

LOW COST PUBLIC TRANSPORT IMPROVEMENTS

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ABSTRACT: Concern has been expressed about the massive capital investment programmes and deficits of public transport undertakings now being financed by Australian Governments and the continued decline in passengers carried. This paper reviews the investment programmes of the undertakings and compares them with other cities abroad. It concludes that investment in Australian public transport systems has not been directed towards significant service improvements that could be expected to attract passengers. Nor have labour-saving devices been developed to the extent abroad.

It is argued that better value for money could be obtained from low cost public transport improvements. However, the limitations placed on management by the strength of the Australian union movement is recognised.

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INTRODUCTION

The last 10 years has seen a big change in the attitude of Australian Governments towards the finances of public transport. The situation in which we now find ourselves in the 1970's is one of escalating deficits and record investment in capital works and is in sharp contrast to the tight rein on public transport deficits and minimum investment in capital works of the previous decade.

Even the Commonwealth Government observing the State's finances floundering under the increasing burden of rail and bus deficits, somewhat belatedly entered the fray and has been handing out money for new rollingstock, research and so on.

Fares on most public transport systems have been held down, in some cases to quite unrealistic levels, and some systems have begun to market (advertise) the services they offer, meagre though many of the services are these days.

Despite the apparent effort, and huge expenditure, that has gone into public transport during the last decade, the results in terms of passengers carried has been disappointing to many of the people behind the rehabilitation programmes.

The thoughts running through Charles Halton's ⁽¹⁾ mind, which incidentally, one could assume would be forcibly brought home to Federal Cabinet, were depicted to the first of the Transport Outlook Conferences organised by the Bureau of Transport Economics in Canberra in 1975. He said during his keynote address:-

"If we first examine urban passenger transport, which is perhaps in itself the most complex issue of all, the major question appears to be whether public transport will continue to carry a declining share of urban trips. Figures recently released by the Australian Bureau of Statistics indicate that between May 1970 and August 1974 the proportion of people travelling to work by public transport in State capitals dropped from 30% to 24%. This was despite a growing awareness of the costs and problems associated with motor vehicle travel in urban areas, and despite intense concentration on methods of improving urban public transport systems.

1 Mr. Halton is Secretary, Commonwealth Department of Transport.

The Australian Government continues to provide assistance to urban public transport, which I have already outlined, must be examined in the light of these results. Comfort and convenience appear to be key factors in influencing personal preferences between urban public transport and the motor car."

It is fair to say, I think, that the Commonwealth's interest in public transport, particularly urban passenger transport, has not escalated since 1975. One might even be getting the impression these days that the Commonwealth would like to be right out of this arena and that its primary role in the land transport scene will in future be concentrated more and more on national road and rail objectives leaving the cities' transport problems to the States.

Why then is it that the money and effort that has gone into public transport over the last decade met with such a poor response, and if the declining interest of the Commonwealth in this field is a reality, where do we go from here?

The Last Decade

First of all, it is useful to reflect on what the transport systems were like in the 1960's and where the money has been spent.

Rail systems, particularly Melbourne and Sydney (which account for about half of the passenger miles by urban public transport systems in the country) were in a run down condition with the majority of the urban trains dating back to the commencement of electrification. The permanent way, signalling, stations and equipment were in mediocre to poor condition and there was little passenger appeal about any of the public transport systems with the possible exception of Melbourne trams. These have always been impeccably kept and provide a high level of service, albeit expensive, relative to other cities. (Fare levels are a reflection on Government policy, not the relative cost of trams versus other modes).

The real need during the 1960's was for a realistic modernisation programme for urban public transport along the lines adopted in almost every major European city. The emphasis there was on new technology to reduce labour costs and to increase the level of service to the passenger. During the 1960's Europe saw the rebirth of the modern tramcar as an articulated unit and no less than 38 cities in Germany alone took delivery of these modern cars. Subway systems were modernised and expanded in the larger cities and new fare collection devices brought flexibility to travel while permitting conversion of all trains, trams and buses to 1-man operation. The improvements commenced in the 1960's have continued and there is no sign of them abating. A recent

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trend, however, has been to abandon some of the more optimistic schemes for extensive underground systems and to settle for modern tramways often operating in traffic free thoroughfares.

