



AUSTRALIAN RAIL TRACK CORPORATION LTD

**DOCUMENT TYPE: PROJECT PROPOSAL REPORT
(PPR)**

**PROJECT DETAIL: PORT BOTANY RAIL LINE UPGRADE
METROPOLITAN FREIGHT NETWORK
INTERFACE AND IMPROVEMENT
PROGRAM**

**LOCATION: SYDNEY URBAN:
PORT BOTANY-
ENFIELD-
SEFTON PARK/
FLEMINGTON, NSW**



A ADMINISTRATION

PROPONENT DETAILS

A1 COMPANY DETAILS

AUSTRALIAN RAIL TRACK CORPORATION

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A2 PROJECT DIRECTOR

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PROJECT DETAILS

A3 PROJECT NAME

Port Botany Rail Line Upgrade /
Metropolitan Freight Network (MFN) Interface and Improvement Program.

A4 CORRIDOR LOCATION

Sydney Urban

A5 PROJECT SUMMARY

The Project consists of a package of sub-projects which involves:

- Upgrading the Port Botany railway line to meet growing demand for container transport by rail and to achieve efficiencies in operating and maintenance practices
- Integrating the management and operation of the Metropolitan Freight Network (MFN), including the Port Botany Rail Line, with the Southern Sydney Freight Line (which is currently in the tender phase) and ARTC's Macarthur-Melbourne railway line.

The key sub-projects are:

Port Botany Rail Line Upgrade

- A major reconfiguration of Botany Yard, which is the interface between the rail network and the stevedore loading facilities, to reduce congestion and increase capacity
- Signalling at the entrance to Cooks River Yard to streamline entry and exit from the yard, improve operational efficiency, and integrate the control of train movements with train control for the rest of the corridor.
- Establishment of train staging capacity at Enfield Yard to hold and resequence trains away from the congested Port Botany area.

Metropolitan Freight Network Interface and Improvement Program

- The key work will be a re-organisation of train and signal control (which is currently controlled from various RailCorp locations) so that train and signal control for the entire corridor through to Port Botany is centrally controlled from ARTC's train control facility in Junee.

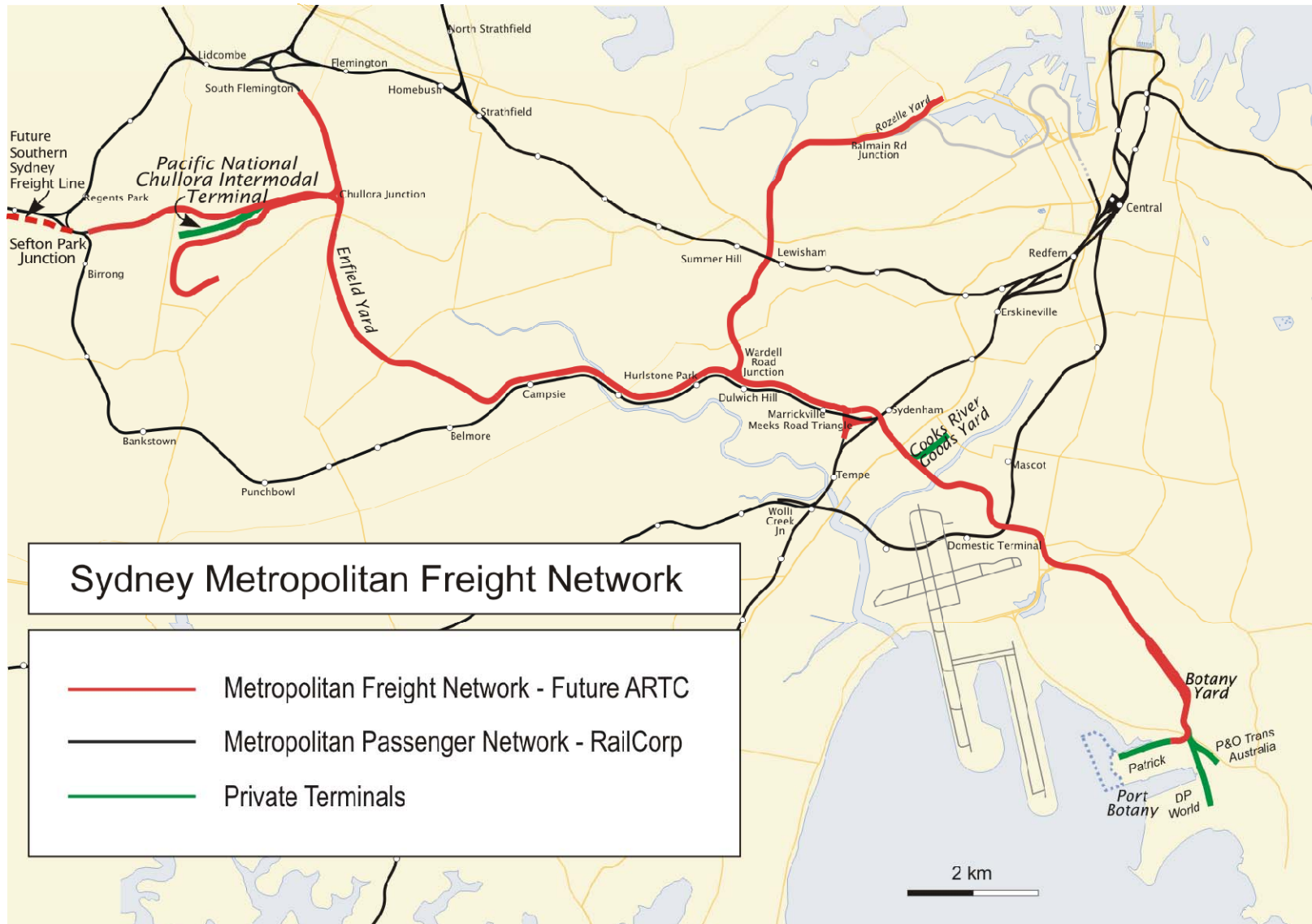
A map of the Metropolitan Freight Network is shown on the next page, which shows the locations of Botany Yard, Cooks River and Enfield Yard.

