

**RAILWAY STATION UPGRADING PROGRAMME IN NSW FOR EASY
ACCESS: ECONOMIC VS. FINANCIAL EVALUATION**
Presented at Australian Transport Research Bureau Conference by
Mr D Jain Executive Director of Eze Solutions Pty Ltd

Introduction

This paper analyses the economic return on investment as distinct from the financial return, on the railway station upgrading program carried out in NSW for mobility impaired (M.I) passengers. Benefits to M.I passengers were considered separately from benefits for all passengers. These were basically taken as 'economic benefits.' Apart from these benefits, benefit to Railways, as an organisation were separately considered. In essence therefore there were three net present value's (NPVs) on the investment made, as below:

- NPV taking into account economic benefits to M.I passengers only.
- NPV taking into account economic benefits to "all" passengers as a result of the station upgrade.
- Financial benefit to railways.

This upgrade had to be carried out as a legislative requirement, however, the endeavour of the study was to analyse how and why three NPVs above differ and what factors contributed to achieving a positive NPV on all the three accounts.

Background of the Study

NSW has a rail network of over 850 kilometres of track and 301 stations, using around 1500 carriages in the Sydney, Newcastle and Wollongong areas. Over 900,000 passengers are carried each weekday on 2,200 services.

Current estimates indicate that some form of disability affects about 16 per cent of the community. On this basis and given the increasing tendency of the disabled to participate in the community, people with disabilities are beginning to form a larger sector of the transport market. The rail system is the most accessible of existing forms of public transport and hence should prepare its stations for the special needs of disabled passengers.

There are also now obligations under both Federal and State Legislation and Standards to provide improved access to services; via the Disability Discrimination Act (DDA), Draft Accessible Transport Standards, NSW Anti Discrimination Act (ADA), NSW Disability Services Act and the NSW Disability Policy Framework.

A station-upgrading program was undertaken in NSW to provide 'Easy Access' to Mobility Impaired (MI) passengers as well as to provide improved amenities to staff and all the other passengers. This program was subjected to an economic as well as financial appraisal. Whereas economic analysis focused

**RAILWAY STATION UPGRADING PROGRAMME IN NSW FOR EASY
ACCESS: ECONOMIC VS. FINANCIAL EVALUATION**
**Presented at Australian Transport Research Bureau Conference by
Mr D Jain Executive Director of Eze Solutions Pty Ltd**

on community benefits, financial appraisal looked at benefits to railways from this investment.

Below are the items generally included in the scope of works for station upgrading.

- Lifts
- Canopies
- Modified Concourse
- Toilets eg. Easy Access and Public
- Ramp/Stairs/Footbridges/Pathways
- Improved Lighting
- Modified Station Entrance
- Booking Office
- Additional Signage/Indicators
- Painting
- New Fencing eg. Loop-Top
- Upgrading Ancillary Services
- Increased Milling Area
- Upgrading of Station Staff Amenities/Facilities
- Additional Drainage
- New Roofing
- Retail Concession and Number of Outlets
- Parking Spaces
- Baby Changing Facilities
- Closed Circuit Television (CCTV)
- Additional Ticket Barriers
- Station Master Office
- New Landscaping
- Resurfacing eg. Tiling and Paving
- Platform Extension
- Automatic Vending Machine (AVM)

MI passengers were classified as being:

- The elderly (passengers over 40 years of age)
- People with strollers, young children, shopping or luggage
- People with hearing or sight problems
- People with mobility problems - temporary or permanent
- People who are short or frail

**RAILWAY STATION UPGRADING PROGRAMME IN NSW FOR EASY
ACCESS: ECONOMIC VS. FINANCIAL EVALUATION**
Presented at Australian Transport Research Bureau Conference by
Mr D Jain Executive Director of Eze Solutions Pty Ltd

Key Features of Economic/Financial Evaluations

The key features of Economic vis-a-vis Financial Evaluations are shown in the table below:

Feature	Economic	Financial
Perspective	Economy	Railways
Objective	Using the community's resources efficiently	Using Railways resources efficiently
Pricing	Opportunity cost and market prices	Market prices
Externalities	Included	Excluded
Income distributional effects	Excluded	Excluded
Taxes and subsidies	Excluded	Included
Interest	Excluded	Excluded
Depreciation	Excluded	Excluded

**RAILWAY STATION UPGRADING PROGRAMME IN NSW FOR EASY
ACCESS: ECONOMIC VS. FINANCIAL EVALUATION**
Presented at Australian Transport Research Bureau Conference by
Mr D Jain Executive Director of Eze Solutions Pty Ltd

Economic and Financial Costs and Benefits

In the evaluation that was carried out for the different stations, the Economic and Financial Costs and Benefits were taken as follows:

