set by the Ministry of Transport, which announced the intention to close the railway line – which is not unusual in peripheral areas – unless the district agrees to the roughly sketched option to preserve the service (or parts of it) under its own responsibility. The ministry was very clear in naming the conditions for this option, i.e. demanding a change of the institutional frame of transport planning in that region, including a transfer the responsibility and a lump sum for financing the future service. The Ministry was particularly eager to overcome thought restrictions and to make this case a model for other cases, which are expected to be on the political agenda soon.
2. This impulse would have gone up in smoke, if there had not been such an interest in the region itself to preserve the railway service. The range of stakeholders with a strong interest in the railways' survival was – and still is – wide and includes active and realistic people. The activities of the citizens' initiative and the train operator, in particular, gave the necessary momentum to the process.
3. Finally, all of the relevant stakeholders have been involved in the process of decision making, which was important to keep the momentum.

Of course, at this stage it cannot be foretold, whether the process will finally succeed in preserving the railway service. In fact, it is necessary to keep an eye on the following issues to avoid an eventual closure of the railway service:

- The subsidy for the railway service is considerably lower than previously. It, therefore, is still disputed, whether the sum will be sufficient. It is recommended to subject this to a detailed assessment.
- All stakeholders who are newly involved in the organisation of the railway service have limited capacities. The district is undergoing a considerable administrative modernisation including the merger of four former districts to the largest German district (covered area). It proves to be difficult to find the time for a responsibility which was transferred to the district level without respective allocation of man power. The constellation in the citizens' initiative is not that different: all members are new to the issue and are, particularly in the tourist season, occupied with their personal business. For these reasons, it would be not surprising if the interest and support of these stakeholders diminish over time, particularly if no success is perceived.
- Finally, the integration of an external moderator proved to be very helpful: the moderator was independent of all stakeholder interests and positions and was not part of any conflicts which had developed so far. This made it possible to reveal and promote the issue of a future integrated bus and train network as solution for the challenges. Through the implementation of this measure, this issue, formerly with no representative in the region at all, gained importance in the region. As the external advice could be only of a limited period the local stakeholders will be solely responsible for the future decisions, in particular the district administration and the citizens' initiative.

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INFOMOBILITY AS SOLUTION TO PROBLEMS OF MOBILITY AND TRANSPORT IN RURAL AREAS

Wiktor Żuchowski, Bartosz Guszczak

Institute of Logistics and Warehousing

Centre of Logistics Knowledge

ul. Estkowskiego 6, 61-755 Poznań, Poland

wiktor.zuchowski@ilim.poznan.pl, bartosz.guszczak@ilim.poznan.pl

ABSTRACT

It is known that the inhabitants of rural areas are facing the problem of mobility. Infomobility can help in solving this problem; it refers to the procedures, systems and devices based on the intelligent transport systems (ITS) and services that enhance the mobility of people through the collection, processing and distribution of information. Infomobility services may have an impact on different groups of users, such as passengers, municipalities, transport operators and fleet managers. It can be said that they generate benefits for each of these groups. However, in many regions these services are not always used in the optimum way. The answer to this problem is the POLITE project, the goal of which is to share good practice between regions with more experience and regions which are willing to accept the support and want to use infomobility services. In this paper the authors present the best practices with infomobility potential, which give an excellent example of how you can cope with the problem of mobility in rural areas. The best practice is a demand responsive transport system, which is successfully implemented in Krakow low urbanized areas.

In order to better customize PT offer to citizens' needs, the city of Cracow has introduced and tested a new demand-responsive transport service in a chosen area of three districts. The DRT service, called Tele-Bus, was launched in Cracow after the transfer of technology and know-how from Genoa. DRT is a "many to many" public transport service with fixed stop points and flexible routes and timetables. It operates every day in the south-eastern part of the city and during defined operating hours. The main objective of demand-responsive transport (DRT) in Cracow is to better serve passengers by supplying better personalized service that could be in tune with their actual needs regarding journey time and destination. An important assumption is the lack of significant costs generation associated with the service launch and day-by-day operation. DRT clients just contact dispatchers by phone using a special free line dedicated only for that service. Dispatchers collect information from passengers and introduce the data into the system, which plans the routes; output information is given to tele-buses. The only limitation from the passengers' point of view is the fact that an order must be placed at least 30 minutes before the planned start of the trip.

The article presents the characteristics of infomobility services, the POLITE project, as well as best practice in the area of infomobility.

1 INTRODUCTION

The abbreviation DRT refers to the term of the demand responsive transport. In Poland there is only one solution of that kind in Cracow, defined as "a tele-bus" or "a dial-a-bus service". The DRT solution is so little known that it requires clarification, popularization and

finally also implementation. Urban or suburban areas around Polish conurbations seem to be an excellent scene for action for officials, who are often following an innovative approach, given that in many European regions a huge number of similar transport solutions have been successfully implemented and used. Therefore, there is no impediment to the implementation of similar solutions in rural areas, especially in those with quite high level and size of population, justifying such implementation. The DRT system has been described under the POLITE project²² as one of good practices, which can be transferred further.

2 The POLITE project

In recent years public transport companies have been developing their offer not only through the improvement of the quality of their services, but also through the enhancement of availability and attractiveness of their offer. Convincing the inhabitants of a conurbation to collective transport is becoming a key question to road traffic. The attempts at moving passenger streams from cars to public transport, aimed at reducing congestion, require activity of public transport companies and support of public benefit organizations. The POLITE project, which is one of the EU projects implemented by the Institute of Logistics and Warehousing, is concerned with offering support to such measures.

POLITE is an acronym of the full name of the project, i.e. Policy Learning in Information Technologies for Public Transport Enhancement. Although the term POLITE can be associated with the Greek word meaning the city/town, the project is concerned with all areas of operation of public transport, including cities and towns, the suburbs or typically rural areas. Moreover, the objective of the project is popularisation of solutions related to the integration of many means of transport, with special emphasis on solutions in the area of infomobility.

One of the basic objectives of the project is the improvement of use and attractiveness of public transport. This task should be achieved through the facilitation of transfer of solutions in the area of infomobility, i.e. through the improvement and popularisation of direct access to interactive sources of information for passengers, both present and potential ones. The examples of promoted solutions include improvement of information, comfort of travelling, the possibility of on-going planning of optimum connections, or purchase of tickets through electronic channels.

Yet another objective of the POLITE project is the promotion of co-modality of public transport. The passenger is also the focus of interest under this objective. Synchronization of travel frequency, based on the studies of passengers' needs, leads not only to the improvement of users' satisfaction, but also to optimum use of transport infrastructure.

The collection of information on good practices will enable the provision of ready solutions to public administration employees, which can be quickly transferred to their own local or regional area. After developing analyses of requirements of a given region, these solutions will be adapted to any identified requirement, as long as appropriate solutions can be provided by the partners of solution "donors".

Even if identified good practices are not directly compatible with the requirements, possibilities or character of regional needs of "the recipients" of practices, the knowledge of such practices will enable improvement of awareness of possibilities available to public administration and public transport, thus becoming the basis for the strategy and long-term development perspectives.

²² More information on the project is available on the website: www.polite-project.eu

The main result of the POLITE project will be a horizontal or vertical transfer of selected good practices between the regions of project participants (see Figure 1). The last task under the project consists in the development of implementation plans of selected good practices in the regions with lower culture of public transport.



Figure 1: Partners of POLITE project [1]

2.1 Good practices

How are good practices understood under the POLITE project? In compliance with the definition from the dictionary of INTERREG IVC scheme, a good practice is defined as *an initiative (e.g. methodologies, projects, processes, and techniques) undertaken in one of the programme's thematic priorities which has already proved successful and which has the potential to be transferred to a different geographic area. Proved successful is where the good practice has already provided tangible and measurable results in achieving a specific objective* [2]. This definition applies to good practices, i.e. the measures which are quite popular and usually present in more than one region. The hierarchic arrangement of good practices is possible, under which the best practice will be the top one. For the requirements of the POLITE project, the definition of the best practice of ERDF fund has been used: *“Best practice – a way, technique, methodology, innovative practice that, through experience and*

*research, has proven to reliably lead to a desired result and is considered to **be superior to all other known**. It contributes to the improved performance of an organisation, usually recognised as “best” by other peer organisations.”*

2.2 Infomobility

The project places special emphasis on infomobile services, i.e. services related to the collection, processing and dissemination of transport-related information using intelligent transport systems (ITS). Appropriately prepared and disseminated data shall provide information on available means of transport to commuters, both before and during the journey.

POLITE focuses on good and best practices related to IT technologies, which are used for the needs of public transport under the operator-passenger relation. Any other practices not related to IT can also be identified and disseminated, especially if they co-exist together with other best or good practices. An example of good practice not related with IT is the designation of public transport vehicles with colours, with the aim of facilitating and improving the process of identification of appropriate public transport lines.

3 Rural areas demand response transport

DRT, which in the article is called demand-responsive (public) transport, is a form of public transport the daily operation of which is determined by the needs of its users. Under one of the versions of the Niches [3] project, demand-responsive transport was defined as “the advanced, user-oriented form of public transport, characterised by flexible routes and variable timetable of small or medium-sized buses, operating between bus stops in compliance with current passenger needs”. Figure 1 presents the location of demand-responsive transport among other means of urban transport.

The operation of the system is quite simple - a potential passenger contacts the control centre of DRT traffic by phone and passes information concerning the planned starting and end site of journey, the number of persons and the time at which he intends to start the journey. Optionally, the passenger may also define the time at which he intends to reach the destination. The operator controls the status of orders placed for a given time on the on-going basis as well as the occupation of vehicles, and he plans the bus route with the support of optimization systems. On the basis of these data the operator informs the passenger of the time at which he should be present at a given bus stop. The passenger confirms the receipt of information and all he has to do is to wait for the arrival of the bus at the specified time.

Transport Categories Relationship and Apply Examples

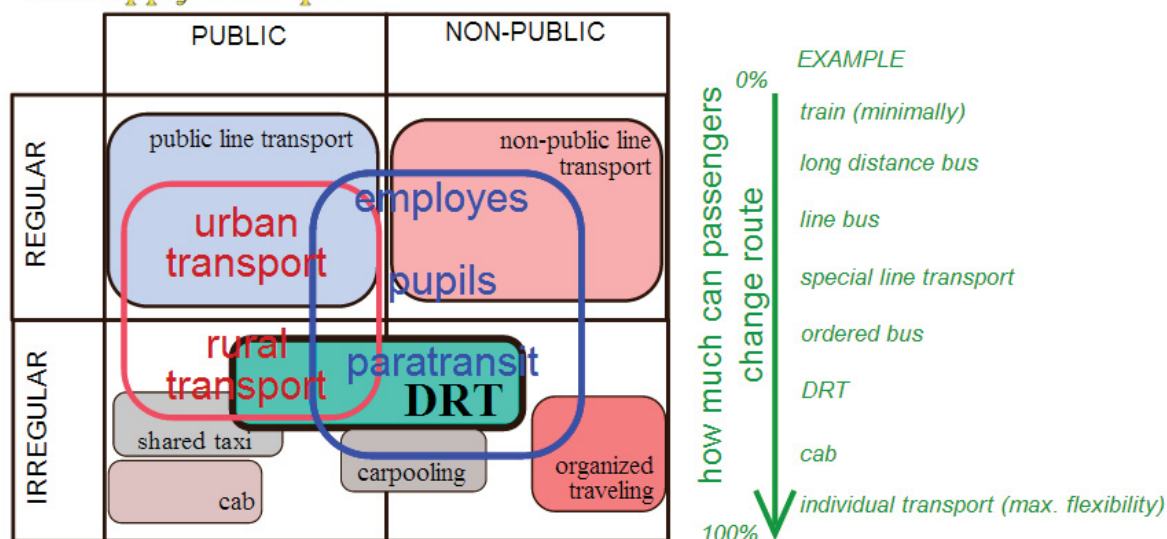


Fig.2: Rural transport and DTR on the background of others means of transport [4]

When deciding to use demand-responsive transport, the passenger does not know the exact bus route. He has to be prepared for a slightly longer (during rush hours) or shorter journey time in relation to the timetable of operating transport, depending on the number and location of transport bookings.

