

6. CityRail rolling stock requirements

6.1 Extra rolling stock for patronage growth

Of the 140 suburban Millennium carriages now on order, 56 are to replace life-expired carriages (see section 6.2) and the balance are to provide additional capacity to cater for short-term patronage growth, mainly through the provision of eight-carriage trains on services currently provided by six-carriage trains.

Future additional *suburban* carriage requirements to cater for further patronage growth, assuming this growth is broadly consistent with the “medium growth” scenario discussed in section 3.1 and applied in section 4.4, are:

- A further 60 Millennium suburban carriages by 2006, and
- A further 80 to 100 suburban carriages by 2011.

These requirements could be met through the steady delivery of up to 30 new suburban carriages for patronage growth each year from 2003, at a cost of about \$83 million per year.

Similarly, to cater for the forecast *intercity* patronage growth the intercity electric fleet will need to increase by 40 carriages by 2005 (16 for the South Coast and 20 for the Central Coast) and by up to a further 40 carriages by 2011 (12

for the South Coast, 16 for the Central Coast, eight to replace *suburban* Tangaras which currently have to be used for some services to Wyong and Springwood and four for use while other intercity carriages are being maintained).

These additional intercity “growth” requirements are planned to be met by two tranches of new carriages in 2003–05 and 2009–11, at a cost of \$60 million per year. The first order, for 40 new “outer suburban” carriages, is expected to be placed in the near future, while the second, for a further 40 carriages to be developed from 2006, would be timed to fit in with the schedule for the replacement of old intercity rolling stock.

6.2 Replacement of the existing CityRail fleets

The 56 carriages that will be replaced by the initial delivery of 80 Millennium suburban carriages from 2002 are “Tulloch” carriages, originally used in combination with single-deck “red rattlers”, dating back to the mid-1960s.

By 2006 a much more challenging suburban fleet replacement task will have arisen: the oldest carriages in the initial, non-airconditioned fleet of 500 double-deck stainless steel suburban carriages will be 35 years old, and all 498 will need



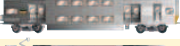



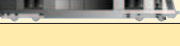

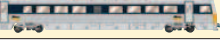
CityRail's existing fleet			
Type	Number of carriages	Air conditioned?	Age
Suburban electric train carriages			
 Tulloch “trailer” cars	56	No	35–37 years
 Double deck S and R cars	498	No	21–29 years
 Double deck K cars	160	Yes	16–20 years
 Double deck C cars	56	Yes	15 years
 Tangaras	368	Yes	7–12 years
Intercity electric train carriages			
 Intercity V cars	238	Yes	12–31 years
 Outer Suburban Tangaras	80	Yes	5–6 years
Diesel train carriages			
 620 Class	14	No	~40 years
 Endeavours	30	Yes	6 years

Table 6.1. Suburban and intercity fleet growth and replacement strategies.

(assuming 80 “outer suburban” Tangara carriages are switched to suburban services and an additional 120 outer suburban carriages—40 to cater for patronage growth and 80 for replacements—are purchased by 2007)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Suburban carriages											
New carriages to cater for patronage growth		30	30	30	30	30	30	30	30	30	30
New carriages to replace life-expired carriages	56					20	50	50	50	50	50
Cost	\$154 m	\$83 m	\$83 m	\$83 m	\$83 m	\$138 m	\$220 m	\$220 m	\$220 m	\$220 m	\$220 m
Intercity carriages											
New carriages to cater for patronage growth			20	20					20	20	
New carriages to replace life-expired carriages					40	40					43
Cost			\$60 m	\$60 m	\$120 m	\$120 m	–	–	\$60 m	\$60 m	\$129 m

to be replaced over the following ten years. (It would cost more than \$1 million per carriage to refit these carriages to modern standards, and this would not address the problems posed by their ageing structures, which would still need to be replaced at a later date. State Rail studies have shown that replacement from 2006 is more financially attractive.)

