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WHAT HAPPENS WHEN MOBILITY-INCLINED MARKET SEGMENTS FACE ACCESSIBILITY-ENHANCING POLICIES?

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Abstract—Improvements in accessibility are increasingly suggested as strategies leading to a reduction in vehicular travel, congestion, pollution and their related impacts. This approach assumes that individuals, if offered an opportunity, are likely to reduce their travel. It also assumes that accessibility-enhancing land-use changes will increase transit and non-motorized trips in lieu of automobile usage. However, there are numerous indications that people engage in excess travel and are not necessarily inclined to reduce it. This paper presents a number of hypotheses on the reasons for excess travel and the relationships among attitudes toward travel and responses to accessibility-enhancing strategies. It suggests that different market segments are likely to respond to policy measures in different ways. In particular, if a large segment of the population prefers mobility over the reduced travel offered by accessibility improvements, then such policies will be less effective than anticipated. © 1998 Elsevier Science Ltd. All rights reserved

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1. INTRODUCTION

In recent years there is a growing quest among transportation planners and environmentalists to address transportation problems through improvements in accessibility rather than mobility. This quest is part of a broader debate about the transportation/land-use interactions in which a central theme is whether or not increased density should be a policy objective for transportation goals (Newman and Kenworthy, 1989; Steiner, 1994; Handy, 1996). Underlying this approach is the assumption that travel is a derived demand. Specifically, travel patterns are the result of two major factors: the desire or need of people to engage in certain activities and the spatial distribution of opportunities to perform these activities. Presumably, if changes in the spatial distribution could significantly enhance access to activities, the amount of travel could be reduced.

With the growing concern for the environmental impacts of travel, particularly of automobile travel, policy-makers search for strategies which reduce vehicle-miles traveled (VMT) without jeopardizing the benefits accrued by personal mobility. In particular, a significant body of literature has emerged in recent years suggesting that land-use changes which promote mixed developments and greater residential densities will deliver some environmental and other transportation benefits. The advocacy of land use measures to ameliorate the environmental impacts of transport can be found in many policy statements both in Europe and the United States (UK Royal Commission on Environmental Pollution, 1994; Cervero, 1995).

The transportation benefits of land use strategies are expected to be accrued through two changes. First, it is assumed that density and mixed-use will encourage the use of public transport

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and non-motorized modes, and second, increasing densities are likely to reduce further sprawl and its accompanying dependence on the automobile. The retardation of sprawl is also likely to deliver another environmental benefit, namely a decline in the rate of coverage of open land by housing and space-consuming transport infrastructure.

But what if accessibility were enhanced through greater densities and mixed uses, and people still produced excess driving? While public policies that improve accessibility should probably be maintained, it is increasingly recognized that (at least some) human beings value mobility, and may not be willing to forfeit it. There is evidence to suggest that excess travel is in fact prevailing in some contexts and it seemingly violates some basic economic tenets which assume that people would tend to minimize travel costs, if opportunities to engage in activities are available at lesser distances.

The central hypothesis proposed in this paper is that human beings have an intrinsic drive for mobility. The intensity of this drive may vary among individuals, so that some may desire to increase mobility whereas others may prefer to reduce it, or stay at the current state. However, it is important to identify the magnitude of such groups to assure that public policies aiming at accessibility improvements do not result in addressing the 'wrong' problem or only part of it. It is possible that alternative policy options are warranted if the 'drive to drive' is very strong among some groups in the population, who may tend to prefer distant destinations over the accessible ones in their own neighborhoods.

Much of the land-use/transportation interactions debate can be divided into two sets of questions (Steiner, 1994; Cervero and Gorham, 1995; Kitamura *et al*., 1997):

First, does density make a difference, or more specifically:

(1a) Do people who reside in high density areas make fewer and shorter vehicular trips?
(1b) Is density encouraging the use of public transport and non-motorized modes?

Second, assuming that accessibility provided by density does deliver more environmentally desired travel patterns, is there a demand for such patterns? Specifically:

(2a) Why do (some) people travel when they don't need to, and who are they?
(2b) Does a change in location itself initiate a change in behavioral patterns, or do people first desire to change their behavioral patterns and then move to locations which facilitate the desired change?
(2c) Do (some) people prefer higher densities and mixed land use?

It is suggested that unobserved utility attributes (that is, aspects of lifestyle, personality, and attitudes which are frequently not captured by travel surveys, especially those surveys focusing on 'objective' measures of travel obtained, for example, through travel diaries) account for some of the responses to the second set of questions. In this paper, we examine primarily question (2a).