Detailed diagrams of the proposed Botany Yard and Enfield sub-projects are included as attachments E1 and E2.

Project Proposal Report (PPR)



Port Botany Rail Upgrade and MFN Interface Program



The various sub-projects are presented as an integrated package in this PPR as the benefits that flow from the various works are inherently inter-linked and cannot be properly evaluated in isolation. In particular:

- The various sub-projects of the Botany Line Upgrade are operationally interlinked e.g. the Enfield Staging Facility is necessary to realise the full benefits of the Botany Yard reconfiguration.
- Realising the benefits of the various Botany Line Upgrade sub-projects requires that the line be controlled from ARTC's control centre in Junee, which is the key component of the MFN Interface project.

A6 PRIMARY PROJECT CATEGORY

Rail

- Capacity augmentation – improved capacity in the corridor through track reconfiguration at Botany Yard and Enfield
- Strengthening – track upgrading at Botany Yard
- Technology – signalling at Botany, Cooks River and Enfield, and train/signal control from ARTC's control centre

A7 PHASES SEEKING FUNDING

This PPR seeks approval for funding of the **Project Development** phase.

\$7 million of funding is being sought under this PPR to progress the Project Development activities. The total estimated project cost (Project Development plus Project Delivery) is \$65 million.

A subsequent PPR will seek separate approval for Project Delivery funding (estimated cost \$58 million).



B STRATEGIC FIT

PROJECT IDENTIFICATION

B1 IS THE PROJECT IDENTIFIED IN THE NATIONAL LAND TRANSPORT PLAN AND / OR BILATERAL AGREEMENT?

Yes. The Project forms part of the “Northern Sydney and Port Botany Rail Corridors” project included in the AusLink National Projects funding program.

DEFICIENCIES, NEEDS AND DEPENDENCIES

B2 HOW DOES THE PROJECT SATISFY THE NEEDS OF THE CORRIDOR?

The AusLink Sydney Urban Corridor Strategy (SUCS) identified rapid growth of container traffic through Port Botany as a key challenge facing the Sydney urban corridors over the next 20 years.

The Strategy identified improving rail links from Port Botany and enhancing landside port capability and freight distribution as short-term priorities for the Sydney urban corridors, addressing the AusLink objectives of capacity, efficiency, productivity, reliability, safety and sustainability.

The Project is directly oriented to addressing these SUCS priorities and the AusLink objectives. Table B2.1 on the following page below shows the project outcomes relative to various AusLink objectives.

In particular, the Project is critical to:

- meet growing demand for container transport by rail in the Port Botany corridor
- reform the operation and management of the Metropolitan Freight Network generally by integrating the MFN with the ARTC network.

B3 IMPACTS ON / BY OTHER PROJECTS?

The Project is complementary to a number of other existing and prospective projects being undertaken by ARTC and other parties, as detailed in Table B3.1 on page 8.

Table B2.1 Project Outcomes vs AusLink Objectives

Relevant AusLink objectives	Project Outcomes
Capacity	<p>Improved capacity on the Port Botany rail line to meet growing demand for container transport by rail.</p> <p>Road congestion benefits flowing from diversion of freight from road to rail.</p>
Efficiency	<p>Operational efficiencies flowing from reduced congestion and increased capacity on the Port Botany line.</p> <p>Reductions in road maintenance expenditures flowing from diversion of freight from road to rail.</p>
Productivity	Improved productivity of rolling stock, train crew and train control/signalling resources.
Reliability	Improved rail freight reliability contributing to improved rail market share and lower rail cost structures.
Safety	<p>Reduced road accidents by facilitating increased rail market share and fewer road heavy vehicle safety incidents.</p> <p>Reduced rail safety risk flowing from improved track condition in Botany Yard (reduced derailment risk) and extension of signalling systems at Botany Yard and Cooks River (reduced probability of safeworking incidents).</p>
Sustainability	Reduced air pollution, greenhouse emissions, noise flowing from diversion of freight from road to rail.

Project Proposal Report (PPR)



Port Botany Rail Upgrade and MFN Interface Program

Table B3.1 Impacts on or by other projects

Project	Description	Impact on Botany/MFN Project	Status	Completion	Proponent	Funding
Southern Sydney Freight Line	Freight only connection between Metro Freight Network at Sefton Park Junction and ARTC lease network at Macarthur.	Connects to Metro Freight Network. MFN+SSFL provides freight-only connection between; - Port Botany and proposed Moorebank terminal. - Chullora Intermodal terminal and main southern line. MFN signalling and train control will be integrated with SSFL.	Design complete. Construction out to tender.	2009	ARTC	ARTC
ARTC North-South Corridor Strategy	Package of works to capture increased rail market share in North-South Corridor (Melbourne-Sydney-Brisbane).	Sefton Park Junction-Chullora-Flemington section of MFN is part of the North-South corridor Chullora Intermodal Terminal is located on this section of the MFN	Component projects being progressively implemented.	2009	ARTC	ARTC and Australian Govt
Northern Sydney Works	Package of works to provide additional freight capacity between North Strathfield and Broadmeadow	Additional freight volumes between North Strathfield and Broadmeadow will feed into the MFN.	Planning about to commence.	2009 (planning)	NSW agencies with ARTC support	Planning - AusLink Construction – tbd
Port Botany Expansion	Expansion of Port Botany to create five new shipping berths.	Essential to increase port container throughput. New rail connection to Port Botany line.	D&C tenders have closed	2011	Sydney Ports Corporation	Private Sector
Enfield Intermodal Logistics Centre	New intermodal terminal to handle port container traffic with capacity of 300,000 TEU per annum.	Served by the MFN. Essential to provide Intermodal Terminal capacity to meet NSW Government targets for rail-borne container traffic.	Planning approval obtained.	To be determined (likely <5 years)	Sydney Ports Corporation	Private Sector
Moorebank Intermodal Terminal	Potential intermodal terminal to handle longer term growth in both import/export and domestic markets	MFN+SSFL provides freight-only connection between Port Botany and proposed Moorebank terminal. Would provide additional intermodal capacity to cater for longer term growth in rail borne container traffic	Potential requirement being considered by Australian & NSW Governments.	To be determined (likely >5 years)	Not yet considered.	Not yet considered.