The task of the operator, apart from the on-going rationalization of transport routes, consists in the transmission, in an electronic and wireless manner, of any planned points of the route to the driver's interface. This interface, which is equipped with the location system, plans future routes or, if it is still possible, modifies the present route. The driver, on the other hand, shall follow the planned and optimized route, stopping at all bus stops in compliance with the indications of the interface installed in the bus.

The main advantage of demand-responsive transport is the improvement of access to public transport in the areas or at times when conventional services cannot be offered for various reasons on the level which is satisfactory to passengers. Furthermore, DRT solutions effectively prevent social exclusion of persons who do not possess their own means of transport, and who live in the area with quite low degree of urbanization, e.g. in rural areas. The success of demand-responsive transport solution, which has been popularised through word-of-mouth marketing or promotional campaigns of the operator, can be a convincing argument for changing a private car for a means of public transport. The data from actual implementations demonstrate a successive increase in persons using this kind of public transport.

Demand-responsive transport solutions usually enable reduction of public transport costs (in relation to the timetable-based solutions) in the areas of implementation with medium and low public transport demand (suburban, rural, and low-urbanized areas). Dedicated routes, smaller and flexibly selected buses (depending on availability) as well as the adaptation of the intensity of traffic to the size of the stream are only some of the factors which lead to savings and reduction of exhaust gases. The introduction of DRT is usually related with the increase in the scope of operation of public transport, too.

However, it is necessary to incur initial costs, which consist in the expenses for the optimization system, equipping the vehicles, the communication system, the modification of traffic control centre and other similar expenses. The costs of additional infrastructure and the costs related to employing the staff of traffic control centre are considered the running costs. An important outlay, which is often not taken into account, is the financing of campaigns aimed at popularisation of the new transport solution. Implementations usually have to be supported with public funds and, as in the majority of public transport cases, they have to receive subsidies during operation.

The most important factor of implementation, however, is passengers' satisfaction. After the initial adaptation period or the period of getting accustomed to the change, passengers praise the novel solution and they literally "vote with their legs" by changing the currently used means of transport for demand-responsive transport, which is confirmed by the example of the increase in the number of passengers during the first four years of DRT system operation in Florence (figure 3).

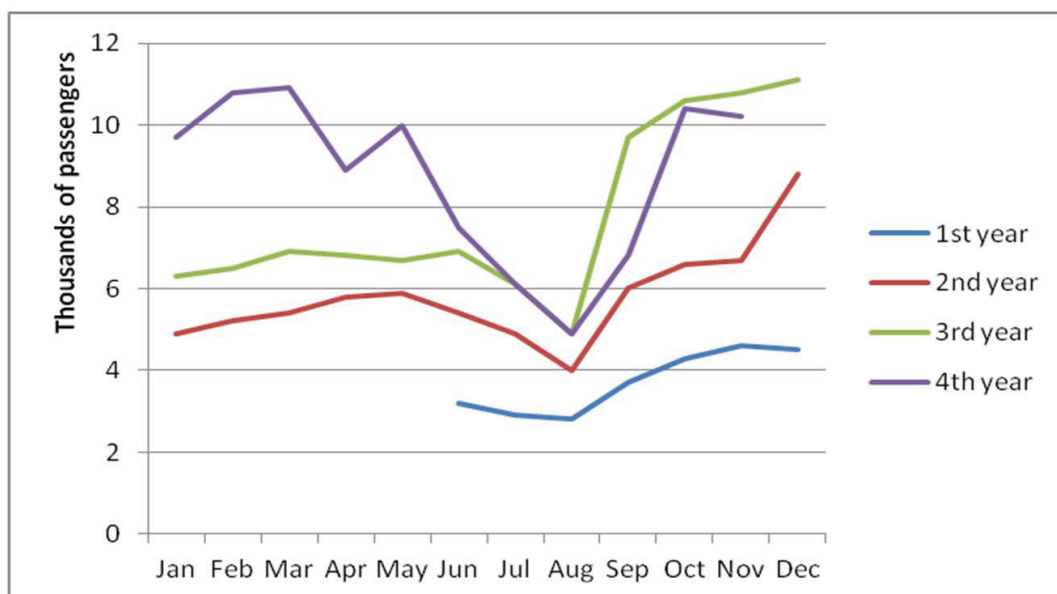


Fig.2: The increase in the number of passengers in the first 4 years of DRT system operation in Florence [5]

DRT solutions are not restricted only to public and urban transport. Solutions of a similar nature are often used in the airports, thus filling in the gap between transport operating according to the schedule and taxis.

Demand-responsive transport solutions can be transferred quite easily. The transfer of knowledge should be understood as the transmission of ordered and interpreted bundles of information, which does not have to be strictly technical: it can be e.g. economical knowledge or the knowledge in the area of logistics or marketing" [6]. The existing demand-responsive transport solutions can be exemplary solutions, i.e. the best practice ready to be implemented in another location with similar characteristics in the area of transport demand. Thus Telebus in Cracow started to operate, since it was created as an element of the EU project entitled Civitas Caravel, on the basis of experience of Italian partners under the project, who had implemented the model solution a few years before in Genoa. This is the only DRT system operating in Poland at present [7]. It should be stressed that the fare system in the telebus is the same one as in the whole public transport in Cracow, and it also includes the system of fare discounts.

The principles of operation of Tele-bus in Cracow stress one of the main defects of demand-responsive transport - passengers who have not booked their journey by phone can receive the service only if there are available seats on the bus and on the approved route which the bus follows. This defect can be reduced by the use of mobile applications, informing on the potential passengers on the on-going basis of possible travel options.

This currently developing state-of-the-art mobile technology can significantly facilitate access to demand-responsive transport. Many urban buses have already been equipped with location systems and many control centres dispose of current information of the location of their vehicles. Making this information available on internet platforms and transferring it further to mobile phone screens, tablets or city monitors is only a question of time. The transport can also be ordered on-line in the future, which will take the part of the load from the operators of control centres. Mobile technology seems to exactly match the needs of demand-responsive transport and it can become the source of its further development in the nearest future.

4 CONCLUSIONS

The POLITE project offers the possibility of transfer of publicly available knowledge from one place to another, from the Cities of Good Practices to Transfer Cities. It should be added that the POLITE project will also involve the initiation of co-operation with other regions outside the partnership with the view to enhancement of awareness of the existing infomobile solutions in Europe. This is an excellent opportunity for the cities in which infomobile services are not well developed to catch up in this area. Appropriately developed infomobile systems make public transport more attractive to passengers. The cities (the Managing Bodies of Public Transport) are the main beneficiaries of the implementation of this solution. The benefits mainly consist in more effective and efficient management of public transport.

One of the good practices identified under the POLITE project as DRT solutions based on telephone communication and operators that introduce the data manually has survived successfully for the number of years. State-of-the-art technologies, which provide systemic support to demand-responsive public transport, offer the possibilities of computerisation of both ordering passenger transport and route planning or organization. Such infomobile solution can help in further development of DRT and its successful implementations. The benefits of other solutions in the area of infomobility in the areas with low intensity of public transport-related infrastructure should also be taken into account.

The Cracow example is one of the sources that can serve as a good practice which can be transferred readily. The statement that there are no areas with appropriate level of population and urbanization, where such innovations can be introduced, is also not true. The only reasons for the lack of DRT solutions in rural areas can be the lack of appropriately disseminated knowledge on the benefits of demand-responsive transport and the unwillingness to try new solutions that have not been proved in the existing conditions, which, however, cannot be any justification for the lack of attempts in the area of implementation of demand-responsive transport. It is worth changing this situation.

There are many ideas and initiatives formed on their basis, but the main factor of effective transfer of good practices is the consequence in their implementation and on-going consultations with the stakeholders - representatives of public transport and inhabitants [8].

Acknowledgements



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SOCIAL SPATIAL CHANGES AND CHANGES IN URBAN DESIGN BECAUSE OF NEW TRANSPORT INFRASTRUCTURE

Maik Hömke

ETH Zurich, Department of Architecture, gta
Wolfgang-Pauli-Straße 15, HIL D74.1, CH-8093 Zurich, Switzerland
maik.hoemke@gta.arch.ethz.ch

ABSTRACT

The present study will establish the socio-spatial effects of a transport infrastructure in a rural area. Using a wide variety of empirical methods, the intention is to show the ways in which increasing urbanization in a former rural area can be demonstrated, on the basis of social criteria.

The aim of the study is to show that research focusing merely on economic and physical effects in a given area, and ignoring the social aspects of new infrastructure, inevitably suffers a loss of quality. The special characteristic of the present study lies in the way in which it assesses infrastructure developments, in regions that were previously peripheral, on the basis of urban development phenomena and social phenomena.

1 INTRODUCTION

Increasing expansion of transport infrastructure is taking place in more and more countries. This trend, strongly encouraged by the globalization process, is reflected in ever-shorter journey times in both national and international travel. During such developments, extensive urban-planning alterations in areas that are being provided with new transport infrastructure tend to be viewed purely in terms of economic and efficiency benefits – and particularly in terms of the time saved when travelling the distance from starting-point to destination. An interesting aspect here is that the importance of time appears to be superseding the importance of space. However, there has been little research on the socio-spatial effects of new transport infrastructure systems. There is no awareness or sensibility for such changes, and as a result hardly any methods are available to investigate phenomena of this type. The present study is therefore intended to add a new level to research on the efficacy of new transport facilities – namely, the socio-spatial effects of transport infrastructure.

2 RESEARCH QUESTION

The main research question asks for which kind of changes in urban design and social space can be observed in the field of new transport infrastructure. Because it is not easy to answer this question as a whole, the answer is split into three parts. In a first part of the study only changes in urban design in the environment of new transport infrastructure are observed. Secondly all changes in social space committed by changes in urban design will be investigated. At least the question arises which changes will be occur in the perception of

traveled space while using new transport infrastructure, shortly: which social spatial changes in the transport infrastructure itself can be observed.

3 CASE STUDY

The new Lötschberg Base Tunnel in Switzerland is to be taken as an example case for the purpose. When the 34.6-km Lötschberg Base Tunnel opened for scheduled operations in December 2007, the rural communes in the Upper Valais region acquired a strong new link with the catchment area of Berne. For example, the train journey between Visp (in Upper Valais) and Berne was shortened from 2 hours to less than 1 hour. In addition to the link with Berne, internal public transport connections in Upper Valais were also tremendously improved and extended. Interchange links were improved, connections were better organized, high-frequency timetables were introduced and services were substantially increased – transport facilities that are every bit as good as an urban railway network.

The study will therefore observe on the one hand changes in urban design and social space in the small municipality of Visp and on the other hand changes of social space within the transport infrastructure while traveling in the tunnel.

