

# TOWARDS A COST-BENEFIT ASSESSMENT OF SOCIAL EXCLUSION IN THE TRANSPORT SECTOR

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## ABSTRACT

*We have always known that heedless self-interest was bad morals; we know now that it is bad economics.*

FRANKLIN D. ROOSEVELT

In this paper we explore the interface between cost-benefit analysis (CBA) and transport & social exclusion. We analyse a case where the price of procuring a driving license is driven above the market solution (where supply equals demand). Here we assume that due to the standard calculations based on CBA, it has been concluded that the benefits from increasing the quality of driving training will be larger or equal to its cost. But as a result of the quality improvements, we see that the price has increased above the market level. The issue we raise in this paper is that though measure such as high-priced driving license could be justified through a traditional CBA, it will lead to social exclusion nonetheless. This is an understanding which demands further refining of analytical tools like CBA before considering the implications of transport policies on different sections of the society.

## 1. INTRODUCTION

Transport and social exclusion is a relatively new theme of study in the transport research arena. This paper sets out to discuss the current understandings on this topic. It emphasises that firstly, social exclusion (due to transport constraints) can lead to disintegration in the society and secondly, the traditionally established cost-benefit analysis (CBA) can include assessment of social exclusion to get a more realistic picture of the costs imposed by the transport sector. The study postulates that social exclusion should be considered an *externality* or *cost*.

In order to explore this facet, we here assume that social cohesion depends upon the differences between the groups and the differences within the group. The larger the differences between the groups and the smaller the differences within, the more difficult it will be to integrate these two groups. In this context, social exclusion due to transport can be of importance. Studies show that the exclusion of immigrant group, for instance, leads to formation of isolated neighbourhoods and also limit their ability to access labour market and further get well paid jobs. Both these elements can be argued to cause both larger differences between the immigrants and natives and smaller differences within the immigrant population, thereby increasing further isolation (disintegration). A question which can then be put forth is if social exclusion reduces integration and if this is a process that is growing in strength, can the current regime be called sustainable? And does the current ways and means of measuring transport need and cost capture this process?

A second question is to what extent the decision making process is able to capture the importance of this theme indirectly. In this regard, there are economic models (*for example, the median voter theorem and Nash negotiation*) that show that both in the case of democratic decision making and negotiations, the issue would not be addressed.

We delve into the case of high priced driving license and the subsequent alienation of low-income groups from procuring it which leads to social exclusion. Further discussions on the subject are based on the following (fundamental) assumptions:

- The consumers base their choice for travel mode on the time cost only.
- Car usage gives higher utility than public transport usage only if it has a lower time cost, and vice versa.
- Although the effects and changes are functions of time, the time aspect will not be dealt with explicitly. Instead we will deal with the issues of stability and development on a mere intuitive basis.
- We use the following definition of Pareto efficiency:  
‘A situation is said to be Pareto efficient if there is no way to rearrange things to make at least one person better off *without* making *anyone* worse off. Much of economics is concerned with identifying inefficient situations and designing policies and institutions that will promote efficiency and reduce inefficiency. A policy or action that makes at least one person better off without hurting anyone is called a *Pareto improvement*.’ (Webnotes on microeconomics, <http://wilcoxen.cp.maxwell.syr.edu/pages/225.html>)

Having laid out the assumptions, we delve into highlighting the overlapping zone between transport & social exclusion and CBA and some of the challenges involved in

making social exclusion a part of the CBA. In order to achieve this, the paper has been divided into the following sections:

- i. Cost-benefit analysis
- ii. What does the concept of 'social exclusion' entail?
- iii. Is such exclusion measurable? Some comments from the past researches
- iv. The case of high-priced Driving License
- v. Summary

## 2. COST-BENEFIT ANALYSIS<sup>1</sup>

### 2.1 The method

Cost-benefit analysis (CBA) is an analytical method employed to evaluate any programme/ project/ policy acceptable if it confers a net advantage i.e. if 'benefits' outweigh 'costs'. The method involves providing a quantified overview of the advantages and disadvantages of alternative projects or measures. These advantages and disadvantages are expressed in terms of cost and benefits and are wherever possible expressed in monetary terms. Proponents of cost-benefit analysis make two basic arguments in its favour. First, use of cost-benefit analysis ostensibly leads to more 'efficient' allocation of society's resources by better identifying which potential regulatory actions are worth undertaking and in what fashion. Secondly, it is contended that this method produces more objective and more transparent government decision-making by making more explicit the assumptions and methods underlying regulatory actions. A typical CBA will entail the following three steps:

- i. Estimating costs: the first step in CBA is to calculate the costs of a public policy. Thus, atleast in theory, the cost side of CBA is relatively straight forward and it considers either the opportunity cost of items or the prevalent willingness to pay for various facilities. What is unique to cost-benefit analysis, and far more problematic, is the monetary valuation of the benefits of life, health, inclusion etc.
- ii. Monetizing benefits: apart from the obvious inputs on which a monetary value can be put, CBA also entails creating artificial values. As mentioned above, this is a problematic and difficult part of the process. For example, economists create artificial prices for health and environmental benefits by studying what people would be willing to pay for them. One popular method, called 'contingent valuation', is essentially a form of opinion poll. Researchers ask a cross-section of the affected population how much they would be willing to pay to preserve or protect something that cant be bought<sup>2</sup>.