C PROJECT OVERVIEW

RISK

C1 RISK MANAGEMENT

This PPR addresses the Project Development phase of the Project which is considered to encompass low risk activities.

The Project Development phase is considered unlikely to generate any significant physical or safety risks.

The most significant risk that may be encountered relates to possible delays in progressing design, planning and approvals, due to the fact that during the Project Development phase, the corridor will remain controlled by Rail Corporation NSW (RailCorp). Commencement of ARTC's proposed lease of the Metropolitan Freight Network is likely to occur either before or during the Project Delivery phase.

ARTC is taking the following steps to mitigate the risk:

- Development of an ARTC-RailCorp Agreement to spell out the rights and obligations of the parties during the Project Development phase of the Project.
- Establishment of a joint ARTC-RailCorp Project Control Group to oversee the Project Development activities

Further risk assessment will take place to consider risks that may be encountered during the Project Delivery phase. However, the type of works proposed are being undertaken by ARTC elsewhere on the network on a regular basis, and the works will be located within an established freight-only rail corridor, so prima facie it is considered unlikely that major risks will be encountered.

C2 EFFECT OF MARKET CONDITIONS ON PROJECT

The market for rail infrastructure works is very strong at the present time and this has exerted considerable upward pressure on infrastructure project costs.

However, ARTC is well placed to secure competitive prices for the delivery of the works. The works can potentially be delivered through a number of delivery mechanisms, and ARTC is in a position to select which delivery mechanism will deliver the lowest project costs. The delivery mechanisms include:

- Through ARTC's established Alliances.
- As a variation to contracts to be let for Southern Sydney Freight Line construction. This is, for example, likely to be the optimum method for delivery of the MFN signalling interface works.
- Calling new tenders for the works

Preliminary estimates have included consideration of the impact of market conditions on project costs. Project Delivery costs will be subject to detailed assessment during the Project Development phase.

C3 IS THE PROJECT 'FIT FOR PURPOSE'?

Works would be carried out in accordance with ARTC's developed standards for engineering, design, construction, testing and commissioning. These standards have been developed over considerable time by ARTC and its predecessor organisations from a fit for stated purpose perspective. No element of the Project would exceed normal infrastructure performance expectations.

The Project will be implemented in a manner fully consistent with the similar projects on the ARTC network.

C4 GOVERNANCE ARRANGEMENTS

The Project Development Phases will be overseen by a Project Control Group, chaired by ARTC and with representation from RailCorp, as the current infrastructure owner.

C5 CONTRACTUAL ARRANGEMENTS

As part of the Project Development phase, consideration will be given to the contractual arrangements to be adopted for the Project Delivery phase.

As stated previously, the options include delivery through ARTC's established alliances, as a variation to SSFL contracts, or as newly tendered works.

The contractual arrangements proposed will be detailed in the PPR for the Project Delivery phase.

C6 EXEMPTIONS FROM TENDER PROCESS?

The provisions of Section 24 do not apply as the recipient of the funding is not a State nor an authority of a State.

However, it should be noted that all of the delivery options that may be used by ARTC have been or will be subject to competitive processes:

- Delivery through established alliances: ARTC has competitively sought, received, evaluated and chosen its alliance partners to deliver its overall works program. These four alliances represent a significant cross section of the track, civil and signalling construction capacity in Australia.

Port Botany Rail Upgrade and MFN Interface Program

- Variations to SSFL or other contracts: Contracts to construct the SSFL are being let through a competitive tender process. ARTC has called for tenders, which are due to be received during December 2007. Further, ARTC has previously competitively sought, received, evaluated and awarded major contracts for the procurement of concrete sleepers and rail.
- Newly tendered contracts: Any new contracts would be subject to a competitive tender process.

C7 DO NCOP FOR CONSTRUCTION INDUSTRY APPLY?

Yes

PROJECT SCOPING PHASE OUTCOMES

C8 OPTIONS INVESTIGATED/REJECTED?

See Table C8.1.

C9 PREFERRED OPTION

The preferred option consists of the following works:

Botany Line Upgrade

- Major reconfiguration of Botany Yard
- Signalling at the entrance to Cooks River Yard
- Establishment of staging capacity at Enfield to hold and resequence trains away from the congested Port Botany area.

Metropolitan Freight Network Interface and Improvement Program

- Re-organisation of train and signal control for the MFN to be centrally controlled from ARTC's train control facility in Junee.
- Other minor works may be identified during the Development Phase and may be incorporated in the PPR for the Project Delivery phase.

Project Proposal Report (PPR)



Port Botany Rail Upgrade and MFN Interface Program

Table C8.1 Scoping Phase – Options Investigated

Project / Subproject	Options Investigated	Comment	Outcome
Botany Yard Reconfiguration	Do nothing	Does not achieve desired improvements in yard capacity and reductions in train delays.	Rejected
	Reconfigure Yard	Necessary to achieve desired operational outcomes. Option developed through an iterative process with key stakeholders. Various options involving differing track configurations were considered. Through that process, the proposed configuration of the yard has been refined to meet operational objectives.	Recommended
Cooks River Signalling	Do nothing	Requires continuing manual operation of the yard interface.	Rejected
	Signalling at yard entry	Only feasible option to deliver operational objectives.	Recommended
Enfield Yard Staging	Do not establish staging facility	Does not meet operational objectives – would require trains to be held within Botany Yard to await stevedore windows (inbound) or paths (outbound).	Rejected
	Staging at alternative location (non-Enfield)	Review of Enfield-Botany corridor did not identify any feasible alternative locations.	Rejected
	Enfield staging facility	Necessary to achieve desired operational outcomes for staging of train away from Botany Yard. Option developed through an iterative process with key stakeholders. Various options involving differing track configurations were considered. Through that process, the proposed configuration of the yard has been refined to meet operational objectives.	Recommended
MFN Interfaces	Continue current signalling & train control arrangements	Requires 'contract back' of signalling and train control activities to RailCorp for indefinite period, which would not meet ARTC commercial or efficiency objectives.	Rejected
	Undertake interface works to control signalling from ARTC Junee Control	Only feasible option to deliver operational objectives.	Recommended

C10 STAKEHOLDER / PUBLIC CONSULTATION DURING SCOPING

ARTC has undertaken specific industry consultation with the following stakeholders:

- Asciano (Patrick)
- Asciano (Pacific National)
- DP World
- RailCorp
- Sydney Ports Corporation
- NSW Ministry of Transport
- NSW Office of the Coordinator General

In addition, the NSW Office of the Coordinator General has included material in relation to the proposed projects in consultation material with a broader group of industry stakeholders (including road transport operators, shippers, freight forwarders, terminal operators etc), as part of consultation processes over Sydney Ports Corporation's proposed Enfield Intermodal Logistics Centre.