The following section explores the differences between mobility and accessibility as background for the subsequent discussion. Section 3 describes the evidence for excess travel, some of the underlying factors generating such seemingly irrational behavior, and the transportation/environmental policy problem posed by excess travel. Section 4 suggests a series of hypotheses on the existence of a desire for mobility and the relationships among attitudes toward travel and responses to accessibility-enhancing strategies. Finally, Section 5 briefly presents the implications of the proposed hypotheses, together with proposed directions for further research.

2. MOBILITY AND ACCESSIBILITY

Mobility and accessibility are too often used interchangeably, with insufficient clarity as to the difference between them. However, in recent years a number of studies have contributed to the distinction between the terms. Mobility is a complex concept, as it represents both positive and negative notions (Boer, 1986; Hagerstrand, 1989). On the one hand, it is cherished as a freedom, even a 'right' (Houseman, 1979), and as an indicator of economic welfare. On the other hand, it is seen as a cost, to both the individual and society. Building upon Jones (1989), we see the following measures of mobility as relevant to the discussion of the mobility–accessibility policy debate:

- The amount of actual movement performed by an individual. It may be measured in terms of trips, distance or time, and may include both motorized and non-motorized movements. It

should be noted that some measures such as the number of trips and the distance travelled are complementary indicators of mobility, each expressing a different element, which in the context of accessibility may be very different.

- Aggregate measures of transport system performance. Such indicators describe the availability of travel alternatives, including various types of infrastructure and services. Examples include vehicle ownership or availability, or vehicle-miles of transit service offered. The main drawback of this type of measure is that it does not express in any way the amount of actual movement by the population. It is clearly a supply-based measure.
- Measures of choice or the freedom of the individual to move, using the available opportunities. This measure is more of a perceptual one which describes whether or not individuals feel they have the option to be mobile, regardless of actual behavior.

Viewing mobility as the actual amount of travel, it is possible to distinguish between types of mobility on the basis of their social efficiency or desirability. Different forms of mobility contribute differentially to the well-being of the traveller and to society. A particular form of mobility (e.g. driving alone) may be personally efficient and hence may contribute to social benefit in terms of improving social welfare, but if it is accomplished by means which generate significant negative externalities, it may on net be socially inefficient.

Mobility under this definition is the outcome of the activity program an individual engages in. It can be expressed as a demand for activities or travel, where the costs are an integral part of the demand. Thus the mobility exercised by an individual is affected by the perception of personal and social costs associated with movement.

Accessibility, on the other hand, is an attribute of location and time (Hagerstrand, 1989; Handy, 1993a, 1996; Handy and Niemeier, 1997). It may also be attributed to a situation of an individual in time and space. As the concept of accessibility technically does not involve movement, it is generally considered by environmentalists to be a positive concept. In view of the negative societal impacts of mobility, there is a desire to identify access as the prime objective of the transportation system. The notion of maximizing accessibility *instead* of mobility is politically an attractive concept (Handy, 1994).

Jones (1989) also refers to accessibility as one measure of mobility, noting its importance as an unambiguous measure due to the fact that increasing accessibility is always preferred whereas increased mobility may be a mixed blessing. He also stresses that accessibility is a measure of supply, namely potential mobility, and is not a descriptor of behavior.

Traditionally, improvements in accessibility were obtained by improvements in supply, particularly through the expansion of infrastructure (roads and rail) and services. These have improved both accessibility *and* mobility. In recent years, such accessibility gains attained by means of increasing inefficient (automobile-based) mobility are deemed undesirable. Instead, accessibility improvements which are accomplished through land use planning policies such as mixed-use developments and job-housing balance, as well as by temporal policies such as alternate work schedules, are considered socially efficient.

The discussion on mobility and accessibility is often associated with the dichotomy of urban and suburban travel patterns and transportation problems. Residential location (urban vs suburban) to some extent represents a trade-off between accessibility and mobility. Suburban settings are considered to lead to greater automobile dependence, that is, greater mobility, together with lower accessibility, compared to denser urban settings. The concept of neo-traditional developments is to an extent viewed as the option of transferring an 'urban opportunity' environment, namely urban accessibility, to a suburban setting. As much of the urban transportation problem is really regionwide in nature, and associated with suburban mobility, it is desirable to address the urban–suburban dimension in the discussion of mobility and accessibility.

