Public Transport Authority
Government of Western Australia

Our ref: 10672
Enquiries: Hugh Smith

20 October 2008

Lyndon Rowe
The Chairman
Economic Regulation Authority
Rail Division
P O Box 8469
Perth Business Centre
PERTH WA 6849

Request for Section 9 Determinations

In accordance with your request we enclose the information required under Clause 9 of Schedule 4 of the Railways (Access) Code 2000 for the following routes:

1. Perth to Midland comprising the following two route sections:
   Perth to East Perth
   East Perth to Midland

2. Perth to Robbs Jetty comprising the following three route sections:
   Perth to North Fremantle
   North Fremantle to Fremantle; and
   Fremantle to Robbs Jetty

1. Definitional Information

For each route section in question we have provided a summary sheet which contains:

(a) Route section and Track distances
(b) Ceiling Price Schedule
(c) Floor Price Schedule
(d) Gross Replacement Value

2. Basis of the Cost Developed

(a) Railway Access Code
The costs have been calculated in accordance with the definitions and the principles of the Code.

(b) Costing Principles

The costing principles are as previously submitted and accepted by ERA. The costing principles were last updated on the 14th March 2008.

(c) PTA Costing Model

All of the costs are extracted from the PTA Costing model. The costing model was created in 2003-04 and further developed in 2007-08. The model forms the basis for the asset revaluation of the Metropolitan Train Network.

The model incorporates the following assumptions:

- Interest during construction for track at the rate of 1 Km per day
- Interest during construction for non track infrastructure such as bridges stations and tunnels is at the rate of $1M per month.
- WACC is set as approved by the Economic Regulation Authority.
- Unit rates for capital are based upon rates for the Mandurah line indexed to 30th June 2008 by applying the Building Cost Index published by the Department of Housing and Works. Otherwise they are based upon the most recent construction data.
- Construction and Engineering overheads are set according to the PTA Costing Principles of 20%.
- Track Maintenance costs are based upon maintenance costs for the Northern suburbs line indexed by the CPI to reflect current costs as at the 30th June 2008. Station maintenance costs are based upon internal PTA engineering data. The overhead electricity network is based upon the whole network costs. The costs have been indexed by CPI to reflect current costs as at 30th June 2008. A similar approach has been performed with Signals and communications costs.
- Economic lives are based upon the approved PTA Costing Principles. Economic life information for stations and the electricity overhead system where not included in the PTA costing principles but for the purposes of the Model have both been given an economic life of twenty five years.
- The GRV capital costs are calculated as an annuity at the beginning of the period according to the PTA Costing Principles. An allowance for Working Capital has been included consistent with the Costing Principles.
- Perth Station costs are allocated to each route by passenger boarding's and to each route section by train kilometres.
- Operating costs are derived from Train Control system and are allocated to each route section by train klms.
- Overhead costs have been allocated by staff numbers to the regulated framework and within the regulated framework by train klms to each route section.

3. Source of Inputs and Basis of Costings

For each category the following sources of information and costs are included:

Capital Costs

(a) Track Capital

- The unit costs are based upon rates extracted from the Mandurah line indexed to 30th June 2008 by applying the Building Cost Index published by the Department of Housing and Works.
- Economic lives are based upon the PTA costing principles.
- The population data is based upon route section definitions and is contained in the PTA costing Model.
- It is assumed that only concrete sleepers are used in the network and that the rate is 1,430 sleepers per klm and rail weight is set at 50kg and ballast set at a depth of 200mm.
- Maximum operating design speed for passenger trains is 140Kph

(b) Tunnels, Bridges and Overhead Electricity

- The unit costs are based upon rates extracted from the Mandurah line. Tunnels are based upon average PTA ledger rates sourced from internal PTA reviews. The unit costs for those bridges over water are based upon the costs associated with the Goongoongup Bridge in East Perth. Station costs are based upon internal and external reviews of costs for construction of the existing station structures. The costs have been indexed to the 30th June 2008 by applying the Building Cost Index published by the Department of Housing and Works.
- Economic lives are based upon the PTA costing principles. The economic lives for stations and the overhead electrical network is 25 years. This figure is based upon PTA experience with these assets.
- The population data is based upon physical verification and the Fixed Asset register of PTA. The data is contained in the PTA Costing Model.