Broader public consultation was not undertaken to determine the preferred scope, as the proposed sub-projects involve relatively low-scale upgrading/reconfiguration within the existing rail corridor, which is not expected to generate significant community impacts.

ENVIRONMENTAL, CULTURAL AND SOCIAL ISSUES

C11 ENVIRONMENTAL OR CULTURAL LEGISLATION

The proposed works are entirely within the rail corridor. Each sub-project will be subject to a Review of Environmental Factors (REF) during the Project Development phase. As the nature of the work is within the scope of normal railway activities this is not expected to raise material environmental issues.

C12 STAKEHOLDER / PUBLIC CONSULTATION DURING DEVELOPMENT PHASE

ARTC will maintain industry consultation with the previously identified stakeholders during the Project Development Phase.

A Communications Plan will be developed to pro-actively manage public communications over the Projects. The proposed sub-projects will not in their own right generate significant community impacts so large-scale public consultation is not proposed for the Project.

The Project has a significant interface with other projects of broader community concern, in particular Sydney Ports Corporation's expansion of Port Botany and its proposed Enfield Intermodal Logistics Centre. ARTC will cooperate closely with Sydney Ports Corporation and other relevant NSW Government Agencies to manage any 'flow-on' issues that arise in that context (e.g. any community concerns about increasing rail volumes).



D TECHNICAL DATA

OUTTURN INVESTMENT COSTS

D1 PROJECT SCOPE PHASE COSTS

The Project Scope phase is complete. Costs for the Scoping Phase have been absorbed within ARTC's internal budget and AusLink funding is not being sought.

D2 PROJECT DEVELOPMENT PHASE COSTS AND D3 PROJECT DELIVERY PHASE COSTS

The total estimated cost for the full Project is \$65 million (Project Development and Project Delivery phases combined), of which \$7.0 million is being sought under this PPR to progress the Project Development phase.

Under the Project Development phase, funding is being sought for:

- Consultancy costs to progress various activities including:
 - site survey
 - preliminary and detailed design
 - detailed construction cost estimates
 - revised benefit-cost assessment
 - project delivery risk assessment
 - environmental assessment
 - relevant planning approvals
- Stakeholder management relevant to the above processes
- Project management and other costs associated with the Project
- Procurement of certain long lead time items to permit expeditious construction of the various sub-projects during the Project Delivery phase, including:
 - track turnouts
 - track circuits

Project Proposal Report (PPR)



Port Botany Rail Upgrade and MFN Interface Program

Table D3.1 Forecast Project Development and Project Delivery Costs

	AusLink 1			AusLink 2	Total
	2007/8	2008/9	Subtotal	2009/10	
Approval sought this PPR					
Project Development Phase					
Consultancy Costs (Design, Environmental Assessment etc)	1.4	2.0	3.4	-	3.4
Public & stakeholder participation	0.1	0.1	0.2	-	0.2
Proponent's management and other costs	0.5	0.5	1.0	-	1.0
Long lead time materials	-	2.4	2.4	-	2.4
Phase Sub-total	2.0	5.0	7.0	-	7.0
Future PPR to be submitted					
Project Delivery Phase[#]					
Port Botany Line Upgrade	-	19.0	19.0	27.0	46.0
MFN Interface & Improvement	-	5.0	5.0	7.0	12.0
Phase Sub-total	-	24.0	24.0	34.0	58.0
Project Total	2.0	29.0	31.0	34.0	65.0

Project Delivery phase estimates are subject to review during the Project Development phase

D4 INDEX RATES

Costs are quoted in 2007/8 dollars (real) and have not been escalated for inflation.

A discount rate of 7% has been adopted in the Benefit Cost Analysis..

D5 ELIGIBILITY FOR AUSLINK FUNDING

The Project is eligible for AusLink funding and, as described previously, forms part of the broader “Northern Sydney and Port Botany Rail Corridors” project already included in the AusLink National Projects funding program.

TIMING

D6 KEY MILESTONES

Activity	Target Completion
Project Development Phase (this PPR)	
Survey	Feb 08
Preliminary design	Apr 08
Order long lead times materials	Apr 08
Final design	Aug 08
Environmental assessment & approvals	Sep 08
Project Delivery Phase (future PPR)	
Call and evaluate tenders	Aug-Nov 08
Commence construction	Dec 08
Complete Botany Yard and Enfield track work	May 09
Complete MFN interface works	Oct 09
Complete Botany Yard, Cooks River and Enfield signal works	May 10

DESIGN AND CONSTRUCTION FEATURES

D7 LATENT GROUND CONDITIONS

These will be assessed during the Project Development phase.

D8 DESIGN LIFE

For project assessment purposes, an assessment “sunset” of 2026 has been assumed, which corresponds to available forecasts for container demand in the cross-metropolitan market. This equates to an assessment period of 18 years. This is an extremely conservative assumption, and the bulk of works undertaken will have an economic life considerably in excess of this figure.

The individual component design lives are listed Table D8.1 below.

Table D8.1 Component Design Lives

Element	Design Life
Track (including rail, sleepers, fastenings and turnouts)	50 years
Signalling system	20 years
Lighting and electrical equipment	20 years
Culverts	50 years
Buried drainage	100 years
Earth drainage	20 years nominal
Formation and trackside cess drains	50 years
Train control system	20 years
Communications system	20 years
Services, signals, train control and communications infrastructure	20 years
Relocated services	50 years

Operationally, ARTC’s assessment is that the Project will provide sufficient corridor capacity to meet growth in rail demand until at least the 2016-2020 period. Additional investment may be required to meet growth beyond that point, however this will be additive to the works proposed in this PPR and will not render any of the current Project obsolete.

