

Attracting New Patrons and Retaining Existing Patrons - A Forgotten Trade-Off?

Trevor J. Grigg
*Professor and Head
Graduate School of Management
The University of Queensland*

Abstract:

The patronage of public transport systems experienced several decades of decline. Only recently has there been evidence in several systems of a reversal of this downward trend, although even where the trend is upwards it is rarely at a rate sufficient to maintain public transport's market share of urban travel.

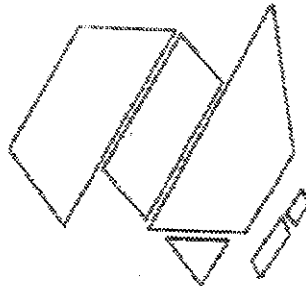
In examining patronage trends, it is important to recognise that from year to year a number of patrons cease using the system while others are attracted to it. It is also important to question the relative levels of resources committed to retaining existing patrons as compared to the resources committed to attracting new patrons.

The aim of this paper is to develop a simple model to explore this trade-off.

Contact Author:

Professor Trevor J. Grigg
Graduate School of Management
The University of Queensland
BRISBANE QLD 4072

Telephone: (07) 365 6225
Fax: (07) 365 6988



1. INTRODUCTION

The patronage of public transport systems world-wide has shown a steady decline over the period 1970 to the mid 1980's. Since the mid 1980's there has been evidence in several systems that this downward trend has at least been halted and, in some cases, is being reversed. The reasons for this reversal of patronage trends can be attributed to a diverse number of factors, including:

- improvements in the overall quality and level of service provided by public transport operators
- increasing levels of car congestion in urban corridors
- decreased availability of central city parking spaces and the development of associated parking pricing policies
- improved marketing of public transport services by operators
- increasing school retention rates, leading to an increased use of public transport by school aged members of the community
- increasing levels of unemployment, "forcing" significant sections of the community to make use of public transport systems, and
- increased participation of women in the workforce which, together with other changes in household lifestyles and structures, has meant that the household motor vehicles are not as available to all members of the household as they may have been previously for the purposes of school and work journeys.

However, in examining the trends in public transport usage, it is important to recognise that from year to year a number of patrons stop using the system while others are attracted to it. The reasons why patrons might leave a system include:

- completion of their schooling
- exiting from the workforce on retirement or for other reasons, and
- switching to other modes of transportation because these modes have become more attractive.

Because from year to year some patrons are leaving and others are being attracted to a system, it is important to ask questions about the relative level of resources committed to retaining existing patrons as compared to the resources committed to attracting new patrons. It may, for example, be far more cost effective to focus primarily on retaining existing patrons and to give less emphasis on attracting new patrons or vice versa.

The aim of this paper is to develop a simple model to explore this trade-off in an introductory manner.

2. THE MODEL FRAMEWORK

Consider a public transport agency that has an existing patronage of P within a given time period prior to the beginning of the next time period 1. Further, let the unit costs and benefits and other patronage attributes of the system be as follows:

- let b be the net social benefit of each passenger trip made, including all costs associated with that travel, except for those costs expended by the agency in the marketing of services in order to retain existing patrons or to attract new patrons. These costs could include those associated with deliberate decisions to alter the quality and level of service of the services provided to existing customers.
- let c be the average cost expended in attracting "new" patrons per unit time period, expressed in terms of the cost per "new" passenger trip made.
- let r be the average costs expended in retaining existing patrons per unit time period, expressed in terms of the passenger trips undertaken by existing patrons per unit time.
- let a be the proportion of existing patrons (trips) at the beginning of a time period retained by the agency (that is, still using the services of the agency), at the end of that time period.
- let mP be the number of new patrons (trips) attracted to the public transport agency's system in a given time period expressed as a fraction m of the number of patrons (trips) at the beginning of time period 1, namely P . That is, for the sake of simplicity, it is assumed that the agency is able to attract a constant number of new patrons per unit time, with these new patrons drawn from the overall growth in the number of trip makers, which, if linear growth is assumed, implies that the public transport agency maintains a constant share of the growth in overall travel. This is an assumption of convenience and could be altered, as required, in any modelling exercise.

