Chapter for “Success and failure of TDM measures”

The Network society and the networked traveller

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Kurzfassung

Dieser Kapitel setzt sich mit den verkehrspolitischen Folgen der gefallenen generalisierten Kosten des Verkehrs auseinander. Es betrachtet diese Frage durch das Prisma der veränderten Strukturen der sozialen Netzwerke der Bevölkerung und der veränderten Struktur des sozialen Kapitals, das in diesen Netzen erzeugt und gepflegt wird. Die veränderten Strukturen werden mit einer kürzlich abgeschlossenen Befragung kurz dargestellt (Distanzen zwischen Freunden; Anteile nicht-lokaler Kontakte und Häufigkeit der Kontakte).

Schlagworte

Sozialkapital, Soziale Netze, Verkehrsverhalten, Verkehrspolitik

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Abstract

The relentless trend of falling generalised cost of travel has created a world in which travellers mix local and non-local interactions easily, be it face-to-face or mediated by the various forms of telecommunication. The implications of this change of scale have not yet been fully discussed, as the most relevant literature in sociology generally skirts around its practical implication. The chapter will discuss the interaction between social capital creation, travel and transport policy and to outline how transport policy has to overcome its limits to achieve its goals.

Keywords

Social capital, network traveller, transport policy

Preferred citation style

1 “Networked” everything

Since the late 1990s the word “network” has become a buzzword, which is being used to add interest, even when the context is divorced from the technical meaning of the term: a set of entities linked by identifiable bonds, e.g. intersections by roads, airports by scheduled flights, telephone exchanges by cables, persons by common descent, joint activity or a common history. Still, this usage reflects that many commentators need a shorthand to characterise a now clearly noticeable shift in the economic and social structure of their societies (see for example Castells, 1996, 1997, 1998, Friedman, 2005 or Barabasi, 2002). The ongoing reduction in the costs of travel (see below) and the even steeper reduction of telecommunication (see below) has allowed the individual to decouple itself in many aspects of daily life from its immediate local environment. The individual was formerly not so aware of the networked nature of its social and commercial life, as it shared many, maybe most partners with those around it. The individual has now become aware, that its network - more likely, than not - is rather different from the one of its physical neighbours. These individualised networks of contacts justify the description of today’s travellers as networked travellers, even more so as they rely heavily on technological networks and the services on them to build, maintain or restructure their private and commercial social networks. They own networking tools including cars and bicycles (for road travel), season tickets and discount/loyalty cards for reduced price public transport travel (land and air), land line and mobile phones, computers and internet access facilities and rights (cable and wireless). They are likely to build and maintain private home pages, profiles on social networking web sites, address books and link collections. They may publish web logs and share photographs through publicly accessible websites.

The network travellers, as a rule, do not form communities with the neighbours any more. They share the same public and semi-public spaces1 around their front door, but it is unlikely their networks of friends, acquaintances, work colleagues, fellow parishioners etc. will overlap. They might not even know their neighbours2. The literature on neighbourhood assumes that spatial vicinity is matched by social vicinity, as it would be produced, if the memberships

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1 Hallways, atriums, gardens, parking lots and other facilities operated for the benefit of a group of owners and their tenants.

2 In the UK General Household Survey 2000/01 47% claimed to know most or many of the neighbours of their street or block (See www.esds.ac.uk for access to the data and simple tabulations from it). The questions did not specify the meaning of “know”.
of the residents’ social networks would substantially overlap (see Day, 2006 for a comprehensive literature review). Lloyd challenges this myth already in 1984, when he writes:

“as the late Philip Abrams (1980) so cogently argued, we still carry an image of the traditional community – a ‘densely woven world of kind neighbours, friends and co-workers, highly localized and strongly caring within the confines of quite tightly defined relationships’. But such communities were the response to poverty and insecurity now hopefully abolished in western urban industrial society ….”

Still, this view of the social world still seems to be prevalent in many policy discussions, especially in transport and urban planning. This chapter will reinforce this old message in its empirical part and then discuss the policy implications of the associated spatially distributed social capital of the network traveller in the network society. Drawing on a new survey undertaken at ETH the following section will show how large the distances between our respondents and their important contacts are. This will be supplemented by information about the spatial distribution of the membership of Swiss service clubs. The main section will then discuss the interactions between policies to increase the generalised costs of contact and the spatial distribution of social contacts and what policy implications derive from these interactions.

