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# Arc Infrastructure Pty Ltd

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## Part 5 Instruments: Costing Principles

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# 1. INTRODUCTION

## 1.1. Preamble

The purpose of the Railways (Access) Act 1998 ("the Act") and the Railways (Access) Code 2000 ("the Code") is to establish a rail access regime that encourages the efficient use of, and investment in, railway facilities by facilitating a contestable market for rail operations.

Arc Infrastructure Pty Ltd as agent for Arc Infrastructure StandardGauge Pty Ltd and Arc Infrastructure NarrowGauge Pty Ltd ("Arc"), owned by BPIH Pty Limited (100%) is the manager of the leases of the freight rail infrastructure network in Western Australia, previously operated by the State Government owned Westrail.

The Act requires nominated parts of the rail network managed by Arc to be made available for access by third party rail operators. Schedule 1 of the Code lists the sections of the Arc network covered by the Code.

The Costing Principles are the main facet of the access regime to ensure that the correct risk return balance is struck between third party train operators and Arc.

The objectives of the Costing Principles are:

- to provide the framework for the calculation and determination of Incremental Costs and Total Costs required under the Code; and
- to define the manner in which the keeping and presentation of the railway owner's accounts and financial records so far as they relate to the determination of the Incremental Costs and Total Costs will occur.

Definitions for key terms referred to in the Costing Principles, whether defined in the Act or the Code or not, are provided in Section 8.

The Over-payment Rules determined by the ERA under Part 5, Section 47 of the Code are linked to the Costing Principles in so far as application of the Ceiling Price Test defined in Clause 8 of Schedule 4 of the Code is concerned. The Over-payment Rules, as determined, set out the methodology in dealing with overpayments where breaches of the Ceiling Price Test have occurred.

## 1.2. Background

These Costing Principles have been developed on the basis that they are a set of principles and that they will need to be supported by databases and costing models containing considerable detail, which will change from time to time. That detail is not contained in this document but Arc recognises that it must:

- prepare and have the information available for the ERA at all times and its preparation and maintenance must be consistent with these principles;

- respond to any request or Determination by the ERA related to these Costing Principles and their application;
- comply with its obligations under the Code.

### **1.3. Relevance of the Costing Principles**

The Costing Principles are a statement of the principles, rules and practices that Arc will apply to calculate the Incremental Costs and Total Costs on a route section basis, as required to be established under the Code.

The Code also allows Arc to negotiate prices between the Floor and Ceiling and as such the Floor and the Ceiling costs only provide the lower and upper bound to potential final prices for access which will be established by negotiations (and if necessary arbitration).

Although this document only refers to the Costing Principles, Arc notes that Clause 13, Schedule 4 of the Code provides the Pricing Guidelines on which negotiated access prices under the Code are to be based.

Arc is prepared to discuss access with interested parties either within the requirements of the Code or outside the Code. The rights and protection offered under the Code are not extended to negotiations and agreements undertaken outside the Code.

### **1.4. Definition of Route**

The Code refers to specific "routes" in Schedule 1. In this context, the term is used to define groupings of contiguous track sections between junctions for the purpose of exhaustively listing the track sections covered by the Code. Route is a defined term in the Code meaning "those parts of the railway network and associated infrastructure to which this Code applies, and includes part of a route".

Schedule 2 of the Code defines a "route section" as sections of the railway network that has been divided for management and costing purposes.

Arc will calculate the Incremental Costs and Total Costs at the route section level, which will then be aggregated to provide a total Incremental Cost and Total Cost for the "route" nominated by the access seeker. The route sections for key parts of the network, which will be used in the application of these Costing Principles, are included in Section 7.3. If Incremental Cost and Total Cost calculations are required for the rest of the network in Schedule 1 of the Code, they will be provided to the access seekers in accordance with Section 9(1)(c) of Part 2 of the Code.

The route Total Costs together with volume detail provided as part of Section 7(1) (of the Code will assist access seekers to assess price consistency and accuracy.

Schedule 2 of the Code lists the information relating to the standard of and the characteristics of the infrastructure, together with operating limits, for each route, which must be provided to access seekers.



## 1.5. Service Quality Commitment

Arc will adopt economically and technically efficient practices to provide a network which maintains service quality at the specified operational levels for the network.

## 1.6. Structure of this Document

This statement of Costing Principles is structured into seven further sections:

- Section 2 – Determination of capital costs
- Section 3 – Determination of operating costs
- Section 4 – Determination of overhead costs
- Section 5 – Other matters
- Section 6 – Compliance and review
- Section 7 – Annexure
- Section 8 – Definitions.

# 2. DETERMINATION OF CAPITAL COSTS

## 2.1. Introduction

The Total Costs, and in certain circumstances the Incremental Costs, include a capital charge which is intended to reflect the cost to Arc of establishing and replacing infrastructure capacity over time. The Code sets out the basis for determining the capital charge based on an annuity formula, calculated having regard to the gross replacement cost of the infrastructure, its economic life and an allowable rate of return. The capital charge, using the annuity formula, compensates Arc for both the return on capital and for capital depreciation.