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<sup>1</sup> This section borrows heavily from the following source: Heinzerling L. and Ackerman F. (2002) *Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection*, (Georgetown: Georgetown University Law center).

<sup>2</sup> Many surveys of this sort have been done, producing prices for things that appear to be priceless. For example, the average American household is supposedly willing to pay \$257 to prevent the extinction of bald eagles, \$208 to protect humpback whales, and \$80 to protect gray wolves. These numbers are quite large: since there are about 100 million households in the country, the nation's total willingness to pay for the preservation of bald eagles alone is ostensibly more than \$25 billion. An alternative method of attaching prices to unpriced things infers what people are willing to pay from observation of their behavior in other markets. To assign a dollar value to risks to human life, for example, economists usually calculate the extra wage - or "wage premium" - that is paid to workers who accept more risky jobs. Suppose that two jobs are comparable, except that one is more dangerous and better paid. If workers

- iii. Discounting the future: Costs and benefits of a policy frequently occur at different times. Often, costs are incurred today, or in the near future, to prevent harm in the more remote future. When the analysis spans a number of years, future costs and benefits are *discounted*, or treated as equivalent to smaller amounts of money in today's currency value. Discounting is a procedure developed by economists in order to evaluate investments that produce future income. The larger the discount rate, and the longer the time intervals involved, the smaller the present value. Cost-benefit analysis routinely uses the present value of future benefits. That is, it compares current costs, not to the actual currency value of future benefits, but to the smaller amount we would have to put into a hypothetical savings account today to obtain those benefits in the future. This application of discounting is essential, and indeed commonplace, for many practical financial decisions. If offered a choice of investment opportunities with payoffs at different times in the future, one can discount the future payoffs to the present in order to compare them to each other. The important issue for social policy, as we shall see, is whether this logic also applies to outcomes related to opportunities – like social inclusion, access to employment and other opportunities – that are not naturally stated in currency terms.

## 2.2 Principles of cost-benefit analysis

A CBA is based on welfare economics, and can be described as resting on five main principles, namely:

- i. consumer sovereignty;
- ii. willingness-to-pay;
- iii. maximizing efficiency;
- iv. distributional neutrality;
- v. social constraints.

### 2.2.1 Consumer sovereignty

Consumer sovereignty refers to the right of consumers to choose how to spend their income. This serves as a starting point for analysis. Different consumers will make different choices; however within the framework of cost-benefit analysis, none of these choices is regarded as more correct than another. Individual preferences are respected, and the choices made on the basis of these preferences are simply taken as data. If someone drives his or her car even for a very short distance, economists will not assess this as silly and advise the individual that walking is healthier and friendlier to the environment. In general, economic theory makes the assumption that consumers are perfectly rational utility maximizers. This means that each consumer chooses the most preferred pattern of consumption, given his or her budget constraint and the set of commodities available for consumption. This assumption of rational utility-maximizing consumer behaviour is closely connected to the normative status granted to consumer sovereignty. This connection actually has clear policy implications. Only if it can be

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understand the risk and voluntarily accept the more dangerous job, then they are implicitly setting a price on risk by accepting the increased risk of death in exchange for increased wages. What does this indirect inference from wage rates have to say about the value of a life? A common estimate in recent costbenefit analyses is that avoiding a risk that would lead, on average, to one death is worth roughly \$6.3 million. This number, in particular, is of great importance in cost-benefit analyses because avoided deaths are the most thoroughly studied benefits of environmental regulations (Heinzerling et al. 2002).

shown that consumers do not act in their own best interest, a case can be made for what is usually referred to as paternalism. Paternalism means that consumers will be restricted in making their own choices; that these choices will be made by a more well-informed agent acting on their behalf.

### *2.2.2 Willingness to pay*

Individuals' preferences for goods and services, following from their utility maximization, are monetized in their willingness-to-pay. In existing markets the consumers' willingness-to-pay show off in the demand and eventually in the market pricing. The market resolves the rationing problem by balancing demand with supply through pricing, providing a social allocation from individuals' provision for their own needs. That the strength of preferences regarding the provision of goods is assessed in terms of the maximum amount individuals are willing to pay represents the second basic principle of CBA. However, consumers who act in their own interest will not necessarily always promote social interests. *Market failure* includes cases in which a market does not exist at all, cases in which there are external effects of production or consumption, cases of markets that are permanently out of equilibrium, and monopolies. Thus, markets cannot solve all social problems, and CBA has actually been developed in order to help find solutions to problems in cases of market failure. To help find solutions to social problems that the market does not solve, economists study the demand for such solutions by investigating if it is possible to estimate individuals' willingness to pay for the provision of non-market goods.