3. EXCESS TRAVEL

3.1. Some evidence for excess travel

Conventional economic thought assumes that travellers weigh the disbenefit of distance or travel time against the benefit of the destination when assessing alternative destinations (e.g. Sullivan,

1990, on economic location theory and Barnard, 1987 on utility maximization models of destination choice). For example, as Goodwin and Hensher (1978 p. 25) express it, the nature of travel as a derived demand implies that the decision to travel or not involves "a simple trade-off between the advantages or benefits to be derived from being at a destination and the disadvantages or costs involved in traveling to that destination." In fact, much of the transportation development philosophy is based on the argument that travellers seek to save travel time and that their value of time is the justification for investments in transportation infrastructure.

But, there are a number of indications that people travel more than would be expected if the fulfillment of activity demand could be satisfied only through accessibility. If true, this phenomenon has obvious implications for environmentally-oriented policies intended to reduce travel. We will refer to this phenomenon as excess travel, meaning travel that exceeds what could be a minimum satisfying level. The evidence for excess travel is arising in a variety of different contexts.

The concept of excess or wasteful commuting, for example, has received much attention over the last 15 years (e.g. Small and Song, 1992), where excess commuting is defined to be the amount exceeding that predicted by standard location models. In general, some of this apparently excess travel may be due to ignorance with regard to the network structure or available services, some due to constraints on the individual (such as the need to consider two careers in choosing a residential location), some due to the omission of factors increasing the utility of more distant destinations, and some due to a utility for travel itself. In the current context we refer to the latter condition.

Another set of evidence on excess travel is derived from the study of telecommunications-transportation interactions. It is often suggested that telecommunications offers 'accessibility by means of virtual mobility'. In the absence of an intrinsic desire to travel, one would assume that the adoption of telecommunications-based alternatives to travel would have been more attractive than what can at present be seen. In some cases, a more limited adoption is likely due to external constraints (Mokhtarian and Salomon, 1996). But there is also evidence that through traveling, some dimensions of the utility function are satisfied despite the costs of the travel activity, and hence substitution is not the only, or even most likely, interaction (Salomon, 1985; Batten, 1989; Mokhtarian, 1990). Willis Warren succinctly characterized this attitude when he wrote: "In answer to Bill Gates's question 'Where do you want to go today?' [referring to the slogan of a Microsoft advertising campaign featuring various uses of the Internet for 'virtual travel']—how about 'outside'?" (letter to *Newsweek*, 11 November 1996).

Another aspect to the role of telecommunications is as a complementary adjunct to travel. Technologies such as cell phones and modems reduce the disutility of travel by making travel time more productive (Niles, 1994). This facilitates additional travel which would otherwise be avoided as having too high an opportunity cost.

A third set of evidence is based on conceptual considerations supported by aggregate empirical data. In a recent paper Maggi *et al.* (1995) have posed the question of why people travel, especially when there are increasing opportunities not to travel and the (environmental) costs of travel are rising. They point to evidence in the developed world, which demonstrates an increase in the amount of travel by individuals, a transition from slower (transit) modes to faster (private) modes and an increase in the total distances covered (Schafer and Victor, 1997). They point out that the time saved through faster travel is not translated into non-travel activities but into greater distance travelled (Bieber *et al.*, 1994). Furthermore, it seems that the growth in travel is mostly for discretionary purposes (Chlond and Zumkeller, 1997). Maggi *et al.* suggest a number of hypotheses on why people travel. Among the internal forces which encourage 'excess' travel are the utility derived from travel itself, the utility derived from certain lifestyles which are associated with mobility, and the desire to intimately experience the physical space. Among the external reasons for excess travel are the availability of low-cost travel technologies, socio-demographic changes, the culturization of movement and the inconsistent policy environment.

Excess travel may be observed in all three of the main purposes of individuals' travel (the generation of income, the maintenance of the household and discretionary travel). In the discretionary travel category, joy riding may be the ultimate example of excess travel by choice, where the activity motivating the trip is travel itself. In the mandatory travel category, the phenomenon of excess commuting has been referred to previously. In the maintenance travel category, it is

suggested that excess travel by choice is increasingly practiced as well. With the development of shopping facilities at the outskirts of metropolitan areas and shopping activities becoming a combination of maintenance and entertainment, the choice of shopping destination very often may violate the minimum distance assumption. While part of the utility of the more distant destination may derive from its greater inherent attractiveness, we suggest that even if two shopping opportunities were almost identical, the more distant one would sometimes be chosen by some people due to the utility of travel (or to the negligible disutility of travel) itself.