(c) Signalling and Communication Capital

- The unit costs are based upon rates extracted from the Mandurah line indexed to 30th June 2008 by applying the Building Cost Index published by the Department of Housing and Works .
- Economic lives are based upon the PTA costing principles.
- The population data is based upon route section definitions and is contained in the PTA costing model.

Maintenance Costs

(a) Track Maintenance

- Track maintenance is based upon maintaining the infrastructure to a serviceable level until the end of its economic life. The activities and rates are contained within the PTA Costing Model.
- Unit rates are extracted from rates used in the Northern Suburbs line indexed by the Consumer Price Index to 30th June 2008.

(b) Signalling and Communications Maintenance

- These costs are based upon costs developed in the original model indexed by the Consumer Price Index to reflect current costs as at 30th June 2008.
- The activities and costs are contained within the PTA Costing Model.

Operating Costs

- Operating costs are based on upon costs developed in the original model indexed by the Consumer Price Index to reflect current costs as at 30th June 2008 for Train Control, Train Scheduling, Emergency Management and the cost of information.
- Operating costs are allocated between routes based upon Train Klm's.

Overhead Costs

- PTA Overheads
- Overheads are based upon costs developed in the original model indexed by the Consumer Price Index to the 30th June 2008 and include:
    1. IT costs
    2. Management costs including motor vehicles.
    3. Support costs including HR services and Accounting Services.

- They are allocated to each route section by train Klm's. This is considered the most equitable method of allocation for a passenger network.

4. Attached Information

The following information is attached to assist in understanding the output of the PTA Costing Model.

- Route sections and distances
- Ceiling, floor, capital, maintenance, operating and overheads by route section
- Bridges
- Overhead allocation
- Rates for capital and maintenance

5. Basis of Costs

The unit rates for capital are based upon information developed in the original model adjusted by an appropriate index to reflect current costs.

The unit rates for track maintenance are based upon actual rates provide by track maintenance engineering professional. Signals and communication costs are based upon rates in the original model indexed to 30th June 2008 by applying the Building Cost Index published by the Department of Housing and Works. Station maintenance costs are based upon an increasing percentage rate of the capital value of the station.

Overheads and operating cost are based upon costs in the original model indexed by applying the Consumer Price index to the 30th June 2008 to reflect current costs.

6. Conclusion

We believe that the model and attached information are sufficient for you to proceed with the Section 9 determinations and look forward to assisting you I this process.

Yours faithfully

Hugh Smith
General Manager Network & Infrastructure

Public Transport Authority
Government of Western Australia

Line Kilometres

Route Section	Points	Route Kilometres	Track Kilometres
Perth Central (excl) to East Perth (excl)		2.65	7.51
	822 (excl) - 772 (excl)		
	823 (excl) -771(excl)		
	771(excl) - 772 (incl)		
	772 (excl) - d/e main Platform		
	773 (excl) - d/e Car Dock		
	772 (excl) - d/e shunt		
	774(excl) - 776 (excl)		
East Perth Terminal (incl) - Midland (incl)		13.63	26.79
	771 (incl) - 740 (incl)		
	771 (incl) - 725 (excl)		
	740 (excl) - d/e Midland		
	741 (excl) - d/e Midland		
	Signal 94 - 755 (excl) W'bridge		
	764 (excl) - p/s boundary B'dean		
Perth Central (excl) to North Fremantle (incl)		16.29	33.85
	841 (excl) - 876 (excl)		
	840 (excl) - 878 (excl)		
	876 (excl) - 874 (incl)		
	874 (excl) - d/e		
	874 (excl) - d/e		
	Wharf Access to P/S Boundary		
	862 (excl) - d/e Showgrounds		
North Fremantle (excl) to Fremantle (Incl)		2.45	7.61
	876 (incl) - 881 (incl)		
	878(incl) - 882 (incl)		
	881 (excl) - 894 (incl)		
	882 (excl) - 889 (excl)		
	881 (excl) - 894 (excl)		
	882 (excl) - d/e Fremantle		
	886 (excl) - d/e Fremantle		
Fremantle (excl) to Robbs Jetty (incl)		3.32	3.32
	894 (excl) - Sig 3K Robbs		