The circumstances where the Incremental Costs will include a capital charge are where it is necessary to make capital expenditure to provide the service (either because of the need to expand capacity or because of the characteristics of the service requested). In such cases, it is appropriate to include the cost of this capital in the Incremental Costs. These circumstances will usually be limited to situations where capacity has to be expanded to meet the customer's requirements. In calculating an operator's incremental cost, the economic life assumption underpinning the annuity payment calculation for these types of capital costs will be based on the economic life of assets listed in Section 7.1. If the assets service a time limited project, then the annuity will be based on that shorter life, and the ERA will be advised as to the reasons for the shorter life assumption.

There are five key elements which underpin the determination of the appropriate capital charge:

- infrastructure to be included in the calculations;
- gross replacement value;
- economic life of the asset;
- allowable return; and
- annuity calculation.

Each of these elements is discussed below.

## 2.2. What infrastructure is included

The assets included in the capital calculations include only the assets directly engaged in the provision of rail infrastructure services, as defined in the Code and include:

- railway track, associated track structures, over and under track structures, supports (including supports for equipment or items associated with the use of a railway);
- tunnels and bridges;
- stations and platforms;
- train control systems, signalling systems and communications systems;
- buildings and workshops; and
- associated plant, machinery and equipment.

Sidings or spur lines that are excluded by Section 3(3) or (4) of the Act from being railway infrastructure are not included.

Assets which support operating functions will be included in the operating cost or overhead cost calculations as appropriate. Assets included in this category are motor vehicles, computers, printers, facsimile machines, photocopiers, system hardware and software, mobile and fixed communications, office furniture and equipment. The cost of these assets will be calculated on a net basis.

In accordance with the ERA's Determination, Arc has not included cuttings and embankments in the initial capital calculations. However, expenditures on cuttings and embankments incurred since the commencement of the Rail Access Regime, to create capacity or expand the network, or improve operating standards or efficiency, will be included in the calculation of the Total Costs.

## 2.3. Gross Replacement Values

There are a number of underlying assumptions which effect the calculation of Gross Replacement Values (GRV) including:

### *Capacity of Infrastructure*

The infrastructure is required to be optimised to meet current and reasonably projected demand.

Arc believes the existing network can meet the current and reasonably projected demand for all users taken together. If Arc sought to include the costs of additional infrastructure to meet projected demand it would need to demonstrate:

- the basis of the demand projection, and
- a commitment to the capital expenditure.

### *Route Optimisation*

Arc has assumed that the optimised network is provided by the rail track within the existing corridor of the land and therefore the resulting lateral alignment of the network is considered efficient.

### *Contributed Assets*

Contributed assets will be included in the cost of capital for the purpose of calculating the GRV and the Total Costs. Contributed assets include both government and operator contributed assets, and the cost of operating and maintaining these assets will also be included in the calculation of Total Costs.

In the case of Government and operator contributed assets, the value of the contributed capital will be accounted for as an equivalent annuity payment which is to be included in the revenue earned on the asset, for the purpose of the Price Test.

As an illustration, if Arc contributed 50% of the capital cost of a new level crossing, with the other 50% coming from another source, then for the purpose of the Total Cost calculation, the full cost of the level crossing calculated as an annuity would be added to the Total Cost of the relevant route section. As for the 50% contribution from the other source, that amount would be annualised and treated as revenue for the purpose of the Ceiling Price Test of that route section.

### *Greenfields Site*

For the purposes of calculating the GRV, the replacement cost calculations are to assume a greenfields site and hence costs related to constructing around rail traffic, surface restoration and other surface diversions are excluded from the GRV.

### *Modern Equivalent Assets*

Replacement values are to be assessed on the basis of Modern Equivalent Assets (MEA), where appropriate.

Arc considers that the majority of the existing track configuration (that is sleeper type, rail weights, etc.) can be adopted as the MEA. It is assumed, however, that this track configuration is new in accordance with the Code. Where the Total Costs calculated for a specific route using MEA is significantly higher than the existing infrastructure calculation, the ERA may determine that it is not appropriate to apply MEA. Under these conditions the pre-existing infrastructure may be used in determining the Total Costs if the existing infrastructure meets current and anticipated operational and safety standards and if the infrastructure components are available in the market.

However, Arc recognises that the ERA, when determining the Incremental Costs and Total Costs on the various routes as part of the Clause 9, Schedule 4 of the Code review, will decide the MEA applicable to the route sections and the exceptions proposed by Arc.

Arc calculates the GRV using current market tested unit rates for materials and construction based on the MEA, or using the existing infrastructure, if appropriate. All Total Costs will be calculated using best practice capital cost unit rates. Where there is a likelihood that the Total Cost calculation for a route section has the potential to breach the Total Cost, the ERA may require an independent review of these costs.