### *2.2.3 Maximising efficiency*

The objective of a CBA is to find the most efficient solution to the problem that is subject to analysis. Efficiency in welfare economics is a value term, closely related to consumer surplus. The consumer surplus is the welfare in monetary terms of consumption (of either market or non-market goods), given from aggregate demand in value terms ('the area under the demand curve') minus the cost of provision (price – if it exists). The CBA measures efficiency increases in economic terms, usually referred to as potential Pareto improvements. A potential Pareto improvement refers to a situation in which those who get the benefits of a change that is made are able to compensate those who lose from the change, while retaining a net benefit. In practice, a potential Pareto improvement is regarded as attained whenever the benefits of an action are greater than the costs of the action. The objective of a CBA is thus to identify policy options that provide marginal benefits that are at least as great as the marginal costs of those options – increasing society's efficiency (socio-economic yield).

### *2.2.4 Distributional neutrality*

In a CBA it is normally not relevant who gets the benefit and who pays the cost. Thus, an ordinary CBA is neutral with respect to distributive issues; it does not take a position concerning how best to distribute benefits and costs among various groups of the population. Fairness in income distribution is not the issue that CBA seeks to solve.

### *2.2.5 Social constraints*

However, a social CBA cannot be removed from fundamental social constraints. The CBA becomes meaningless without institutions that are to promote the welfare of individuals. In short, social institutions and basic equity ('rule of law') represent prior

premises of CBA. As Adam Smith pointed out, while individual benevolence in every act may be dismissed, justice is really a necessary condition for social welfare. One may bring this further and claim that CBA really gains its relevance in modern states with rule of law, democracy and transparent governance.

Opinions about the suitability of using CBA to illuminate options for solving social problems depend very much on how acceptable one considers the basic principles of CBA to be [8]. In particular, a strict application of the principle of consumer sovereignty may be problematic. A case in point: to what extent is a severely dependent individual like refugee capable of making judgements regarding his or her mobility? Should not society intervene in the interest of providing equal mobility opportunities, by modifying the understanding of the externality produced by heavy car dependence?

### 2.3 The pros

The arguments in favour of the CBA fall primarily into two broad categories: first, there exist economic assertions that that better results can be achieved with CBA. Second, there are legal and political claims that a more objective and more open process can emerge through this kind of analysis. The first claim regarding efficiency sees a wide adoption of CBA to further efficiency by ensuring that regulations are only adopted when benefits exceed costs and by helping direct regulators' attention to those problems for which regulatory intervention will yield the greatest net benefits. But many advocates also raise a more specific argument, imbued with a greater sense of urgency. The government, it is said, often issues rules that are insanely expensive, out of all proportion to their benefits – a problem that could be solved by the use of CBA to screen proposed regulations. Thus much of the case for CBA depended on the case against current regulations. We will analyse this further in the case of issuing of driving license.

A second important set of arguments holds that CBA would produce a better regulatory process – more objective and more transparent, and thus more accountable to the public. The idea is to prevent an agency from doing either from just doing anything it wants or, more individually, from benefiting politically favoured groups through its decisions. CBA has been offered as a means of constraining agency discretion to avoid these kinds of results.

Another important goal said to be promoted by CBA is transparency of administrative procedures. For example, in the case of environmental protection which involves input from biologists, toxicologists, epidemiologists, economists, engineers etc., the technical details leave much to be desired in terms of clarifying issues like how much scientific uncertainty is too much, which human populations should be protected from illness, how important the future is relative to the present etc. In order for the public to be part of the process of decision making about the environment, these judgments must be offered and debated in language accessible to people who are not biologists, toxicologists, or other kinds of experts. Many advocates of cost-benefit analysis believe that their methodology provides such a language. They also assert that cost-benefit analysis renders decision making transparent insofar as it requires decision-makers to reveal all of the assumptions and uncertainties reflected in their decisions.

## 2.4 The cons

The arguments against CBA abound the research circles today referring primarily to these four fault lines:

- i. The standard economic approaches to valuation are inaccurate and implausible.
- ii. The use of discounting improperly trivialises future harms and the irreversibility of some environmental problems.
- iii. The reliance on aggregate, monetized benefits excludes questions of fairness and morality.
- iv. The value-laden and complex cost-benefit process is neither objective nor transparent.