Public Transport Authority
Government of Western Australia

Ceiling Price Schedule

Route Section	Maintenance	Operating	Capital	Perth Station Allocation	Working Capital	Overheads	Total
Perth Central (excl) to East Perth (excl)	390,798	32,416	2,755,563	100,285	99,063	63,635	3,441,760
East Perth Terminal (incl) - Midland (incl)	1,977,911	166,578	8,888,586	522,113	319,545	331,301	12,206,033
Perth Central (excl) to North Fremantle (incl)	2,260,296	199,140	9,611,269	826,977	345,525	400,302	13,643,509
North Fremantle (excl) to Fremantle (Incl)	485,826	29,971	3,122,905	124,463	112,268	60,247	3,935,680
Fremantle (excl) to Robbs Jetty (incl)	68,658	40,618	779,557	3,972	28,025	1,922	922,752
Total	5,183,489	468,723	25,157,880	1,577,809	904,426	857,407	34,149,735

Floor Price Schedule

Route Section	Maintenance
Perth Central (excl) to East Perth (excl)	377,870
East Perth Terminal (incl) - Midland (incl)	1,957,562
Perth Central (excl) to North Fremantle (incl)	2,249,914
North Fremantle (excl) to Fremantle (Incl)	468,342
Fremantle (excl) to Robbs Jetty (incl)	103,946
Total	5,157,635

Gross Replacement Value

Route Section	Signalling	Comms	Track	Stations	Bridges and Subways	Overhead Power	Train Control	Tunnels	Boom Gates & Crossings	Project Mgmt & Interest	Total
Perth Central (excl) to East Perth (excl)	6,756,613	570,646	12,144,786	1,476,723	7,084,825	2,174,082	299,521	18,541,183	1,301,091	10,745,890	61,095,359
East Perth Terminal (incl) - Midland (incl)	9,732,830	2,932,415	46,382,038	36,859,728	32,560,571	11,172,090	1,539,168	-	17,871,142	26,146,955	185,196,937
Perth Central (excl) to North Fremantle (incl)	11,863,563	3,505,643	38,433,915	45,864,243	9,716,154	13,356,009	1,840,044	42,438,708	10,539,582	32,416,375	209,974,236
North Fremantle (excl) to Fremantle (Incl)	1,751,167	527,611	15,557,605	6,871,594	32,854,532	2,010,124	276,933	-	-	12,484,374	72,333,940
Fremantle (excl) to Robbs Jetty (incl)	2,373,217	-	4,242,564	-	-	-	375,305	-	4,139,120	2,231,041	13,361,246
Total	32,477,389	7,536,314	116,760,908	91,072,288	82,216,081	28,712,304	4,330,971	60,979,892	33,850,935	84,024,636	541,961,718

Train Kilometres

Route Section	
Perth Central (excl) to East Perth (excl)	183,013
East Perth Terminal (incl) - Midland (incl)	952,815
Perth Central (excl) to North Fremantle (incl)	1,151,259
North Fremantle (excl) to Fremantle (Incl)	173,268
Fremantle (excl) to Robbs Jetty (incl)	5,529
Total	2,465,884