The key steps required to complete a GRV estimate based on MEA are:

- identify the route that the GRV is being calculated for;

- assess the existing railway infrastructure specification to ensure that the MEA test is appropriate;
- review asset databases to ensure the population of assets is correct;
- confirm existing network capacity will meet current and reasonably expected future demand on the network;
- confirm unit rates are based on efficient costs;
- complete an analysis of each asset class to optimise the network to a MEA; and
- calculate the current replacement cost GRV of the railway infrastructure using the MEA or existing asset specification if appropriate.

The key capital cost drivers Arc will adopt to ensure a MEA network are:

- the operating track standard (axle load, speed);
- population of supporting infrastructure (bridges, culverts); and
- topography of route (gradient and track curvature).

The operating standards that Arc will apply for determining GRV are as follows:

- for that part of the Standard Gauge network that is part of the DIRN (Kalgoorlie to Kwinana) as defined by the Australian Transport Council the standards in place at 1 January 2002; and
- for the Standard Gauge branch lines and the Narrow Gauge main and branch lines the standards that Arc is required to maintain the tracks at in accordance with the lease obligations entered into in December 2000.

### *Unit Rates*

Arc has built unit rates into the Arc Costing Model based on an independent engineering consultant's report; where these rates have any adjustment for scale or scope or the impact of location these assumptions will be included.

This information is contained in Arc's Costing Model and will be made available to the ERA and contains information of the source and the assumptions that are currently used in the model.

In addition, Arc will identify and provide to the ERA unit rate information and assumptions that it considers can be released as part of any public consultation process for the ERA's Clause 9, Schedule 4 of the Code determination on the Incremental Costs and Total Costs to apply to certain routes.

### *Design, construction and project management fees*

Arc will apply design, construction and project management fees at a rate of 20% of the total cost of the infrastructure and based on an economic life of 50 years.

Because Arc uses primary unit rates for establishing construction costs, it is appropriate to charge the full project management on the materials cost calculated for the infrastructure. In cases where such fees are included in unit rates, Arc accepts that the project management fee should be reduced to account for such charges, keeping total design, construction and project management fees in line with a 20% limit.



### Financing charge during railway infrastructure construction

The Code requires that the GRV for railway infrastructure be applied as part of the calculation of the capital charge. Consistent with this approach is that Arc will include in the capital cost an allowance for its cost of capital and related financing fees and charges during the construction period.

Arc will apply the WACC determined by the ERA to the construction cash flows to calculate the financing charge. Upon completion of construction, the interest calculation ceases. In determining the annuity payment attributed to such costs, a 50 year economic life assumption will be utilised.

Construction rates will vary depending on scale and scope and also the geography and the impact of other infrastructure on the route. Arc has used an average construction rate of one kilometre per day. This rate will be based on the entire route and allocated to route sections on a per kilometre basis. The ERA may consider a higher or lower rate in some sections of the network and adjust the construction rate accordingly.

### 2.4. Economic Life

Arc has evaluated the economic lives of its infrastructure based on the application of MEA with new components and key determinants of asset life such as environmental factors, which will have an impact to extend or reduce the life of the asset.

This evaluation is based on generally accepted industry lives and Arc's own experience. The lives adopted by Arc are generally consistent with those accepted in other regimes.

Two assets subject to reduced lives due to the specific nature of the rail operation in which they are used are:

- rail life – affected by track curvature and volume; and
- turnouts – a complex asset which has a different spread of lives for components.

With regard to rail life, the track curvature and volume specific to a nominated route will reduce the life of the rail. The effect of such curvature and traffic volume on economic life will be represented using the matrix shown below. These estimates are based on engineering assessment of rail life on curves, and have been approved by the ERA.

Life Expectancy (Years)				
Rail Curvature	0-10MGT	>10-15MGT	>15-20MGT	>20MGT
0 to 400 metre radius	15	8	7	6
400 to 800 metre	30	14	12	10
> 800 to tangent	70	65	62	60

MGT = Million Gross Tonnes

This matrix assumes that rail lubrication is used as a preventative maintenance method.

In the case of turnouts some components have different lives. As approved by the ERA, Arc will calculate the annuity based on the individual components and the lives of each component as shown below:

Turnout Sub asset	Value in % (Concrete)	Value in % (timber)	Life 0-10 MGT	Life >10-15 MGT	Life >15-20 MGT	Life >20 MGT
Bearers (concrete)	18		40	35	32	30
Bearers (timber)		10	18	15	13	12
Blades and Stock Rails	12	14	9	5	5	4
Rail bound crossings	24	26	17	12	12	10
Balance of turnout	46	50	25	22	21	20

MGT = Million Gross Tonnes

Whilst this will be discussed in the section relating to maintenance in Section 7.1, the maintenance regime has been set to allow the asset to reach its economic life. It has been assumed that the asset is life expired at the end of that period, has no economic (salvage) value and there are no costs to reclaim or dispose of the life expired assets.

