

Limerick – Galway Service Development including the reintroduction of Passenger Rail Services between Ennis and Athenry

SOCIO-ECONOMIC COST BENEFIT ANALYSIS

Introduction.

This paper sets out the results of a socio economic cost benefit analysis of the reintroduction of passenger rail services between Ennis and Athenry as part of the service development along the Limerick – Galway corridor.

The basic approach to the analysis is along the lines set out in the 'Transport Project Appraisal Manual' (December 2005) prepared by Goodbody Economic Consultants for the Department of Transport.

The different parameter values are also in line with those suggested by Goodbody. In line with the recommendation of that report a 'willingness to pay' approach is adopted and as such benefits are measured at market prices.

Capital Cost.

The total infrastructure capital cost is €106.5m (including VAT) and this is phased in over the two year period 2006 – 2007 to facilitate the introduction of services from the beginning of 2008.

No capital cost is included for additional rolling stock since the service will be operated by units already in the fleet. As such this is a sunk cost.

Operating Costs.

The operating costs have been derived on the basis of current unit rates and assumptions on work practices. These are set out in the Business Case. The base operating cost for year 1 is €3.065m. This is increased thereafter by a 1.5% annual factor (i.e. the projected annual increase over a base inflation rate of 2.5%).

Passenger Numbers.

The passenger forecasts have been based on an analysis undertaken by FabreMaunsell (2004) for Iarnrod Eireann with a relatively high growth assumption in the earlier years.

Annual passenger numbers are forecast to double from 0.1m in year 1 to 0.2m in year 5. Thereafter growth in passenger numbers will be in line with the economic growth rates set out below.

Economic Growth.

The economic growth assumptions are in line with those suggested by Goodbody, which are in turn derived from ESRI forecasts.

The forecast annual real growth in GNP per person employed are

2002 to 2010	2.70%
2011 to 2015	2.37%
post 2015	2.29%

These economic growth rates are used to forecast the increase in annual passenger numbers and to update the value of time savings, accident cost savings and environmental cost savings on an annual basis.

Time Savings.

The future time savings must be viewed in the context of the ongoing upgrade of the N18 which will benefit both car and bus journeys.

For the purpose of this analysis it is assumed that rail passengers will only have time savings during the critical commuting peaks and that these account for half of all journeys.

It is assumed that the average time saving will be 10 minutes up to 2012 and will reduce to 5 minutes thereafter to reflect the completion of the N18 upgrade between Gort and Oranmore. The Ennis bypass will be open for traffic in 2007.

Half of the journeys are attributed a 'commuting' value of time and the other half are attributed a 'non-commuting' value of time. Inflating up from the suggested 2002 values and taking a weighed average of the two, the hourly value of time in 2006 is €8.57. This is inflated going forward by the economic growth rates.

Car Transfer.

It is assumed that 50% of train users are would be car users and that the average car occupancy rate is 1.2. Hence a car reduction rate of 40% is assumed to estimate the number of cars taken off the road.

The car journey length between Limerick and Galway is 105kms. However for the purpose of this exercise the average car journey length transferred to rail is assumed to be 30kms to reflect the commuter belt activity and the location of the new stations relative to Galway and Limerick.

Car Operating Savings.

Two savings are attributed to the would be car journeys diverted to the rail services (fuel costs and non-fuel costs). These have been estimated using the Goodbody parameter values, based on a 50kph average link speed. As recommended these are held constant in real terms during the term of the appraisal.

No car operating savings are attributed to other car users who continue to use their cars since the relatively modest modal transfer, in absolute terms, is unlikely to result in an increase in link speeds along the corridor.

Accident Cost Savings.

The accident cost savings are based on the rates for the different accident types (fatal, injury, damage) recommended by Goodbody and are inflated going forward by the economic growth factors.

Statistics regarding the rate and severity of collisions per million vehicle kms have been derived from NRA 2004 statistics. The average cost of a collision was estimated at €54,700 (€57,700 2006 prices). These have been inflated going forward by the economic growth rates outlined above.

Environmental Costs.

The environmental cost savings are based on the aggregate rates for all car types types recommended by Goodbody. These are inflated going forward by the economic growth factors.

For the purpose of this exercise it is assumed that half of the vehicle kms occur on urban roads and that the other half occur on a highway environment. Higher environmental costs are associated with urban roads.

Results.

The results of the analysis, based on the assumptions outlined above, are presented in Table 1. The investment yields a negative NPV result of -€137m over a 30 year period using the recommended Department of Finance 5% real discount rate.

A number of sensitivity tests have been undertaken on this result and these confirm the negative rate of return. Even with a doubling of passenger numbers, average time savings and average car journey lengths diverted the socio-economic appraisal still yields a negative NPV of -€120m.

Conclusions.

Given the scale of the infrastructure costs along with the ongoing annual operating costs, the projected patronage levels will not be adequate to generate a positive socio-economic NPV result using the agreed standard appraisal parameter values for transport investment projects required by the Department of Finance Appraisal Guidelines (February 2005).