The evidence about excess travel suggests that there are some factors contributing to the utility of travel which are not observed by available instruments. These can be of two types: objective and subjective. Each is discussed below.

3.2. Reasons for excess travel: unobserved objective factors

The conventional analysis of travel assumes that a trip is made in order to engage in a particular activity at the trip end. However, it is very often the case that more than one activity is performed in a single location and it is the mix of activities which motivates the travel, but this mix or its utility to the individual escapes the conventional research instruments. What this suggests is a very simple claim that travel may be motivated by multiple activities that need to be identified in order to explain at least part of the excess travel phenomenon. This, however, does not conflict with the notion of improved accessibility, which may still reduce some travel.

What may seem to be excess travel may also be evidence of changes in the labor market. With the growing specialization of the labor market, and the increased dispersion of tasks to small entrepreneurs in production processes, the choice of work location becomes more complex. Consider, for example, the case where job-housing balance is measured, and accessibility to jobs is apparently attained. The underlying assumption is that the balance is not only in the quantitative dimension, but also in the quality of jobs suitable for the residents. Simple assumptions, which fail to account for a qualitative mismatch, will result in observations of excess travel.

Similarly, as evidenced in a number of studies (e.g. Wachs *et al.*, 1993), residential location is only in part attributable to commute distance. It is determined by a host of factors which seem to override the costs of excess travel.

3.3. Reasons for excess travel: unobserved subjective factors

At first thought, the question may arise: 'If people enjoy traveling for its own sake, why does travel time always have a negative coefficient in the utility function for mode choice and other travel choice models?' There are several technically possible answers to that question. For example, because that is the hypothesized impact of travel time, models not conforming to that hypothesis are discarded—either by the researcher/planner or by the journal editor/executive board. Alternatively, travel time may have a positive coefficient for a minority segment of the population, but the negative coefficient in a final model represents an average across the population as a whole. But the most plausible answer in the context of the present discussion is that it is not travel time itself, but other aspects of travel which contribute positively to utility (Reichman and Salomon, 1983). The average effect across the population of these other, unmeasured aspects is captured by the constant term of the utility function, with the remainder of the effect subsumed within the error term. Thus, the negative contribution of travel time to the utility of a more distant destination may sometimes and for some people be outweighed by the positive contributions of other (unmeasured) factors, resulting in the apparently random (to the analyst) selection of an alternative whose deterministic portion of utility may be lower but whose total utility is higher.

Relating this discussion to the passage from Goodwin and Hensher (1978) cited in Section 3.1, it becomes apparent that the utility of engaging in an activity requiring travel can be usefully decomposed into three components (Jones, 1978, p. 298): the (net) utility of the activity at the destination, the *disutility* (negative aspects) of travel to the destination (generalized cost), and the *utility* (positive aspects) of travel to the destination (usually unobserved subjective factors). (Jones actually decomposes the first component further into positive and negative aspects of the activity, but that distinction is less relevant to our discussion of travel here). While destination choice models explicitly trade off the first two components, mode choice models ignore the utility of the destination (which is assumed to be fixed and constant across all mode alternatives) and compare just the observed disutilities of each mode (through measures of travel time and

cost), assuming that the alternative with the least negative observed disutility has the highest probability of being chosen. The third component—the positive aspect of travel—is seldom addressed quantitatively.

This tripartite nature of the utility of an activity/trip combination illustrates the extreme that (contrary to the implication of Goodwin and Hensher's (1978) statement) a trip can be made even when the utility of the activity itself is zero or even negative, as long as the positive utility of travel outweighs the combined magnitudes of the other two components. In these cases the demand for travel (which appears to be excess travel if the third component is unmeasured) is *not* derived from the demand for the activity, as is universally assumed, but from the demand for travel *per se* (Reichman, 1976). The more common case is the one described earlier, in which the third component increases the total utility of a more distant destination beyond what it would otherwise seem to be, again resulting in apparently excess travel when that more distant destination is chosen.

Thus, the main hypothesis explored in the following sections is that excess travel is a result of unobserved subjective factors. That is, the total utility of travel may in part be attributed to subjective factors which, again, are not captured by conventional travel behavior research instruments. These include travel-related perceptions and attitudes.