D9 PROJECT FLOODING SERVICEABILITY

This will be formally assessed during the Project Development phase, however prima facie the proposed works are not situated on flood-prone sites..

D10 PROJECT HEAVY WORKS AND IMPACT ON ENVIRONMENT

The works to be undertaken would not generally be regarded as ‘heavy works’. Subject to the completion of relevant Reviews of Environment Factors, it is not anticipated that the works will have material environmental impacts.

D11 VISUAL AMENITY AND TRAFFIC NOISE

Visual amenity and traffic noise will be considered in the Review of Environmental Factors for each sub-project. However, visual amenity and traffic noise issues are unlikely to be significant, for the following reasons:

- The works are located in heavily industrial environments, do not increase the size of the rail reserve nor do they overtly change the look or visual amenity of the railway.
- New track sections would be constructed adjacent to existing operational lines but no new large structures are proposed.
- Road access for construction purposes will be via the existing road systems serving the adjacent industrial areas.

A construction noise and environmental management plan will be prepared to mitigate any possible adverse construction noise that may arise.

DEMAND FORECASTS

D12 EXISTING TRAFFIC VOLUMES/COMPOSITION (PRE-PROJECT)

Table D12.1 shows typical daily (weekday) and annual train movements on the Port Botany Line and the MFN generally. Additional detail is provided in Attachment E3.

Table D12.1 Existing Rail Volumes (Both Directions Combined)

	Port Botany Line (including Cooks River)		MFN Total	
	Typical Weekday	Approx. Annual	Typical Weekday	Approx. Annual
Port Botany import/export containers	26	7,600	26	7,600
Domestic intermodal (incl. steel)	-	-	20	6,200
Coal, minerals, ballast	4	1,200	20	5,700
Grain & general freight	4	1,300	8	2,600
Total	34	10,100	74	22,200

D13 FORECAST TRAFFIC VOLUMES/COMPOSITION (POST –PROJECT)

Forecast train volumes are shown in Table D13.1.

Table D13.1: Forecast Train Volumes

	2007/08	2010/11	2015/16	2020/21	2025/26
Import/export	7,600	10,100	14,200	14,500	15,000
Domestic (all traffics)	14,600	15,600	17,300	18,700	20,900
Total	22,200	25,700	31,500	33,200	35,100

The volumes in Table D13.1 include traffic growth to and from existing metropolitan terminals plus the approved Enfield Intermodal Logistics Centre. Volumes from other terminals which may be developed in the longer term (for example Moorebank) may require a further tranche of facilitating rail investment, and hence they have not been considered in this PPR.

D14 IMPACT ON OPERATIONS DURING CONSTRUCTION

Delivery of the works will be structured to minimise, as far as possible, impacts on train movements. For particular activities, such as installation of turnouts into running lines and commissioning of signalling alterations, track possessions will be required.

Detailed delivery planning will be undertaken during the Project Development phase, to minimise impacts on operations.

SAFETY

D15 SAFETY AUDIT

A Safety Audit Schedule will be prepared at the commencement of the Project Delivery stage identifying the frequency of the formal safety audits that will be conducted during construction and the elements that will be reviewed during each audit.

In particular, the safety audits conducted during the construction stage will ensure;

- Compliance with ARTC and (if relevant at that time) RailCorp safety management systems
- Compliance with relevant legislative rail and occupational health and safety requirements
- Compliance with relevant accredited operator systems.

D16 CRASH TYPES (FAULTS AND CONDITION) IDENTIFIED

Not applicable.

D17 HISTORICAL CRASH RATES COMPARISON

Not applicable.

D18 SAFETY ISSUES ADDRESSED BY PROJECT

The Project will address the following safety issues:

- Improved track condition in Botany Yard to reduce derailment risk.
- Extension of signalling systems at Botany Yard and Cooks River to reduce the probability of safeworking incidents.

In addition, the Project is expected to facilitate a substantial shift from road to rail in the cross-metropolitan container movement, which would generate substantial reductions in road accidents.

BENEFIT COST ANALYSIS

D19 BASE CASE

The Base Case for this analysis is taken as:

- No change to the configuration of Botany Yard, Cook River and Enfield.
- No change to current network control and signalling arrangements for the Metropolitan Freight Network.
- Limited growth in import/export rail volumes for the first two years of the assessment period (until 2008/9), at which point rail volume is assumed to be capacity constrained because of the rail infrastructure constraints described above.

It is further assumed that growth in rail volumes in other (i.e. domestic) markets is the same in both the Base Case and the Project Case. The logic for that assumption is that any growth that does occur in other (non-port) markets is attributable to other investment (e.g. ARTC's North-South Strategy), rather than the investment that is the subject of this PPR. Accordingly no incremental growth in those other markets has been included in the benefit-cost analysis.

Additional details of the efficiency constraints imposed by the Base Case and the works proposed in the Project Case to address those deficiencies are provided in Table D19.1.



Table D19.1 Base Case vs Project Case

Base Case Assumption	Base Case Description/Impact	Project Case
<p>Infrastructure No change to configuration Botany Yard, Cooks River, Enfield</p>	<p>Botany Yard</p> <ul style="list-style-type: none"> • A mixture of siding lengths, ranging from 400 to 1500 metres. • A lack of sufficient separation between arriving and departing trains • A significant 'pinch point' between the eastern and western halves of the yard • Restricted capacity between the yard and the stevedores (in particular, into DP World and P&O Trans Australia, which are only served by one track connection from Botany Yard) • The layout of the yard requires trains to propel (reverse) at low speed over distances of up to 2km into the stevedores • Trains need to be held within Botany Yard to await stevedore windows (inbound) or paths over the RailCorp network (outbound), due to impact of freight curfews over the RailCorp network and lack of staging capacity at other locations. • The yard is only partially signalled, with localised control by RailCorp's Botany yard staff. <p>Cooks River</p> <ul style="list-style-type: none"> • Unsignalled entry to yard necessitating manual intervention and complex co-ordination between SPC Cooks River management, train crew, Botany Yard managers, Sydenham Signal Box and RailCorp Train Control 	<p>Botany Yard</p> <ul style="list-style-type: none"> • Construction of new track connections through the central part of the yard, in order to: <ul style="list-style-type: none"> - create two arrival and two departure roads each with a length of approximately 1700m, and each with holding capacity for two trains (on each track). - remove the current pinch point - substantially reduce the distance for propelling movements • Construction of a third track between the yard and the stevedores, with provision of separate arrival and departure roads into each stevedore (including the proposed new terminal). • Full signalling of the yard, as far as the Botany Road overbridge, with remote control from ARTC's Junee network control centre. <p>Enfield</p> <ul style="list-style-type: none"> • Create staging capacity to relieve Botany Yard of trains awaiting stevedore windows (inbound) or paths over the RailCorp network (outbound) <p>Cooks River</p> <ul style="list-style-type: none"> • Signalled entry to Cooks River Yard.