BENEFITS	COST
<p>Economic</p> <ul style="list-style-type: none"> • Percentage of additional fare that passengers may be willing to pay for additional amenities • Saving in entry/egress time of passengers • Additional revenue as a result of additional passengers • Additional revenue from new retail concessions • Residual Value. (Taken as 5% of total capital investment in year 20) 	<p>Economic</p> <ul style="list-style-type: none"> • Capital Cost • Additional Operating Costs <p style="text-align: right;">Maintenance/</p>
<p>Financial</p> <ul style="list-style-type: none"> • Additional revenue as a result of additional passengers • Additional revenue from retail concessions • Residual Value. (Taken as 5% of total capital investment in year 20) 	<p>Financial</p> <ul style="list-style-type: none"> • Capital Cost • Additional Operating Costs <p style="text-align: right;">Maintenance/</p>

Valuing Passenger Amenities

A study conducted in 1995 outlined the values placed on rail service quality by commuters. All commuters will derive greater amenity from these stations with the proposed improvements to accessibility, convenience and ambience.

However, station upgrading may generally have little impact on passengers' decisions to use rail in the short term. When viewed from a broader perspective though, the upgrading may significantly influence the public's perceptions of the network, its convenience and therefore, over the long term, may increase usage as a result. The table overleaf summarises the average value of benefits derived from installing these facilities as outlined by the above-mentioned study. It includes:

- A percentage of the average fare that passengers would be willing to pay for the improvements

**RAILWAY STATION UPGRADING PROGRAMME IN NSW FOR EASY
ACCESS: ECONOMIC VS. FINANCIAL EVALUATION**
Presented at Australian Transport Research Bureau Conference by
Mr D Jain Executive Director of Eze Solutions Pty Ltd

- A percentage change in revenue as a result of increased demand

FACILITY	% CHANGE IN FARE THAT PASSENGERS WOULD BE WILLING TO PAY.	UNDERTAKE N IN THE EASY ACCESS UPGRADE	% CHANGE IN REVENUE AS A RESULT OF INCREASED DEMAND.
a) Passenger lifts	0.9	Yes	0.4
b) 10% pt. Improvement in station rating	4.2	Yes	1.7
c) 10% rating improvement in cleanliness	0.6	Yes	0.3
d) Platform security camera	2.8	Yes	0.8
e) Computerised train indicator board	1.4	Yes	0.7
f) Automated ticket machines	1.1	Yes	0.5
g) Modern Appearance	0.6	Yes	0.3
h) Improved Lighting	1.7	Yes	0.8
i) Clean available toilets	1.6	Yes	0.7
j) Kiosk/newsagent/ca fé	0.6	Yes	0.3
k) Platform Shelter & shade	1.4	Yes	0.7
l) Platform Seating	1.6	Yes	0.8

The average value of benefits from station improvements are not additive because each passenger will have unique preferences, and on average they will value their total amenity at a lower rate than the amenity from individual facilities. The reason for this is that each improvement will not meet everyone's ideal requirements, and while some may gain from facilities not in their ideal station improvement package but nevertheless of value, the overall result would be a lower aggregate benefit.

In quantifying the value of user benefits for this project, we assigned 2% of the average fare as the value of benefit derived by all passengers and 3% for mobility impaired, given that the improvements allow them to avoid steep ramps and stairs. It was also assumed that there would be no disamenity from congestion surrounding lifts, due to generally locating them away from the most direct path of passengers.

**RAILWAY STATION UPGRADING PROGRAMME IN NSW FOR EASY
ACCESS: ECONOMIC VS. FINANCIAL EVALUATION**
**Presented at Australian Transport Research Bureau Conference by
Mr D Jain Executive Director of Eze Solutions Pty Ltd**

Percentage change in revenue (as a result of an increase in patronage) was taken as a one-off 2% (percentage of all passengers) in year one following completion of the project. Mobility impaired passengers are expected to increase by 5% in the first year, followed by 2% each year there after.

Amount of egress/entry time saved by M.I. passengers as well as all the other passengers was also estimated at each of the stations and then quantified as a benefit. This was done by placing a value in terms of "dollars per hour" on the time saved of each of the category of passengers.

Benefits to Passengers and Railways

The Benefits that were considered in this analysis were:

- Economic benefits to Mobility-Impaired passengers
- Economic benefits to all passengers
- Financial benefits to Railways

The make-up of the benefits is as shown below.