Before this discussion, the chapter will offer an argument, why industrialising countries have for the last 200 years pursued investment strategies, which as an unintended side effect have dissolved the once spatially dense and social tight neighbourhoods and villages (see Figure 1). The link between the economies of scale and scope and welfare, as measured in market prices of goods, had been highlighted by A. Smith in 1776, a time when the positive effects of road and canal construction had already been amply demonstrated in the Netherlands, France and the UK (see for example Vries and Van der Woude, 1997). These facilities enabled the larger market areas, which are a necessary precondition for those larger or more specialised firms, especially if the economy wants to avoid detrimental spatial monopolies, or does not want to rely on population growth alone. They enable these larger market areas by lowering the generalised costs of travel and transport. The virtuous cycle between increased scale and scope higher gross domestic product and therefore larger investment capital for transport facilities and the associated lower generalised costs of travel and transport has been maintained since. The investment takes two forms: the industrialised societies have invested in more slots\(^3\) to move persons and goods smoother, more direct and with just more reserve capacities by building infrastructures. Societies collectively, in the case of public transport, and individuals

\(^3\) The transport infrastructure provides slots for moving persons and vehicles. For air traffic, rail roads and canal ships these slots are explicit and familiar, but they occur also in road traffic through traffic lights, and they are self organised whenever pedestrians, cyclists and car drivers interact and compete for road space.
have invested in larger, faster and more comfortable vehicle fleets. Mass motorisation is the prime example of this transformation.

Figure 1  Qualitative model of market size for goods and services

This positive feedback loop is dampened by a lag between the growth in demand and the growth in the supply of slots. The increase in market size and area produces increases in ton and person kilometres and in conjunction with the increase in fleet size overproportional increases in vehicle kilometres. Without rationing or pricing the resulting competition for the existing slots results in congestion and higher generalised costs of travel. This congestion is perceived more acutely as time goes by, as the travellers’ willing to pay for travel time savings grows (vtts) with their average real incomes.

This ever growing market size has not been confined to the traded goods. The residents of this shrinking world (See Figure 2 for the example of Switzerland since 1950) have adjusted their residential location to obtain better and more housing on larger lots outside the urban cores. They have used their ever cheaper cars (See Figure 3 for the quality adjusted prices of Swiss cars) to travel and to migrate, for example for a better education or for a better employer. The even more dramatic fall in telecommunication costs (See Figure 4 for the US long distance market) has been the basis for maintaining contact with those left behind after one of those
moves. The next section will show what is currently known about the spatial distribution of persons known and important to the average person today.

Figure 2  Road travel time - scaled maps of Switzerland (same scale for both year)

Maps: Axhausen, Dolci, Fröhlich, Scherer and Carosio (2006); the highway investment has halved the size of the country in terms of travel time
Figure 3  Quality adjusted 2004 purchase prices for private cars 1906 – 2004

Data: Frei (2005) for Switzerland 1950 – 2004; Raff and Trajtenberg (1985) for the USA, 1906 – 1940. The Swiss time series is very likely underestimating the drop in the quality adjusted prices since 1985, as appropriate time series data on vehicle electronics were not available for analysis.

Figure 4  Real costs of US interstate and international telephone calls 1930 - 2000

Adapted from FCC, 2001
2 Current knowledge about the social network geographies

The networked travellers have to maintain their social networks by remaining in contact with those persons which are important to them, or with which they want to spend time (see below for a detailed discussion of social capital). One of best known sociologists of social networks, Barry Wellman, has recently admitted that there is very little literature on the spatial distribution of the members of social networks (Mok and Wellman, 2007):

„To the best of our knowledge, this is the first study that systematically examines the role of distance in social networks in an era after the advent of cars, phones and planes but before the coming of the Internet (and other new media, such as mobile phones)”.