Instead of following Europe's example of incremental improvements, Sydney and Melbourne embarked upon expensive underground railways while Brisbane scrapped the second best street passenger public transport system in Australia. (Brisbane did have an excellent tramway system with a frequency of service equalled only by Melbourne).

The Eastern Suburbs railway in Sydney, now expected to open in May and cost \$160M., adds only 1 city and 3 suburban stations to the suburban rail network and it is doubtful if it will carry as many passengers as the Swanson Street tramline in Melbourne. (7,400 passengers in both directions past the maximum load point between 8-9 a.m.). The Melbourne underground, which is a bit further off, will cost even more and I am yet to discover the extent of tangible benefits that will accrue to the majority of rail passengers there. Both of these schemes are luxuries with which these cities could well have done without until their existing asset was modernised to perform a fast, efficient and above all, reliable public transport function with a reduced labour force.

It is even more difficult to find a motive for Brisbane scrapping its trams when so many cities, particularly Sydney, regretted doing the same thing in the 1950's. Since the trams were scrapped in the mid sixties, patronage dropped from 90M. in 1966 to 49M. in 1978⁽¹⁾ - a 46% drop. One of the worst results in the country, if not the worst. During the same period Melbourne's trams lost 28% of their patronage.⁽²⁾

The apparent failure of the bus services probably hastened electrification of the railways.

These examples are the highlights of the initial stages of the boom in capital expenditure on public transport. Subsequently, large orders have been placed for rolling stock particularly in Sydney where over 1200 new buses have been delivered over the last decade. A further 500 or so are in the course of delivery. Incidentally, it is interesting to observe the effect of a tramway system on the replacement of rolling stock. Since the war, some 3630 trams and buses have been delivered, or are in the process of being delivered to the Public Transport Commission of N.S.W. and its predecessors. These figures include 100 corridor trams which only saw 7 years service and 224 Atlantean double deckers many of which have also been withdrawn after a relatively short life.

1 Source: Brisbane Yearbook Volume 4.

2 Source: M.M.T.B. Annual Reports.

In Melbourne, only 334 new trams and 609 buses have been or are being delivered giving a total of 943 vehicles, or just over one-quarter the number of new vehicles for Sydney. The comparison illustrates the longevity of the electric tramcar in comparison with buses, an aspect which has some appeal to conservationists. New railway rollingstock in the course of delivery in Sydney, Melbourne and Brisbane is a big improvement over the dawn of the electric era. New stainless steel vehicles are brighter, faster, more attractive and, most importantly, more reliable than the ancient models being replaced. However, the programme for these new cars is in danger of going too far too quickly. In Sydney, all off peak services are now tabled to be operated with modern stock yet at least 150 new cars are still to be delivered. This raises the question as to how desirable is it to operate peak hour services with brand new equipment which is idle for so much of the time instead of rehabilitating the best of the old cars for restricted peak hour service? The latter alternative would at least have provided an opportunity in the not too distant future to develop an entirely new, technologically advanced and perhaps more economical to run, electric train, which might in turn take over all the off peak running.

Integration of rail services as currently practised in Australian urban rail systems has some operational advantages but there are also severe disadvantages. For example, an accident or a failure in one part of the Sydney metropolitan rail network quickly spreads throughout the system causing widespread disruption to timetables. Perhaps an even more serious shortcoming of integration is the inability to modernise one part of the system at a time and achieve immediate benefits from the capital invested in new technology. Just as a chain is only as strong as the weakest link, a completely integrated system can perform only as well as the worst equipment.

Track renewals, upgrading the signalling system and replacement of bridges and structures will continue to be a heavy drain on capital funds for which the passenger will perceive little change in the level of service. These expenditures are nonetheless unavoidable as the Granville disaster proved and the burden of the current costs is a reflection on management in the past.

In summary, the last decade has seen major expenditure in extensions to the railway systems in Sydney and Melbourne, (neither of which have carried any passengers yet) accelerated, expenditure on rolling stock replacements and general maintenance of the systems. There have been no significant improvements in service which might be perceived by the public as a reason to use public transport. Private car travel has continued to

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gain popularity and patronage on public transport has continued to decline. (See Table 1.)