One approach would be to commence a major suburban carriage replacement program in 2006, for 50 carriages per year until 2016, after which the later series of double deck suburban carriages will be life-expired and due for replacement at the same steady rate of 50 carriages per year, followed by the Tangaras.

An alternative approach has been adopted, however, under which:

- The 80 “outer suburban” Tangara carriages now used for intercity services will be switched to suburban services, deferring the need for the delivery of replacement suburban carriages until 2007.
- The gap in the intercity fleet will be filled by ordering 80 additional new “outer suburban” carriages for delivery in 2006 and 2007, to supplement the initial (2003–05) “growth” order of 40 outer suburban carriages (see section 6.1).
- 50 replacement suburban carriages will be delivered each year from 2007–08, at a cost of \$138 million per year, with this steady rate of delivery being maintained (in effect) indefinitely, because by the time all the double deck fleet has been replaced the early Tangaras will be life-expired and due for replacement.

The advantage of this strategy is that it will result in a more homogeneous and higher-powered “outer suburban” fleet, improving maintenance efficiency and (with only minor

modifications) providing the performance characteristics that will be needed to take advantage of any future high-speed rail alignments in the Central Coast and South Coast corridors (see section 5).

Replacement of the oldest “V set” intercity carriages will need to commence by 2012. By this time these carriages will be more than 40 years old.

Table 6.1 summarises the proposed suburban and intercity fleet growth and replacement strategies.

The diesel-powered CityRail fleet includes 14 “620 class” rail cars, now close to 40 years old, which are used in the Hunter Valley. After examining a range of options for the lower Hunter, including electrification and buses, a State Rail study has concluded that the best approach is to replace these life-expired trains with 14 new diesel-powered carriages, with an option for a further six carriages (bringing the total cost to about \$70 million), and to relocate three Endeavour carriages from the Hunter to the Southern Highlands, where demand is increasing rapidly. This strategy has been approved by the Government.

Additional Endeavours for Southern Highlands services and/or for conversion to Xplorers for Countrylink will also become available with the electrification of the Dapto–Kiama line.

6.3 Rolling stock maintenance and cleaning

Maintenance expenditure requirements

Over the next five years routine maintenance costs for CityRail’s electric fleet are expected to be about \$51 million per year for the existing electric fleet, which is largely maintained

at the Flemington, Mortdale and Hornsby maintenance depots, and \$4 million (2001–02) to \$31 million (2005–06) for the new Millennium trains, which will be maintained by the rolling stock supplier at a new maintenance facility built by State Rail at Eveleigh (2000 A\$).

Routine maintenance expenditure on CityRail's electric fleet will then need to increase as the number of carriages being serviced increases and the fleet continues to age, although as the new trains replace old rolling stock such as the "S" and "R" double deck suburban carriages over the next 15 years or so many maintenance requirements will decrease (for example, brakes will need to be checked and adjusted much less frequently).

Major periodic maintenance expenditure requirements for CityRail's electric fleet over the next five years—including expenditures of up to \$15 million per year on the upgrading of the Maintrain maintenance facility at Clyde and additional expenditures of \$23 million to \$38 million per year, recently approved by the Government, to reduce the time between major component change-outs and refurbishments from six to four years—will vary between \$104 million and \$131 million per year.

These estimates do not include the cost of:

- Widening doors and retrofitting wheelchair-accessible toilets on the intercity "V car" fleet (\$15–20 million), and
- Installing automatic wheel measuring technologies, an urgent requirement from both a safety perspective and a maintenance cost efficiency perspective (\$17 million).

Routine maintenance costs for CityRail's diesel-powered fleet are expected to increase from about \$16 million per year in 2001–02 to about \$19 million per year in 2005–06, and major periodic maintenance costs are expected to be between \$24 million and \$27 million per year.