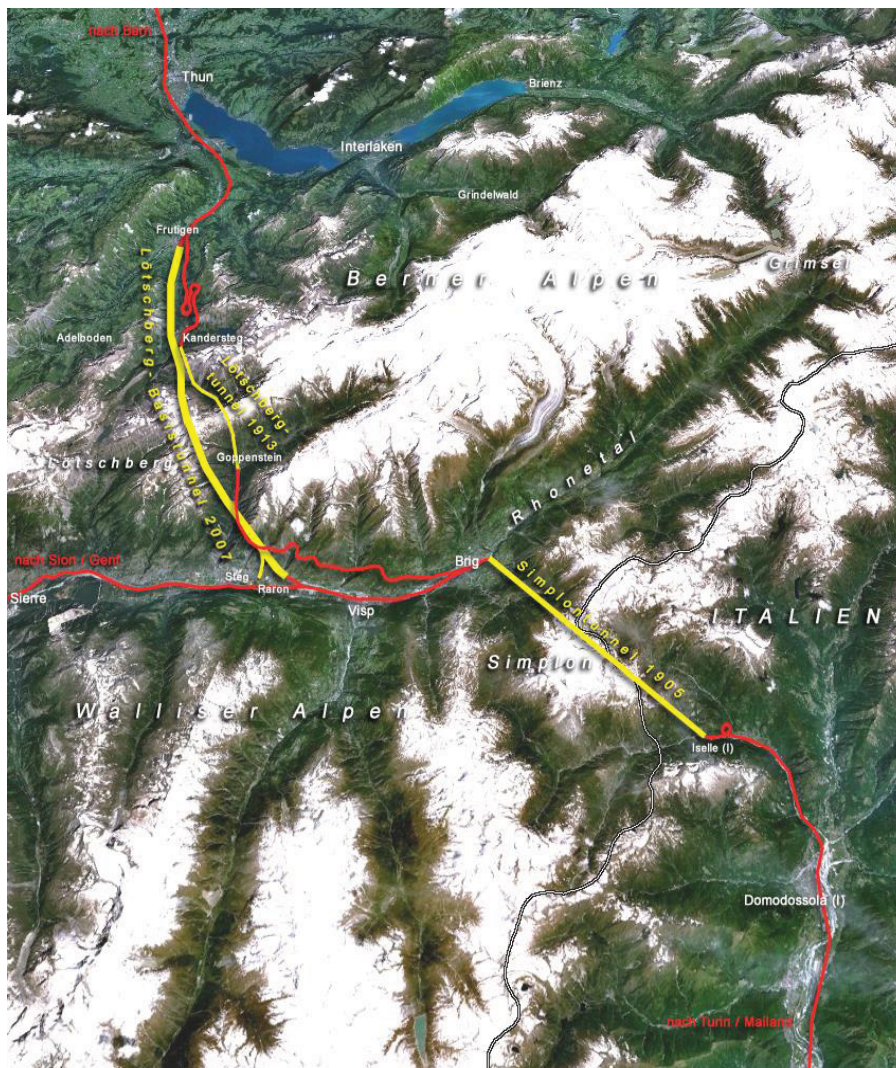


Figure 1: Map showing the old Lötschberg track and the new tunnel [1]

4 METHODS AND FINDINGS

Criticizing studies which have only a focus on economic facts or better connection possibilities because of a new transport infrastructure, this study has to show, that the new Lötschberg base tunnel has also positive economic effects and better connections before showing changes in urban design and social space.

So first of all a timetable analysis was made. This is important to find out, if the new connection is a better connection at all. So the numbers of trains were counted before and after the tunnel opening. Also the interchange connections in the whole Upper Valais were reviewed.

The next graph shows that there is a tremendous increase of connections in Visp. Also better interchange connections can be observed.

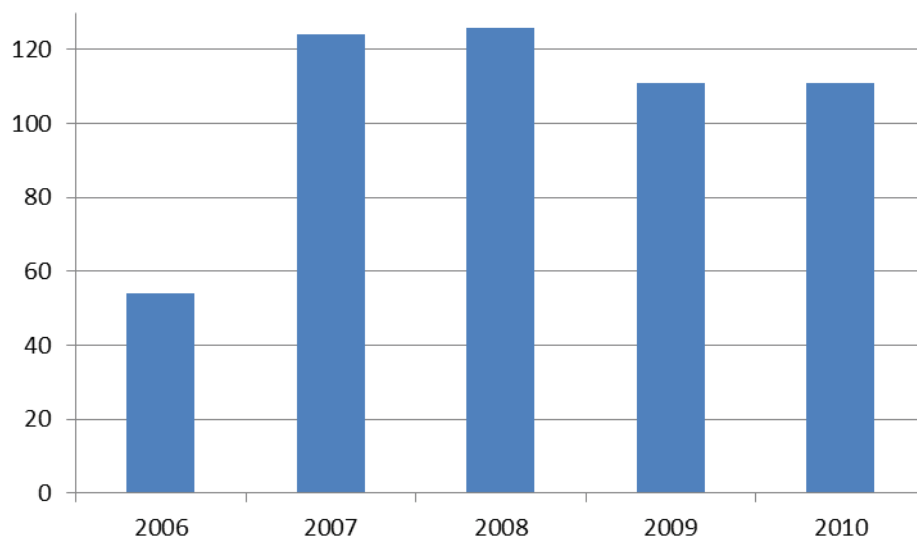


Figure 2: Number of train connections before (2006) and after tunnel opening (2007-...) in Visp

To find out about economic effects of the new tunnel, a more sociological, empirical way was used to show these effects. Not using GDP or similar data, but observing shop opening times and using a survey of shop owners. With the help of these findings some economic effects can be shown: Since the new tunnel is used for scheduled operations, shop opening hours in Visp were smartly increasing. Also new national and international shops can be observed. In most of the shops also an increase of customers can be seen, connected in some cases with a higher volume of sales.

So the economic effects and better connections with the help of the new railway track are demonstrated. Now it is possible to start with the investigation of the three research focuses within this work.

4.1 Historical urban design analysis

To observe changes in urban design because of new transport infrastructure, five public spaces within the municipality of Visp were selected. Then an extensive analysis was made with photo and map comparisons from different time periods. Also actual descriptions of the places were done. It can be shown, that traffic infrastructures have influences on historical and current urban design, starting with roadhouses for travelers thru the Alps, the so called Susten, and not ending with the new railway station in Visp. The same time these

changes can be observed, it is possible to see different focuses in town planning and development because of different transport infrastructures.

4.1.1 Urban design developments because of new dwelling areas

But not only in the old part of Visp can changes in urban design be observed. There are also some new areas for new build dwellings, for example Visp West. In 2009 and 2011 photos were taken and compared to each other. Two pictures are presented below and one can see that there is a strong increase in building new dwellings, and first time in Visp, dwellings for rent. Also the first time real estate companies are investing in Visp to build rental dwelling areas.



Figure 3: On part of Visp West in 2009 (left picture) and in 2011 (right picture)

4.2 Social space analysis

The next part of the study investigates the social spatial changes in public spaces of Visp. To find such changes observations of greeting behaviour (Simmels attribute for a small municipality), daily activities and number of persons on a place are observed to different times and days.

Findings are that no changes in greeting behaviour are observable. So the new infrastructure doesn't change the small municipality behaviour after five years. But what one can see is the increasing of people on public spaces near to the new transport infrastructure. The same time public spaces with no access to the new transport infrastructure have less people. Also it is observable, that social spatial changes have a strong link to the changes in urban design. Some additional expert interviews of people of the municipality and the canton help to classify these findings.

4.3 Social space analysis inside of the new transport infrastructure

Finally social spatial changes immanent in the transport infrastructure itself are investigated. For this, travelogues from different time periods are used and compared with actual prepared travelogues. To have an idea, three examples from different time periods are mentioned above:

Goethe: "A mild, gentle air filled the area. Here the Etsch turns again against noon. The hills at the foot of the mountains are cultivated with wine. Over long, low summerhouses the sticks pulled, the blue grapes hang delicate of the cover down and mature at the warmth of the close ground." [2]

Schivelbusch: “It remains for him [the traveller, note of author] only, to overlook the nearer-lying objects and landscapes and view of those things far away, this means to look on more slowly passing things.” [3]

Actual: The train starts in time. In the train it is clean. Nice blue of the seats, only the carpet could be cleaned with a vacuum-cleaner.“

Even in the tunnel you see mountains, but only on the screen of the Lötschberger, showing advertisements.“

The three examples had shown the different perceptions of space because of different travel modes. Goethe mentioned every small detail. With the railway Schivelbusch wrote about the use of the panoramic view. Actual driving in the tunnel means to have the concentration only on things in the train and no longer on the outside.

To have a complete picture, additional travel observations were made. By these observations of people using the different trains, the old track above the Alps and the new track under the Alps were compared and different activities in the trains were observed. One can see that there are different activities in connection which kind of track is used. In the tunnel only the in cabin room of the train is mentioned by the passengers and also working in the train become more and more important. A more detailed view on activities in the train in connection which kind of track are chosen shows the graph below.

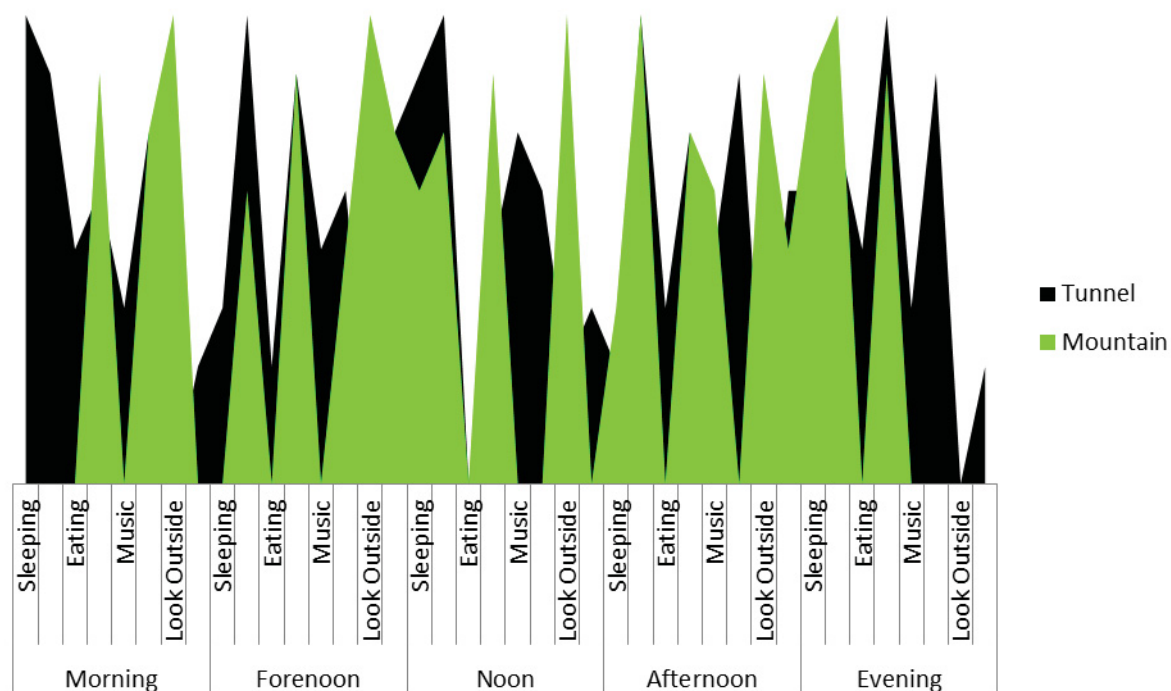


Figure 4: Different activities on different railway tracks

5 CONCLUSION

The findings while using the different research methods to observe changes in urban design because of new transport infrastructure are that new constructed buildings have a strong connecting to the new transport infrastructure (roadhouses (Susten), railway station). Also near to the new transport infrastructure bigger free (public) spaces are installed and new dwellings for more (expected) people are built.

In the social space perception it is evident, that adoption of new rooms starts, but very slowly. The adoption is strongly connected to details in urban design. Also one can see that most of the new travellers are without consequences for the social space of Visp, because they only use Visp as a station to change and not to explore Visp. But the inhabitants of Visp are more and more concentrated in the public areas around the new railway station.

Last point of the investigation is the social space perception within the new transport infrastructure. As mentioned above, the travelled space lost more and more importance, the same time the importance of the room perception inside of the transport infrastructure rises. All activities have also a strong inside concentration.

Summing up, the study shows that new transport infrastructure creates new buildings and urban situations. The social adoption of these new urban situations is strongly connected to urban design quality. A change in social perception of these new situations is not observable after such a short time of research (five years). In the transport infrastructure more and more inside uses are observable. So the trains are used as a second office. Finally the new transport infrastructure creates new traffic in Visp. More and more people use the car to come to the station, so that street infrastructure is most of the time overloaded.