TABLE 1⁽¹⁾

GOVERNMENT RAILWAYS: PASSENGER-JOURNEYS(a), SYSTEMS, 1967-68 TO 1971-76

('000)

Year	N.S.W.	Vic.	Qld.	S.A.	W.A.	Tas.	Clth.	Aust.
Suburban								
1967-68	238,061	141,733	24,065	14,447	9,628	870	..	428,804
1968-69	233,211	140,788	25,771	13,760	9,832	838	..	424,200
1969-70	236,347	140,309	26,317	13,441	10,227	712	..	427,354
1970-71	238,800	138,131	27,621	13,393	10,557	636	..	429,139
1971-72	(b)196,097	133,840	30,184	12,918	10,800	597	..	384,436
1972-73	194,140	108,970	30,500	12,756	11,143	559	..	358,068
1973-74	192,228	110,141	32,003	12,914	11,332	514	..	359,132
1974-75	167,868	112,757	34,821	11,997	n.a.	273	..	n.a.
1975-76	157,919	104,748	32,448	12,033	n.a.	19	..	n.a.

(a) Based on ticket sales making allowance for periodical tickets. Tickets sold at concession rates are counted as full journeys.

(b) Figures for earlier years include unremunerative journeys.

Passenger Reaction to Public Transport Improvements

There have been some isolated improvements to public transport services, however, it is quite difficult to obtain reliable data on passenger reaction partly because there are very few improvements, as such, to measure. Two examples are discussed below:-

(a) Manly Ferry Service

One good example in Sydney was the restoration in January 1978 of the Manly ferry service from a 2-boat 45 minute interval service to a 3-boat half hourly memory headway. The

1 Source: Commonwealth Year Books

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result of this improvement was a 22% increase in patronage (12,000 additional passengers per week) after the first six months of the restored service. Patronage on the run is still well below the level prior to the service being cut to the two-boat timetable in 1974 but hopefully, as confidence returns to the regularity of the service, patronage will continue to increase.

Unfortunately, the net cost of the improvement, i.e. the gross cost less additional revenue, is close to \$200,000 per annum. Nevertheless, this result, and the net result of the Manly ferry operations, should be examined in relation to losses on other services (particularly the Government buses that run in competition to the ferries and lose far more per passenger kilometre) and the benefits a reliable ferry service bring not only to commuters but to the tens of thousands of tourists who regard a trip on the Manly ferry a must. In any event, the cost of operating the hydrofoil services which also compete with the ferries could be cut by \$200,000 per year with very little reduction in service, albeit some reduction in reliability, by reducing the spare hydrofoils from 2 to 1 and by reducing the off peak service, which is currently well in excess of demand, from 3 to 2 vessels. This move would actually improve co-ordination with buses.

(b) Burwood Tramway Extension

The other significant improvement in a public transport service in Australia in recent times is the East Burwood Tramway extension in Melbourne. Although no operating cost details are available, for a capital cost of some \$2½ million, an additional 15,000 passengers per week have been attracted to the service. An interesting point here is that, contrary to the claim by some motoring organisations that public transport is mainly useful for C.B.D. oriented trips, only 38% of the new passengers on this extension travel to or from the city and 26% commenced and finished their journey within the extension.

As a relatively low cost public transport service improvement, it will be interesting to compare the net gain in passengers for dollars invested on this line with the Eastern Suburbs Railway in Sydney, the Melbourne Underground and even the Brisbane suburban electrification.

A quick review of other service improvements around the country reveal that the nature of the projects usually involve a re-organisation of existing bus services and while a number of worthwhile projects have been introduced, none have attracted anything like the patronage of the two examples above.

The introduction of Transit Lanes in Sydney has assisted bus punctuality and attracted some additional patronage and exclusive bus lanes and tram reservations

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in other cities are highly praised by operators.

Another relatively low cost public transport improvement has been the introduction of 2-way radios and computer based communication systems. Most Australian cities are planning on introducing these in one form or another and some are already in operation by private as well as Government operators. Finally, provision of better passenger information is being fostered in some cities, particularly Melbourne, with the provision of route and timetable information at stopping places.

One of the best run public transport systems in the English speaking world, and certainly the one that seems to have had the greatest success if passengers carried is used as a yardstick, is Toronto. There, the number of passengers boarding the system increased from 271 million in 1963 to 349 million in 1977. (Boardings are counted because many journeys are made up of 2 or more modes using a free transfer ticket.)