As set out in the Business Case the merits of the project and the case for investing in it however must be looked at in the wider context of a range of planning and development benefits.

A 'Project Appraisal Balance Sheet' has been prepared along the lines suggested by Goodbody Economic Consultants for the Department of Transport projects. This is summarised in Table 2.

It is clear from this that the main justification for the investment relates to regional development.

The extent to which investment objectives are achieved will be critically dependent on the local authorities planning for developments on the basis of a key role for the railway within an integrated transport network and travel management.

**Chief Executive,
Iarnrod Eireann,
Connolly Station,
March 2006**

Table 1: Results of NPV Calculations (€'millions).

Year	Capital Cost	Operating Cost	Total Costs	Time Savings	Fuel Costs	Non Fuel Costs	Accident Costs.	Environ Costs
2006	-40.000	0.000	-40.000	0.000	0.000	0.000	0.000	0.000
2007	-66.500	-0.100	-66.600	0.000	0.000	0.000	0.000	0.000
2008		-3.065	-3.065	0.075	0.083	0.092	0.009	0.016
2009		-3.065	-3.065	0.097	0.104	0.115	0.012	0.020
2010		-3.065	-3.065	0.119	0.124	0.138	0.015	0.025
2011		-3.065	-3.065	0.142	0.145	0.161	0.018	0.030
2012		-3.065	-3.065	0.166	0.166	0.184	0.021	0.035
2013		-3.111	-3.111	0.087	0.170	0.188	0.022	0.037
2014		-3.158	-3.158	0.091	0.174	0.193	0.023	0.038
2015		-3.205	-3.205	0.096	0.178	0.197	0.024	0.040
2016		-3.253	-3.253	0.100	0.182	0.202	0.025	0.042
2017		-3.302	-3.302	0.105	0.186	0.206	0.026	0.044
2018		-3.351	-3.351	0.110	0.190	0.211	0.028	0.046
2019		-3.402	-3.402	0.115	0.195	0.216	0.029	0.048
2020		-3.453	-3.453	0.120	0.199	0.221	0.030	0.050
2021		-3.504	-3.504	0.126	0.204	0.226	0.032	0.053
2022		-3.557	-3.557	0.131	0.208	0.231	0.033	0.055
2023		-3.610	-3.610	0.138	0.213	0.236	0.035	0.058
2024		-3.665	-3.665	0.144	0.218	0.242	0.036	0.061
2025		-3.720	-3.720	0.151	0.223	0.247	0.038	0.063
2026		-3.775	-3.775	0.158	0.228	0.253	0.040	0.066
2027		-3.832	-3.832	0.165	0.233	0.259	0.042	0.069
2028		-3.889	-3.889	0.172	0.239	0.265	0.044	0.073
2029		-3.948	-3.948	0.180	0.244	0.271	0.046	0.076
2030		-4.007	-4.007	0.189	0.250	0.277	0.048	0.079
2031		-4.067	-4.067	0.198	0.256	0.283	0.050	0.083
2032		-4.128	-4.128	0.207	0.261	0.290	0.052	0.087
2033		-4.190	-4.190	0.216	0.267	0.296	0.055	0.091
2034		-4.253	-4.253	0.226	0.274	0.303	0.057	0.095
2035		-4.317	-4.317	0.237	0.280	0.310	0.060	0.100
Sub-Total NPV's			-€144.744	€1.772	€2.496	€2.766	€0.389	€0.648
							Overall NPV	
							-€136.673	

Table 2: Project Appraisal Balance Sheet.

Criteria	Qualitative Statement	Scale 1-5
Economy	<ul style="list-style-type: none"> The economic return on the project is poor due to relatively modest volumes and competitive road journey times. An increased annual operating subsidy will be required. 	<p>1</p> <p>1</p>
Safety	<ul style="list-style-type: none"> Construction and operating standards will ensure that the railway will be the safest mode along the corridor. A reduction in car usage will result in a modest decrease in road accidents 	<p>5</p> <p>1</p>
Environment	<ul style="list-style-type: none"> The rail service will lead to a reduction in car usage along the N18 and within the two major congested urban centres, Galway and Limerick with resulting positive environmental impacts. There are no significant adverse environmental impacts associated with the project during the construction phase. It will represent as good fit with the rural landscape. 	<p>3</p> <p>4</p> <p>5</p>
Accessibility and Social inclusion	<ul style="list-style-type: none"> The GDP of these regions are lagging behind the national average and will receive a welcome boost. The rail service will open up wider regional access to key facilities including 4 third level colleges and 2 regional hospitals. 	<p>4</p> <p>5</p>
Integration	<ul style="list-style-type: none"> Close integration with bus mode at three major nodes, significant scope for the development of park and ride facilities and potential for shuttle bus service to Shannon Airport. Highly compatible with Mid-West and Western regional planning guidelines and local authority development plans and strategies. Integrates well with the wider InterCity rail network and expands options for both intra and inter regional travel Positive impact on regional balance with added potential for a viable economic cluster outside Dublin. 	<p>5</p> <p>5</p> <p>5</p> <p>3</p>