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PUBLIC TRANSPORT IN THE RURAL AREAS OF THE PILSEN REGION

Vlastimil Melichar, Jindřich Šedivý

University of Pardubice, Jan Perner Transport Faculty
Department of Transport Management, Marketing and Logistics
Studentská 95, 532 10 Pardubice, Czech Republic
vlastimil.melichar@upce.cz, jindrich.sedivy@students.upce.cz

ABSTRACT

The search aims at identifying specific transport solutions to the problems faced by the rural passengers in and around the area of Pilsen Region. The work tries to demonstrate the prevailing passenger travel problems in many locations as mentioned below:

1. Pilsen-NorthDistrict – north part from line Manětín - Mladotice - Plasy – Kralovice
2. Town of Zbiroh

The search tries to establish the new concept of rail and road connecting mode facility to the rural passengers near by the Northern District of Pilsen (Plzeň) Region so that they will get benefited even in the absence of complete railway lines. In the case of second location Zbiroh the problem is to build the travel solution for a distance of six kilometres between the centre of the town to the nearest train station using the existing modes of transport facilities available.

1 INTRODUCTION

Genesis of the study:

In December 2010 a new solution of public transport services was introduced in the Pilsen – North District. Due to economic reasons it proved ineffective to order the trains for a public use in that part of the track where the number usually does not exceed 5 passengers per train. Therefore, the terminal station for regional trains coming from Pilsen (Plzeň) is Žihle. The capacity of the trains in the part Žihle – Blatno u Jesenice (Ústí Region) was concentrated / moved to a 33 km long part between Pilsen and Plasy. Some of the trains that operated only between Pilsen and Plasy have been complemented by the bus connections in section Plasy-Mladotice-Žihle and Lubenec (Plasy, Mladotice, Žihle and Blatno are regular interchanging points). In order to complement the offer, other connections have been established i.e. Kralovice-Žihle and Kralovice-Manětín via Mladotice. The connection Kralovice-Manětín via Žihle is also operated on weekends during the summer holidays.

The second area, the town of Zbiroh is not a typical rural area. Zbiroh is a town of about 2,500 inhabitants situated near the border to the Central Bohemia Region. There is a 6 km distance from the town centre to the Prague-Pilsen railway.

The problem of this solution is a dislocation of the interchanging point from Zbiroh (4 km from the town centre) to the new railway station of Kařez (Prague-Pilsen railway). The Zbiroh station has been cancelled for passenger trains on April 28, 2012.

In the light of the above, the study was carried out in the region of Pilsen to understand the prevailing transport problems faced by the rural passengers of Pilsen, North-District and the travellers in and around the town Zbiroh. The study aims to provide some practical solutions to the public transport problems and tries to provide feasible locational and scheduling guidance.

2 METHODS AND NEW SOLUTION PROCEDURES

2.1 District Pilsen - North

In December 2010, when some regional train connections were replaced with the bus services between Plasy and Blatno u Jesenice, the main challenge was to formulate an optimal timetable considering some of the following restrictive conditions into account:

- Available modes of transport connectivity in Plasy
- Possible number of existing links to the present bus lines and possibility of connectivity to modes of transport in Mladotice
- Present availability of the bus connection to the inter-regional trains in the Žihle railway station
- To see if there is a possibility of to create Blatno as a point of interchanging mode of transport, considering its complementary effect on the transport system
- In a broader context to ensure interconnection with other bus lines in Mladotice, Žihle and Blatno.

Within the researched areas the following bus lines have been selected:

Table 1: Bus lines in the new concept – status December 2010 [5]

Line number	Line route
460127	Mladotice – Manětín – Bezvěrov – Bezručice
460162	Mladotice – Kralovice (replacement of the train because of track closing)
460181	Kralovice – Žihle – Manětín
460334	Plasy – Mladotice – Žihle – Blatno – Lubenec
460805	Kralovice–Plzeň

Weekend connections Kralovice – Pilsen and back have been removed from line 460800 into the line 460805 (line 460800 is operating only on working days including 20 connections in both directions), the route in Horní Bříza and Pilsen changed and a number of connections multiplied. During 2011 the concept was stabilized, which consisted of shortening the route line 460127 and re-establishing the line 460790 and transfer lines in the section Kralovice - Žihle from line 460181 into the line 460810 Kralovice - Žihle - Blatno - Lubenec. Line 460162 was cancelled and incorporated into the line 460790. In the sections where the bus lines replace the trains (Kralovice – Mladotice – line 460790, Plasy – Blatno – line 460334 and Žihle – Blatno – line 460810) the tariff of the railroad carrier is valid, as well.

Due to unfavorable winter conditions the line 460181 operates only during the summer holidays, on weekends and public holidays. The line is to connect the touristic destinations such as Rabštejn nad Střelou (see figure 1) and Manětín with Žihle (interchanging point) and Kralovice (regional centre).



Figure 1: Bus type SOR in service as line 460181 on the narrow historic bridge in Rabštejn 2.7.2011

The capacity of passenger rail transport saved in the section Plasy - Mladotice - Žihle – Region border was moved to section Plzeň–Plasy [2] [3] [4] [7] with a higher transport potential. This allowed the introduction of a one hour cycle on working days. On Saturdays and Sundays there is a two hour cycle complemented by the bus connection on the route Kralovice (if possible, there is a connection between trains from/to Rakovník and buses) – Plasy – Pilsen, by 5 pairs of the connection on Saturdays and 4 pairs on Sundays, respectively. This line is specific thanks to the possibility of changing the transport modes at the station „Sady Pětatřicátníků“ in Pilsen. “Sady Pětatřicátníků” is the central interchanging point for tramway lines 3 walking minutes from a central square and 5 minutes from the central station by the city tram.

From Pilsen to Plasy and Kralovice the route has been extended by 2 km in order to eliminate the delays of the trains. The bus starts at the Central Bus Station, continues to the stop in vicinity of Central Railway Station and finally to “Sady Pětatřicátníků”. The line was opened in December 2010 and stabilized 2011 as an outcome of changes on the Pilsen route and a train timetable between Kralovice and Rakovník due to technical reasons.

Based on the new concept the following bus connections are currently operated:

- 460127 – Manětín – Bezvěrov – Bezručice
- 460181 – Kralovice – Žihle – Manětín
- 460334 – Plasy – Mladotice – Žihle – Blatno - Lubenec
- 460790 – Kralovice – Mladotice – Manětín – Rabštejn nad Střelou
- 460805 – Kralovice - Plzeň
- 460810 – Kralovice – Žihle – Blatno – Lubenec

The supply of connections has now improved (see table 2).

The options of interchange are (see figure 2):

- **Bezručice** (Tachov District) – in the town center an option to change to other bus lines; at the railway station interchanging point – line 460127 and trains – route 177 via Konstantinovy Lázně (the only well-known classic spa in Pilsen Region) and Pňovany, where other connections to Pilsen or Stříbro can be found.
- **Bezvěrov** – interchanging possibility – line 460127 and lines 421232, 440080, 481650 via Pilsen or Karlovy Vary/Sokolov (connection to Karlovy Vary Region)
- **Blatno, žel. st.** (Ústí Region) – serves only as a complementary interchanging point between the bus line 460334 (460810) and the line 562772 (created by the Ústí Region); there is also an option to change between trains (routes 160 and 161) or mutually between buses and trains.
- **Kralovice, žel. st.** (railway station) – interchanging point - bus line 460790, 460805, 460810 and trains (route 162) from Kralovice to Rakovník; if necessary, the train waits for a bus line 460805 up to 5 minutes (upon call to a dispatcher).
- **Kralovice** – numerous options of bus interchange
- **Kralovice, ZVŠ** – selected connections from line 460790 to the line 460800 or 460805
- **Manětín** – interchanging point – lines 460790 and 460127; there is also the possibility to change to other lines. At the stop „Manětín, Vladměřice“, one could choose among the line 460790 and 440070 or 460030 from/to Pilsen. (Line 460181 has not good connections in Manětín due to the preference of the connections in Žihle.)
- **Mladotice** – interchanging point - lines 460334 and 460790
- **Mladotice, žel. st.** – interchanging point – trains (route 160), bus line 460790 (buses are waiting for the trains connections up to 5 minutes)
- **Plasy** – numerous options of bus interchange (e. g. among lines 460334, 460710, 460760, 460780 and 460800)
- **Plasy, žel. st.** (railway station) – interchanging point between rail (section Pilsen – Plasy) and bus line 460334 (connections are waiting to each other for 5 minutes).
- **Plzeň, hlavní nádraží ČD, Americká**– a name of the bus stop near the Central Railway Station in Pilsen, where passengers can change modes of transport – interchanging point between trains, city transport and the regional line 460805 in direction from Pilsen to Kralovice
- **Plzeň, Sady Pětatřicátníků** – interchanging point for line 460805 – changing to the city transport, connection to the Central Railway Station each 5 minutes (from 8 AM until about 7 PM each 3,5 minutes)
- **Žihle** – at the stop nearby the railway station the largest interchanging point of numerous lines is situated in selected area – interregional trains in direction of Plasy – Pilsen or to the Ústecký Region (via Žatec – Chomutov – Most), bus lines 460181, 460334, 460810 (buses are waiting up to 5 minutes for a train and for other buses).

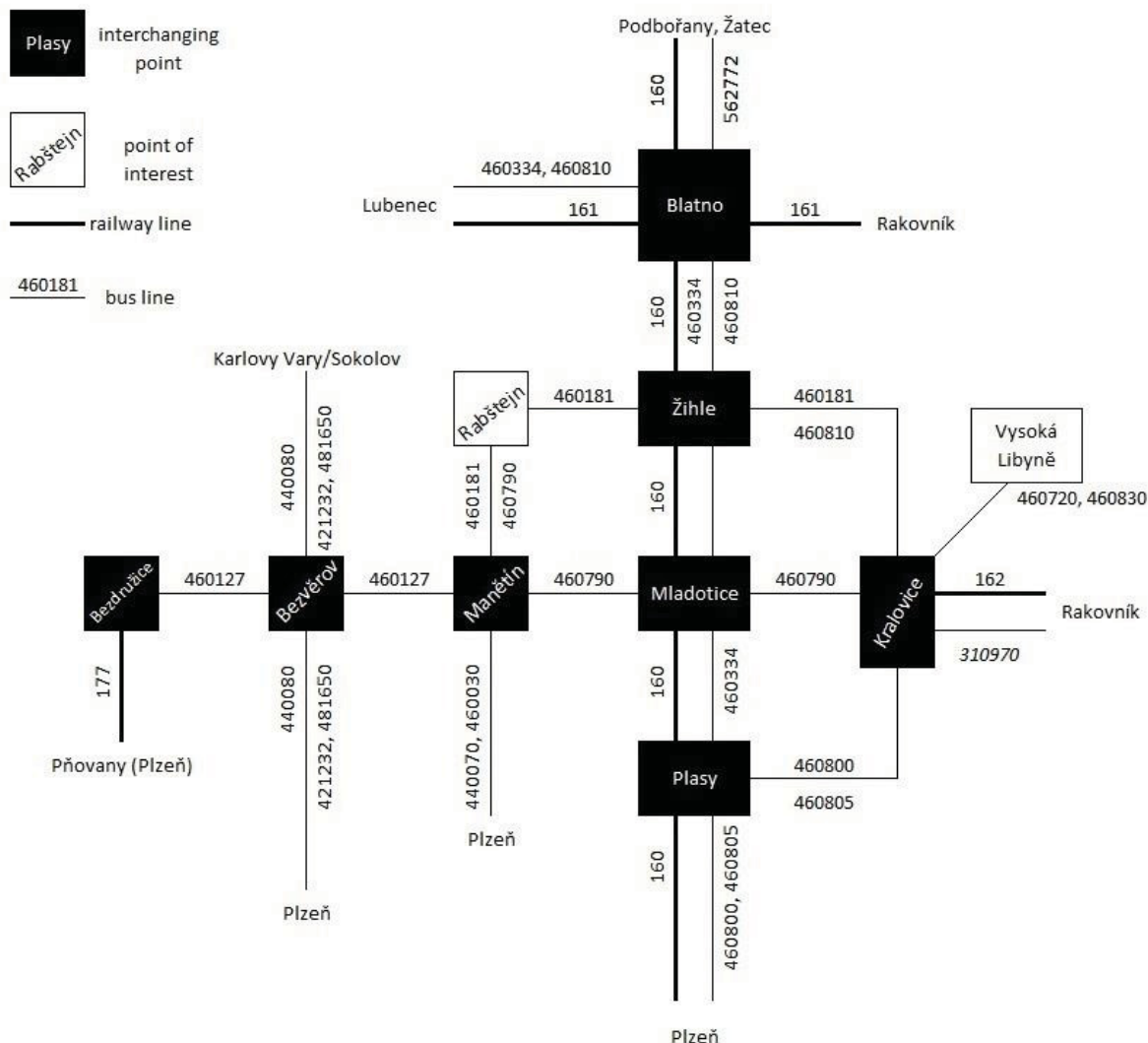


Figure 2: Schema of the new concept with illustration of selected interchanging points

Source: [2] [3] [4], delineation authors

Timetables for lines 460181, 460127, 460334, 460805 and 460810 are based on the integral timetable method due to the connections to the trains at interchanging points. It is not a full concept because of the sparsely populated area. In this area, there is also one specific place. It is the village of Vysoká Libyně. It was serviced (except to one connection provided by line 460720) by the commercial lines only. Due to the economic reasons all commercial lines (440801, 460840 and 570672) have been stopped.