There may be circumstances where the economic life of an asset is dependent on the life of a specific business such as a mine. If assets are included in the GRV specifically to service a time-limited project then the annuity will be calculated on that life. Arc will advise the ERA of the reasons for the shorter life assumption. In addition, the three year review of the GRV would also assist the ERA in assessing the validity and continuation of that assumption.

In these instances, especially if the life is short (say 10 years or less) there will be a need to include salvage and re-use costs.

The economic lives of the assets adopted by Arc are set out in Section 7.1.

## 2.5. Allowable return

In accordance with the Code, the WACC as applied to Arc will be determined by the ERA and reviewed (by the ERA) each year at 30 June.

## 2.6. The annuity calculation

The annuity calculation provides a return on capital and implicitly provides for depreciation of the asset.

Arc has adopted the methodology (applying the PMT formula) used in a Microsoft Excel spreadsheet to calculate the annuity required.

The MS Excel terminology for the Annuity formula (PMT) is described:

- Rate of Interest:** be set at the relevant WACC as defined by the Code.
- Nper:** be expressed in years and based on the relevant economic life of the track sections.
- Pv:** Is the GRV of the relevant route section.
- Fv:** is the salvage value, if any, which remains at end of economic life. When an asset achieves its full economic life, then the salvage value is to be set at zero.
- Type:** be set at the start of the period by inputting "1".

This formula calculates the costs at the beginning of the period which does not reflect the actual payment cycle for access charges. The appropriate methodology is to calculate the change monthly in arrears but this is not possible under the definition in the Code where economic life for the GRV of the railway infrastructure is to be expressed in years as the number of periods.

To allow for this, the ERA has determined that Arc can include in its operating costs a proxy for the working capital required because of the effects of the formula (refer to Section 3.3).

### 3. DETERMINATION OF OPERATING COSTS

#### 3.1. Introduction

Arc has prepared its operating costs based on the efficient cost of maintaining the MEA network.

#### 3.2. Efficient Cost Tests

Arc will test whether the operating costs used for determining the Incremental Cost and Total Cost are efficient as follows:

- benchmarking will be used where it is available and comparable;
- for certain processes and activities unit costs from competitive tendering may be used;
- if the maintenance programs are based on accepted industry standards for maintenance which describe the scope and frequency of the activity then this may be considered to be efficient;
- actual costs may be used where the consumption and scope are efficient (eg. train controller's salaries if the number of controllers and their range of duties are efficient by benchmarking);
- actual costs may also be used where the costs:
  - come from a competitive market such as insurance; or

- are regulatory costs (such as the cost of Rail Safety Accreditation).

In measuring efficiency, Arc recognises that these costs change over time especially as a result of innovation and technological change.

### 3.3. Definition of Operating Costs

In determining what maintenance activities are required to maintain MEA infrastructure in a GRV based regime, major periodical maintenance activities (MPM) have not been included. For the purpose of the Costing Principles, this is because MPM is assumed to extend the economic life of the assets.

However, it is noted that the use and definition of MPM has a wide variety of application and interpretation in the rail industry.

There are some activities which are included in both MPM or in Cyclical Maintenance in a GRV based regime and are not exclusive to either.

Therefore Arc has defined the terms Routine and Cyclical Maintenance to detail what activities have been included in operating costs.

Operating costs are defined in the Code and Arc has four categories of operating costs in Arc's Costing Model as follows:

- Routine Maintenance for track, and signals and communications;
- Cyclical Maintenance for track, and signals and communications;
- Network Management Costs; and
- Working Capital.

#### *Routine and Cyclical Maintenance for track*

Arc has developed a track maintenance model which calculates the cost of maintaining the track infrastructure in accordance with the defined assumptions documented in the Costing Principles. The assumptions adopted in this process are:

The track infrastructure is new at year 1 and is maintained to realise the defined economic life of components of the asset. The infrastructure maintenance levels and the frequency of the activities are deemed to comply with the Australian Standard AS4292 Parts 1 and 2 which specify safety requirements of the Railway Safety Management System. Arc's maintenance practices also comply with the Codes of Practice for both the Narrow and Standard Gauge network.

The maintenance regime is broadly classified into two categories:

- routine maintenance; and
- cyclical maintenance.

There are two major activity classifications within Routine Maintenance.

- routine inspections; and



- routine maintenance – which typically follows the inspection process.

The inspection regime includes patrolling, on-train inspection, track condition monitoring (using recorder vehicles), defined event inspections by patroller and structures inspection.

Routine Maintenance is therefore the corrective action taken as a follow up to routine inspections.

