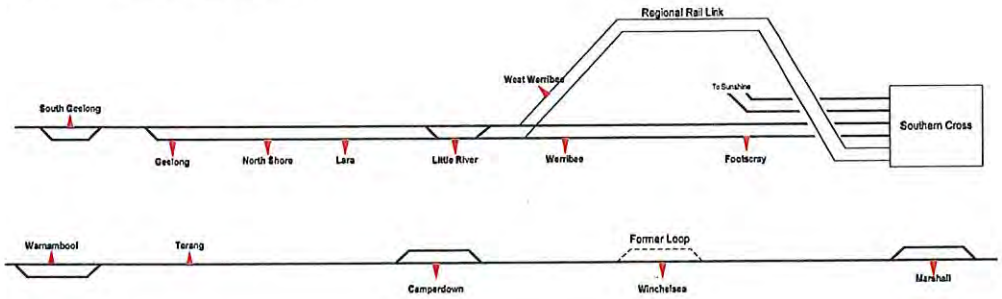
12. Network Constraints – South Western Corridor (Interurban)

12.1. Existing Conditions

The Geelong rail line is comprised of 72 km of double track railway between Melbourne and Geelong. The first 32 km of the line to Werribee is currently shared with electric suburban services. This inner section suffers from congestion due to the high level of traffic and mixture of metropolitan and regional trains.

Between Werribee and Geelong the route is dual track that is signalled for bi-directional running although the usual plan of operation sees the two tracks operate in a conventional Up and Down pattern. The maximum permissible speed is 160 kph.

12.2. Corridor Diagram



12.3. Active Projects

Regional Rail Link

Regional Rail Link (RRL) will make a major change in the way the Geelong corridor operates. Following the completion of RRL in 2015, a dedicated pair of regional tracks will run from Southern Cross Station to Wyndham Vale (West Werribee) via Deer Park, providing total segregation between regional and metropolitan services.

The segregation of services will allow a substantial upgrade to the frequency of Geelong services. A peak operation providing a 7½ minute peak headway, and a 15 minute off peak headway is envisaged. In the absence of further infrastructure upgrades beyond Geelong, a lesser service frequency would be provided to South Geelong, Marshall and Grovedale. The RRL Concept of Operations (COO) recognises the need for infrastructure upgrades beyond Geelong.

Grovedale Station

The current government has committed to the construction of a new station at Grovedale to support demand from the Armstrong Creek Growth Area. The project is currently in its infancy with a business case expected to be completed by the end of 2011. At this stage construction is forecast to be complete by the end of 2014.

Rail Revival Study

A planning study has recently been launched to investigate the reactivation of direct rail services between Geelong, Ballarat and Bendigo (via Maryborough and Castlemaine). The feasibility report, due for completion in mid-2012, will examine the demand for such a service, what service level could be provided and how much the services will cost. This study would also have implications for the Western and Northern corridors.

Avalon Airport Rail Link

Preliminary investigations are being undertaken into the possible provision of a rail link to Avalon Airport. This would have significant implications for V/Line operations on the corridor. Development of the preferred option is expected to occur in 2012.

G21 Regional Growth Plan

The regional growth plan will develop a 30-year land use plan for the G21 region. The G21 region includes the following five municipalities:

- Borough of Queenscliffe
- City of Greater Geelong
- Colac Otway Shire
- Golden Plains Shire
- Surf Coast Shire

Southern Geelong – Strategic Investment Plan for Public Transport Infrastructure

This project is aimed at determining the whole of Victorian Government investment in Geelong over a 10-year period. This will inform strategy for future rail upgrades along the line including the future use of Geelong stabling and the interface with Armstrong Creek.

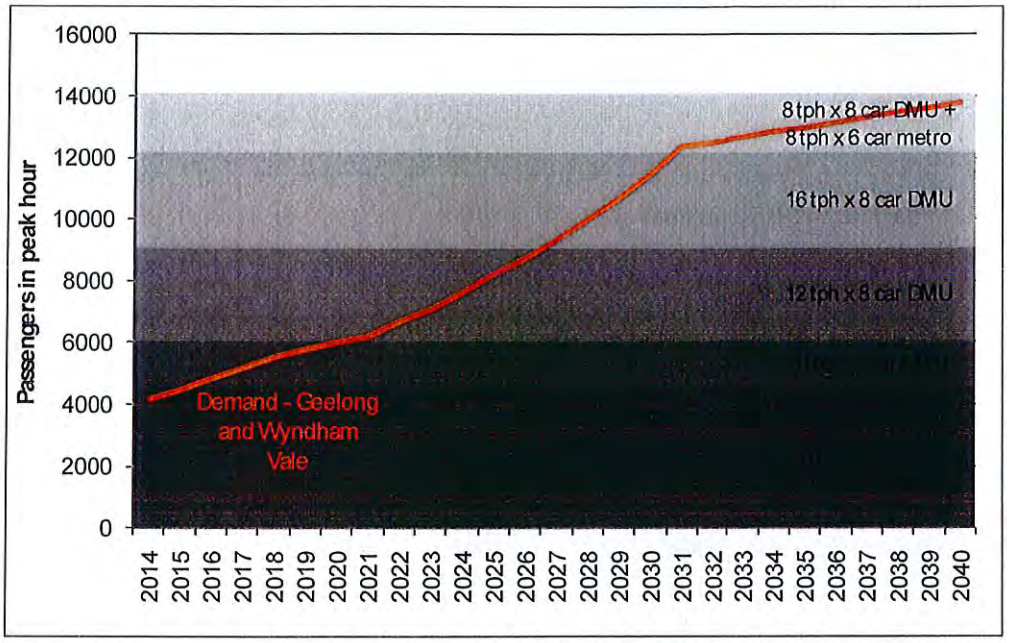
Geelong Station – North east station precinct development site