3. TRIPS (PATRONS) TIME SERIES

At the beginning of time period 1, the number of trips made on the system in the previous time period is observed as P . Therefore, during time period 1, the number of trips $P(1)$ made on the system will be given by:

$$\begin{aligned} P(1) &= \text{retained patronage} + \text{attracted patronage} \\ &= a.P + m.P, \text{ where } 0 \leq a \leq 1 \\ &= (a+m)P \end{aligned}$$

For subsequent time periods 1 to t

$$\begin{aligned} P(2) &= a P(1) + mP \\ P(3) &= a P(2) + mP \\ P(t) &= a P(t-1) + mP \\ &= [a^t + m(1+a+a^2+\dots+a^{t-1})]P \end{aligned}$$

$$\text{Simplifying, } P(t) = [a^t + m(1-a^t)/(1-a)]P \quad \text{for } a \neq 1$$

For large t , that is as $t \rightarrow \infty$

$$\begin{aligned} \dot{P}(t \rightarrow \infty)/P &= P(\infty)/P \\ &= m/(1-a) \quad \text{for } a \neq 1 \end{aligned}$$

Time series plots of patronage $P(t)$ are shown in Figure 1 and serve to highlight the significance of the relative ability to attract new patrons for longer term patronage levels, given the inability of any agency to retain all existing patrons from one period to another. Note that, depending on the relative ability of an agency to attract or retain patrons from one time period to another, there will be either patronage growth or decline in the future.

4. THE NET SOCIAL BENEFIT TIME SERIES

The total net social benefit in period $B(t)$, including all marketing costs associated with retaining some fraction of existing patrons and attracting new patrons, is given by:

$$B(t) = b P(t) - r(a.P(t)) - c.(m.P)$$

where $b.P(t)$ equals the total net social benefits of patronage $P(t)$

$r(a \cdot P(t))$ equals the total cost of retaining patronage $a P(t)$ in period (t) , and

$c \cdot (mP)$ equals the total cost of attracting new patronage mP in period (t) .

$$\text{That is, } B(t)/(bP) = [1 - a(r/b)]P(t)/P - m \cdot (c/b)$$

For large t , that is $t \rightarrow \infty$:

$$\begin{aligned} B(t \rightarrow \infty)/(bP) &= B(\infty)/(bP) \\ &= [(1 - a(r/b))/(1 - a) - (c/b)] \cdot m \end{aligned}$$

That is, in the longer term, the total net social benefit (including all marketing costs and costs associated with altering levels and quality of service), will only be positive if

$$\begin{aligned} a &> (b-c)/(c-r) \text{ for } a < 1 \\ &> (1-c/b)/(c/b - r/b) \text{ for } a < 1. \end{aligned}$$

Time series plots of total net social benefits $B(t)$ are shown in Figure 2. The significance of variation in the average cost of attracting patrons is highlighted in the figure. As expected, total net social benefits decrease with increasing costs of attracting patrons, other parameters held constant. Note, that the particular retention and attraction rates for patrons assumed (namely, $a=0.9$ and $m=0.15$) imply patronage increases over time (refer to Figure 1.) Nevertheless, as Figure 2 demonstrates, it takes several time periods for the total net social benefits per period to exceed their initial level because of the combined effects of patrons discontinuing their use of the system and the recovery of the initial costs incurred in attracting patrons.

5. MARKETING POLICY IMPLICATIONS

What the above analysis has shown is that once decisions are made, either implicitly or explicitly, concerning the level of resources that will be committed to either attempting to retain existing patrons or to attract new patrons, the public transport agency has set itself on a time series trajectory of patronage and total net social benefits which will lead to either an improvement or a decrement on the existing situation.

It is interesting to note in the context of the Brisbane City Council bus operations, for example, that the recent reversal in the downward trend of patronage has been associated with significant changes in both the level and the quality of service provided and associated marketing efforts and fare structure changes. Although the data are not available to substantiate the hypothesis, it seems reasonable to assume that the changes in patronage observed are due largely to a change in the resources committed to retaining and attracting new patrons, in terms of both the level and the balance of the resource allocation. In effect, these changes have resulted in a different trajectory of patronage and total net social benefits over time than would otherwise have been the case (refer to Figure 3).

In Figure 3, prior to time t_1 , patronage was in decline as patrons left the system at a faster rate than new patrons were attracted. Between time t_1 and t_2 , the public transport agency introduced a new approach to marketing its services, such that beyond time t_2 patronage began to trend upwards as both retention and attraction rates increased in response to the marketing effort.

In terms of the modelling framework provided, changes in the patronage trajectories can be also conveniently demonstrated, as presented in Figure 4. Figure 4 shows the longer term levels of patronage response and total net social benefit (including all costs) which can be expected from an initial existing position, for given retention and attraction rates for patrons, the associated unit costs of marketing to both retain and attract patrons, and the net social benefits per trip.

For example, consider a situation where one agency decides to increase the level of resources committed to attracting new patrons to its system from c_1 per attracted patron to c_2 , thereby increasing the attraction rate from m_1 to m_2 , commensurate with this increased resource allocation. Assuming no other changes, the agency can expect an increase in the longer term level of patronage, than would otherwise have been the case, from P_1 to P_2 . It can also expect for there to be a change in the total net social benefits (including all costs). As shown in Figure 4, there is an increase in the overall level of benefits from $B_1(\infty)$ to $B_2(\infty)$, but this need not necessarily be the case as the eventual outcome is determined by the relative increase in patronage versus the relative increase in the resources committed to achieve that improvement.

