4 METHODOLOGY AND ASSUMPTIONS

4.1 Option Appraisal

The economic and financial appraisal of the identified options covers the full duration of the Greater Western franchise, including the extension period, i.e. to 2015/16, discounted to 2004/5. Costs, revenues and benefits are at 2004/5 prices and a discount rate of 3.5% has been adopted in line with SRA practice.

Revenue and un-priced benefits for each option have been modelled using the SRA Western version of Moira, containing revenue for 2003/4, with each option evaluated within Moira against a base of the December 2004 timetable. The December 2004 version of Moira has been obtained from the First Group "bid" option that was supplied by the SRA. This has been amended to reflect the know changes on the North Cotswold route. Prices have been uplifted to 2004/5 levels assuming an annual RPI rate of 2.5%.

4.1.1 Demand Growth

Demand growth is based on the SDG GW RUS forecasts (using PDFH4-based methodology). Demand growth rates between 2002/3 and 2016/7 have been converted into average annual growth rates by broad geographical area as shown in Table 1 below.

Table 1 Average Annual Demand Growth (all ticket types)

		Dest										
		Cll London	W London	Berkshire	Oxfordshire	Bristol Area	South Wales	South West	Cotswolds	Wiltshire	External	Total
Orig	Ctl London	0.0%	2.8%	1.7%	1.5%	2.9%	2.8%	3.3%	2.9%	2.7%	0.0%	2.4%
	W London	2.1%	2.8%	1.5%	1.3%	2.4%	2.1%	2.3%	2.4%	1.8%	1.8%	2.1%
	Berkshire	2.8%	2.9%	2.1%	1.8%	0.9%	1.4%	1.5%	1.2%	1.9%	2.1%	2.5%
	Oxfordshire	2.8%	2.7%	2.2%	1.9%	0.8%	0.9%	1.4%	1.4%	1.5%	1.5%	2.2%
	Bristol Area	3.2%	1.7%	1.1%	0.6%	0.9%	0.8%	1.0%	1.4%	1.3%	1.2%	1.5%
	South Wales	2.8%	1.4%	1.2%	0.6%	0.6%	0.6%	1.0%	0.9%	1.1%	1.0%	0.8%
	South West	3.3%	1.4%	1.3%	1.1%	0.8%	1.0%	1.2%	1.1%	1.1%	1.4%	1.5%
	Cotswolds	3.0%	1.9%	1.2%	0.7%	0.8%	0.9%	1.1%	1.4%	1.4%	0.9%	1.6%
	Wiltshire	2.5%	2.2%	2.0%	0.7%	0.9%	0.7%	1.0%	0.8%	1.5%	1.3%	1.8%
	External	0.0%	2.1%	2.3%	1.8%	1.2%	0.9%	1.6%	1.4%	1.5%	0.0%	1.7%
	Total	2.6%	2.7%	2.0%	1.6%	1.2%	0.8%	1.5%	1.6%	1.8%	1.5%	1.9%

Specifically each option has been mapped to the appropriate Origin-Destination growth rates (weighted by 2002/3 volumes) in the table to arrive at a suitable annual growth figure for each option. Note that for Peak service options, season ticket growth was used rather than overall growth.

4.1.2 Revenue

The demand forecasts assume that real pricing of 1% p.a. is achieved over the forecast period, and the demand forecasts are already adjusted for price elasticity effects. For each option revenue is assumed to grow at 1% p.a. above the specific option demand growth.

4.1.3 Unpriced Benefits

(a) User Benefits

Calculated user benefits for each option consists of the user Value of Time and the crowding cost.

Value of Time growth follows TEN, section 2.15, i.e. 2.19% pa between 2000 and 2005, thereafter 2.03% pa.

Crowding Costs – in order to appraise the crowding benefits (or disbenefits) for each option, the escaped (or worsened) economic costs of crowding have been calculated. Crowding levels were calculated on a train-by-train basis using Moira with loads, with the resultant future year crowding cost change compared to the base year calculated using PDFH 4 crowding cost values.

(b) Non-User Benefits

Non-user benefits have been calculated on a flow basis using outputs from Moira. Key assumptions are that half of new users have transferred from road, with a car occupancy rate of 1.5 and a decongestion value of 15 pence per kilometre (assumed to be at 2003/4 prices). These values are consistent with SRA advice on recent proposals.

4.2 Cost Modelling

Each option has been assessed using a generic cost model. Each option has a specification, which details changes to the timetable and/or resources. From this specification the following input data are derived:

- Change in units and HST vehicles leased by unit type
- Change in train mileage by unit type
- Change in train hours by unit type

The change in units has been evaluated by timetable analysis. The train mileages and train hours have been calculated from Moira outputs.