Further development is proposed in the station precinct to build on the work already done with the creation of Trainshed Way.

12.4. Demand Forecasts

The Geelong line will require regular increases in capacity over the next 20 years due to anticipated growth in the Geelong area itself as well as the need to serve the new stations on the Tarneit corridor (see below). MITM forecasts for 2021 and 2031 indicate that growth on the Tarneit corridor could be as much as 12% per annum for that period as high density

residential areas develop around the railway. As a result, the DOT anticipates that from about 2022 the Geelong line services will need to be supplemented with additional Wyndham Vale short starters to sweep the inner stations. In the event that growth on the Tarneit corridor is quicker than anticipated the implementation of Wyndham Vale short starters could be brought forward to Phase 1, but this is likely to impact on Geelong service travel times and network reliability. V/Line considers it likely that the introduction of short starters will need to be brought forward.



12.5. Freight Operations

Geelong is a key hub on the Victorian freight network. The port of Geelong is a major terminal for the shipment and export of grain and bulk products. The port is served by both Broad and Standard gauge lines that provide links to Western and North Western Victoria. Standard Gauge freight operations are totally separated from Broad gauge passenger operations. Broad Gauge freight on the Melbourne-Geelong line typically operates outside the peaks. The Geelong-Ballarat Railway provides a key link between the Port of Geelong and the North-Western region of Victoria. As passenger services are not currently scheduled to operate over this line, freight operations are not constrained by passenger train activity. The current Government has announced a study into the feasibility of reopening the rail lines between Geelong, Ballarat and Bendigo which could mean that passenger services are reintroduced to this corridor.

12.6. Proposed Timetable

The following table has been developed as part of the Regional Rail Link Concept of Operations:

Trains per hour on the Geelong line

Service (* indicates electrified service)	PEAK/2hrs		OFF PEAK	
	Marshall/Geelong	Manor Lakes/Black Forest Road	Marshall/Geelong	Manor Lakes/Black Forest Road
Phase 0 (Pre-RRL upgrades)	5/9	0	3	0
Phase 1 (Opening of RRL)	8/12	0	4	0 #
Phase 2 (Medium term)	8/16	0	4	0 #
Phase 3 (Long term) short starters from Manor Lakes/Black Forest Rd and additional rolling stock [2018-2022]	8/16	4/8	4	0 #
Phase 4 (Ultimate provision)	8/16	8*/16	4	4*

With current infrastructure beyond Geelong, of the services designated Marshall / Geelong there will be an approximately even split between services originating or terminating at Marshall / South Geelong and services originating or terminating at Geelong. The ultimate aim is to provide the full interurban timetable to the interurban boundary, which is currently Marshall but will move beyond that to Grovedale if a new station is constructed there as expected.

Phase 1 – Opening of RRL (2015)

Service Level

With the opening of RRL V/Line will operate 8 trains in the peak hour (arriving at Southern Cross between 7:30 and 8:30) and 12 trains across the peak two hours (arriving at Southern Cross between 7:00 and 9:00). A 15-minute frequency in both directions will operate between the morning and evening peaks. In the peak hour the eight trains will each operate as 6-car VLocity trains meaning that capacity will be insufficient for the forecast patronage.

Stopping Pattern

It will be desirable to operate services at regular intervals and following a clock-face pattern as much as possible. V/Line agrees with the premise of providing a homogenous service to help balance out train loadings hence optimising train path utilisation as well as improving

reliability and track capacity. This homogenous service profile would see the following stopping patterns:

- Marshall services will stop at South Geelong, Geelong, Lara, Little River, Manor Lakes and Tarneit;
- South Geelong services will stop at Geelong, North Geelong, North Shore, Corio and Lara; and
- Geelong services will stop at North Geelong, North Shore, Corio and Lara.

This service pattern will need to be reviewed based on demand experienced at North Geelong, Manor Lakes and Tarneit. Demand could be such that these stations warrant an increased frequency of service.