Why would travel have a positive utility? Modern western culture has assigned symbolic value to mobility. This is evident in the marketing of automobiles as well as of international tourism opportunities of various types (beach or ski resorts, cruises, pilgrimages, adventure tours, and even 'eco-tourism'), which are nowadays advertised through popular media to, and purchased by, broad segments of the population. This is a marked difference from the pre-aviation era in which only the affluent could travel for long distances. This has its parallels in urban lifestyles, where the separation of work and residences is routine and long distance commuting is not only socially and culturally accepted as a norm, but may even be viewed as 'leisure travel', or at least as a consequence of a leisure orientation of society (Chlond and Zumkeller, 1997).

Still another direction of support for the claim that some people are not inclined to reduce their automobile travel comes from the literature which focuses on attitudes toward the automobile and its use. The gratification derived from driving, even aimlessly, and the ownership and use of certain types of automobiles seem to fulfill some needs, for some individuals (Lewis and Goldstein, 1983; Flink, 1988; Cullinane, 1992; Wachs and Crawford, 1992; Webber, 1992).

A similar line of reasoning is drawn from the study of shopping behavior. Tauber (1972) claimed that people engage in shopping activities for many other reasons than simply obtaining some goods. He suggests that role playing, diversion, learning about trends, sensory stimulation, communications with others, etc., are all factors which seem to encourage shopping activities. Building upon his list, we argue that people travel to fulfill many of these and other goals.

One factor which may help to explain excess travel and the lack of interest in accessibility-based alternatives to travel was brought forward by the study of transitions. Richter (1990), in a study of transitions between roles, has suggested that people prefer to have some time buffer between their respective home and work roles. Her findings support the hypothesis that commuters do not necessarily prefer to minimize commuting distance, as they may attribute a positive utility to travel time up to a certain level. This may be viewed as an opportunity cost of *not* traveling: some time apart from other household members may be necessary to minimize domestic friction.

A study by Wachs *et al.* (1993) has shown that the point of indifference between satisfaction and dissatisfaction with regard to commuting time lies at about 45 min for a southern California sample. It is difficult to judge whether satisfaction is derived from the relative time (compared to other commuters of whom they are aware) or from the absolute value. Young and Morris (1981) have observed that the distribution of levels of satisfaction with regard to travel time is not monotonic. The peak satisfaction (in their Melbourne based sample) was at about 15 min. The two studies clearly indicate that satisfaction is not a linear function of travel time, suggesting some level of acceptance or maybe, following Richter, even a desire for mobility.

A very different analysis, which has partially prompted our hypotheses about the phenomenon of excess travel, was performed by Ramon (1981). As her work has never been published, and yet is quite germane to the discussion at hand, it is worth elaborating her approach and findings in some detail. She defined the following concepts, and measured them for a sample of 474 adult residents of Jerusalem in 1977:

- *Travel attitude (TA)*: One's general liking for travel, measured on a semantic scale from 'love' to 'hate'. For Ramon's sample, on a five-level scale between 'like travelling very much' and 'hate travelling' the distribution was 18, 41, 26, 11 and 3 % respectively. Thus, nearly 60 % of her sample expressed some degree of affinity for traveling.
- *Objective mobility (OM)*: The amount one travels, measured by number of trips and/or distance.
- *Perceived mobility (PM)*: One's view of the amount traveled, rated on a semantic scale from 'a little' to 'a lot'. On a seven-level scale between low and high, Ramon found 37% in the lower three levels, 23% in the intermediate level and 40% in the upper three levels of perceived mobility. Note that as Ramon defined them, both OM and PM are based on Jones' (1989) first definition of mobility (discussed in Section 2.1 above).
- *Satisfaction (S)*: One's satisfaction with the amount traveled, measured by the response to the statement 'I would like to travel [much more than ... the same amount as ... much less than] I do now.' Those wanting to travel more than now are considered 'deprived', those wanting to travel the same amount are classified as 'balanced', and those wanting to travel less are considered 'surfeited'. Individuals who feel surfeited are likely to exploit access-enhancing policies and their responses are in the 'right' direction. However, the balanced and particularly the deprived groups are not likely to respond in the desired direction, especially if they perceive the marginal costs of travel to be very low. If these two groups are sufficiently large, it may offset the benefits accrued from the accommodation of the desire to reduce travel of the surfeited group. In Ramon's sample (429 respondents), 49% felt they were in a balanced state, 33% felt deprived, and 19% felt surfeited. Thus, the group most likely to be susceptible to strategies aimed at reducing travel was the smallest of the three, constituting less than one-fifth of the sample.