Cyclical Maintenance represents tasks that are undertaken at regular intervals which are necessary to achieve the expected asset life and include:

- track resurfacing, rail grinding, ballast top up and cleaning, rail defect removal and structures maintenance to achieve economic life; and
- firebreaks, scrub slashing, drainage, access roads and road seal on level crossings to meet operational and safety requirements.

The cost of repairing incidents such as fire and flood, or damage caused to the track as a result of derailments or accidents has been included in maintenance costs but only to the extent they are not recoverable from insurance or operators. The cost of repairing incidents will not be included if it can be shown that Arc is negligent in its responsibility as a railway owner. Arc intends to calculate incident costs based on a historical cost approach. However, Arc understands that the ERA will decide on the manner in which the cost of incidents will be calculated when determining the Incremental Costs and Total Costs on the various routes as part of the Clause 9, Schedule 4 of the Code review.

The track maintenance model is incorporated as part of the Arc Costing Model and includes all the assumptions and prices used. As the level of maintenance activity varies over the life of the asset, it is appropriate to calculate the net present value of the projected stream of maintenance costs that occurs over the life of the asset, starting with the assumption of a new asset in year 1. The annualised value of this stream of costs is then used to represent an average annual maintenance charge over the life of the asset.

These are costs included in the definition of Operating Costs in Schedule 4 of the Code.

### *Routine and Cyclical Maintenance for signalling and communications*

Signalling and communications costs are largely based on Routine Maintenance because of the safety and operating requirements of these systems.

Routine Maintenance is based on industry accepted inspection regimes and based on fault history. It includes specified periodical inspections and procedures (including testing) and responses to faults.

Cyclical maintenance is significantly less important for signalling and communications and includes component rebuilds to achieve economic life.

The signal and communications maintenance model is incorporated as part of the Arc Costing Model. The annual charge is based on an annualised value of the net present value of maintenance costs stream. Maintenance costs are allocated to route sections according to train movements.

These are costs included in Part (b) of the definition of “operating costs” in Schedule 4 of the Code and the NPV of the cash flows is then used to calculate an average annual maintenance charge over the life of the asset.

### *Network Management Costs*

There are Arc costs directly associated with operational management of the network as defined in Part (b) of the definition of “Operating Costs” in Schedule 4 of the Code.

They reflect a centralised train control system and include compliance costs with Arc’s Rail safety accreditation requirements under the Rail Safety Act, train scheduling and requirements for emergency management.

### *Working Capital*

Because of the limitations in the Code in calculating the annuity formula described in Section 2.6 Arc has included in its operating costs an annual working capital charge that is calculated by multiplying  $\frac{1}{2}$  of the WACC by the annuity.

## **3.4. Allocation of Operating Costs**

Track and signalling maintenance costs are directly allocated to route sections based on the nature and population of the infrastructure.

Centralised train control cost will be apportioned directly to routes based upon actual train control resources managing traffic over each route. Allocation of non-sector specific operating costs including costs in Part (a) of the definition of “Operating Costs” in Schedule 4 of the Code is in accordance with the allocation rules using GTK or train movements and listed in Section 7.2. In general terms, train movements have been linked to Network management functions and the management of maintenance related functions have been linked to Gross Tonne Kilometres. Arc is of the view that this will provide the most appropriate allocation between users which are predominantly rail freight customers. The allocation of Operating Costs will in the first instance be apportioned to the route level and subsequent allocation to the Route Section will be determined by the ERA as part of the Incremental Cost and Total Cost determinations.

## **4. OVERHEAD COSTS**

### **4.1. Definition of Overhead Costs**

Overhead costs are defined in the Code and Arc has two categories of overhead costs in the Arc Costing Model as follows:

- Arc overheads; and
- Corporate overheads.

These are defined in Section 8 and included in the Arc Costing Model.

Arc is a separate legal entity and has an efficient overhead structure which relates to its business of access provision. It should be noted that Arc has no other function than the

provision of access. Nonetheless, Arc notes that only those overhead costs attributed to activities related to the Code's definition of railway infrastructure will be included in the Floor and Ceiling Price Tests.

The Arc overheads are defined in Section 7.2(i).

Arc's parent company provides certain corporate overhead functions to Arc, at Arc's expense.

#### **4.2. Allocation of Overhead Costs**

The allocation of Overhead Costs will in the first instance be apportioned to the route level and subsequent allocation to the Route Section level will be determined by the ERA as part of the Incremental Cost and Total Cost determinations.

Details of overheads included are set out in Section 7.2.

## **5. OTHER MATTERS**

### **5.1. Variation of Incremental Costs and Total Costs**

Following any determination of Incremental Costs and Total Costs, the costs may be indexed annually, for a period of up to five years. Where the determination of Incremental Costs and Total Costs has been made in relation to an Access Agreement, the costs will be indexed for a period of up to five years from the commencement of the Access Agreement. The purpose of the indexation is to enable the administration of the Over-payment Rules in relation to revenues received under the Access Agreement and to enable Total Costs to reflect a reasonable return to Arc over the five year period without requiring Arc or the ERA to redetermine the Incremental Costs and Total Costs over that period.