The national rail revenue change attributable to the option is also calculated. The input data are entered into an operating cost model, which calculates incremental costs in the following categories:

- ROSCO costs (where additional units are required)
- Servicing and light maintenance
- Diesel fuel costs
- Cleaning
- Staff Costs
- Network Rail usage costs
- Station charges
- Marginal station running costs
- Retailing costs
- Revenue driven overheads
- Traincrew management and HQ overheads

Unit cost data for each of these cost categories is derived from benchmark values Jacobs have access to from previous studies. The following assumptions are made in calculating these values, based on our experience and knowledge of the businesses concerned.

- Average empty train mileage is assumed as 1.5% train mileage for Thames and Great Western services and 4% for Wessex. On a few options where this is significantly different this has been overwritten by option. Fleet availability is assumed as:

- HST 76%
- HST additional coach 88%
- Adelante 71%
- Voyager 80%
- Thames 82%
- Wessex 84%
- Staff productivity as a %age of train hours is 56.25%. Staff requirements for the train formations are assumed as:
- HST Driver, conductor and 2 on-board staff.
- Adelante and Voyager Driver, conductor and 1 on-board staff
- Thames Turbo, a driver only operation is assumed for Thames Inners and a view on driver / conductor and driver only mix has been taken from timetable analysis for Thames Outers.
- Wessex Driver and Conductor
- Retailing costs average 9% of revenue (standard retail commission rate)
- Other revenue driven costs average 3%
- Train crew and HQ overheads average 10% of controllable costs

4.3 Qualitative criteria driven by the overall objectives for the franchise

(a) To improve efficiency (unit costs) and overall cost of the franchise (subsidy reduction)

Pursuit of this objective will need to ensure achievement of the affordability constraint.

Substantially worse	Slightly worse	Neutral	Slightly better	Substantially better
Significant increase in net costs incurred (over £5m PV over 10 years)	Some modest additional net costs (under £5m PV over 10 years)	No material net cost impact likely (+/- £0.5m PV over 10 years)	Some modest reduction in net cost likely (under £5m PV over 10 years)	Significant net cost reduction anticipated (over £5m PV over 10 years)

(b) To improve performance (punctuality and reliability)

The objective is to improve PPM for the franchise overall.

Substantially worse	Slightly worse	Neutral	Slightly better	Substantially better
Significant deterioration in train performance likely to occur (potential to adversely affect Gtr W service group PPM significantly (i.e. by 1% or more)	Some modest deterioration in train performance likely to occur (unlikely to adversely affect service group PPM significantly (i.e. by 1%)	No material train performance impact likely.	Some modest improvement in train performance likely to occur (unlikely to affect service group PPM significantly (i.e. by 1%)	Significant financial improvement anticipated (Potential to improve service group PPM significantly (i.e. by 1% or more)

(c) To provide value for money

For new activity, transport economic benefit:cost ratio with a pass mark of [2:1]
For reduction or withdrawal, a net cost saving to transport economic disbenefit ratio of greater than [2:1]. Very lightly used services and station calls should be identified and reviewed as part of this franchise replacement specification process.

We suggest two measures, firstly the scale of net economic benefit:

Substantial disbenefit	Slight disbenefit	Neutral	Slight benefit	Substantial benefit
Substantial economic NPV loss (over £5m PV over 10 years)	Some negative economic NPV (up to £5m PV over 10 years)	No material transport economic NPV impact likely (+/- £0.5m PV over 10 years)	Some negative economic NPV (up to £5m PV over 10 years)	Substantial economic NPV gain (over £5m PV over 10 years)

Secondly as a test of value for money, a benefit / cost ratio measure. This depends on whether the option delivers service enhancement or retrenchment, and whether it incurs costs increase or decrease.

Value for Money test		
For service enhancement schemes		For service retrenchment schemes
Positive Benefit with some cost increase	Positive Benefit and cost reduction	Cost reduction with some economic disbenefits
BCR 2:1 or higher	Negative BCR (x:-y)	Cost reduction to benefits foregone ratio of 2:1 or higher

(d) To develop rail's contribution in the transport market in the region

Options should be developed with the aim of enabling rail to achieve it's potential for underlying passenger demand growth in existing markets and penetration of new markets. Given the difficulty in obtaining market share information, the measure proposed is the contribution to demand growth projections for existing markets and the assessment of market potential for new markets.