When population is taken into account, it appears that the number of trips per capita per annum has remained virtually unchanged at 163 while in Sydney it declined from 230 in 1963 to 149 in 1977. (See Table 2).

What is the secret in Toronto?

Service levels in Toronto are very high. Trains and trams in 10 major corridors usually run every 3 to 5 minutes on all lines all day and every 4 to 10 minutes at night and during weekends. Buses serve the less densely populated areas and don't run as frequently but they do operate on memory headways for passenger convenience. There is a free transfer system between all modes and interchange is made convenient by the provision of escalators and other passenger amenities. All rolling stock is beautifully maintained and there are no exterior advertisements to detract from the image of the service.

The first subway line north south along Yonge Street, opened in 1954, replaced the most heavily trafficked tram route in the city. The second, an east-west link along Bloor was the second heaviest tramline. There have been a number of incremental extensions over the years and the subway now consists of 51 Km of track with 49 stations. The street public transport system has also been upgraded. Trams and trolley buses operate on the heaviest routes while diesels provide the feeder links. In recent years, the trolley bus network has been extended and the fleet completely renewed. Half the tram fleet has been rehabilitated and the other half is being replaced by 200 new trams currently in the course of delivery. A new 7 Km light rail link to Scarborough will use some of the new cars when it opens in 1982.

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Table 2

Comparison of Public Transport
Patronage in Sydney and Toronto

Year	Population (000's)		Annual Patronage (millions)		Per Capita Patronage	
	Sydney	Toronto	Sydney	Toronto	Sydney	Toronto
1957	2,072	1,381	531	295	257	214
58	2,123	1,429	515	291	242	204
59	2,173	1,487	497	290	228	195
1960	2,241	1,527	490	282	218	185
61	2,303	1,566	468	268	203	171
62	2,353	1,609	469	269	199	167
63	2,397	1,662	461	271	192	163
64	2,441	1,716	466	275	191	160
65	2,491	1,802	469	288	188	160
66	2,542	1,846	486	307	191	166
67	2,593	1,888	482	314	186	167
68	2,645	1,906	480	323	183	170
69	2,698	1,935	480	322	179	166
1970	2,753	2,004	481	324	176	162
71	2,977	2,086	477	330	161	158
72	3,018	2,069	431	345	143	167
73	3,041	2,079	439	332	145	160
74	3,063	2,093	434	330	141	158
75	3,083	2,107	411	358	134	170
76	3,095	2,106	382	351	124	167
77	3,114	2,145	380	349	122	163

Note: Sydney patronage figures have been reduced by 16.4% to adjust for public transport transfers. The adjustment is based on the results in the report "Guidelines to Zone Fare Systems" by Stapleton Transportation Planning Pty. Ltd. and is needed to make comparisons with the zone fare system operating in Toronto.

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Levels of Service in Australia

Compare this with Australian cities and the picture is not very bright. In Sydney and Melbourne, the railways are the backbone of the system but there is only a handful of suburban stations in Sydney where the timetabled interval between trains throughout the day is better than 15 minutes. On most lines it is 30 minutes and even on the city underground there are scheduled gaps of 11 and 15 minutes regularly occurring throughout the day often followed by 2 trains in quick succession. Melbourne's trains are not much better and certainly there is nothing to match the Toronto frequency of service.

Melbourne's trams provide the most frequent public transport service in Australia. Every line, and there are 30 of them, has a 12 minute service or better all day (including Saturdays) and a 20 minute service up until 11 p.m.. Where 2 lines converge on a common route, the times are married to halve the gaps between trams. On Sundays the 20 minute service operates in the afternoon and a 30 minute service in the morning and evening.

Buses in most Australian cities run on a variety of headways most of them every 20 or 30 minutes, a few a little better, and a lot much worse.

Perth has probably the best Government bus system in Australia in terms of cost of operation, reliability and public and employee relations and, given the sparse population, service levels are not bad except at night and during the weekend when, in comparison to Melbourne's tram services, the system practically closes down. The cost recovery at around 55% is up with Melbourne's trams and compares very favourably with Sydney's buses on about 36%. But, as I said, the service levels can't compare with Melbourne's trams, which appear to provide the best value (i.e. service level,) for money (i.e. cost to taxpayer) in Australia.