Arc will index the Total Costs based on CPI minus the "X" factor and the WACC. Arc will index the Incremental Costs based on CPI minus the "X" factor. The "X" factor is set at one quarter of the annual change in CPI. The WACC is published annually by the ERA.

In determining CPI, the Australian Bureau of Statistics Weighted Average of Eight Capital Cities All Groups CPI index will be used. The annual change in CPI is calculated as the percentage change in CPI to the September quarter of each year from the corresponding September quarter of the previous year. Arc will submit the indexed Incremental Costs and Total Costs for determined routes to the ERA for review and approval.

### **5.2. Calculation of the Total Costs**

Clause 1, Schedule 4 of the Code includes a definition of the total costs to be included in the calculation of the Total Costs.

The Ceiling Price Test is defined in Clause 8 of Schedule 4 to the Code. The calculation of Total Cost is the same for all operators, and will be based on:

- Capital costs (Section 2 of this Costing Principles document);
- Operating costs (Section 3); and
- Overhead costs (Section 4).

Arc recognises the need to demonstrate to the ERA that the costs referred to the above are efficient.

### **5.3. Calculation of Incremental Costs**

The Floor Price Test is defined in Clause 7, Schedule 4 of the Code.

The calculation of incremental cost is dependent upon a number of specific circumstances which will vary based on each access application. Each operator can have a difference incremental cost and the sum of all operators incremental costs for the route must not be less than the total incremental costs resulting from all operations on the route.

Arc will apply the following factors to calculate the Incremental Cost:

- the percentage that the incremental traffic represents of the total traffic;
- the existing overall level of traffic (that is, high or low density traffic use);
- the requirements of the service (e.g. high speed passenger versus low speed freight);
- the nature of the infrastructure (which will influence the operating costs) and the specific requirements of the user; and
- the nature of the train operations and its impact on overhead costs.

These factors will influence the derivation of the incremental costs to be avoided and issuing a set of rules which deals with these and other factors either individually or in combination is impractical. Each application will be based on its individual circumstances and will set out the factors that Arc determines are relevant in calculating the Incremental Cost. If factors other than those mentioned above are considered relevant by Arc it will apply to the ERA to have these additional factors included.

Capital costs will only be incorporated in the Incremental Cost when it can be demonstrated that the operator's requirements require additional capital investment to increase the capacity of the MEA.

Given the likelihood that the Incremental Cost for a particular route section is unlikely to have a capital requirement attached to it, this means that the Incremental Cost of a route section will generally be based on the operating and overhead costs attributed to that route section.

## **6. COMPLIANCE AND REVIEW**

Stakeholders have the ability to express any concern to the ERA which may arise at any time and the ERA will investigate such claims.

The ERA has the power under the Code to amend the Costing Principles at any time and Access Seekers and Operators can at any time request the ERA to consider amendments.

The ERA can also commission special audits at any time on any Costing Principles issue where additional assurance is required.



## 7. ANNEXURES

### 7.1. Economic Life of Assets

		Life Expectancy					
1	Earthworks for track	100 yrs					
2	Bridges, Tunnels and Culverts						
	a Bridges (not footbridges)	100 yrs					
	b Culverts	50 yrs					
3	Level Crossings	20 yrs					
	Access Roads	10 yrs					
4	Fencing of track	15 yrs					
5	Track Materials						
	a Rail Life			<b>0-10MGT</b>	<b>&gt;10-15MGT</b>	<b>&gt;15-20MGT</b>	<b>&gt;20MGT</b>
	Curve < 400m			15yrs	8yrs	7yrs	6yrs
	Curve 400-800m			30yrs	14yrs	12yrs	10yrs
	Curve > 800m & tangent			70yrs	65yrs	62yrs	60yrs
	b Turnouts	<b>Value %</b>	<b>Value %</b>	<b>0-10MGT</b>	<b>&gt;10-15MGT</b>	<b>&gt;15-20MGT</b>	<b>&gt;20MGT</b>
		<b>Concrete</b>	<b>Timber</b>				
	Bearers Concrete	18%		40yrs	35yrs	32yrs	30yrs
	Bearers Timber		10%	18yrs	15yrs	13yrs	12yrs
	Blades and Stock Rails	12%	14%	9yrs	5yrs	5yrs	4yrs
	Rail bound crossing	24%	26%	17yrs	12yrs	12yrs	10yrs
	Balance of turnout	46%	50%	25yrs	22yrs	21yrs	20yrs
				<b>Concrete</b>	<b>1:2 steel</b>	<b>1:4 steel</b>	<b>Timber</b>
	c sleepers			50yrs	30yrs	25yrs	20yrs
	d Ballast			25yrs	25yrs	25yrs	25yrs
	e Jewellery			25yrs	25yrs	25yrs	25yrs
6	Track Construction			50yrs	50yrs	50yrs	50yrs
7	Roads and shunter's pathway	10yrs					
8	Signalling						
	a Track Construction	20yrs					
	b Flashlights	20yrs					
	c Boomgates	20yrs					
9	Communications	20yrs					
10	Maintenance						
	a Track Signs	10yrs					
11	Contractors Margin and Overheads	50yrs					
12	Engineering and Contract Management	50yrs					
13	Interest on Construction	50yrs					