CBA requires the creation of artificial prices for all relevant social impacts. To weigh the benefits of regulation against the costs, we need to know the monetary value of preventing social exclusion, providing safer environments etc. CBA, which relies on estimates of individuals' preferences as consumers, also fails to address the collective choice presented to society by most social problems.

Further, philosopher Henry Richardson argues that reliance on the cost-benefit standard forecloses the process of democratic deliberation that is necessary for intelligent decision-making. In his view, attempts to make decisions based on monetary valuation of benefits freeze preferences in advance, leaving no room for the changes in response to new information, rethinking of the issues, and negotiated processes that lie at the heart of the deliberative process [22]. In the following section, we explore the concept of social exclusion (SE) and its interface with transport before commenting on how the method of CBA may be employed to discuss social exclusion. Surprisingly, this theme yet remains an untouched domain.

## 3. WHAT DOES THE CONCEPT OF 'SOCIAL EXCLUSION' ENTAIL?

A constant refining of the idea of 'development' has finally convinced us that analysing development solely through economic growth, increasing GNP etc. suffers from serious fallacies. Through the influential works of Amartya Sen, Martha Nussbaum, Mahbub-ul-Haq and the likes, development has acquired the broader connotations of capabilities, integration etc. (The Human Development Report, published annually by the UNDP since 1990, draws substantially on the idea of *capabilities*). The last decade witnessed a vigorous pursuit by the European debate on social exclusion and work undertaken at the International Institute of Labour Studies to include 'social cohesion' as one of the main dimensions of development. Thus 'What has been happening to social exclusion' is a fundamental question that needs to be asked about development and its style and patterns [2]. Though there exists myriad forms of interpretation, the three easily discernible dimensions provided by this concept are as following:

1. Process orientation (the realisation of a dynamic social process that can be changed)  
"Social Exclusion is a dynamic process of being shut out, fully or partially, from any of the social, economic, political and cultural systems which determine the social integration of a person in society" [31].
2. Participation in decision-making (this being posited as an integral feature for inclusion in society)

“An individual is socially excluded if (a) he or she is geographically resident in a society and (b) he or she does not participate in the normal activities of citizens in that society” [3].

### 3. The role of space and location (there by identifying isolation, both through self-imposition and spatial processes, in influencing the experience of exclusion)

“A multi-dimensional process, in which various forms of exclusion are combined: participation in decision-making and political processes, access to employment and material resources, and integration into common cultural processes. When combined, they create acute forms of exclusion that find a spatial manifestation in particular neighbourhoods.” [16].

Undoubtedly, social exclusion is a complex and multi-faceted concept, referring to the interplay between individuals and societies expressed through disadvantage, alienation and lack of freedom. The challenge lies in delineating the different facets of social exclusion and addressing them both individually and as a part of an integrated development process. One of such facets of social exclusion has been recognised to be the inability to participate in normal societal activities due to lack of accessibility or transport disadvantage. Transport has been recognised as a vital medium of alleviating or exacerbating social exclusion. The next section explores this particular nuance of social exclusion.

#### 3.1 Transport and social exclusion

Transport has been recognized as an important factor leading to social exclusion [5,9,12,13,14,15,17,21,25,26]. Breaking through the traditional association of transport to revealed travel behaviours, the theme of transport and social exclusion brings forth an entire array of physical, social, cultural, age-related, gendered, economic etc. differentiations on the dais for incorporating in the transport discussion. Lucas et al. [13] highlight four main ways in which transport can contribute to social exclusion. These are: (i) the negative impact of road traffic, (ii) inadequate public transport [30], (iii) reduced or poor accessibility to basic facilities [6,18] and (iv) travel poverty [24].

In a pioneering effort to streamline this subject, UK’s Social Exclusion Unit (SEU) finally put it forth as a policy issue. Within the UK transport sector, the existing policy discussion around transport and social exclusion envisages transport’s role as a constraint on effective service delivery in a range of policy areas targeted by the current Government, such as health, healthy food, education and training [4,7,26,27,28]. The recent report from (Social Exclusion Unit, 2003) makes significant movement towards ‘access to services’ understanding. It proposes a set of processes and protocols for the transport planning community called ‘accessibility planning’ by which access to services can be improved and the negative role of transport in the experience of social exclusion can be tackled. Similar work as part of the Scottish Executive funded-work on Social Exclusion and Transport [11] have also adopted the accessibility planning principle.

An analysis of the contexts which created and perpetuated social exclusion in Britain revealed the following five key barriers in accessing key services [26]:

- *The availability and physical accessibility of transport:* For some people there was no public transport, or it did not go to the right places or at the right times, or it did not go often enough or reliably enough, or vehicles were not accessible to disabled people.
- *Cost of transport:* Some people found the costs of personal or public transport to be very high or unaffordable. Bus fares have reportedly risen by nearly a third since



1985. Motoring costs accounted for 24 per cent of the weekly expenditure of households in the lowest income quintile who had cars.