In this paper he and his co-author analyze a small sample of 29 egocentric social networks, which had been geocoded in the 1979, data which had set idle since then. The work since then has focussed on convenience samples based on prior data sets collected for other purposes (See Mok and Wellman, 2007 for examples from the literature) or employs very rough categorisations of distance, such as “same neighbourhood, same city, same country, abroad”. Figure 5 is also based on an administrative sample: the membership of the Swiss affiliates of an international service club. Such clubs have the mission to recruit locally and one would expect the members to live close to the location of their weekly meeting. The analysis shows that the mean distances involved can be substantial and that even these archetypically parochial clubs are quasi-regional institutions today. Note for example, the many clubs marked in black, which members have to travel on average about 10 km to their weekly meetings.
In a 2006 survey, Frei and Axhausen have collected information about nearly 300 ego-centric social networks from a representative sample of Kanton Zürich residents (See Larsen, Urry and Axhausen, 2006 for qualitatively similar results based on a much smaller sample of interviews) (Axhausen, Frei and Ohnmacht, 2006 describe the survey method and provide some initial modelling results). The respondents were asked to report both the persons, who are socially and emotionally important for them, but also those with whom they spend leisure time. The survey mixed a face-to-face interview (about 60 min) with a self-completion questionnaire, which the respondents returned after the interview. They reported twelve contacts on average, whose home addresses were geocoded at the level of municipality or postal code, which is rather detailed in the Swiss context, where the average population of a municipality is only 2,500 residents.

The distribution of the great-circle-distances (Figure 6) between the respondents and their contacts has two parts: a “local” mass, i.e. inside the municipality or postal code of about ⅓ of the contacts and an approximately lognormal part with a discontinuity due to intercontinental contacts. The scale and reach is impressive. The respondents generally combine local with non-local contacts (Figure 7), which reflects the need and desire for sociability in the vicinity of the home. The share of respondents, who have only local contacts, is small, not quite 5%;
even with a wider definition (up to 20% non-local contacts) the share grows only to 13%. Slightly less rare are respondents who have only non-local contacts (8%; 20% for the wider definition of 80% and more non-local contacts). When one considers that the postal code covers areas larger than the “neighbourhood” of urban planning, then one can see, that the imagined community of the neighbourhood is unlikely today (See Campbell and Lee, 1992 for a 1988 US survey with documents about 15 known neighbours; or Campbell, 1990 for a 1939 US survey, in which the respondents could still identify 32 neighbours on their residential block; see Crow, Allan and Summers (2002) for a qualitative study of today’s rather non-involved neighbouring style; for neighbouring in the context of a “netville” see Hampton and Wellman, 2001 and 2003).

The number of face-to-face visits drops exponentially with the distance to the contacts (Figure 8), which reflects both the time and monetary costs of long-distance travel, especially for intercontinental travel. Nevertheless, even these intercontinental journeys occur regularly and one can assume that they are of relatively long duration. The phone and asynchronous contacts (email and short text messages (SMS)) show a much slower distance decay due to their lower costs, but also the reduced needs to co-ordinate and debrief fewer joint meetings. (The appropriate modelling is still outstanding, but see Axhausen, Frei and Ohnmacht, 2006 for a preliminary analysis of a subset of this data).
The great circle distance accounts for the spherical shape of earth. Distances between local contacts were coded as 1 km. is frequency the right word?

Figure 7  Share of respondents with a given share of contacts among all contacts within their residential postal code or municipality
Asynchronous messages comprise here SMS or “texting” (short message service) and email

Given the number and spatial distribution of personal contacts it is not surprising, that about 40% of travel and of kilometres travelled are classified as leisure in official statistics (See the tables in Larsen, Urry and Axhausen, 2006). But leisure travel is dominated by being with and meeting other people, as can be easily seen in Figure 9, which shows how many persons travel with the respondents on their way to various types of leisure activities.
Figure 9 Mean number of persons travelling with the respondents of the 2003 Thurgau six-week travel diary survey by type of leisure

See Löchl, Schönfelder, Schlich, Buhl, Widmer and Axhausen (2005) for the data
3 Hypotheses about travel and social capital

The evidence presented so far has clearly shown that the public is generally not living local lives, but lives which involve contacts across a wide range of scales. They construct these networks over the course of their lives from the friendships, “collegueships” and contacts they were able to form and to maintain. Ascribed contacts such as family and work clearly play a role, but they do not dominate. Neighbourhood contacts are sought, but they are not central to the networks. The networks are generally not strongly overlapping, but distinct, especially those not involving contacts from school or work (see also Hogan, Carrasco and Wellman, forthcoming). These networks, these contacts are valuable to, are esteemed by the persons involved.