Before reductions there was one daily connection in both directions in the timetable of line 440801, two connections in both directions on working days using the line 460840 and one connection in both directions in timetable of the line number 570672. During the reductions the new connections and the line 460830 have been opened. Now, when all commercial lines have actually been cancelled the connection to Kralovice is carried out by the lines 460720 and 460830.

The line from Podbořany (Ústí Region) via Jesenice (Central Bohemia Region) to Kralovice (Pilsen Region) was cancelled in 2009 (June 30th). Since 1st of July 2009 the connection from Kralovice has been replaced by the line 460830. Since 7th of March 2010 till

10th of January 2011 the line 570672 from Most to Pilsen was gradually reduced. The line 440801 was gradually reduced, too. Since 2012 it had been operated on Fridays and Sundays only. The last connection provided by this line was on 31st of August 2012. The timetables for the lines 460720 and 460830 have been modified to the present form. The required connection to Pilsen on Sundays was released by the line 460720 from Kralovice at 5:20 PM (connection from Rakovnick – line 310970) to Vysoká Libyně and back to Kralovice; the bus from Kralovice continues without changing as the line 460805 in direction of Pilsen.

2.2 Town of Zbiroh

Initially, the issue seemed to be less complicated than the one in District of Pilsen-North. However, two limiting conditions need to be taken into consideration. In particular, the change of train timetable and the bus route extension due to a relocation of interchanging point from railway station Zbiroh to a new station of Kařez which has been constructed as a result of railway modernization. It was on April 28, 2012 when the new train stop was activated and the station Zbiroh was cancelled for passenger trains.

Currently, the bus route is by 2 km longer than before. Thus, the vehicle circulation is 4 km longer. In terms of timing it takes about 8 minutes of extra time for all stakeholders. The connection from the centre of Zbiroh to the railway track is necessary due to frequent transport on the railway, as well as better railway connection supply in comparison to the bus connections.

Since 9th of December 2012 the train timetable has undergone significant changes. While the passenger trains had been arriving from one direction at regular 54 minutes and those from opposite direction at 03 minutes, due to a potential start of the railway reconstruction the arrivals changed to 44 and 15, respectively. The creation of the bus timetable was therefore very difficult with relation to the above mentioned restrictions as well as other relevant lines. The relevant lines consisted of 470510 (Kařez, railway station – Liřná), 470520 (Kařez, railway station – Zbiroh – Zvíkovec – Chřič; during working days possible connection twice per day from Chřič to Kralovice by 460831) and 470530 Zvíkovec – Zbiroh – Rokycany – Hrádek. There was a special discussion on the website of Zbiroh town focused on the relevant topic. At the moment, there have not been any more discussions going on as it was decided to resolve the issue.

Since 9.12.2012 there have been two similar issues – limited options to ensure the connection from a train stop to the centre of Zbiroh and further to the village of Liřná and back. One issue had been appearing at 11 AM and the second one four hours later. In the morning the issue was solved by employing the second bus which had a service break (the break took place at other time). In the afternoon the problem was resolved by adding completely new connections ensured by a small minibus for 8 passengers in cooperation of regional authority, carrier, municipality and the public transport organizer. Therefore, two connections from Zbiroh to railway stop Kařez (15:26 and 16:26) have been added during the working days. To ensure the connection at late working days the special connections upon call (demand transport) were introduced already in 2011.

3 CONCLUSION

3.1 District Pilsen – North

In December 2010 the new concept of passenger transport was introduced in the above mentioned area. Due to the weather conditions in winter and further requests the

concept was stabilized. In order to provide the train connections operated in 2 hours period (with some exceptions) the timetables were constructed on integral timetable basis. Thus, the transportation offer has now improved.

The train transport has been optimized. On the section Plzeň-Plasy the passenger trains are operated in 1 hour period during the working days (1 hour period before December 2010). With regard to the economic and technical reasons the regional trains from direction of Pilsen terminate at station Žihle from where the intraregional connections to Ústí Region can be taken. One stop only (Pastuchovice) is therefore almost without any train service at all. This stop is only usable for the residents of Pastuchovice and Velečín (about 130 residents together). The daily use of bus connection amounts currently to 5 person on average from each of the villages. The bus service comparison before the new concept and after that is shown in following table.

For the bus transport service before and after the concept change refer to the tables Table No. 2A and 2B given below:

Table 2A: Bus services before and after the new concept – comparison table – working days [5]

WORKING DAYS												
Route section	November 2010						March 2013					
	No. of lines	first at	last at	period		notice	No. of lines	first at	last at	period		notice
				morning	afternoon					morning	afternoon	
Plasy – Mladotice	5	5:20	15:15	-	-		9	5:10	20:00	-	2 hrs	
Mladotice – Plasy	5	4:45	14:46	-	-		8	5:30	19:35	1 h	2 hrs****	
Mladotice – Žihle	5	5:39	16:30	-	-		7	5:30	20:21	-	2 hrs	
Žihle – Mladotice	5	4:30	15:53	1 h	-		7	5:04	19:04	1 h	2 hrs	
Žihle – Lubenec	2	6:45	14:50	-	-	MON, WEN - 3 lines	5	5:04	17:04***	-	2 hrs	
Lubenec – Žihle	2	13:40	15:30	-	-	MON, WEN - 1 st at 8:30 AM	5	6:10	18:15	-	2 hrs	
Kralovice – Mladotice	8	5:20	19:42	-	-	MON, WEN - 9 lines	8	4:22	18:04	-	1-2 hrs	
Mladotice – Kralovice	8	6:00	20:10	-	-	MON, WEN - 9 lines	7	5:30	19:30	2 hrs	2 hrs	
Mladotice – Manětín	3	5:40	16:25	-	-	MON, WEN - 4 lines	8	4:55	18:30	-	1-2 hrs	
Manětín – Mladotice	3	6:50	17:50	-	-	MON, WEN - 4 lines	7	5:10	19:10	2 hrs	2 hrs	
Manětín – Rabštejn	3	6:00	16:45	-	-		4	6:10	18:10	-	2 hrs	
Rabštejn – Manětín	3	6:20	17:05	-	-		4	6:41	18:30	-	2 hrs	
Manětín – Bezdružice	3	5:30*	15:05*	-	-		5	5:30	18:50	-	2 hrs	
Bezdružice – Manětín	3	7:00**	16:45**	-	-		5	6:30	18:05	1,5 hrs	2 hrs	
Kralovice – Žihle	4	5:15	15:50	-	-	MON, WEN - 5 lines	5	5:45	18:30	-	2 hrs	MON, WEN - 7 lines
Žihle – Kralovice	4	5:55	17:05	-	-	MON, WEN - 5 lines	7	5:15	19:06	-	2 hrs	MON, WEN - 9 lines

* terminal stop Úterý ** starting from stop Úterý *** in section Žihle - Blatno 19:04
 **** in schooldays 1 h period

Table 2B: Bus services before and after the new concept – comparison table – SAT, SUN, public holidays [5]

<i>SATURDAYS, SUNDAYS, PUBLIC HOLIDAYS</i>												
<i>Route section</i>	<i>November 2010</i>						<i>March 2013</i>					
	No.of lines	first at	last at	<i>period</i>		notice	No.of lines	first at	last at	<i>period</i>		notice
				morning	afternoon					morning	afternoon	
Kralovice – Žihle	0	-	-	-	-		3	8:30	16:30	4 hrs	4 hrs	
Žihle – Kralovice	0	-	-	-	-		3	11:06	19:06	4 hrs	4 hrs	
Žihle - Rabštejn – Manětín	0	-	-	-	-		3	9:46	17:06	4 hrs	4 hrs	Jul, Aug only
Manětín - Rabštejn - Žihle	0	-	-	-	-		3	10:20	18:20	4 hrs	4 hrs	Jul, Aug only
Kralovice – Plzeň	2	7:00/12:50	17:20/20:30	-	-	SUN - 3 lines	5	5:45/7:45	19:47	2 hrs (SAT)	2-4 hrs	
Plzeň – Kralovice	2	10:45/16:00	18:40/22:00	-	-	SUN - 3 lines	5	7:00/9:00	22:00	2 hrs (SAT)	2-3 hrs	
Kralovice – Mladotice	5	5:30	19:42	-	-	SAT - 6 lines	2					
Mladotice – Kralovice	5	6:00	20:10	-	-	SAT - 6 lines	2					
Mladotice – Bezdružice	0	-	-	-	-		2					
Bezdružice – Mladotice	0	-	-	-	-		2					

7:00/12:50 - SAT/SUN

The supply of service on working days between Kralovice and Pilsen is the same and is not shown in this table. This table clearly shows that the supply and the connection distribution have improved after the new concept implementation. The option of train ticket use (booked in advance) in a selected sections of lines 460334, 460790 and 460810 is user friendly, as well.

3.2 Zbiroh (center) – Kařez (train stop) connection

The cooperation between the local municipality and the operator enabled to harmonize the joining links so that the utmost number of connections could be preserved also in relation to other links connecting nodes[4] [7]. At the same time a minibus has been used for a selected number of connections (45% cost savings per 1 km). This allowed a provision of the evening connections upon demand/request. Thanks to extra added connections the vehicle is used more frequently / the capacity has increased – since 3rd of March 2013, 2 pairs of connections have been added into the timetable of line 470530 in section Zbiroh – Mýto. The route enters Kařez. The connections go via railway stop Kařez, if applicable. The connections are operated by the cooperation with Town of Mýto during the days of school attendance. For passengers travelling from Zbiroh to railway stop in Kařez (or in return) this represents an extra bonus.

In a future, the low entry vehicles (in both directions) will be set into operation with optimal capacity (gradual application of EU directives) [1] [6]. Connections between modes of transport will be also improved with regard to the plans of creating the public dispatching centre of Pilsen Region.

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TRAFFIC FLOWS AND PUBLIC TRANSPORT OFFER IN THE VYSOČINA REGION

Vilmos Oszter

KTI Institute for Transport Sciences Non Profit Ltd.
Transport Policy and Economics Division
Thán Károly u. 3-5., H-1119 Budapest, Hungary
oszter.vilmos@kti.hu

ABSTRACT

This paper aims to give an overview about the settlement structure, travel patterns and public transport offer in the Vysočina Region (Czech Republic) by using the existing databases and the first results of the on-going RAILHUC project. The paper discusses the main traffic flows of the regions and also examines the modal-split in the region. It presents briefly also the regional characteristics of the examined areas by providing an overview of the key demographic indicators, spatial structure and its impact about the transport demand.