- *Services and activities located in inaccessible places:* Developments including housing, hospitals, business and retail were often located in areas not easily accessible to people without a car. Between 1986 and 1997, the number of out-of-town shopping centres increased four-fold.
- *Safety and security:* Some people were unwilling to use public transport or walk to key services because of fear of crime or antisocial behaviour, or fear of road accidents. For example, 53 per cent of women and 23 per cent of men felt unsafe waiting on a train platform after dark.
- *Travel horizons:* Some people were unwilling to travel long journey times or distances, or did not know about or trust transport services. The average distance to work for people on low incomes was three miles compared with eight for the general population.

We see that the present understandings of this theme revolve broadly around the interface of accessibility and space (and location). Past studies have dealt in a very limited way with some other important dimensions of SE, namely, ease of procuring driving license, participation in decision-making and how to intrude in the processes leading to social exclusion. The following sections elaborate these themes further by borrowing from the field of economics.

#### **4. IS SOCIAL EXCLUSION (CREATED BY TRANSPORT DISADVANTAGE) MEASURABLE?**

A common problem facing operationalising amorphous concepts like *capabilities* and *exclusion* is developing a yardstick against which progress can be measured and monitored. The importance of such yardstick originate from the fact that the impact of government policies, measures and programmes can be examined over time only if improvements can be measured and shortfalls identified and corrected [2]. As Streeten (1994:236) notes, 'there is considerable political appeal in a simple indicator that defined important objectives and contrasts them with other indicators'. However, being a relatively new concept, there does not exist an established frame of reference for measuring social exclusion in the transport sector. The initiative in this field has been taken up by SEU's approach through its focus on accessibility to local services and activities and developing the said accessibility indicators. Accessibility indicators comprise a set of local indicators and target to measure accessibility and the analysis undertaken has concentrated primarily on the following six areas:

- Access to work
- Access to learning
- Access to healthcare
- Access to food shops
- Access to social, cultural, and sporting activities
- Impact of traffic on deprived communities

Further, the box below offers some tentative examples of the type of indicators that SEU underlines as likely to be needed to monitor and evaluate delivery on the plan. With a strong focus on the role of space and location in developing these indicators, clearly the point completely amiss here is the omission of the two other dimensions of social exclusion, namely the elements of process orientation and participation in decision making. I propose that this arises primarily due to a constricted understanding of social exclusion itself. A much better understanding can be generated through framing social exclusion as a cost or externality. Only then can we ensure its inclusion in the traditional cost-benefit analysis and have a strong impetus to put forward the development of alternatives for reducing social exclusion. The next section delves into this concept and puts forth arguments for it.

**Box1. Potential indicators for monitoring improvements in accessibility**

**Journey times and distance to bus stops**

- Proportion of people within 10 minutes walk of a [5, 10, 15]-minute bus service
- Proportion of people who can get to [key employment locations/appropriate hospital/affordable food shop/] within [45] minutes door-to-door by public transport
- Proportion of 5–11-year-olds who can get to [xx] primary schools within [1 kilometre]
- Barriers to using public transport
- Proportion of fully accessible buses on certain routes or in areas
- Proportion of people who say they do not use public transport because of fear of crime

**Trip rates**

- Trips per person by mode of transport or journey purpose
- Customer care and satisfaction
- Proportion of transport staff trained in customer care and disability awareness
- Overall customer satisfaction with public transport services

**Impacts**

- Number of child pedestrian casualties per 1,000 children in population
- Levels of air pollution

**Driving/car access**

- Proportion of households with access to cars

**Cost of travel**

- Average local bus fare per mile
- Average bus fare

**Access to services**

- Proportion of people saying they find access t Access to work
- Access to learning
- Access to healthcare
- Access to food shops
- Access to social, cultural, and sporting activities
- Impact of traffic on deprived communities
- Access to specific services (for example, hospital, GP, school, college etc.) difficult

**Access to food shops**

- Proportion of people within [500 metres] walk of a food shop

*Source: Social Exclusion Unit 2003*

### 3.2 Social exclusion as an externality (process orientation)

We saw that the dimension of process orientation defined SE as a dynamic process of being shut out, fully or partially, from any of the social, economic, political and cultural systems which determine the social integration of a person in society. This process inevitably occurs as a by product of the actions taken by the society as a whole. Referring to our former example (of natives vs. immigrants) and the importance of public transport as a medium of alleviating social exclusion recognized by previous studies, we pose that the social exclusion is occurring as an externality in the society. Externality is

defined as:

'When the activity of one entity (a person or a firm) directly affects the welfare of another in a way that is outside the market mechanism, that effect is called an externality (because one entity directly affects the welfare of another entity that is 'external' to it). Unlike effects that are transmitted through market prices, externalities adversely affect economic efficiency' [23].