3.4. The transportation/environmental policy problem posed by excess travel

While there is an increasing realization that the automobile dependence of wide segments of the population, certainly in the United States but also in Europe, has serious negative impacts on the economy and more so on the environment, public policies do not necessarily produce the right signals to curtail excess driving. The low costs of operating an automobile, mortgage interest deductions that encourage low density housing, and various fringe benefits and tax breaks which support automobile usage may be more influential than policies designed specifically to curtail driving (e.g. encouragement of carpooling, improved transit services, telecommuting options, or the encouragement of neo-traditional neighborhood developments). In other words, the policy signals produced by various authorities—or by the same authorities in different contexts—can very often result in contradictory results, or simply cancel each other (Marshall and Banister, 1997; Dery, 1998).

A clear example of conflicting policy signals is the fact that automobile travel is perceived as cheap, not only because individuals fail to account for externalities but also because many fail to consider the real costs of the marginal trip and consider only out-of-pocket (fuel) expenses. Given the relative stability of fuel costs, policies designed to increase travel costs are actually not affecting the way individuals incorporate costs into the driving decisions.

In recent years, congestion and air quality concerns have driven an increasing interest in congestion mitigation policies, including the consideration of measures which directly affect the demand for travel. Congestion pricing is often cited as a desired policy (Small, 1992, 1993; Button, 1994), although generally, political support for measures perceived as 'sticks' is lagging behind the 'carrot' policies (Altshuler, 1979; Giuliano, 1992; Grieco and Jones, 1994; Wachs, 1994). Much attention is given lately to the role of accessibility and land-use policies as potential mitigators of automobile travel. Some studies propose improvements in accessibility through increasing land use mix and density to attain a reduction in motorized travel and particularly in driving (Cervero and Gorham, 1995; Dittmar, 1995; Ewing, 1995). Others are less optimistic about the role of land use-based approaches, claiming that accessibility at the local and regional scales differ in their effect on travel (e.g. Giuliano, 1991; Giuliano and Small, 1992; Handy, 1993a,b, 1996; Southworth, 1997).

Experience with a number of travel demand management techniques has demonstrated that individuals respond in ways which differ much from the politically touted results, sometimes

resulting in behavior which is detrimental to the policy objective (e.g. Marshall and Banister, 1997). The compatibility between transport policy measures and travellers' behavioral adjustments has been addressed by Salomon and Mokhtarian (1997). They suggest that the range of responses as seen by the traveller may be very different from that assumed by the policy-maker. Consequently, some congestion mitigation strategies, perhaps most obviously the case of investment in rail, have failed to draw people out of their cars. Instead, people consider a wide set of possible adjustments ranging from accommodating the increase in travel time to quitting work altogether. We here suggest that differences in peoples' attitudes toward driving and mobility may affect their choice of response.

In the ongoing study just referenced, we are examining the choice of response to growing congestion (Mokhtarian, *et al*., 1997). We have identified six tiers of responses, ranging from travel-maintaining responses through travel-reducing strategies to changes in location and lifestyle adjustments (which may also reduce travel). While we generally tend to assume that individuals will move from one tier to another when the gains to be won in the lower tier are exhausted, we suggest that different market segments may exhibit differential transitions between tiers. For example, people who seek greater mobility are more likely to stay within the first tier than to employ travel-reducing adjustments offered by enhanced accessibility.

The basic hypotheses of this study are derived from some premises about the concepts of accessibility and mobility. The two terms are not substitutive policy objectives. In addressing transportation system objectives (economic, social, environmental), it is becoming increasingly obvious that no single family of interventions can ameliorate all problems. A widening range of transportation policies addresses various objectives and balanced packaging of policy measures is becoming the name of the game. Some problems will respond to accessibility improvements whereas others are addressed by improvements of mobility.

4. THE DESIRE FOR MOBILITY: SOME HYPOTHESES

Against the multitude of literature, much of it emanating from planning professionals, which suggests that land-use policies and specifically, higher densities and land-use mix, should be promoted to gain environmental benefits, there is a smaller body of literature rebutting this. The main argument is essentially that offering more opportunities in proximity to residences, may not necessarily accomplish the desired goal of reducing automobile usage. Recently, for example, Crane and Hengel (1997) suggest that changes in car usage levels following improvements in access depend on the price elasticity of the demand for car use, rather than on the enhanced accessibility to land use opportunities. Accessibility offers the *potential* to reduce trips and emissions. But does it provide a solution for all? To assess the potential effectiveness of such policies, it is important to improve our understanding of excess travel and its causes.