1 LOCAL CHARACTERISTICS OF THE SETTLEMENT STRUCTURE AND THEIR IMPACT ON PASSENGER FLOWS

The Vysočina Region is located in the southern part of the Czech Republic, close to the Austrian border, however the region does not border directly with Austria. The spatial structure of the region is rural with a high number (704) of small villages with a median number of only 208 inhabitants (Figure 1).

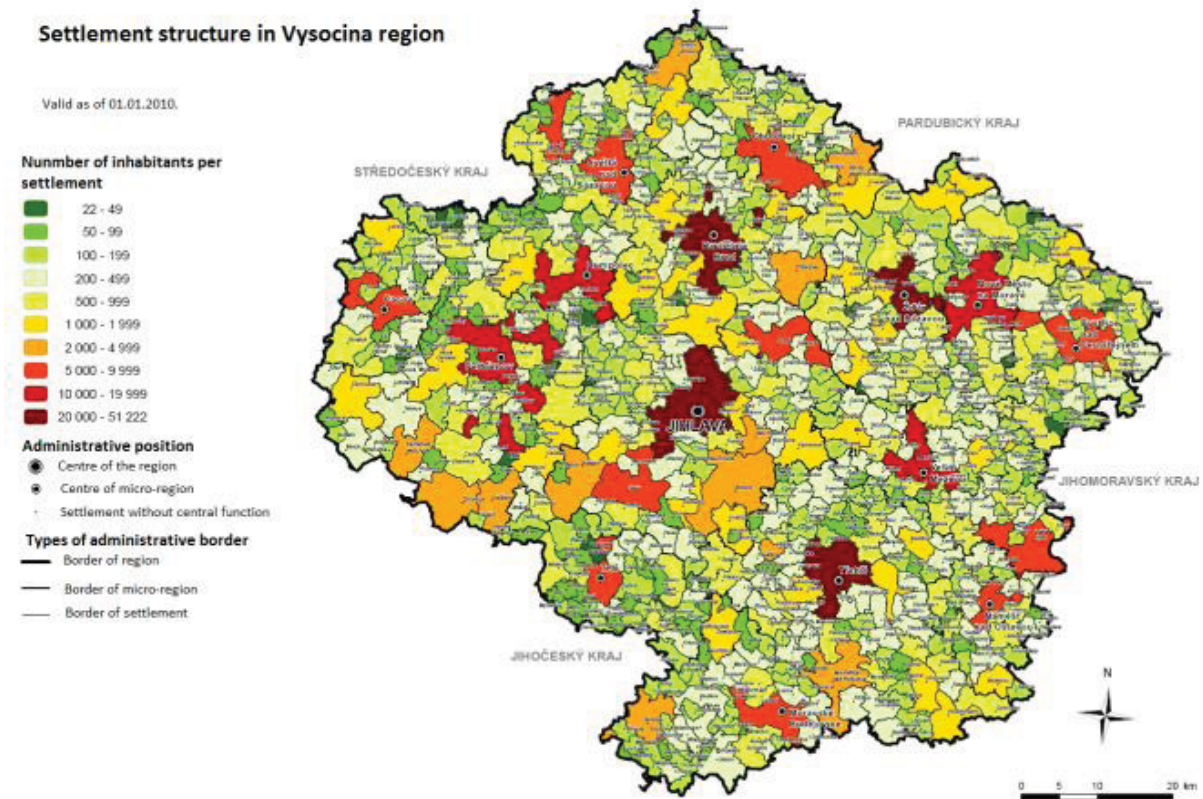


Figure 1: Settlement structure in the Vysočina Region (NUTS3), 2010 [1]

The smallest villages are mostly located in the outer core of the region and due to its peripheral location and weak accessibility to the main service they are not very attractive for the younger generations. Just like in many other regions the share of the older people is significantly higher in these settlements which demand different transport supply from the public transport financing region.

The region has a network smaller towns, sub-centres with the top of the regional centre Jihlava and the main railway transport hub Havlíčkův Brod [2]. The commuting patterns to these regional centres are being analysed by using the results of the RAILHUC project.

The heart of the rail transport in the Vysočina Region is Havlíčkův Brod which is located on the TEN-T railway line PP 22 (Athens – Sofia – Budapest – Vienna – Prague – Nuremberg/Dresden). This priority railway axis links RAILHUC project's hubs of Győr, Vienna, Brno, Havlíčkův Brod and Dresden. The city of Havlíčkův Brod has around 25 thousands inhabitants. The other functional centre is Jihlava node situated 27 kilometres south of Havlíčkův Brod. Jihlava, the regional capital, has about 50 thousands inhabitants. The surroundings of both hubs have a rural character, so the hubs area needs to be researched in a wider and more complex way, being considered as the whole Vysočina Region. The settlement structure is polycentric, which is reflected on fragmented passenger flows. The passenger flows from the eastern part of the Vysočina Region diverge to the city of Brno, outside the region, so the linkage of external hubs has to be taken into consideration, which is accentuated by missing international passenger trains in the Vysočina Region. In the following chapters we will present the traffic demand and supply in the Vysočina Region and the planned interventions in order to enhance the efficiency of the public transport system.

The total numbers of commuters to work and school to/from Havlickuv Brod and Jihlava can be seen in the tables below (Table 1 & 2)²³. These numbers of commuters are researched by Population and Housing Census which was done by Czech Statistical Office in 2001. These tables show numbers of commuters without splitting between transport modes. The census was repeated in 2011 but the new data have not been available so far. Other trip purposes were not researched.

Table 1: Commuters to Havlickuv Brod and Jihlava, 2001

To destination	Total number of commuters	Commuters to work	Commuters to school	Daily commuters (to work and school)
Havlickuv Brod	8,030	6,165	1,865	6,581
Jihlava	16,820	11,536	5,284	12,764

Table 2: Commuters from Havlickuv Brod and Jihlava, 2001

From destination	Total number of commuters	Commuters to work	Commuters to school	Daily commuters (to work and school)
Havlickuv Brod	3,365	2,180	1,185	1,772
Jihlava	3,821	2,474	1,347	1,957

To find a fresh data, we can search databases of issued tickets in the regional bus system and to census of passengers in the regional trains. These data have confidential character.

1.1 Passengers of regional buses

In working days in October 2012 (23 working days), the total number of 37,810 passengers were carried to Havlickuv Brod by regional buses which means 1,644 passengers a day in average. The strongest relations with destination of Havlickuv Brod (over 50 passengers a day) have the following origins (O/D trips):

- Havlickuv Brod (other stops within the city)²⁴
- Jihlava
- Humpolec
- Chotebor

²³ numbers based on tables A16 and C6 of [3]

²⁴ without urban transport system of Havlickuv Brod

In working days in October 2012 (23 working days), the total number of 123,412 passengers were carried to Jihlava by regional buses which means 5,366 passengers a day in average. The strongest relations with destination of Jihlava (over 50 passengers a day) have the following origins (O/D) trips:

Trest, Brtnice, Polna, Luka nad Jihlavou, Brno, Trebic, Telc, Velke Mezirici, Havlickuv Brod, Humpolec, Zdar nad Sazavou, Jihlava (other stops within the city)²⁵, Prague, Kostelec u Jihlavy, Pelhrimov, Kamenice

From Figure 2 can be seen that the two centres have almost as strong traffic demand to Prague, than between them. The closest regional capital, Brno has just only a second position in terms of travel demand from the functional and transport centres of Vysocina. Due to its size all of the following regional sub-centres mentioned before are just coming after. The two most significant traffic flows are from Jihlava to Kostelec and Telc, nearby important sub-centres with strong connections to the centre of the region.

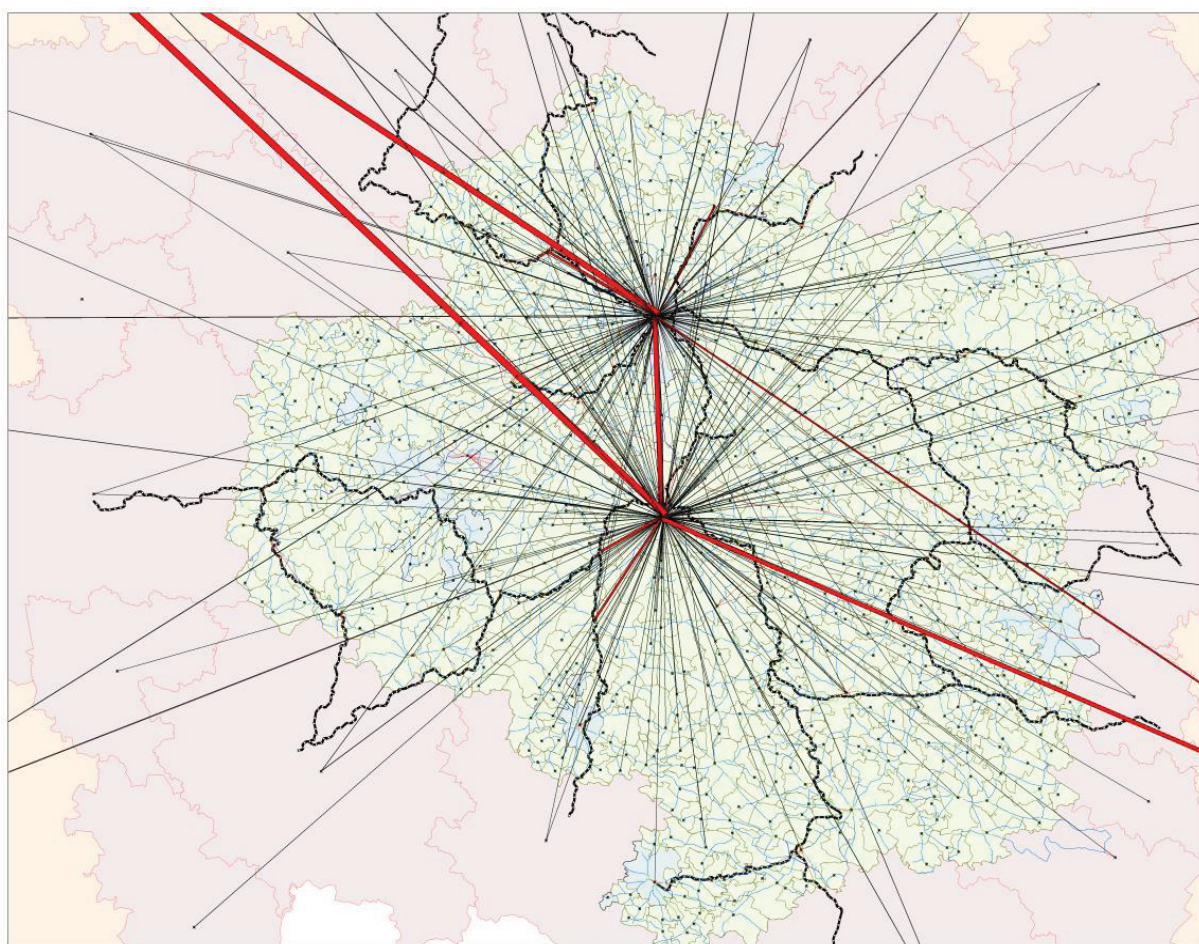


Figure 2: Trip relations from Jihlava and Havlickuv Brod including daily and non-daily commuting to work and school by all modes (railway lines showed) (2001) [3]

The passenger flows which are the sum of the O/D trips assigned to public transport network will be constructed by the model within the RAILHUC project. It is important to know

²⁵ without urban transport system of Jihlava

that these pictures show general demand only, no daily demand, because they show daily and non-daily trips of commuters to school and work, but non-daily trips are not re-count to daily trips (not divided).

1.2 Passengers of regional trains

In the segment of regional passenger trains, the O/D matrix is not known (the data from the ticketing system are not provided by the carriers) but the October census of passengers in regional trains is available. These censuses are taken by railway carriers and taken data have confidential character. Nevertheless the passenger flows can be constructed.