Location and upgrading of train maintenance facilities

As indicated in section 2.1, there are almost no facilities at the main overnight train stabling yards, such as Campbelltown, Penrith, Blacktown and Waterfall, for trains to be washed and minor routine maintenance or repairs to be carried out. This means CityRail trains needing cleaning or even the simplest routine maintenance or repairs have to be taken out of service during the next morning's peak and travel to the train maintenance depots at Flemington, Mortdale and Hornsby (and, in the future, Eveleigh).

In essence, the locations of facilities for minor routine train maintenance reflect the requirements of passenger rail operations some 50 to 70 years ago, when the train maintenance depots were at or near the extremities of suburban rail services, but not those of today's geographically extended operations.

The installation of external train washing plants, raised roads for undercar inspections and maintenance and other facilities for internal cleaning and minor maintenance at the Campbelltown, Penrith, Blacktown and Eveleigh stabling yards, along with a new maintenance road at Flemington adjacent to the lift shop and wash plants at other stabling yards such as Waterfall and Macdonaldtown, would significantly improve the cleanliness of trains and the efficiency of minor maintenance activities (brake maintenance, etc).

These new facilities would necessitate substantial rebuilding of some of the yards, including major resignalling at Campbelltown, in order to permit the necessary train movements. The Campbelltown Yard works alone, which are also highly desirable from the perspectives of improving train movements through the Campbelltown area on the Main South line and improving Campbelltown station, could cost of the order of \$50 million.

There are also a number of other options to improve maintenance efficiency, including the possible rebuilding or replacement of the Hornsby facilities (even if major maintenance tasks are moved elsewhere, a wash plant, stabling and cleaning roads will still be required at Hornsby), a new purpose-built maintenance facility near the Maintrain site in Auburn and a new purpose-built facility next to the existing Flemington lift shop and wheel lathe.

In developing the optimum longer-term maintenance facility solution and deciding whether to proceed with new maintenance facilities at the stabling yards, the main considerations needing to be taken into account are:

- Whether new CityRail rolling stock will be delivered under "design, build and maintain" contracts, with the supplier then being responsible for train maintenance to CityRail standards, or whether State Rail will continue to carry out maintenance on its CityRail rolling stock.

If "design, build and maintain" approaches are adopted, over time State Rail's own maintenance loads will be significantly reduced.

- The fact that whatever the delivery method adopted for new trains, State Rail's own intensive train maintenance requirements will be significantly reduced by the time all of the original "S" and "R" double deck trains have been replaced in about 15 years, because the later types of trains now in service require much less routine maintenance.

In essence, this means that if there is to be a significant investment in minor maintenance facilities at stabling locations etc this investment needs to be made within the next five years, as after that there will be diminishing benefits.

- The types of "outer suburban" trains selected through a competitive tendering process. If these new train designs

are based on Tangaras, the most efficient maintenance locations might well be Hornsby and Mortdale, but if they are based on Millenniums the best location might be at Eveleigh.

- The balance that needs to be achieved between the number of major maintenance facility locations and the complexities of moving empty trains to and from these locations. It has been estimated, for example, that if there were only one major centre at least an extra 50 carriages would be required for the CityRail fleet, simply to cater for the inefficiencies inherent in the extra train movements. While the relatively maintenance-intensive "S" and "R" suburban carriages and "V" intercity carriages are still in operation, at least three major locations are likely to continue to be required.

- The interactions between train stabling (as distinct from maintenance) requirements at Flemington, Mortdale and Hornsby and the adequacy or otherwise of train stabling facilities at other locations. If new and expanded stabling facilities are provided elsewhere (e.g. at Macdonaldtown), the efficiency of operation of the existing maintenance facilities will be able to be significantly improved.

State Rail is about to commence a one-year project to refine and define the options and develop a clear strategy for train maintenance and washing facilities for the future. At this stage, it appears likely that an average of about \$20 million per year will need to be invested in these facilities and associated yard reconfigurations, on top of the train maintenance expenditure requirements already listed, although a higher level of expenditure is likely to be required in the early years, for the reasons explained above.