Port Botany Rail Upgrade and MFN Interface Program

Base Case Assumption	Base Case Description/Impact	Project Case
<p>Network Control No change to current network control and signalling arrangements for Metro Freight Network (MFN)</p>	<p>MFN Network Control</p> <ul style="list-style-type: none"> • Train control and local signal control not integrated • Train control from RailCorp Rail Management Centre Central. • Signal control from Enfield Signal Box, Sydenham Signal Box, Botany • Botany Yard movements controlled by ground staff at Botany • Excessive staffing, duplication of effort, multiple interfaces 	<p>MFN Network Control</p> <ul style="list-style-type: none"> • Centralise and integrate train and signal network for MFN with future Southern Sydney Freight Line (SSFL) • Train control (direction of train movements) and signal control integrated under ARTC network controller • Remote control from ARTC's Junee Control Centre
<p>Rail volumes Limited growth in import/export rail volumes for the first two years of the assessment period Import/export rail volumes static thereafter Domestic rail volumes excluded</p>	<p>Import/export rail volumes</p> <ul style="list-style-type: none"> • Rail volumes through Port Botany are currently growing slowly and exhibiting indications of capacity constraint • Base Case assumes limited growth in import/export rail volumes for the first two years of the assessment period (until 2009/10) • From 2009/10 onwards rail volume is assumed to be capacity constrained because of the rail infrastructure constraints described above <p>Domestic rail volumes</p> <ul style="list-style-type: none"> • Assumed to be the same for Base Case and Project Case 	<p>Import/export rail volumes</p> <ul style="list-style-type: none"> • Unconstrained by Botany yard capacity issues – resolved by Project Case works above. • Import/export rail volumes grow to fill intermodal capacity provided by SPC Enfield Terminal (300 TEU pa) plus limited growth in other existing intermodal terminals • Growth beyond Enfield (e.g. Moorebank) not included as assumed to require a further tranche of facilitating rail investment <p>Domestic rail volumes</p> <ul style="list-style-type: none"> • Assumed to be the same for Base Case and Project Case

D20 EVALUATION PERIOD

2007/8 to 2024/26 (18 years)

The assessment “sunset” of 2026 corresponds to available forecasts for container demand in the cross-metropolitan market.

D21 COSTS AND BENEFITS

Project costs over the three implementation period of \$65 million (undiscounted) / \$55 million (discounted at 7%pa) have been included in the analysis, in accordance with the forecast Project Development and Project Delivery cost in Table D3.1 earlier in this report.

The quantified project benefits are:

- Reductions in train delays, flowing from reduced train congestion in Botany Yard and operational efficiencies from establishment of train staging capacity at Enfield. These have been quantified on the basis of a 10% reduction in the average train dwell time within the Botany Yard precinct (currently 5.6 hours). This is considered to be a conservative assumption. Train delay has been valued at \$5 per minute, based on impacts on above-rail operating costs (in particular train crew and rolling stock capital), as used in ARTC’s standard benefit-cost methodology.
- Network control cost savings due to the replacement of the current labour-intensive practices with centralised control of the Botany Line and MFN from ARTC’s Junee Control Centre.
- Forward reductions in major periodic maintenance costs in Botany Yard and at Enfield
- Significant externality benefits by facilitating increasing transfer of import/export container movement from road to rail, with reductions in road accidents, noise, air pollution, road maintenance costs, congestion and other environmental costs. These externalities have been estimated on the basis of the forecast transfer of net tonne kilometres to rail (i.e. the additional rail NTK in the Project Case relative to the Base Case). Unit costs per ntk are as per ARTC’s standard methodology (sourced from the ATC’s National Guidelines for Transport System Management in Australia and other published sources).

Summary results of the BCA, together with results of sensitivity testing, are provided in Tables D21.1 and D21.2 on the following page. Additional details are included in Attachment E4.

Table D21.1 Summary of BCA Results

	PV \$M
Costs	
Capital costs	55.0
Benefits	
Train delay reductions	8.6
Network control savings	11.9
Forward MPM reductions	15.7
Externalities	
- Road maintenance savings	50.3
- Congestion & accidents reduction	11.2
- Air pollution & greenhouse benefits	12.8
- Noise reduction & other environmental	11.2
Total Benefits	121.7
NPV \$M	66.7
BCR	2.2

Table D21.2 Sensitivity Tests

	NPV \$M	BCR
Project Case	66.7	2.2
Sensitivity Cases		
- Capital costs plus +30%	50.2	1.7
- Maintenance/operating cost reductions -50%	53.0	2.0
- Externalities -50%	5.9	1.1

D22 DISCUSSION

The BCA shows strongly positive results for the Project, with an NPV of \$66.7M and a BCR of 2.2 (7% discount rate).

Sensitivity analysis indicates that the Project is robust, with positive NPVs and BCRs even under a range of adverse sensitivity tests regarding higher-than-forecast capital costs or lower-than-forecast benefits.

The analysis suggests that the Project will produce high external benefits, and these are central to the economic justification of the Project. This result is not unexpected, as a key policy objective of the proposed works is to facilitate a mode shift in the cross-metropolitan container market to and from Port Botany.