The question is how can overall rail, tram, bus and ferry service levels be improved so that they can be presented as an attractive package to potential passengers as they are in Toronto? I will deal with a few examples.

Suggested Low Cost Public Transport Improvements

(a) Railway Timetables

The following is a list of low cost public transport improvements that would appeal to the travelling public.

As the backbone of any public transport system the

railways have the greatest influence on total passenger miles. They have an important effect on the feeder bus network that serves the stations and therefore can influence the operational performance and profitability of the bus routes. Essentially, rail timetables should be designed so that:-

- (a) trains can run on time;
- (b) the fastest possible service is provided between the major trip generators consistent with on-time running;
- (c) headways should be clock face so that trains pass the same point at the same times each hour; and
- (d) services should be frequent, using only the optimum number of cars in a consist.

Failure of trains to run on time, or long gaps in the service, makes it particularly difficult for bus operators to provide effective and economical connections. The longer the gaps between trains, the lower the bus operator's chances of scheduling his services to minimise waiting time at terminals.

In framing railway timetables there is often a tendency to save a few dollars by cutting a run here or a shift there without appreciating the effect on buses and, indeed, passenger confidence in the system as a whole. On this score, Perth sets a very good example, particularly on the Midland and Armadale lines, where great care is taken to ensure that there is co-ordination of bus and rail timetables.

One of the most significant improvements that could be made on Australian railway systems given the industrial relations already achieved in European cities, would be to double the frequency of trains but use half the number of cars and without a guard. The main cost would be that of coupling and uncoupling cars but it would result in a 100% improvement in service. Improvements of this magnitude could not help but be perceived by the public. It is the best example I know of a low cost public transport improvement. Unfortunately, industrial relations are such in this country that accepted practice in other parts of the world are unthinkable here with the result that what looks like a good idea to the man in the street, is unacceptable in industrial terms, or alternatively, the cost is made prohibitive.

(b) Rationalised Bus Routes

There has been a tendency over the years for operating authorities to bifurcate main bus routes to meet the requests of pressure groups such as Progress Associations and Chambers of Commerce. Thus, a 15 minute bus route becomes two 30-minute services operating on different streets. The main service can be made even less attractive by minor (and major) diversions into housing estates or to a minor shopping centre. The

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flexibility of a bus is regarded by many people as one of its major attributes. To a land use planner its flexibility virtually eliminates any impact it may have had on the development and density of land use. It is a factor which has broken down the influence of public transport by destroying the community's association with the route. The big advantage of any fixed track transport system, and this includes trolley buses, is that the public knows the route. In the long term, it generates patronage because of the influence on land use and trip generation.

As it is obviously not easy to implement a fixed track (or wired) public transport system quickly, the next best thing is to rationalise bus routes into a hierarchy of trunk, primary and secondary services. These can be defined as follows:-

Trunk

A trunk bus route is a high frequency service usually made up by a number of routes using a common section. Time-tabling of individual routes should be so arranged as to give an even headway on the common section. The frequency along a trunk route should be at least every 5 minutes during the day and not dropping below 10 minutes at night.

By way of example, a recent check on 9 bus routes sharing a common portion of Parramatta Road leading into Sydney, revealed that in a typical hour (11.15-12.15) 22 buses passed a given stop bound for the city. This would have been sufficient to provide a 2.7 minute service but in fact there were gaps of up to 10 minutes between buses. The average load on the most popular route (No.438) was 36 (4 buses involved) while the sum total of the rest averaged only 15 (18 buses involved). Rationalisation to an even 5 minute service would have saved 10 buses out of 22 and left an average load of 34, 9 less than the number of seats in a single decker bus.

Primary

These should "in fill" all parts of the metropolitan areas not served by rail or ferry. With typical population densities (50 persons per hectare), a primary route should be within 400-500 metres from every household, i.e. the routes should be approximately 800 metres apart. Naturally, in densely populated areas more routes could be supported and in sparser areas fewer routes. The base timetable, that is, the day-time off peak service, should be around 12 to 20 minutes with 20/30 minute service at night and during week-ends. Again, the frequency might be a shade better in more densely populated areas.