Drawing on the foregoing discussion, we propose a number of testable hypotheses, as follows:

1. The primary hypothesis set forth here is that, for an identifiable segment of the population, there is an identifiable desire for mobility for its own sake, beyond the utility of the activity at the destination itself. We believe that at least for some people and in some contexts, travel for its own sake is valued due to one or more of the following character traits or desires:

   - *adventure-seeking*: the quest for novel, exciting, or unusual experiences will in some cases involve travel as part or all of the experience itself, not just as a means to the end ('getting there is half the fun');
   - *variety-seeking*: a more mundane version of the adventure-seeking trait, the desire to vary from a monotonous routine may lead one, for example, occasionally to take a longer route to work or visit a more distant grocery store (Handy and Niemeier, 1997);
   - *independence*: the ability to get around on one's own is one common manifestation of this trait;
   - *control*: this trait is likely to partially explain travel by car when reasonable transit service is available;
   - *status*: traveling a lot, traveling to interesting destinations, and traveling 'in style' (e.g. in a luxury car) can be symbols of a desired socio-economic class or lifestyle;

- *buffer*: as discussed earlier, a certain amount of travel can provide a valued transition between activities such as home and work;
- *exposure to the environment*: 'cabin fever' is one manifestation of this desire, to leave an enclosed building and 'go somewhere', just to experience something of the outdoors;
- *scenery and other amenities*: may lead someone, for example, to take a longer route than necessary to a destination;
- *synergy*: the ability to conduct multiple activities at or on the way to a more distant destination, or the ability to be productive while traveling, may result in apparently excess travel.

The presence of these characteristics can be measured through individuals' responses to attitudinal statements or questions on a survey.

2. In keeping with the concepts measured by Ramon and discussed in Section 2.4, we hypothesize that high values on the characteristics listed above will be associated with high scores on the Travel Attitudes (TA) scale (i.e. a high degree of liking to travel). More specifically, we suggest that, taking TA as a dependent variable in a regression or similar model, a high proportion of its variation can be accounted for by ratings on the above explanatory variables, together with explanatory variables relating to negative aspects of travel such as its physical difficulty, psychological difficulty (mental stress), tedium or monotony, disruptiveness to other desired activities, perception of it as a waste of time, and environmental ideological considerations.
3. We hypothesize the relationships among TA, Perceived Mobility (PM), and Satisfaction (S) to be as shown (in a simplified form) in the following table. That is, we hypothesize that those who like to travel but do not see themselves as doing it a lot will tend to be classified as 'deprived' on the basis of their self-reported satisfaction rating, that those who do not like to travel but do it a lot will tend to be classified as 'surfeited', and that the remaining two categories will tend to be classified as 'balanced' (Table 1).

   In our view, however, it is important to distinguish between at least PM and S (and possibly TA) measures for each of the three types of travel mentioned earlier: mandatory (commute and work-related), maintenance (shopping, medical), and discretionary. For example, it is possible—indeed likely—that a traveler is surfeited in terms of mandatory travel and deprived in terms of discretionary travel. Conversely, a full-time home-based worker may be deprived in terms of mandatory travel (i.e. may wish she could commute to a conventional workplace) while being surfeited or balanced in terms of the other categories. We further believe that it is important to distinguish between urban and interurban travel, as there may be complementary relationships between them.
4. We also suggest that, in addition to potential socio-economic and lifestyle differences, there may be significant differences between suburban and urban residents in the distributions of TA, S, and the positive and negative aspects of travel listed under hypotheses 1 and 2. What is more difficult to determine is whether any observed differences are due to self-selection in the type of residential neighborhood on the basis of prior personality traits and perceptions, or due to the *post hoc* formation of attitudes based on different types of residential neighborhood surroundings (Kitamura *et al.*, 1997). It is likely that both causal mechanisms are at work to some degree.
5. Finally, we suggest that various segments of the population are differentially susceptible to different planning strategies. Specifically, we hypothesize that people who have an intrinsic desire for mobility, and who are currently mobility-deprived, are less likely to adopt travel-reducing strategies (such as residential or job relocation, quitting work, or changing to a compressed work week) or accessibility-increasing strategies such as moving to a neo-traditional

Table 1. Hypothesized relationships among travel attitude, perceived mobility, and satisfaction

		Travel attitude	
		Hate	Love
Perceived mobility	Low	Balanced	Deprived
	High	Surfeited	Balanced

neighborhood development. Conversely, mobility-surfeited people are more likely to respond to measures that increase accessibility and/or reduce travel. Here too, interactions among the three main categories of travel are important.