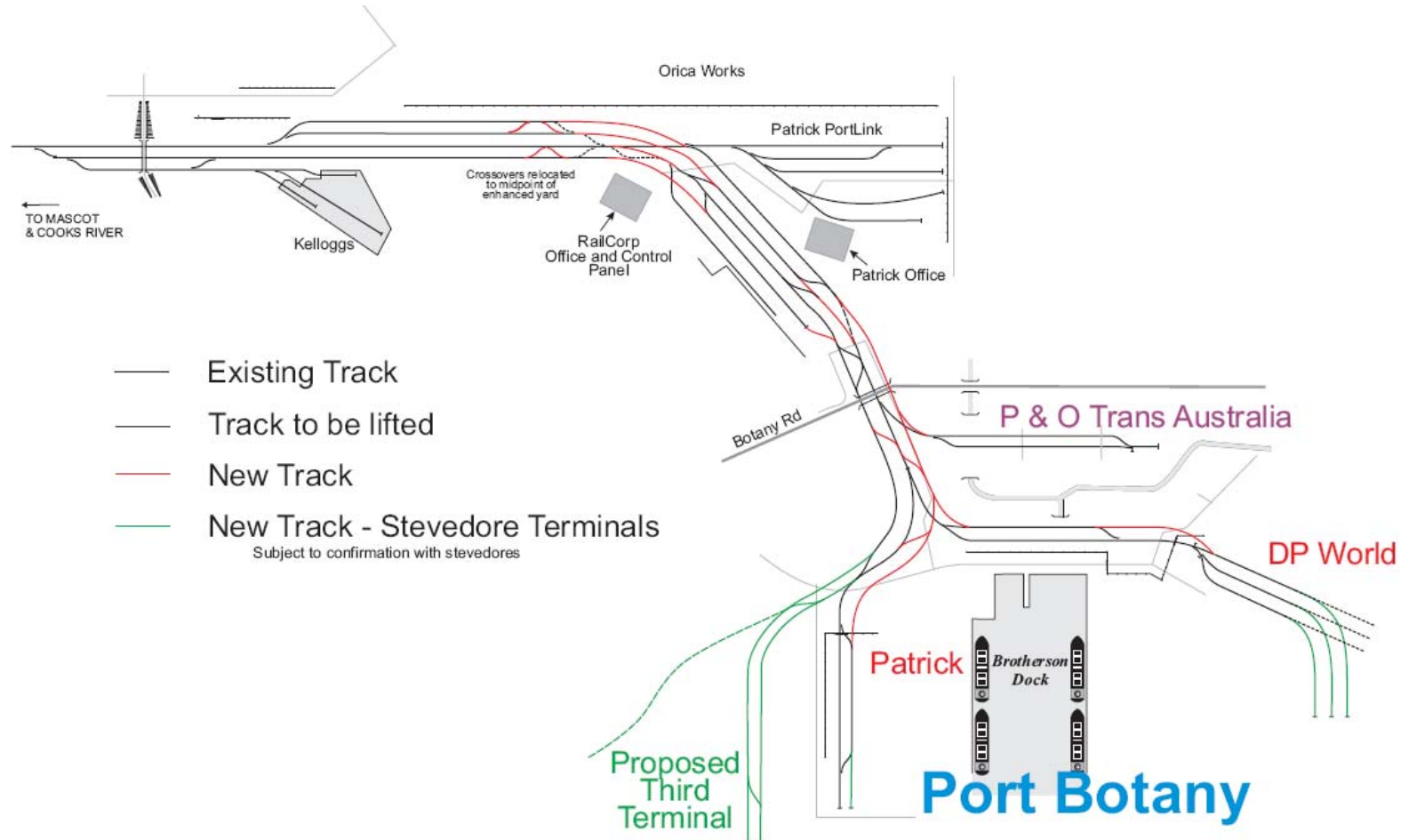
D23 INCREMENTAL BCRs

Results above are reported on an incremental basis, relative to the Base Case.