## 7.2. Operating and Overhead allocation table

Cost Classification	Description	Inclusions	Allocation
<b>Operating Costs</b>	(i) Network management	Access management; train scheduling and operations planning; RAMS management; safeworking management; telephone charges and radio licences	Train numbers
	(ii) Infrastructure Management Costs	Maintenance management; engineering support; and inventory holding costs.	By Region and then GTKs within that Region
	(iii) Centralised train control	Total train control function	Direct allocation to routes based on operational study
<b>Overheads</b>	(i) Arc Overheads	Corridor management; access compliance costs; net cost of computers; office equipment; furniture; motor vehicles; safety accreditation costs; and Arc management costs. Information systems, Payroll , Human resource management; accounting/finance, company secretarial and legal are included as part of Arc overhead.	GTK & Train Numbers Proportion to be agreed by the ERA during Incremental and Total cost determinations.

### 7.2.1. Notes

Two proxies are used to allocate overheads. GTK's are used to allocate costs which vary more in quantum due to volumes moved, and train movements are used to allocate costs which vary more in quantum due to the number of train movements.

### 7.3. Route Sections

Route sections as approved by the ERA are provided:

#### **Route Sections for Selected Routes**

##### *FORRESTFIELD TO KALGOORLIE*

FORRESTFIELD - MIDLAND  
MIDLAND – MILLENDON JN  
MILLENDON JN - TOODYAY WEST  
TOODYAY WEST - AVON YARD  
AVON YARD - WEST MERREDIN  
WEST MERREDIN – KOOLYANOBHING  
KOOLYANOBHING - WEST KALGOORLIE  
WEST KALGOORLIE – KALGOORLIE

##### *KALGOORLIE TO ESPERANCE*

WEST KALGOORLIE – HAMPTON  
HAMPTON - KAMBALDA  
KAMBALDA - SALMON GUMS  
SALMON GUMS – ESPERANCE

##### *KALGOORLIE TO LEONORA*

KALGOORLIE – MALCOLM  
MALCOLM – LEONORA

##### *KWINANA TO BUNBURY INNER HARBOUR*

KWINANA – MUNDIJONG JN  
MUNDIJONG JN - PINJARRA  
PINJARRA – ALUMINA JN  
ALUMINA JN - PINJARRA  
SOUTH PINJARRA – WAGERUP  
WAGERUP – BRUNSWICK JN  
BRUNSWICK JN - PICTON JN  
PICTON JN - BUNBURY INNER HARBOUR

## 8. DEFINITIONS

<b>Access Agreement</b>	Means an agreement between Arc and an entity for access by that entity.
<b>Act</b>	Means the <i>Railways (Access) Act 1998</i> .
<b>Arc</b>	Means Arc Infrastructure Pty Ltd as agent for Arc Infrastructure StandardGauge Pty Ltd and Arc Infrastructure NarrowGauge Pty Ltd.
<b>Arc Costing Model</b>	Means the model that Arc use to calculate Total Costs and includes the associated models and data bases for: <ul style="list-style-type: none"> <li>• the track and signalling and communications model which calculate the GRV of the infrastructure;</li> <li>• track and signalling/communications maintenance models;</li> <li>• the operating costs model;</li> <li>• the overhead and other costs allocation model;</li> <li>• track population data bases;</li> <li>• the usage model which records from RAMS the GTK usage and train movement by route section,</li> </ul> and supporting detail for these models including unit rates, assumptions and sources of information as well as the physical characteristics of the infrastructure including distance and specifications.
<b>Arc Rules</b>	Means Arc's Rules (including the Appendix to the Rules and Working Timetables) issued in accordance with Arc's Safety Management Plan approved under Section 10 of the Rail Safety Act together with any amendments, deletions or additions made in accordance with the Safety Management Plan and all policies and notices issued by Arc for the purpose of ensuring the safe use of the Network.
<b>Code</b>	Means the <i>Railways (Access) Code 2000</i> established under the Act.
<b>Contractor</b>	Means a person or entity engaged by Arc to provide advice about or to perform part of its access related functions.
<b>Costing Principles</b>	Means the principles, rules and practices determined by the ERA in accordance with Section 46 of the Code.
<b>CPI</b>	Means the Weighted Average of Eight Capital Cities All Group Consumer Price Index published by the Australian Bureau of Statistics or the Australian Statistician.