As an alternative strategy, the agency may decide to increase the level of expenditure allocated to retaining existing patrons from r_1 to r_3 per retained trip, triggering an increase in the rate of retention of existing patrons from a_1 to a_3 commensurate with this increase in resources. Assuming no change in the rate m_1 at which patrons are attracted to the system, then consider the situation where, by coincidence, the increase in patronage achieved in the longer term using this strategy is the same as for the alternative strategy of attracting more patrons to the system discussed above. Figure 4 highlights that the agency will achieve a different level of total net social benefits $B_3(\infty)$ (including all costs) using this particular strategy.

The challenge for the agency is to find that balance of resource commitment which maximises the increment in total net social benefits achieved through the application of these additional resources.

6. CONCLUSIONS

The aim of this paper has been a modest one, namely, to highlight that managers of public transport agencies need to recognise the trade-offs they are making when they allocate marketing resources to strategies aimed at retaining existing patrons on the one hand and attracting new patrons on the other. (Although not discussed in the main body of the paper, one would reasonably expect the task of attracting new patrons to be a more expensive exercise on average than the cost of retaining existing patrons).

Agencies recognise that no matter how great the level of expenditure it will never be possible to retain all patrons, who for reasons unrelated to the system, will cease to be patrons over time. Consequently, agencies ought always to expend some resources on attracting new patrons.

To develop further the modelling framework presented, requires empirical investigation of the relationship between the levels of marketing effort expended by agencies and the corresponding responses of the market place to that effort. The challenge will be to separate out the separate effects of the underlying growth in overall travel from the impacts of the marketing efforts. The author suspects that at present an inappropriately low level of resources is being outlaid in marketing public transport services.