If the natives are primarily dependent on cars, and the immigrants face it hard to procure a car/car-driving license, then the market takes into account the revenue which will be generated through the percentage of public transport users and allocate weightage to this product according to this calculation. This inevitably leads to a limited supply of public transport. Economists often claim that markets allocate resources efficiently. Does this mean that having people excluded is efficient? To answer this question, it helps to begin by distinguishing different ways in which people can affect each other's welfare.

Since large numbers of people are using private cars, the traditional transport model captures this tendency and the future transport planning follows this trend. In lack of substantial patronage, the price of public transport increases. Car owners/users are better off, but the welfare of public transport users decreases. In this example, all effects are transmitted via changes in market prices. Suppose that the allocation of resources was Pareto efficient. The shifts in supply and demand curves change relative prices, but competition guarantees that these will be brought into equality with the relevant marginal rate of substitution. Thus the fact that the behaviour/preference of one group affects the welfare of others does not necessarily cause market failure. As long as the effects are transmitted via prices, markets are efficient. However, the 'loss of opportunities' and inability 'to procure jobs' etc. puts forth a different type of interaction. The decrease in welfare of the PT users is not only a result of price changes. Rather the preference of car-users directly affects the utilities of the public transport users. This presents both a process and cost which is still not being taken into consideration while discussing social exclusion. The next section puts forth certain economic understandings related to the case of high-priced driving license to initiate economic interpretations of transport and resultant social exclusion.

## 5. THE CASE OF HIGH-PRICED DRIVING LICENSE (DL)

Traffic accidents are a growing problem in the world today. In general road safety can be improved by measures regarding infrastructure, vehicle or behaviour. The behaviour of a driver is influenced by his competences and capabilities. Having a very strict driving course regime ensures that the driver possesses basic minimum competences and capabilities required for safe driving. There is however another side of the story boiling down to very high priced driving license. This case is more evident in Norway where driving courses are given by private schools, putting the average cost of procuring a driving license in the range of 3000-4000 USD. We further explore this case.

Referring to the assumptions laid down in the introduction (page 2), we start with looking at the market for DL. We wish to keep this simple while at the same time seek to capture the fundamentals. We assume that the market is in perfect competition and the market equilibrium is given by supply equals demand, where the supply side is being run by marginal cost pricing.

$$P = MC \dots \dots \dots (I)$$

Due to the safety concerns and theory inputs regarding driving license, we assume that the new policy increases the marginal cost of supplying a given quantity equally much for all suppliers, therefore increasing the marked price from

$$P=MC \text{ to } P=MC(1+a), 0 < a < 1.$$

The demand for DL in this case is however more complicated to deal with, as there are several factors that may have an effect. Still we find it reasonable to represent the market demand through the aggregated demand curve. So, if the individual consumers demand for DL is given by  $X(p,q,M_i)$ , and his demand for PT is given by  $Y(p,q,M_i)$  (where both goods are discrete),  $p$  represent the price of a DL, and  $q$  the price for a bus card etc. Then the market demand, or aggregated demand is the sum of all consumers' demands, given by the following equation:

$$X(p,q,M_1,M_2,\dots,M_n) = \sum X_i(p,q,M_i) \dots\dots\dots (II)$$

Now, as  $q$  is held constant and  $X$  is a discrete good, the individual consumer demand can be represented by their reservation price. Given this, we can then put the quantity of DL,  $Q$ , as a decreasing function of its price,  $p$ .

$$Q(p)=a - bp \dots\dots\dots (III)$$

This is of course an oversimplified expression, but as it captures the main condition that we are seeking, we assume it holds for now. Given (I) and (III) we can depict the initial equilibrium graphically.

Before the policy to increase the price of driving license, the market was in an equilibrium with  $P = MC$ ,  $Q = Q^*$  and where the consumer surplus was given by the area equal to  $abc$  in Figure 1. After the policy however the price increases to  $P = MC(1+a)$ ,  $Q$  shifts to  $Q_1$  and the consumer surplus is reduced to  $ade$  in Figure 2.