Secondary

These are the supplementary or special purpose routes which only operate at certain times such as rush hours,

industrial or school specials and services to sporting fixtures. In the outlying suburbs, they may be the only services available.

The introduction of a rationalised network of bus routes would eliminate many kilometres of the network and would make the new systems stronger by offering more frequent services on the selected routes. A study of all bus services running into Parramatta revealed that of a total of 340 route kilometres, 120 kilometres could be abandoned, 65 kilometres retained as a primary route network with a secondary network of 155 kilometres. Considerable operating economies could be achieved by diverting passengers from the low capacity, high marginal cost of operating mode (buses) to the higher capacity, lower marginal cost modes, namely, trains, ferries and trams.

(c) Zone Fares

An integral part of any public transport improvement programme is the simplification of the fare collection system and the provision of free transfers between modes. This is virtually an essential element of any real attempt to co-ordinate public transport modes and to get each to perform the function to which it is best suited.

The situation as regards revenue sharing is made more complicated in Australian cities, particularly Melbourne and Sydney, by the operation of so many feeder services by private bus companies. None-the-less, these operators, who number about 90 in Sydney and provide about 600 vehicles to handle the peak commuter traffic, save the Government millions of dollars per annum. Government buses in N.S.W. cost the taxpayer about \$70 million a year but private services operate profitably and pay taxes. It is most important, therefore, that operating conditions do not worsen the financial position of private operators.

A pilot scheme for the introduction of bus/rail periodical tickets (which could apply equally well to multi-ride tickets) has already been developed for the Campbelltown area but has not yet been acted upon by the Public Transport Commission. Basically, the scheme provides for a bus weekly ticket to be purchased with a rail weekly. Two values of bus tickets would be available, one for the first two sections priced at \$1.20 and the other for three or more sections, priced at \$2.00. The price would be the average cash fare for 10 trips in each of the 2 ranges discounted 20% by the bus company and by 10 cents a trip (\$1 a week) by the Government.

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In effect, the bus portion of the combined fare would be discounted by about half but the bus company only loses 20%. The cost to the Government if the system is expanded throughout the metropolitan area is estimated at between \$2 million and \$3 million depending on the number of existing passengers taking up the offer. This does not allow for any additional passengers that might be attracted.

Zone fares on Government transport services would greatly simplify the existing arrangements and would make automation of fare collection that much easier. The multi-ride ticket using validating machines now adopted almost universally in Europe, is slow to be accepted in Australia but is to be introduced in Perth soon at a cost of \$1.3M. Pro rata, this same system could be introduced in Sydney on all buses and at railway stations and ferry wharves for about \$5M.

A further advance on the zone fare concept is exact money when tendering a fare. The idea behind zone fares and multi-ride tickets is to get a high percentage of passengers using the pre-paid ticket system. This is done by offering a generous discount and by eliminating short distance fares for cash. Thus, a passenger wishing to travel only 1 or 2 sections would have to have a periodical or multi-ride ticket. Cash fares would only be available by zone (minimum about 40 cents) and exact money should be placed in a glass fare box. This system eliminates the need for drivers to handle money so their productive time driving the bus (or tram) is increased. Looked at another way, "pay in" time is eliminated and as this is usually on penalty rates, the saving is considerable.

CONCLUSION

The choice of avenues for investment in the past has hampered modernisation and make it difficult to gradually introduce labour-saving methods. The industrial climate in Australia is such that improvement in public transport services is a most costly exercise and in the light of the deficits being increased, are only embarked upon in isolated, usually politically activated, cases.

The most successful attempts to gain patronage have resulted from the Manly ferry timetable improvement and the extension of the Burwood tramline in Melbourne. In general terms, there have been very few other significant improvements in public transport services in recent years that have succeeded in attracting new patronage.

Toronto is the success story in public transport and the most important avenues for attracting patronage seem to

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be:-

1. Better timetabling.
2. Rationalisation of routes.
3. Zone fares incorporating free transfers.
4. Preferential treatment for surface public transport vehicles.

The list of initiatives the transport undertakings could take are endless but in order to achieve significant improvements, at reasonable cost, better industrial relations backed by Government commitment are a pre-requisite.

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