One short hand term for this value is social capital. The view of social capital taken here is different from much of the literature. It is close to the conceptualisation of Völker, Flap and Lindenberg (2006). The literature as reviewed by Lin (1999), Burt (2000) or Sobel (2002) emphasise the benefits, but not the joint action required to produce these benefits. Sobel (2002) begins his paper with

“Social capital describes circumstances in which individuals can use membership in groups and networks to secure benefits”.

Lin (1999) contrasts two views. The structural view, also endorsed by Burt (2000) or Granovetter (1973), locates social capital in the brokerage available to persons occupying “structural holes” in a network, i.e. those who provide the links between otherwise distinct subgroups. The alternative view, attributed by Lin to Coleman and Bourdieu, emphasizes mutual recognition, trust and solidarity in a group. Taking Grieco (1987, 1996) as a starting point, social capital is defined here as the

Stock of joint abilities, shared histories, understandings and commitments enabling the skilled performance of joint activity, even at a distance

of a pair or larger number of persons. In contrast to discussions of human capital or team work, the range of activity is not limited here to gainful employment, but explicitly includes activity which is purely social, enjoyable and hedonic. The return on this social capital is the above average enjoyment, monetary gain, speed of the joint performance in comparison to the conduct of the activity with a randomly selected person, even a randomly selected person trained for the specific activity. In this sense, it is a true capital, i.e. a stock of past achievement and work, stored and put to use in future activity.
This definition sees social capital in the first instance as a private good. Other members of the social networks to which a particular pair or group of persons belong might not be aware of the social capital available to a particular member. Even if they are aware of it, the type and strength of their link with the person concerned might not be strong enough to claim access to that social capital or connection. The management of such claims rests with the persons, who have built their social capital through joint action and thinking. On the other hand, the joint awareness of the social capital available and accessible within a group committed to certain goals enables effective joint action of the group as a whole. The trade in favours, support and information, to which social capital is reduced in the colloquial use of the term, has to be seen as a by-product of the maintenance of the social capital as defined above. It is the oil which smooths the joint performance needed to maintain the social capital\(^4\). It has to be stressed that this view of social capital implies on-going engagement of the persons involved as one has to assume that the skills atrophy when not exercised regularly (see below).

This private good perspective of social capital sits uneasily with the term “social”. It can become social only to the extent that an ascribed group, such as for example family, church, party\(^5\), neighbourhood, local government, can claim access to its members social capital through appeals to their loyalty to the group or idea. It can become social also through the voluntary pooling in voluntary organisations. Employers are normally strictly limited to the commercially relevant parts of their employees’ social capital. Trust in the intentions and reciprocity of the others is crucial for the pooling of social capital, as otherwise free riding will undermine the willingness of the group members to participate in medium term.

It is clear, that social capital as defined above does not require the spatial proximity of the actors involved. It requires regular joint activity, but not co-presence. Still, many activities require co-presence (as discussed in Larsen, Urry, Axhausen 2006) It is reasonable to assume, that social capital has “economies of scope”, through which an initial endowment provides the basis for a larger range of joint activities and therefore skills, making the inclusion of activities requiring co-presence more likely. Nevertheless, social capital does not require trust between the parties, i.e. confidence that the other party will keep the first party’s interests in mind and will act selflessly on it (see Seligman, 2000). This is especially true, when the range of joint activity is limited in range and overall importance.

\(^4\) Networks of patronage, actually hierarchies of patronage are different, because they are based on trading favours (money, employment, permits, etc.) against political support (inside the firm or for public office), but do not imply joint action.