Generally, about 2,000 passengers are carried to Havlickuv Brod by regional trains, while in Jihlava, there are about 1,300 passengers a day (one-way assignment). As the most demanded rail axis directly flowed into the Jihlava or Havlickuv Brod nodes can be evaluated:

- Railway line nr. 225 Jihlava – Havlickuv Brod
- Railway line nr. 238 Havlickuv Brod – Chotebor

The passengers in the fast trains (R) are not included.

1.3 Modal split

One can notice that Havlickuv Brod has the strongest position in railway transport (2,000 regional train passengers a day excl. fast trains vs. 1,644 regional bus passengers a day), while the bigger hub of Jihlava has better position in the bus transport (5,366 bus passengers a day vs. 1,300 regional train passengers a day, excl. fast trains). However if take into account the current estimated modal split based on number of passenger trips, including private cars, the situation is not so favourable: 81 % private cars, 15 % buses, 4 % trains .

By the detailed analysis of O/D matrices developed from databases of issued tickets in regional buses can be evaluated that the position of regional railway transport can be strengthened in these relations, nevertheless the thorough survey is needed:

- Railway line nr. 225 Jihlava – Havlickuv Brod
- Railway line nr. 230 Okrouhlice – Havlickuv Brod
- Railway line nr. 238 Chotebor – Havlickuv Brod
- Railway lines nr. 225/227 in relations of Trest – Jihlava, Telc – Jihlava and Batelov, Dolni Cerekev – Jihlava
- Railway line nr. 240 in relations Luka nad Jihlavou – Jihlava, Brno – Jihlava and Trebic – Jihlava
- Between Jihlava and Prague, of course

On the following (Figure 3) we can observe the traffic flows of more than 100 passengers per day, including daily and non-daily commuters by all transport modes (private car, bus, train).

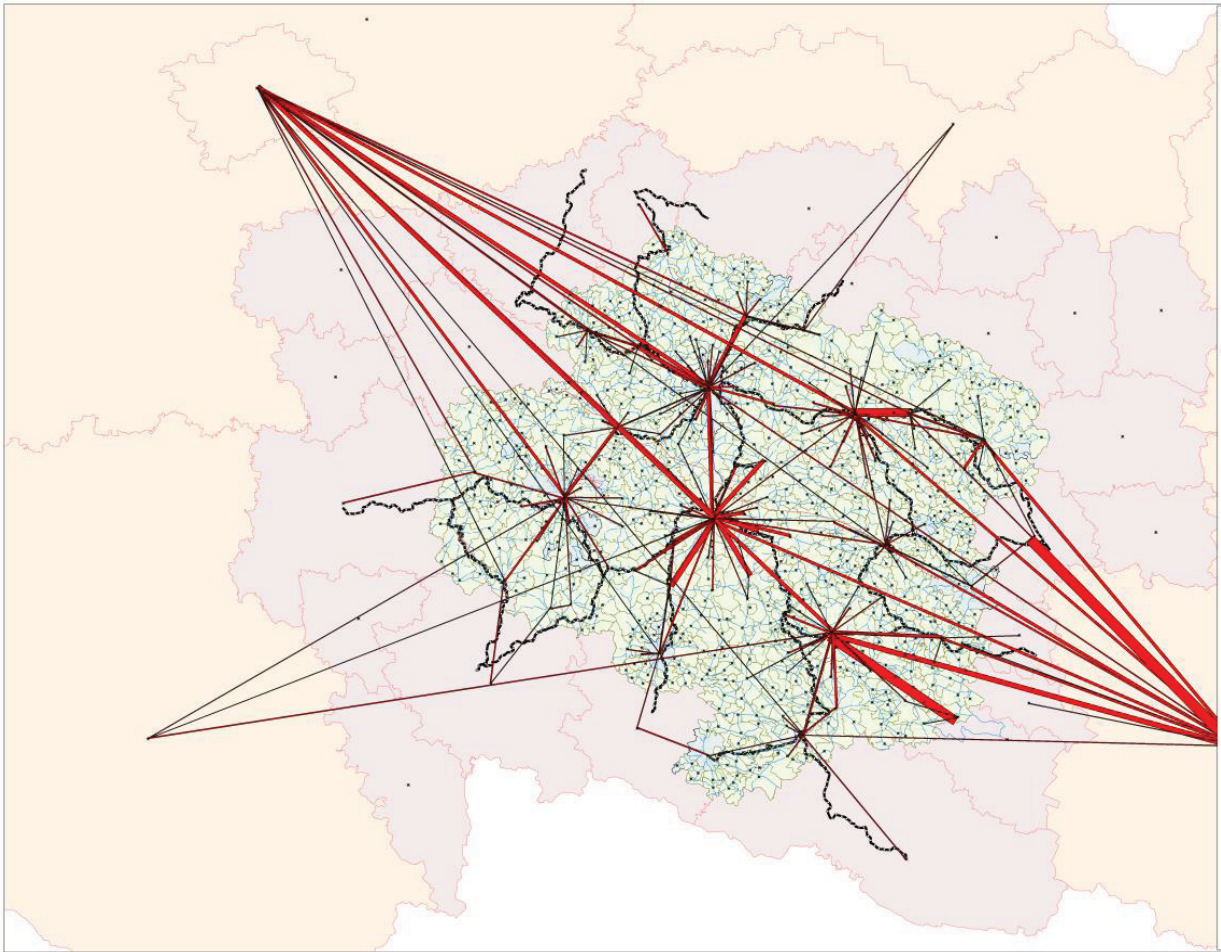


Figure 3: Trip relations of more than 100 passengers, including daily and non-daily commuting to work and school by all transport modes (private car, bus, train) (2001) [3]

Due to the low number of inhabitants of most of the villages, significant regular traffic flows can be observed only around the closest local sub-centres catchment area. As it was the case on Figure 2 the other local sub-centres have stronger connections to the capital city, Prague than to the region's centre, Jihlava. Some sub-centre towns of the eastern part of Vysocina (e.g. Trebic) have stronger relationship to the capital of Southern-Moravia region, Brno, than to the closer, but smaller regional centre Jihlava. It is important to observe that other smaller neighbouring regional centres such as Ceské Budejovice and Pardubice have only limited attraction to the respective edge of Vysocina.

2 CURRENT LEVEL OF PUBLIC TRANSPORT OFFER

Based on the passenger demand situation presented before now we try to assess the public transport services offered by the region through the different public transport providers.

2.1 Railway traffic

In the Vysocina Region, there are two national lines of fast trains, from which the regional railway system is derived:

- R9 Praha – Havlickuv Brod – Brno
- R11 Plzen – Ceske Budejovice – Jihlava – Brno

The main line is known as R9 Praha – Havlickuv Brod – Brno which makes systemic node every even hour in Havlickuv Brod (Figure 4). It is operated in basic two-hours period. Nevertheless, additional trains are operated during rush-hours, which makes one-hour period in morning and afternoon time. These inter-regional fast trains are ordered by the Transport Ministry and are typically composed of old-fashioned carriages of 1st class (one carriage), one service carriage (compartments for children with storage space for prams, bicycles and goods) and 4 or 5 carriages of 2nd class. Nevertheless, the dominant passenger rail traffic between Prague and Brno is operated via Pardubice, outside the region.

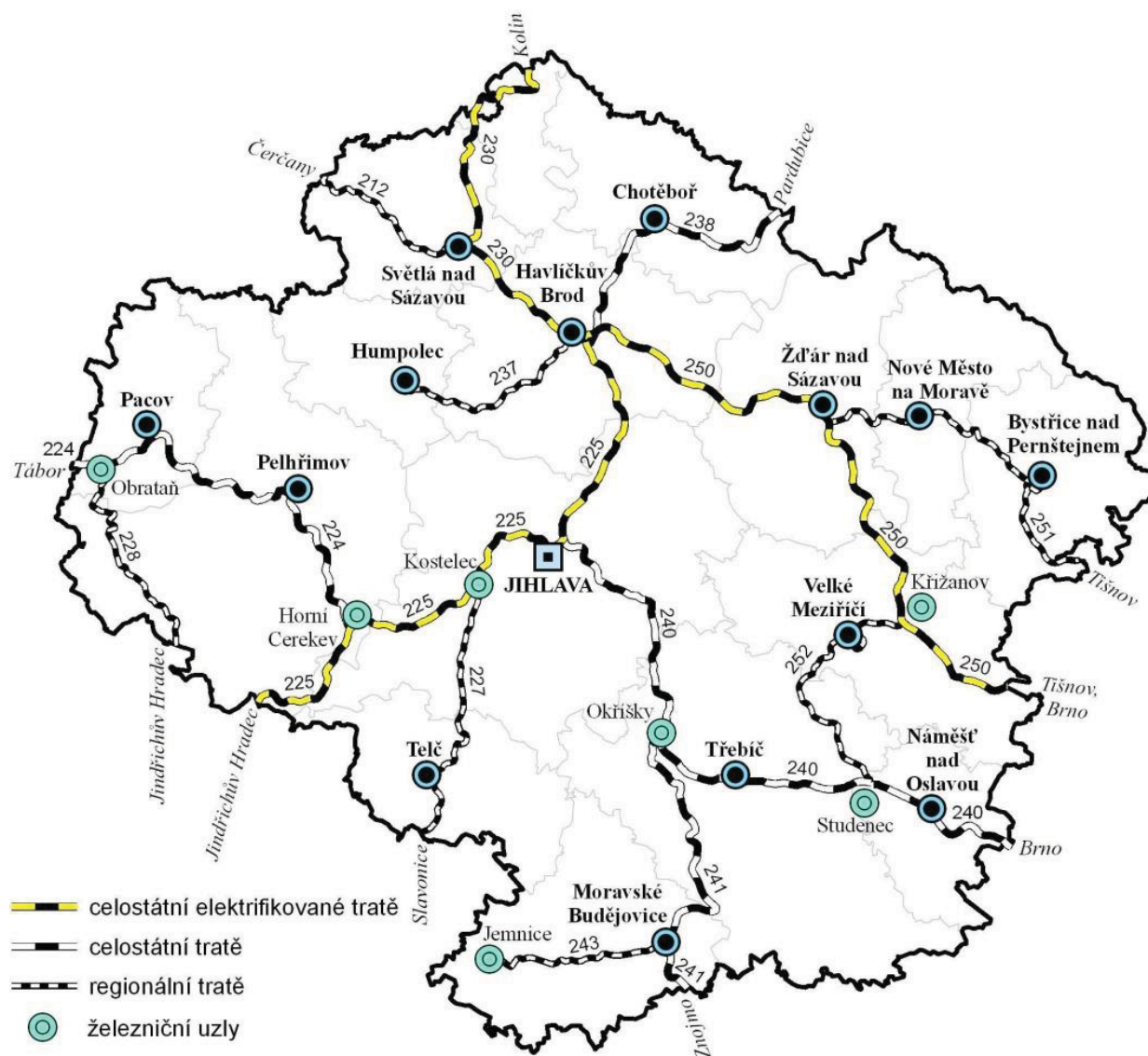


Figure 4: Railway network of Vysocian region (yellow=electrified line) [4]

The R11 line Plzen – Ceske Budejovice – Jihlava – Brno is operated in basic two-hours period. This line is important for connection of South Bohemian and South Moravian Region. Unfortunately, the connection of Jihlava and Brno is uncompetitive due to its slowness (104 kilometres in 2 hours) and motorway which is routed in this relation. As it was seen on Figure 3 the section of Třebíč – Brno on the line has a strong suburban character with an important

amount of daily commuters to Brno. The line has also a strong seasonal character during summer period when it is used for leisure trips (Table 3.). Trains are typically composed of old-fashioned carriages – 1 carriage with a half of 1st class and half of 2nd class (AB), one service carriage (compartments for children with storage space for prams, bicycles, wheelchairs and goods) and 2 coaches of 2nd class. During summer season, the next carriage of 2nd class and next storage carriage (for bicycles) are added.