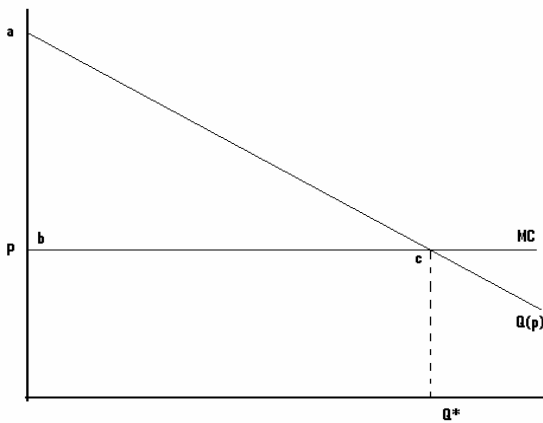


Figure 1. Market curve for Driving License

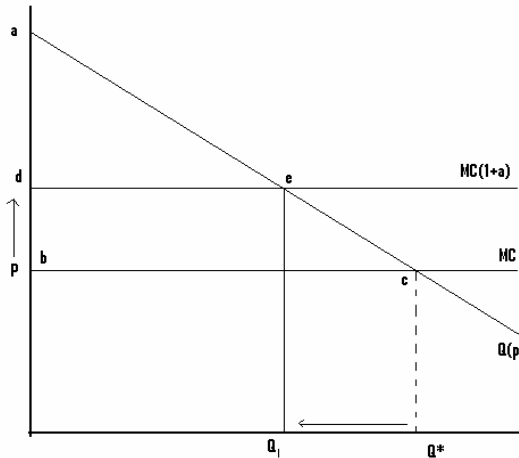


Figure 2. Shifted demand-supply curve

As we can see from the graph above, the policy both reduces the consumer surplus and also excludes the number of people equal to  $Q^* - Q_1$  from having a driving license. The size of this population ( $Q^* - Q_1$ ) will primarily depend on the price elasticity of demand. Given our demand function (III), this elasticity would equal to

$$Elp Q = (p/Q)dQ/dp = -bp/(a-bp) \dots\dots\dots (IV)$$

If we simply assume that that the price elasticity of demand for DL is equal to -1. In other words that a 1% increase in price leads to a 1% decrease in demand. The price elasticity would equal to:

$$E_p Q = |-a/2b| \dots \dots \dots (V)$$

One should note however, that using the equation (IV) alone is far from being a sufficient measure. As given by [19], there are many other factors that would play a role in estimating this elasticity. As we also have assumed that the consumers have preferences for time costs, and as we will show later, that this policy may indeed have an impact of the time cost of both car and PT usage, this element should also have been included in the elasticity estimate. But to cover the full implications of this aspect lies beyond the scope of this paper.

### 5.1 The CBA and pareto efficiency

Given our earlier introduction to the CBA and our definition of pareto efficiency, how can we view the conditions given above? We know that a CBA basically means that the benefits of a project of policy should be estimated to be higher or equal to the costs. Furthermore according to the definition of pareto efficiency, the policy can only be viewed as pareto efficient as long as the benefactors from the policy are capable of compensating the victims of their loss. If we then for simplicity assume that the cost of this policy is given by exclusion alone, what can then be argued to be the benefits of this policy, and can the policy be viewed as being a pareto efficient one from the policy maker's side? To give an answer to this question, we need to discuss some probable implications of the policy. In an attempt to give a brief discussion of plausible implications, we will narrow the discussion down to two cases: (i) A congested system with a high rate of substitution between driving and PT (for example, in Oslo), and (ii) A non-congested system with a low rate of substitution between driving and PT usage.

### 5.2 Implications

The first thing to notice is that the policy will not affect the current drivers directly as they already has a D.L. If we assume that the number of people that stops driving (due to age, illness etc.) is held constant, the policy will mainly have an effect through reducing the quantity of people that enter the driving force. In other words we can argue that the policy over time may both reduce the driving force and increase the general driving skill. On this basis we can further argue that the policy may have a positive effect on the car users over time. How strong this effect is will then depend largely on the congestion and demand elasticity. If we start with looking at the congested case, one good example of how a possible policy effect is given by the Downs-Thomson paradox [1]. If we focus on the essence of this paradox and assume that the matrix is held unchanged, then for a given road-system with a set capacity C, the overall time cost of driving can be put as a function of car frequency F and driving skill s.

$$T(F,s) = \alpha + F(1-s)/C \dots \dots \dots (VI)$$

- where,             $\alpha$  – min drivingtime
- F- Car frequency
- s- Driving skill,  $0 < s < 1$
- C – Capacity

As we can see from (I), both an increase of s and a decrease in car frequency (F) can lead to lower time-cost for the initial car users. If the impact of driving skill (s) is "small", the effect may depend the most of the change in frequency. The size in the reduction of frequency then can depend on several factors, but here we choose to look on the role of the PT system.