\(^5\) To the extent that children grow into the religious and ideological affiliations of their parents.
The social capital structures are embedded in the current structures of the generalized costs of travel and contact and the associated distribution of population, employment and activity opportunities. See Axhausen, 2007 and 2006 for an argument about the underlying dynamics between social networks and the generalized cost of travel and contact. The key results for the policy discussion here are the following hypotheses:

**H1:** The size and spread of the social network geographies is inversely proportional to the generalised cost of travel and contact

and the associated subhypothesis:

**H1.1:** The duration of a face-to-face contact will be proportional to the generalized costs involved, but with marginal decreases in the increased duration.

**H2:** Given the current levels of social capital any increase in the generalized costs of travel will be generally ignored in the short run and will only become visible in the observed sizes of the social network geographies after some time, i.e. a hysteresis pattern of initially slow change followed by fast decrease later will be observed

and the associated subhypothesis:

**H2.1** the selectivity of the contacts will become higher, i.e. the persons will focus on those with whom they are linked with high levels of social capital. These contacts could be anywhere.

Given the level of technological development of the electronic means of communication, one can safely assume that it will be impossible to increase the user costs of electronic communications, short of a massive destruction of existing capacities, especially of fibre optic cables and antennae towers. In all likelihood, all charging systems of private use will adopt in the medium term a fixed fee approach for the provision of the requested capacity (number of slots) and pay-per-use will disappear.

### 4 Policy implications

Against the background of global warming (see for example the recent Stern Report to the British government[^6]), the concerns about social exclusion (See for example Raje, Greico, [^6]www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm)
Hine and Preston, 2004 or Begg, Berghman, Chassard, Kosonen, Kongshøj-Madsen, Matsaganis, Mayes, Muffels, Salais and Tsakloglou, 2001), but also economic development (See the recent Eddington report\(^7\), also to the British government), professional opinion expects that government policy will aim to stop the virtuous cycle sketched above selectively by trying to decouple economic and travel demand growth in general, while helping population groups and regions which are at a disadvantage (For a literature review of this idea, see for example Schneider, Maibach, Trageser, Peter and Rudel, 2006 or McKinnon, 2007). This vision is complemented by sectoral politics aiming at the reduction of the specific energy consumption and CO\(_2\) emissions of transport. While the policy mix will vary from country to country and from location to location, it is likely that it will involve direct rationing or pricing of CO\(_2\) emissions, regulatory approaches to fleet consumption, efforts to reduce the spatial reach of economic activity, investment in public transport, cycling and walking, densification of housing and higher specifications for housing with regards to energy consumption. While it is unclear, if this policy mix is the most efficient, or even if decoupling is a reasonable goal as such, current public opinion seems to favour such an approach. The alternative approach of providing capacity, where visibly needed, and lowering the generalized costs of travel further through investment in speed and accessibility, while enforcing CO\(_2\) reduction and energy savings goals through the dedicated and offset taxes, seems less likely to be adopted.

Before analyzing how the structures of the network geographies discussed above would interact with these policies it is worth highlighting some of their implications under current conditions. The possibility to maintain contacts over long distances should increase the selectivity of them, while increasing their payoffs. It will also reduce the willingness to engage new contacts locally or elsewhere. New contacts are risky investments of time, money and social capital opportunity costs with an uncertain payoff. In the past the costs of long distance travel and communication forced people to adjust their circle of contacts. As everybody was subject to these constraints, new opportunities arose for everyone, especially in the more fluid social environment of the city. Today, the archetypal, but limited opportunities for such enforced new contact formation are change of school, military service, start of university, change of work, the parents of the class mates one’s children\(^8\).

In an environment, where most residents have the bulk of their social contacts beyond the municipal boundary of their place of residence, it will become more difficult to recruit compe-

\(^7\) www.hm-treasury.gov.uk/media/39A/41/eddington_execsum11206.pdf

\(^8\) The linkages and information flows between urban dog owners created by the affinities of their dogs would be an interesting issue, as these are independent of the social standing of the owners.
tent persons for local office. The attachment of the residents is likely to be less to the place of residence, but to the region, which generally captures most of their contacts and of their daily life. In this environment it will be difficult to initiate and sustain local political or civic action, unless there is a clear and present localized danger, such as a new road, rail line or other nuisance.