Benefits to Mobility-Impaired Passengers

- Economic benefit to M.I. passengers as a result of improved amenities
- Economic benefit due to savings in egress/entry time

Benefits to All Passengers

- Economic benefit to all passengers as a result of improved amenities
- Economic benefit due to savings in egress/entry time

Benefits to Railways

- Economic/Financial benefit due to increased patronage from MI passengers
- Economic/Financial benefit due to increased patronage from all passengers
- Economic/Financial benefit due to increased revenue from retail concessions

NPVs were worked out as follows:

- Economic Evaluation – Based on Benefits to M.I. Passengers Only
- Economic Evaluation – Based on Benefits to All Passengers
- Financial Evaluation – Based on Benefits to Railways

**RAILWAY STATION UPGRADING PROGRAMME IN NSW FOR EASY
ACCESS: ECONOMIC VS. FINANCIAL EVALUATION**
**Presented at Australian Transport Research Bureau Conference by
Mr D Jain Executive Director of Eze Solutions Pty Ltd**

In this study economic costs were taken to be largely the same as financial costs. This cost was the total cost of the upgrade and was the same in calculations of the three NPVs above.

Results

From among the 15 stations studied, it was found that there were only two stations (stations A and B) that showed a positive NPV on Economic Evaluation of benefits to M.I. Passengers only.

These stations also showed positive NPV on evaluation of benefits to all passengers as well. The reasons for this was found to be:

- *Station A*
 - High level of M.I. passengers (50% of total passengers in 2001/2002)
 - Moderate level of time saved in entry/egress by using new facilities (5 minutes by M.I. passengers)
 - Average net revenue received by SRA from retail concessions is large
 - Moderate level of usage in terms of passenger journeys per year (1,112,800 in 2001/2002)
 - Moderate likely increases in additional passengers (M.I.s and others) due to the project
 - Moderate benefits to passengers due to improved amenities
 - Low Capital Cost of the project
 - Low recurring costs
 - Moderate average fare paid by passengers (\$5.70 per return journey)

- *Station B*
 - High level of usage in terms of passenger journeys per year (3,198,000 in 2001/2002)
 - Moderate level of M.I. passengers (25% of total passengers in 2001/2002)
 - Hi level of M.I. passengers pay full-fare (80% pay full-fare, 20% pay pension/concession fares)
 - Wheelchair-bound passengers journeys are significant in number
 - Moderate average fare paid by passengers (\$5.50 per return journey)
 - Moderate-High benefits to passengers due to improved amenities
 - Large amounts of time saved by passengers due to improved facilities (15 minutes by passengers on wheelchairs and 10 minutes by other M.I. passengers)
 - Moderate likely increases in additional passengers (M.I.s and others) due to the project
 - Average net revenue received by SRA from retail concessions is large

Only one station viz Station A showed positive NPVs on Financial Evaluation. This was due to a high level of revenue earned by Railways from retail concessions at a much lower investment in capital cost as compared to other

**RAILWAY STATION UPGRADING PROGRAMME IN NSW FOR EASY
ACCESS: ECONOMIC VS. FINANCIAL EVALUATION**
Presented at Australian Transport Research Bureau Conference by
Mr D Jain Executive Director of Eze Solutions Pty Ltd

stations. Besides Stations A and B performing well, there were also numerous other Stations that also showed positive NPVs on Economic Evaluation for benefits to all passengers as well. However upon Economic Evaluation taking into account only M.I passengers, the NPVs were negative.

The reason behind negative NPV on talking into account benefits to MI passengers only was primarily due to (as compared against A and B stations):

- Lower levels of M.I. passengers using the station and its facilities
- Wheel-chair bound passengers journeys were insignificant
- Benefits as a result of improved amenities favour less M.I. passengers and more on all passenger
- Benefits due to savings in entry/egress times are lower
- Likely increases in patronage by M.I. passengers are lower

Conclusion

On the basis of the above it can be concluded that a station upgrading project for 'Easy Access' is likely to show positive NPV's on all the 3 counts viz, Economic Evaluation to M.I passengers only, Economic Evaluation to all passengers and Financial Evaluation, if there are:

- High level of M.I. passengers
- Moderate and above levels of time saved in entry/egress by using new facilities
- Average net revenue received from retail concessions is large
- Moderate and above levels of usage in terms of passenger journeys per year
- Moderate increases in additional passengers (M.Is and others) due to the project
- Moderate and above perceived benefits to passengers due to improved amenities
- Low Capital Cost of the project
- Low recurring costs
- Moderate and above average fare paid by passengers

References

- NSW Treasury: Guidelines for Economic Appraisal, June 1997
- NSW Treasury: Guidelines for Financial Appraisal.
- NSW Government, Total Asset Management Guidelines, 2000

**RAILWAY STATION UPGRADING PROGRAMME IN NSW FOR EASY
ACCESS: ECONOMIC VS. FINANCIAL EVALUATION**
Presented at Australian Transport Research Bureau Conference by
Mr D Jain Executive Director of Eze Solutions Pty Ltd

- Financial and Economic Evaluation report of station upgrade for easy access, 2001