Public Transport Authority
Government of Western Australia

Rail Infrastructure

Route Section	Level Crossing	Bridges	Tunnels
Perth Central (excl) to East Perth (excl)	MOORE ST.	E.PERTH TERMINAL F/B CLAISEBROOK FOOTBRIDGE MCIVER U/PASS	EAST PERTH
East Perth Terminal (incl) - Midland (incl)	CALEDONIAN AVENUE. MOOJEBING ST. COLLIER ROAD MEADOW ST. EAST STREET DEVON ST. ARCHER ST. HELENA ST.	MT LAWLEY SUBWAY MT LAWLEY FOOTBRIDGE MELTHAM FOOTBRIDGE PEDESTRIAN SUBWAY BAYSWATER SUBWAY BAYSWATER_U/PASS ASHFIELD FOOTBRIDGE BASSENDEAN FOOTBRID. BASSENDEAN U/PASS SUCCESS HILL F/BRID. GUILDFORD BRIDGE GUILDFORD BRIDGE GUILDFORD FOOTBRIDGE EAST GUILDFORD F/BR. W.MIDLAND U/PASS	
Perth Central (excl) to North Fremantle (incl)	BUS TERMINAL ACCESS. JARRAD ST. SALVADO ST. MACARTHUR ST.	MILLIGAN ST FOOTBRIDGE WEST PERTH SUBWAY WEST LEEDERVILLE SUBWAY DAGLISH U/PASS NICHOLSON RD SUBWAY SHENTON PARK U/PASS SHENTON BUSWAY KARRAKATTA U/PASS SHOWGROUND SUBWAY CLAREMONT FOOTBRIDGE STIRLING ROAD_SUBWAY COTTESLOE_FOOTBRIDGE PEARSE ST FOOTBRIDGE LEIGHTON FOOTBRIDGE	SUBIACO
North Fremantle (excl) to Fremantle (Incl)		TYDEMAN ROAD FREMANTLE HARBOUR VICTORIA QUAY EDWARD ST FOOTBRIDGE PHILLIMORE ST F/BR	
Fremantle (excl) to Robbs Jetty (incl)	CLIFF ST. PHILLIMORE ST. MEWS RD. ROSE ST. MARINA ACCESS. OCEAN RD.		

Public Transport Authority
Government of Western Australia

Maintenance Rates

	Amount per Activity	Cycle
ACCESS ROADS		
Grader Work	$237 Road length	Every year
Limestone Top Up	$1,183 Road length	Every 5 years
Weedspray	$59 Road length	Every year
BRIDGES		
Cathodic Protection	$1,183 Per bridge	Every 5 years
Painting	$17,741 Per bridge	Every 10 years
Bearing Maintenance FB	$1,183 Per bridge	Every 5 years
Bearing Maintenance Others	$1,183 Per bridge	Every year
Graffiti Other	$2,957 Per bridge	Every year
Graffiti FB	$2,365 Per bridge	Every year
General Repairs	$5,914 Per bridge	Every 10 years
Protective Screens	$5,914 Per bridge	Every 5 years
Handrail repairs	$1,183 Per bridge	Every 5 years
CULVERTS		
Washways	$118 Per culvert	Every 20 years
Painting	$0 Per culvert	Every 10 years
Headwall Maintenance	$2,365 Per culvert	Every 10 years
Graffiti	$118 Per culvert	Every year
General Repairs	$1,183 Per culvert	Every 10 years
FENCING		
Special Maintenance	$0 Per kilometre	Every year
General Repairs	$118 Per kilometre	Every year
LEVEL CROSSINGS		
Major	$0 Per square metre	Every 10 years
Minor	$52 Per square metre	Every 3 years
Rebuild	$0 Per square metre	Every year
TUNNELS		
Special Maintenance	$0 Per tunnel	Every year
Painting	$11,827 Per tunnel	Every 10 years
Drainage	$1,183 Per tunnel	Every 2 years
Graffiti	$1,183 Per tunnel	Every year
General Repairs	$1,183 Per tunnel	Every 10 years
Handrail repairs	$1,183 Per tunnel	Every 10 years
TURNOUTS		
Special Maintenance	$0 Per turnout	Every year
Tamping*	$2,385 Per turnout	Every 3 years
Blade Replacement*	$6,344 Per turnout	Every 2 years
Rebuild Crossing*	$1,650 Per turnout	Every 10 years
General Repairs*	$2,122 Per turnout	Every year
TRACK		
Rail Grinding*	$3,300 Track kilometre	Every 50 years
Maintenance Grinding*	$3,960 Track kilometre	Every 3 years
Cyclic Tamping*	$6,872 Track kilometre	Every 3 years
Ballast	$4,471 Track kilometre	Every 5 years
Joint Correction	$5,914 Track kilometre	Every 20 years
Ultrasonic*	$1,375 Track kilometre	Every year
Hand Ultrasonic*	$666 Track kilometre	Every year
Patrols	$4,482 Track kilometre	Every year
General	$591 Track kilometre	Every 5 years
STATIONS	Maintenance based on percentage of capital cost:	
Year 1	0.05%	
Year 2 to 14	0.6071% increasing to 2.0% (previous year plus 0.1071%)	
Year 15 to 25	2.0% increasing to 4.5% (previous year plus 0.25%)	
Overhead Electricity Network	$23,239 $/route kilometre	Annual
Signals	$26,568 $/track kilometre	Annual
Communications	$19,181 $/route kilometre	Annual
Train Control	$12,223 $/route kilometre	Annual