We believe there to be a longitudinal or dynamic component to the hypothesized behavior. Salomon and Mokhtarian (1997) have developed a list of behavioral strategies for coping with congestion, which can be ordered according to increasing transaction cost. It happens that, in general, the most costly strategies on the list (quitting work, going from full-time to part-time, changing jobs, changing residential location) are the ones that actually reduce travel, whereas the less costly strategies (acquiring a more comfortable or fuel-efficient car, hiring someone to do yard or house work, changing departure time) often affect the amount of travel little if at all. We have found empirical support for the hypothesis that people tend to try the less costly measures first, and if dissatisfaction persists, then proceed to try more costly measures (Mokhtarian *et al.*, 1997). The discussion here may refine that result. If hypothesis 5 is true, then mobility-deprived people may tend to 'settle' into lower-tier strategies and repeatedly try those rather than moving into higher-cost tiers involving travel reduction.

5. IMPLICATIONS AND DIRECTIONS FOR FURTHER RESEARCH

The hypotheses presented above imply that the demand for activities, as commonly measured, may be a poor predictor of the impacts of improved accessibility. Attitudes toward travel and the concept of 'perceived mobility' seem to offer important attributes for distinguishing between market segments which are likely to respond in different ways to policy stimuli in general, and to accessibility changes in particular.

Policies to improve transportation and reduce environmental costs have traditionally been based on supply-side measures, namely increasing the options open to the users. Policies designed to curb travel are relatively rare and viewed by policy makers as less attractive. Restrictions seem to generate evasive behavioral responses. The hypotheses suggested in this study imply that some market segments which are part of the targeted population for transportation policies, are relatively 'immune' to certain types of policies. Accessibility is to some degree irrelevant to such market segments.

If this is the case, it is initially important to identify the size of such segments. Were the travel-deprived segment a small marginal group, it could be ignored. However, if it is a sizable group, it may make certain policy efforts relatively ineffective. It should be borne in mind that implementation of all policies, and accessibility-oriented ones in particular, involve significant direct and opportunity costs. Hence, as an input for policy evaluation, identifying the magnitude of immune segments is warranted.

The size of the market segments can be estimated on the basis of attitudinal measurements and tests of the above mentioned hypotheses. Clearly, attitudinal measurements pose a problem for forecasting purposes. It is reasonable to assume that some attitudes change over time, and differ across culture. It is thus suggested that both longitudinal and cross-cultural cross-sectional studies be carried out to assess the importance of the problem raised by the inclination for mobility. For example, in Israel and elsewhere since Ramon collected her data in 1977, per capita distance traveled and system wide congestion have increased. It would be useful to learn whether travel attitudes, perceived mobility, and satisfaction have changed in Israel in the past two decades in view of these trends, and whether those measures differ today across countries with different levels of objective mobility and congestion.

One objective of such studies would be to identify socio-demographic and economic correlates of mobility attitudes, which can serve to forecast mobility inclination. However, it is likely that lifestyle characteristics (fundamental choices regarding work, family, leisure, and ideology; Salomon and Ben-Akiva, 1983) would be more indicative of the desire to travel, and these characteristics should also be measured and analyzed.

From a policy perspective, many factors need to be considered in evaluating accessibility-oriented measures. For example, the social desirability of job-residence balance may be questioned. Qualitative balancing implies economic segregation, and the substitution of accessibility for mobility may entail negative results for some groups who would benefit from mobility. This

can be the case, for example, for minority groups for whom job-housing balance may imply captivity in lower-paying jobs. Similarly, negative social and economic consequences can arise if shifts in the economy cause unemployment to rise, and longer-distance mobility needs to be exercised in the job search.

From an environmental perspective, the single most important transportation parameter is the potential reduction in VMT. The rationale behind accessibility-enhancing policies is that VMT and consequently energy consumption and emissions can be reduced by the expected shift of motorized trips to non-motorized modes and to public transportation and by a shift in destination to opportunities in greater proximity to residential areas. The success of such policy schemes depends on the behavioral response of transportation users. These, in turn, will be affected by the public perception of the relative costs and benefits of mobility, accessibility, and the environment. We argue that for a certain segment of the population, environmental considerations are outweighed by the benefits of mobility (Garling and Sandberg, 1997). In particular, we have pointed to what seems to be an important preliminary issue in the evaluation of accessibility-oriented policies, namely, identifying how many people will not be responsive to changes in accessibility.

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