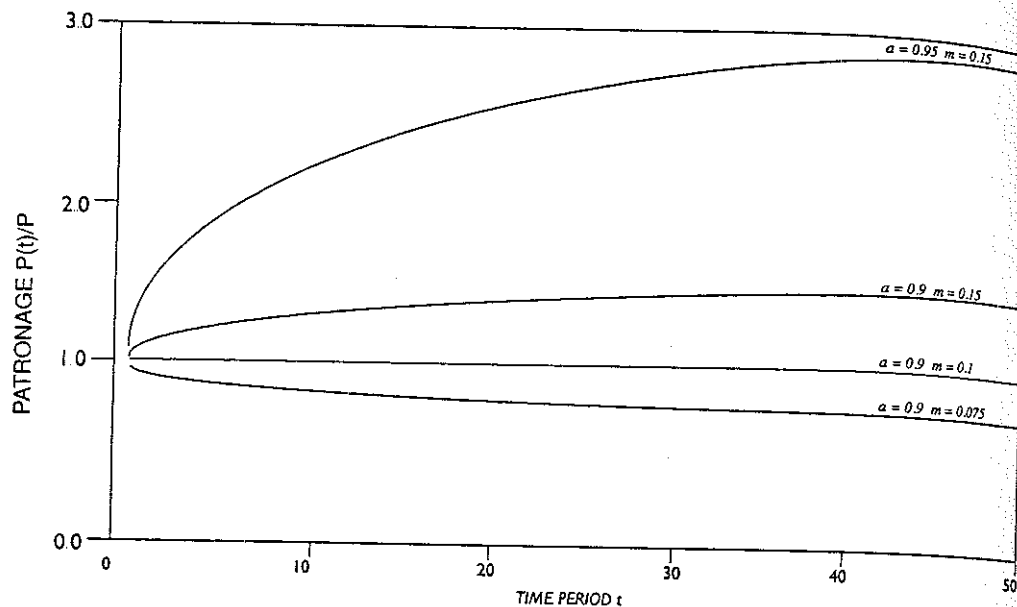


Figure 1 Patronage Time Series

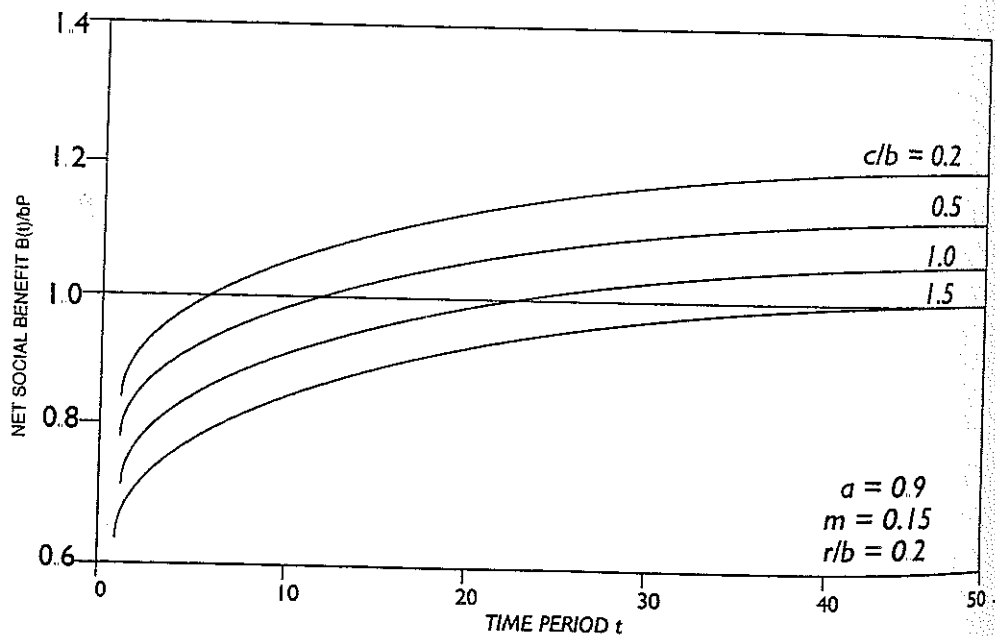


Figure 2 Net Social Benefits

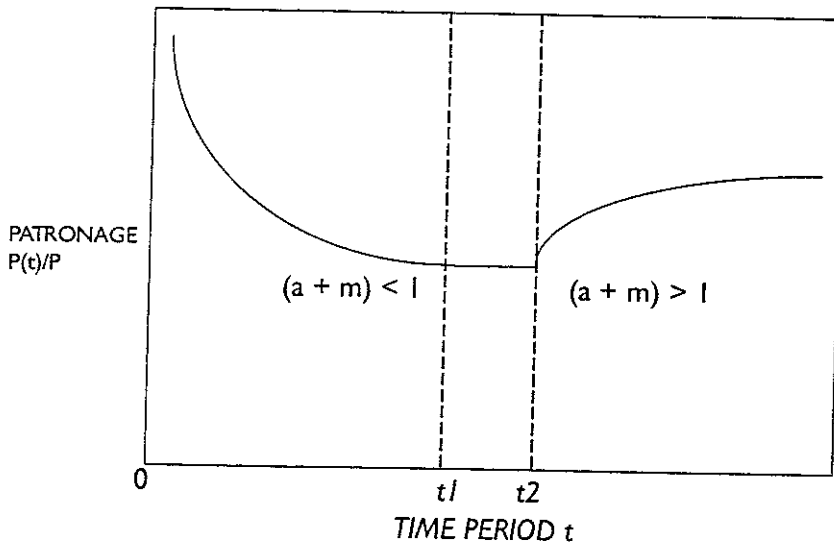


Figure 3 Impact of Effective Marketing

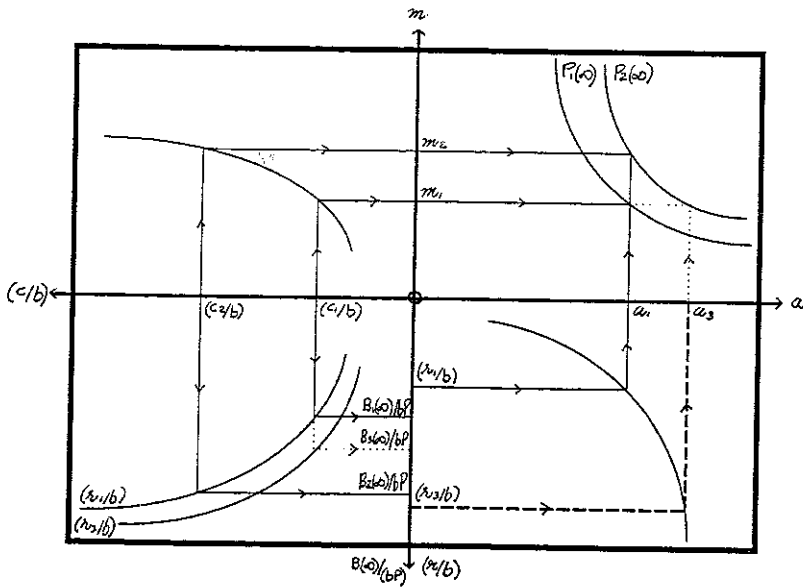


Figure 4 Modelling Changes