Public Transport Authority
Government of Western Australia

Capital Rates

Category	Activity	Unit	Activity Total $
1 Formation		Track m	375
2 Fencing	Supply and Erect	route metres	41
3 Ballast	Supply	Tonne	
	Distribute	Tonne	
	Operational		44
4 Rail - 50kg/m	Supply	Tonne	
	Place (2 rails)	Track Km	
	Place (3 rails)	Track Km	
	Rail	meter	99
5 Sleepers Ng Concrete - 50 kg/m Incl Built In Shoulders	Supply	No	
	Place	No	
Fastenings	Supply	Sleeper	116
6 Sleepers Sg Concrete - 50 kg/m Incl Built In Shoulders	Supply	No	
	Place	No	
Fastenings	Supply	Sleeper	133
7 Sleepers Dg Concrete - 50 kg/m Incl Built In Shoulders	Supply	No	
	Place	No	
Fastenings	Supply	Sleeper	176
8 Turnouts Ng - 60kg/m 1 In 12	Supply	No	
	Place	No	323,029
9 Turnouts Ng - 60kg/m 1 In 16	Supply	No	
	Place	No	346,102
10 Turnouts Sg - 60kg/m 1 In 12	Supply	No	
	Place	No	334,565
11 Turnouts Dg - 60kg/m 1 In 16	Supply	No	
	Place	No	631,224
12 Tracklaying - Ng		Track Km	93
13 Tracklaying - Sg		Track Km	99
14 Tracklaying - Dg		Track Km	127
15 Bridges - Rail Over Water Bow		meters2	6,840
16 Bridges - Rail Over Roadway Bo		meters2	4,302
18 Culverts		per opening	14,009
19 Tunnels	Supply & Place	meters2	4,120
Tunnels Escalation Factor			1
20 Pedestrian Subways Up	Supply & Place	meters2	6,114
21 Vehicular Subways Sw	Supply & Place	meters2	4,302
22 Footbridges Fb	Supply & Place	meters2	2,967
23 Level Crossings	Supply	meters2	
	Place	meters2	10,767
24 Access Roads	Place	route metres	40
25 Track Signs	Supply and Instal	Track metres	4
26 Stand-Alone Ped Gate & Lights	Supply & Place	No	326,874
27 Stand-Alone Ped Crossing With Maize, Bells & Lights	Supply & Place	No	164,811
28 Ped Gates & Lights At Station	Supply & Place	No	326,874
29 Ped Gates & Lights At Road Crossing	Supply & Place	No	315,887
30 Road Crossing With Booms & Lights	Supply & Place	No	376,317
31 Flashing Lights Only	Supply & Place	No	295,286
32 Road Crossing With Booms & Lights (Country)	Supply & Place	No	370,824
Special Road Crossing With Booms & Lights	Supply & Place	No	343,355
33 Point Machines	Supply & Place	No	
34 Signal Systems (Section Rate)	Supply & Place	$/route m	714
35 Signal Systems (City Rate)	Supply & Place	$/track m	906
36 Signal Systems (Claisebrook Rate))	Supply & Place	$/track m	1,728
37 Coms Systems	Supply & Place	$/route m	215
38 Train Control	Annual Cost	$/route km	113
39 Overhead Electricity Network	Annual Cost	$/route Km	820