To the extent, that such a national and international contact network becomes the accepted desirable social norm it defines high levels of skill in terms of foreign language acquisition, confidence and ability to negotiate the transport system and initially unfamiliar environments, in addition to the time and money required for travel and subsistence. For those unable or excluded from the acquisition of these resources the non-local orientation of their physical neighbours excludes them from their daily life and reduces their possibility of interaction and therefore of social capital creation.

For the bulk of the residents the immediate environment around their residence is populated by strangers. While in countries with strong residential sorting by income and ethnicity, the residents can assume that their neighbours should be very likely very similar in attitudes and socio-demographic circumstance, they do remain mostly strangers. (See for example Blakely and Snyders, 1997 and Low, 2003 for the ambivalence of “community” in gated developments). Many residents respond to this situation with feelings of insecurity and fear. One could label this condition localised anomie, as the persons are well integrated on the regional and larger scale, but disoriented and without many local links in the residential environment. The response to this feeling is investment in personal safety, e.g. reinforcement of doors, alarms and intruder detection systems, private security forces in gated developments or cooperative buildings, avoidance of walking and cycling. Given the lack local support from their networks, the residents will have to rely on commercial and government sponsored services in case of need: from the trivial watering of flowers to home care during an illness or after an accident. The freedom from the social control of the neighbours comes at a cost in times of crisis.

The policy mix chosen to implement the goals mentioned above will involve different types of measures, which will be discussed in turn. The focus will not be on their likely success or the size of their contribution to the problem to be solved, but how they will interact with current social network structures and what additional policies might need to be developed to balance these interactions.
The extensive literature on the interaction between spatial form and travel behaviour shows, in simplifying summary, that density in conjunction with local services encourages walking and cycling, but will not change total vehicle mileage much (e.g. Cao, Mokhtarian and Handy, forthcoming; Simma and Axhausen, 2004 or Boarnet and Crane, 2001). In none of this work, nor in the extensive writing of the New Urbanists (e.g. Congress for New Urbanism, 2000) is the scale of the residents’ social network geographies discussed or in the modelling work controlled for. While the feeling of local trust and safety is discussed, it is not operationalized for the analysis of its effects. In the first instance one would not expect, that densification policies such as infill development, easier permissions for mixed housing and commercial developments or additional floors on existing structures, have an impact on the social network geographies, as they would not change the overall cost structure of travel and communication. The resistance against such policies should provide a short term focus for the joint action of the residents. It is unclear how much new local social capital such an effort would build and how long it would be maintained by the residents. The increased walking and cycling will improve local exposure, but the current style of managing retailing and entertainment venues is not conducive to build local social capital, as the managers are generally not local residents, nor are they owners and therefore less likely to engage with the local customers through credit or social interaction beyond the store (See Rae, 2003 for an absorbing and detailed description of the opposite conditions in New Haven before 1930).

The accelerated adoption of energy saving and CO2 reducing technologies through regulation, tax write offs or direct subsidy will interact with the social network geographies only to the extent that they change the budget constraints of the residents or the marginal costs of travel. It is hard to envision that the transition to natural gas and later fuel cell vehicles will not be buffered by subsidies, as it already happened during the much cheaper adoption of catalytic converters (See Frick, Carle, Wokaun and Axhausen, 2007 for the related issue of funding the refuelling infrastructures required for the new fuels). The additional degrees of freedom of the vehicle owners (reduction in the power, weight and size of the vehicles owned; car sharing) will allow them to maintain the same level of transport services without increases in expenditure. If the shift will not be buffered by subsidies, then it will be worth considering measures to encourage formal or informal shared car ownership through a selective subsidy in the form of reduced cost parking provisions.

An increase in fuel taxation via a CO₂ tax will be part of either style of policy package. While it will have less of an impact in Europe, where the increase will be on top of an already high base, it will be rather noticeable in the US or other low fuel tax countries. It is reasonable to assume, that the increase will be balanced through tax reductions elsewhere, especially car
ownership taxation or income tax. As all consumption taxes, it will be regressive, as lower income residents tend to buy cheaper cars and pay little or no income taxes. The higher marginal costs will affect them more then higher income residents, but even those will change their behaviour as their expenditures are now more tightly tied to car use. The rebalancing of the tax load reduces the sunk cost effect of the upfront payments associated with car use (ownership taxation, insurance, leasing rates, one-off purchase costs). A general shift to pay-as-you-drive insurance will reinforce the effect. The same holds for any taxation policy which recovers the currently untaxed benefits of company cars more fully.