Because given the assumption that the travellers have preferences for time-cost only, and that travel mode is of no importance, the consumers “willingness to pay”, or equally, their reservation price for getting a DL, can be argued to depend on the time cost of public transport usage. As the rate of substitution between car and PT usage is high, so that the travellers can switch between car and PT usage with ease. A reduction in the number of people having a DL, with income and transport need kept constant, may give an increase in the demand for public transport. Then as the PT system is running under economics of scale, which means that it faces a falling average cost curve. An increase in demand will not lead to an increase in price, but rather an increase in producer revenues [20]. If the demand is a function of price given by the general expression

$$D(p) = \beta - cp^* \dots \dots \dots (VII)$$

The increase in demand will shift the demand out from  $Q(p)$  to  $Q(p)'$ . For an unchanged price  $p^*$ , the quantity of users will increase from the initial quantity  $Q^*$ , to the new quantity  $Q'$ .

For the users of the PT this may then lead to another unexpected benefit. As given by the Downs-Thomson paradox [1], if the initial PT usage is close to its max capacity, the increased demand for for PT may lead to lowered time cost for the initial PT users! Given these implications and our assumptions, we can clearly see how a CBA could end up favouring this policy and also how it could be viewed as being Pareto efficient.

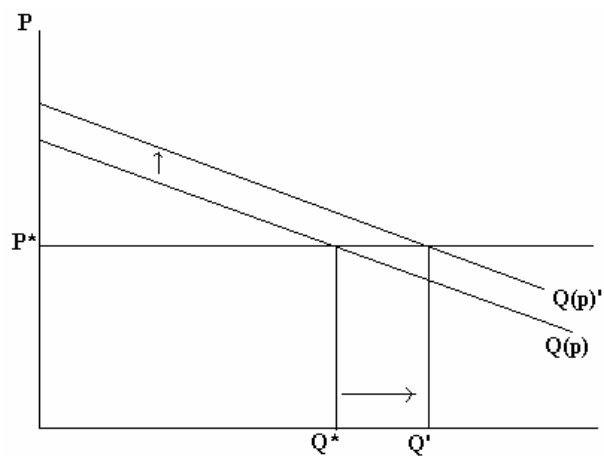


Figure 3. Modified demand-supply curve according to willingness to pay

Now we move on to briefly look on the non-congested case. The expression (VI) holds, but now frequency is low compared to capacity. The reduction in the number of drivers over time will have little impact on the time cost of car users. Also, as the rate of substitution between car and PT is low, and the initial PT usage is “low” relative to capacity, the policy will not have a significant impact on travel time. Therefore, in the non congested case we can argue that neither the initial car or PT users will benefit of the policy beyond the fact of new drivers knowing theory better. Still, if one look on both cases together, the change could still end up being recommended in a CBA aspect, and also viewed as Pareto efficient.

## 6. SUMMARY

Transport and social exclusion remains primarily a sociological issue till date with only preliminary interests from transport planners to test the depths of the problem. Factors like income, culture, age, gender, education etc. will invariably give rise to different preferences concerning mobility patterns. Yet, the present trend is dictated by car related mobility. This is inevitably leading to social exclusion of people with no access to car/car-driving license. Further, research studies have acknowledged that the

differences between the groups are growing. In light of social sustainability, the differences between the groups over time should be either reduced or remain as a minimum stable. But since the differences are growing, the present mobility trends are clearly unsustainable.

Past studies have also highlighted that access to car and driving license has direct implications on entering the labour market. Referring to our analysis of high priced driving license, we can put forth the following questions:

- Would this policy further reduce the excluded people's probability for getting access to labour market?
- Would the policy hit some groups more than others?
- If so, could these increased differences between the groups have a negative impact on integration and therefore the income distribution in the future?
- If some ethnic/low-income groups are affected more than other and becomes even more depended on PT, could this cause more ghettos around the PT system/stations?

Clearly the questions put forward a string of issues having direct bearing on vital issues like integration between natives and immigrants, freedom of participation etc. Out of the three dimensions of social exclusion (process orientation, participation in decision making and the role of space and location), the transport studies have focused primarily on the role of space and location. However, the principles of CBA also recognise the element of decision making process to safe guard the victim when one consumer's sovereign consumption choice clashes with other consumer's choice. The related economic theories implicitly base this on some institutional context that assures basic rights and freedom. However, CBA has not been able to capture the essence of social exclusion in transport decision making. The total costs to society of travel have been framed primarily around costs of accidents, travel time, vehicle operation and environmental impacts. Societal concerns like exclusion due to constrained mobility and related causes are still not included in cost-benefit analyses. As highlighted in the example case, policies like high priced driving license can get both recommended in a CBA analysis and viewed as Pareto efficient without even referring to the implications it might have on social exclusion. Owing to the principles of distributional neutrality, CBA ignores the questions of who suffers as a result of social inequities and therefore, threatens to reinforce the existing patterns of economic and social inequality. Clearly there are a number of complexities involved in discussion social exclusion. However the point to be driven home is that it needs to be made part of main stream transport planning and analysis. Traditional CBA with their focus of maximizing efficiency can often lead to contradicting social principles of integration and social inclusion.

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