<b>Cyclical maintenance</b>	<p>Means tasks that are undertaken at regular intervals (e.g. annually or specific longer intervals) which are necessary to achieve the expected asset life.</p> <p>Tasks could include:</p> <ul style="list-style-type: none"> <li>• track resurfacing - rail grinding; calculation, ballast top up and cleaning, rail defect removal, and structures maintenance.</li> <li>• signalling and communications - servicing, component replacement and cleaning.</li> <li>• track - firebreaks, scrub slashing, drainage, access roads, road seal on level crossings; and</li> <li>• signalling and communications - upgrading of components and change out for detailed servicing.</li> </ul>
<b>DIRN</b>	<p>Means the Defined Interstate Rail Network as set by the Australian Transport Council (ATC) which refers to the Kwinana to Kalgoorlie section of the network.</p>
<b>Efficient Costs</b>	<p>Means those costs that would be incurred by a body managing the railways network and adopting efficient practices applicable to the provision of railway infrastructure, including the practice of operating a particular route in combination with other routes for the achievement of efficiencies.</p>
<b>Economic Regulation Authority (ERA)</b>	<p>Means the Western Australian Independent Rail Access Regulator under Section 13 of the Act.</p>
<b>Incremental Cost</b>	<p>Means the incremental costs as defined in Clause 1 of Schedule 4 of the Code.</p>
<b>GRV</b>	<p>Means the gross replacement value of the railway infrastructure calculated as the lowest current cost to replace the existing assets with assets that:</p> <ul style="list-style-type: none"> <li>• have the capacity to provide the level of service that meets the actual and reasonably projected demand; and</li> <li>• are, if appropriate, MEA.</li> </ul>
<b>GTK</b>	<p>Means gross tonne kilometre.</p>
<b>MEA</b>	<p>Means modern equivalent asset, being an optimised network that is re-configured using current modern technology serving the current load with some allowances for reasonably projected demand growth up to three years into the future. The MEA excludes any unused or underutilised assets and allows for potential cost savings that may have resulted from technological improvement.</p>
<b>MPM</b>	<p>Means major programmed maintenance activities which are, or are associated with, partial asset renewal to maintain functional condition of the infrastructure and which occur at intervals greater than one year.</p>

<b>Network Management</b>	Means activities that are undertaken in the provision of train management. Functions include access management, train scheduling, operations planning, RAMS management, customer service and safe working management.
<b>Overheads</b>	Means overheads attributable to the performance of the railway owner's access-related functions whether by the railway owner or an associate.
<b>Over-payment Rules</b>	The Over-payment Rules are those rules determined by the ERA in accordance with Clause 47 (part 5) of the Code and deal with the circumstance of a breach of the Total test.
<b>Rail Safety Act</b>	Means the Rail Safety Act 1998.
<b>RAMS</b>	Means the Rail Access Management System computer system operated by Arc for the purpose of preparing Train consists and monitoring Train progress on the Network and generally for the purpose of Train Control, including for the provision of information relating to timetables, special train notices, temporary speed restrictions, and track warnings.
<b>Route Section</b>	Has the meaning defined in Section 7.3. of this Costing Principles document.
<b>Routine Maintenance</b>	Means regular and ongoing maintenance activities, which are required to meet specific levels of defined safety and operational standards and commences from day one of operation and is generally continuous for the life of the operation. There are two major activity classifications: <ul style="list-style-type: none"> <li>• Routine Inspections <ul style="list-style-type: none"> <li>○ Track – includes patrolling; track recording using on track recording technology, ultrasonic testing, site inspections; and structures inspections; and</li> <li>○ Signalling and Communications includes programmed inspections and systems and equipment testing</li> </ul> </li> <li>• Routine Maintenance – usually undertaken as a result of the inspection process <ul style="list-style-type: none"> <li>○ Track – includes change out of failed sleepers or components; cross boring; recanting of curves; geometry corrections and tamping following inspections; turnout maintenance, minor formation repairs; and fastening replacement.</li> <li>○ Signalling and communications - includes scheduled services, replacements and cleaning, etc.</li> </ul> </li> </ul>

<b>Total Cost</b>	<p>Means the total of all:</p> <ul style="list-style-type: none"> <li>• operating costs;</li> <li>• capital costs; and</li> <li>• overheads attributable to the performance of the railway owner's access related functions whether by the railway owner or an associate; as defined in the Code, <p>as defined in Clause 1, Schedule 4 of the Code.</p> </li></ul>
<b>WACC</b>	<p>Means the target long term weighted average cost of capital appropriate to the railway infrastructure expressed as an annual interest rate and determined by the ERA in accordance with Clause 3, Schedule 4 of the Code.</p>
<b>Working Timetable</b>	<p>Means the train timetables and operating data for all or part of the network issued as part of the Arc Rules and as amended from time to time.</p>