E ATTACHMENTS

E1 PROPOSED BOTANY YARD ENHANCEMENTS

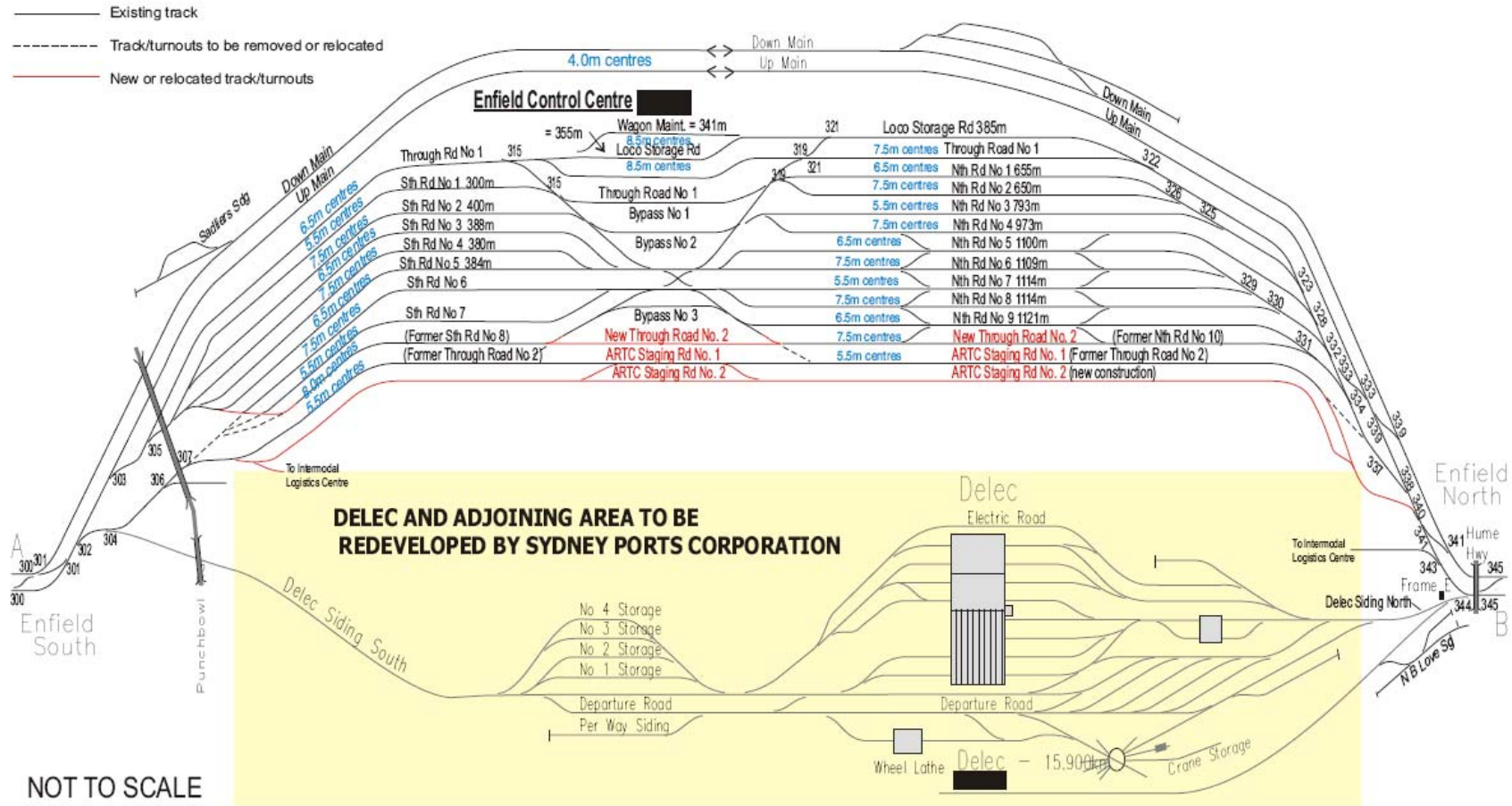


Project Proposal Report (PPR)

Port Botany Rail Upgrade and MFN Interface Program



E2 PROPOSED ENFIELD STAGING FACILITY





E3 EXISTING TRAIN VOLUMES BY LINE SECTOR

Table E3.1 Existing Train Volumes by Line Sector
Trains per day – average weekday 2007

	Sefton Park Junction-Chullora Junction	Flemington-Chullora Junction	Chullora Junction-Enfield	Enfield-Marrickville	Marrickville - Cooks River	Cooks River-Botany	Total*
Port Botany import/export containers	14	12	26	26	26	26	26
Domestic intermodal (including steel)	16	10	4	4	-	-	20
Western coal (western line to Port Kembla)	-	10	10	10	-	-	10
Minerals & ballast	-	-	6	10	4	-	10
Grain & general freight	-		-		4	-	4
Total	30	32	46	50	34	26	70

*Total may be different from the sum of line sections due to services running over multiple line sections

Project Proposal Report (PPR)



Port Botany Rail Upgrade and MFN Interface Program

E4 BENEFIT COST ANALYSIS

PORT BOTANY LINE UPGRADE / MFN INTERFACE & IMPROVEMENT

SUMMARY

Discount rate	7%					
Results		Sensitivity Tests	PVC	PVB	NPV	BCR
BCR	2.21	Capital Costs +30%	71,439	121,684	50,245	1.70
NPV (\$000)	66,731	Cost savings -50%	54,953	107,915	52,962	1.96
IRR	20.1%	Externalities -50%	54,953	60,842	5,889	1.11
PV Costs (\$000)	54,953					
PV Benefits (\$000)	121,684					

COST AND BENEFIT STREAMS

	NPV 7%	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026		
COSTS																						
Project Development	6,236	2,000	5,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Project Delivery	-																					
- Port Botany Line Upgrade	38,635	-	19,000	27,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
- MFN Interface & Improvement	10,081	-	5,000	7,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Total Costs	54,953	2,000	29,000	34,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
BENEFITS																						
Cost Savings																						
- Network control cost savings	11,875	-	-	731	1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463	1,463		
- Future MPM reductions	15,664	-	-	-	2,031	2,031	2,031	2,031	2,031	2,031	2,031	2,031	2,031	2,031	2,031	2,031	2,031	2,031	2,031	2,031		
<i>Subtotal</i>	27,538	-	-	731	3,494	3,494	3,494	3,494	3,494	3,494	3,494	3,494	3,494	3,494	3,494	3,494	3,494	3,494	3,494	3,494		
Train delay reductions	8,594	-	-	627	908	1,170	1,132	1,096	1,063	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031	1,031		
Externality benefits																						
- Road maintenance	50,344	-	-	2,048	4,095	4,621	5,147	5,673	6,199	6,725	6,838	6,951	7,064	7,177	7,290	7,446	7,602	7,758	7,914	8,070		
- Accident	9,589	-	-	390	780	880	980	1,081	1,181	1,281	1,303	1,324	1,346	1,367	1,389	1,418	1,448	1,478	1,507	1,537		
- Congestion	1,618	-	-	52	104	130	156	181	207	232	234	237	239	241	243	248	252	257	262	267		
- Noise	4,126	-	-	133	266	332	397	462	527	593	598	603	609	614	619	632	644	656	668	680		
- Air Pollution	10,356	-	-	334	669	832	996	1,160	1,324	1,487	1,501	1,514	1,528	1,541	1,555	1,585	1,616	1,646	1,677	1,707		
- Greenhouse	2,397	-	-	98	195	220	245	270	295	320	326	331	336	342	347	355	362	369	377	384		
- Urban separation	2,427	-	-	78	157	195	233	272	310	349	352	355	358	361	364	372	379	386	393	400		
- Nature and landscape	4,693	-	-	152	303	377	451	526	600	674	680	686	692	698	705	718	732	746	760	774		
<i>Subtotal</i>	85,552	-	-	3,285	6,570	7,588	8,606	9,625	10,643	11,661	11,832	12,002	12,172	12,342	12,512	12,774	13,035	13,296	13,558	13,819		
Total Benefits	121,684	-	-	4,643	10,971	12,251	13,232	14,215	15,200	16,186	16,357	16,527	16,697	16,867	17,037	17,299	17,560	17,821	18,083	18,344		
Net Benefits	66,731	-	2,000	-	29,000	-	29,357	10,971	12,251	13,232	14,215	15,200	16,186	16,357	16,527	16,697	17,037	17,299	17,560	17,821	18,083	18,344