Table 3: Characteristics of Havlickuv Brod / Jihlava area railway network

Railway lines	Trains (workday)	Average speed
230 Svetla nad Sazavou – Havlickuv Brod	14 pairs of stop-trains	56 km/h
	11 pairs of fast-trains	69 km/h
250 Zdar nad Sazavou – Havlickuv Brod	12 pairs of stop-trains	58 km/h
	10 pairs of fast-trains	82,5 km/h
238 Hlinsko v Cechach – Havlickuv Brod	13 pairs of stop-trains	53 km/h
237 Humpolec – Havlickuv Brod	9 pairs of stop-trains	37,5 km/h
225 Jihlava – Havlickuv Brod	14 pairs of stop-trains	58 km/h
	2 pairs of fast-trains	74 km/h
225 Horni Cerekev – Jihlava	12 pairs of stop-trains	49 km/h
	7 pairs of fast-trains	55 km/h
240 Trebic – Jihlava	11 pairs of stop-trains	48 km/h
	6 pairs of fast-trains	60 km/h

On the line nr. 238 Havlickuv Brod – Pardubice, there are inter-regional trains to Pardubice operated from node at every even hour in Havlickuv Brod. They are composed of low-entry diesel motor units (DMU) 814 known as Regionova, refurbished former diesel power car 810 (known as Bzmot in Hungary). The line is operated in two-hours period timetable. The additional stop-trains are operated during rush-hours.

On the faster main lines nr. 230 and 250, there are operated stop-train lines Havlickuv Brod – Kolin and Havlickuv Brod – Zdar nad Sazavou. They are operated in semi-period timetable which can be equivalent to 2-hours period, additional trains are operated. While the Havlickuv Brod – Zdar nad Sazavou section is mostly operated by low-floor diesel power cars 841 known as Stadler RS-1 Regioshuttle (known as Baureihe 650 in Germany), the Havlickuv Brod – Kolin section is operated by electric locomotive with one low-entry double-deck coach and one service carriage.

The railway line nr. 237 is operated in a closely 2-hours period, derived from periodic timetable of national trains. There are mostly operated low-floor diesel power cars 841 Stadler-RS1. The line with most travel demand, nr. 225 is also operated in a two-hours period; next trains are added for most daytime. Trains are composed of Stadler-RS1 units or locomotive 241 + low-entry double-decker and service coach, while railway line nr. 227 Slavonice – Kostelec u Jihlavy is operated in 2 hours period by 814 units, unfortunately, the change of trains in Kostelec u Jihlavy is required.

The line nr. 240 is operated in a two-hours period, additional trains are operated during rush-hours. Trains are composed of diesel units 854 (2nd class diesel power car) + 054 (2nd class carriage) + 954 (control vehicle of 2nd class). The other remaining railway line which are leading to the neighbouring regions has also a similar offer for the passengers, this is the case on the line nr. 251 from Zdar nad Sazavou to Nové Mesto na Moravé where there is a significant travel demand between the this two towns (located only 11 kms distance) with strong daily relations. On Figure 5 can be observed the number of public transport service

offered. It is worth to check with Figure 3, where the traffic flows are shown. The overall result is that the public transport network is in line with the main traffic flows, however due to some organisational, technical and financial constrains there is a need for changing modes for the passengers (e.g. in Kostelec u Jihlavy) where minimal disturb should be provided (guaranteed transfers, same platforms, preferably direct trains) in order to keep public transport an attractive solution for the citizen's modal choice.

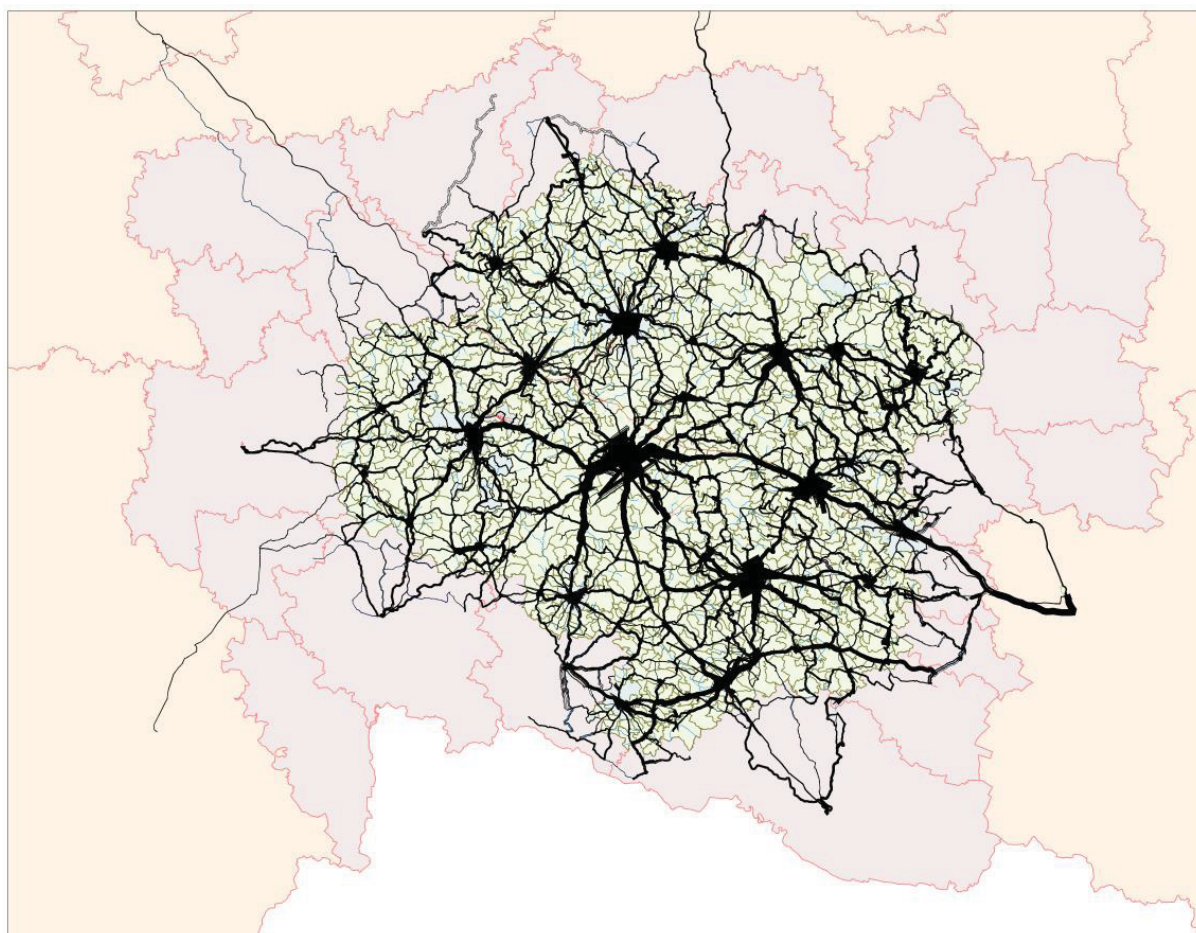


Figure 5: Public transport service offered in the Vysocina Region (weekdays, 2012)

2.2 Regional bus traffic

The regional bus services are not operated in periodic-timetable and mostly they are provided in rush-hours of working days only. Inter-regional bus services are operated commercially and they are not integrated into national public transport system, some destinations are served only in day or week rush-hours.

2.3 Public transport partnership

Unfortunately there is no public transport partnership within the region. The railway and bus systems are operated separately; possibility of intermodal changes has mostly accidental character. Nonetheless, the new interchange stations (rail, bus, P+R, K+R, B+R) are developed within the region (e. g. Havlickuv Brod, Chotebor, Zdar nad Sazavou, Nove

Mesto na Morave, Telc, Namest nad Oslavou), but have no intermodal-traffic function so far (connecting buses are not harmonised – according to timetable and tariff).

2.4 Railway and bus stations

In the Havlickuv Brod railway station concourse, the restaurant and newspaper stalls are operated, as well as at the Jihlava railway station. The railway station in Havlickuv Brod is used for the bus part of the interchange terminal as well. In the Jihlava mesto railway station, there is only a ticket-office available. In the Jihlava bus station, there are newspaper and refreshment stalls operated. The range of services of other comparable stations within the region is similar

3 CONCLUSION

The role of rail and bus transport in the regional public transport system could be defined more properly, or re-defined. Both modes of public transportation can co-operate more. The basis for this cooperation should be the implementation of tariff harmonisation and accessible transfer points. The strong and potentially strong flows and relation should be served primarily by rail transport; the feeding function of buses should be strengthened, while railway lines of weak demand can be replaced by backbone bus lines. Concerning the low population density rural-areas, a feeding network of smaller or micro-buses can be taken into account with flexible, demand-based timetable. However all of the system must be planned for the peak-hours demand for workers and students, but in other times a more flexible (and economic) transport system could be offered for the mostly elderly passengers need.

Nevertheless, railway lines which are routed in axes of higher traffic demand should be developed – on the side of services (improvements of periodic timetable) and infrastructure interventions – repairs of track by reason of increasing of line speed especially in curves for light-vehicles like Stadler RS-1, refurbishments of platforms by reason of barrier-free access to low-floor vehicles like Stadler RS-1 and next purchases of dynamic low-floor vehicles which can increase a travel speed thanks to good acceleration.

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LIST OF AUTHORS

Dr PAULO RUI ANCIÃES

Independent Scholar, London, United Kingdom
p.r.anciaes@gmail.com

CATHERINE DIDIER-FÈVRE

University of Paris Ouest Nanterre La Défense, Nanterre, France
catherine.didier-fevre@wanadoo.fr

BARTOSZ GUSZCZAK

Institute of Logistics and Warehousing, Centre of Logistics Knowledge, Poznań, Poland
bartosz.guszczyk@ilim.poznan.pl

MÁRK HÁRY

Budapest University of Technology and Economics, Department of Environmental Economics,
Hungary, hary.andras.mark@gmail.com

Prof GEORG HAUGER

Vienna University of Technology, Fachbereich für Verkehrssystemplanung, Austria
georg.hauger@tuwien.ac.at

Dr MAIK HÖMKE

ETH Zurich, Department of Architecture, gta, Switzerland
maik.hoemke@gta.arch.ethz.ch

MARIE HUYGE

Polytech'Tours - Projet MOUR (MObilité et Urbanisme Rural) – CITERES, Tours, France
huyge.marie@gmail.com

Prof VLASTIMIL MELICHAR

University of Pardubice, Jan Perner Transport Faculty, Department of Transport Management,
Marketing and Logistics, Czech Republic, vlastimil.melichar@upce.cz

VILMOS OSZTER

KTI Institute for Transport Sciences Non Profit Ltd., Transport Policy and Economics Division,
Budapest, Hungary, oszter.vilmos@kti.hu

Dr TIBOR PRINCZ-JAKOVICS

Budapest University of Technology and Economics, Department of Environmental Economics,
Hungary, tprincz@kornygazdeu.bme.hu

Dr MARTIN SCHIEFELBUSCH

nexus Institut für Kooperationsmanagement und interdisziplinäre Forschung GmbH, Berlin,
Germany, schiefelbusch@nexusinstitut.de

JINDŘICH ŠEDIVÝ

University of Pardubice, Jan Perner Transport Faculty, Department of Transport Management,
Marketing and Logistics, Czech Republic, jindrich.sedivy@students.upce.cz

Dr AXEL STEIN

KCW GmbH, Berlin, Germany
stein@kcw-online.de

TAMARA VLK

Vienna University of Technology, Fachbereich für Verkehrssystemplanung, Austria
tamara.vlk@tuwien.ac.at

MONIKA WANJEK

Vienna University of Technology, Fachbereich für Verkehrssystemplanung, Austria
monika.wanjek@tuwien.ac.at

WIKTOR ŻUCHOWSKI

Institute of Logistics and Warehousing, Centre of Logistics Knowledge, Poznań, Poland
wiktory.zuchowski@ilim.poznan.pl