One would expect *ceteris paribus* both a reduction in total mileage driven and a more than proportional reduction in longer journeys with cars and planes, as the fuel costs become more prominent for these journeys. This response requires an adjustment in the social capital renewal strategies. Initially one would expect that contacts further away will be visited less frequently but for longer. The persons might also make increasing use of side trips associated with professional travel. If the railways are able to absorb their higher energy costs better, or if they are exempted from the CO$_2$ taxation, they should be able to encourage visits along their corridors, especially high speed corridors. In the long run, one would expect that the travellers adjust their social network geographies by reducing its size.

Public policy could reduce the costs in the first phase by providing more long weekends, which are already used extensively today for visiting friends and relatives. If they already exist but are concentrated in certain times of the year, it would be worth redistributing them around the year to provide more flexibility and steadiness. The UK “bank holidays” are a good example in comparison with bunching of holidays before and after Easter in many other European countries.

In the longer run, public policy should increase the support of the formation of local and regional social capital in areas of legitimate public interest, such as politics, sport, arts, traditional festivities and customs through the support of the organisations behind these activities. Beyond these domains, it could support meeting points through appropriate land use regulation and use regimes, which rebalance the needs of the neighbours of such meeting places with the needs of their visitors and users. Putnam, Feldstein and Cohen, 2003 describe a range of successful initiatives of building local social capital trough organising, sometimes sponsored by local government, sometimes by foundations or religious institutions. See Venkatesh

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9 See for example [www.norwichunion.com/pay-as-you-drive](http://www.norwichunion.com/pay-as-you-drive) for the UK market, but similar schemes are offered in Italy and elsewhere.
(2006) though for the difficulties of successful organising in poor neighbourhoods with insufficient internal resources.

The final policy, which is likely to be introduced in both approaches, is revenue-neutral traffic demand management. This policy reflects the inherent difficulties of adding slots, capacity in an urban environment, in which the residents affected by the additional externalities of such new infrastructures tend to have strong levers in the planning systems to stop, delay or redesign such a project (See Flyvberg, Bruzelius and Rothengatter, 2003 for the typical cost inflation in large scale infrastructure projects, which are partially due to such politically necessary, but initially unacknowledged adjustments of the projects). One would expect similar effects as with carbon taxation, but less pronounced, as the travellers can additionally adjust the timing of their activities. On the other hand, the time-space regime of societies is rather rigid in the short term, so that not all adjustment will be easily possible. Public policy could support the adjustment process by the liberalisation of opening hours, the extension of opening hours of public institutions, appropriate regulatory frameworks and infrastructures for delivery services and by providing as much flexibility in employment regulations as is compatible with the productivity of the firms (encouragement of job sharing, telework, part-time work etc.).

5 Conclusions

This discussion has shown that the current spatial distribution of social capital limits the speed with which citizens can adjust their behaviour to policy initiatives currently contemplated to achieve the policy goals of the reduced social exclusion, fewer greenhouse gas emissions and improved welfare. The expected impact on these structures may very well make the citizens unwilling to see these policies adopted in the first place. In the referendum-driven politics of Switzerland, for example, this concern would limit the willingness of the national government to put such ideas forward. The policies needed to address or reduce these concerns are all outside transport policy proper. Transport policy makers will have to enlarge the scope of their policy making and find new partners, if they want to be successful in their core mission: the provision of a transport system which provides the services needed for everyone at minimum social cost.
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7 Literature


Campell, K.E. and B.A. Lee (1992) Sources of personal neighbor networks: Social integration, need or time, Social Forces, 70 (4) 1077-1100.

Cao, X., P.L. Mokhtarian and S.L. Handy (forthcoming) Changes in neighborhood characteristics lead to changes in travel behavior? a structural equations modeling approach, Transportation.