Rolling Stock

Assuming procurement of 34 additional VLocity cars between now and the opening of RRL (with the 34 cars being comprised of 19 single cars to convert the remaining 2-car sets to 3-car sets and five complete 3-car sets), of the 12 trains across the peak two hours 10 would operate as 6-car VLocity trains with 2 operating as 5-car N sets. In the peak hour the eight trains will each operate as 6-car VLocity consists. The capacity provided in the peak hour as well as across the peak two hours will be insufficient to cater for the forecast patronage. Therefore V/Line believes that additional short starters from Manor Lakes with the requisite rolling stock should commence from the opening of RRL.

Infrastructure Upgrades

In the absence of infrastructure upgrades beyond Geelong, only some of the eight trains in the peak hour would originate at either South Geelong or Marshall. There would also continue to be only a single counter peak train to South Geelong.

With significant infrastructure upgrades between Geelong and Marshall an improved level of service could be provided to South Geelong and Marshall. By duplicating the track from the down end of South Geelong to the up side of the Barwon River viaduct and from the down side of the viaduct to Marshall, as well as constructing second platforms at South Geelong and Marshall, six trains in the peak hour could be provided to these locations as well as two contra peak services.

DDA compliant access will also need to be provided to platforms 2 and 3 at Geelong Station. Access to these platforms for mobility-restricted customers is currently being provided by a buggy over a locked pedestrian crossing but this is not a sustainable solution. There are risks associated with this arrangement that are currently being managed with procedural controls; an engineering fix to the problem needs to be provided as soon as possible.

To facilitate the forecast increase in patronage upgrades will need to be undertaken at key stations. The Lara station building has recently been rebuilt but it is expected that there will be a need to further expand the car park. North Geelong station will require refurbishment, platform works and car park expansion. The accessibility issues at Geelong have been touched on above and it is expected that these will be addressed in a transit cities style project. In addition to a second platform South Geelong will require refurbishment of the existing building and an expansion of the car park. Similarly at Marshall there will need to be construction of a proper waiting room and further expansion of the car park.

It is expected that the Geelong stabling expansion (currently being scoped and designed but not yet funded) will provide sufficient capacity to cater for the increase in services under phase 1 of RRL. Further stabling will need to be provided at phase 2. Inner city stabling needs to be considered at a network wide level.

Potential operational impacts

To be developed in the next iteration.

2016

No change

2017

No change

2018

Service Level

An additional four services could be provided in the shoulder peak periods to provide a total of sixteen services across the peak two hours. With infrastructure as outlined below all interurban services would operate to and from a new station at Grovedale.

Stopping Pattern

It is expected that the stopping pattern will follow a similar arrangement as for the 2015 level of service. If the infrastructure upgrades described below are undertaken and all services are able to operate to and from Grovedale it is expected that alternate services would stop at different blocks, with one potentially being North Geelong, North Shore, Corio and Lara and the other potentially Little River, Manor Lakes and Tarneit. Early introduction of short starter services would change the mix of these stopping blocks.

Rolling Stock

V/Line anticipates that by this point in time a high capacity style DMU will be required for Geelong services. It is expected that these trains would operate in 8- or 9-car consists and

would each be able to carry 750 – 800 customers. It is expected that the eight peak hour services would be operated with the high capacity DMUs.

Infrastructure Upgrades

The introduction of a high capacity style DMU will require the construction of a new maintenance facility. This should be constructed in conjunction with a new stabling yard outside of central Geelong. Locating the maintenance and stabling facility beyond Grovedale will allow vehicles to fleet through in the mornings and evenings.

To provide sufficient capacity to allow all services to operate to and from Grovedale, the Grovedale station should be constructed with two platform faces and additional track duplication should be undertaken between Marshall and Grovedale.

All level crossings between Marshall and the new stabling and maintenance facility will need to be upgraded to boom barrier protection. There are six such crossings between Marshall and Moriac.

Beyond 2018

It is expected that the peak service level to the stations in the 'traditional' V/Line territory (Little River to Grovedale) will have reached its maximum by 2018. If not already implemented it is expected that short starter services from Black Forest would be introduced in this timeframe.

With the introduction of a full schedule of short starter services the stopping patterns will be altered to suit. Geelong services would operate express through the Tarneit section while the short starters will stop at the intermediate locations. Further capacity enhancements may be required in the Tarneit section to allow for an increased short starter service level while protecting reliability of Geelong services.

Retirement of the locomotive hauled rolling stock will need to occur at some stage in the period beyond 2018 if not before. V/Line's strategy is to move to an all DMU fleet that achieves as much interoperability as technically possible. The retirement and replacement strategy needs to be considered at a network wide level.

12.7. Required Infrastructure

In order to achieve the proposed frequency of trains a number of rail infrastructure projects will need to be undertaken as described in the previous section. The table below summarises the recommended timeline for upgrade works.

Identified infrastructure requirements in addition to Regional Rail Link:

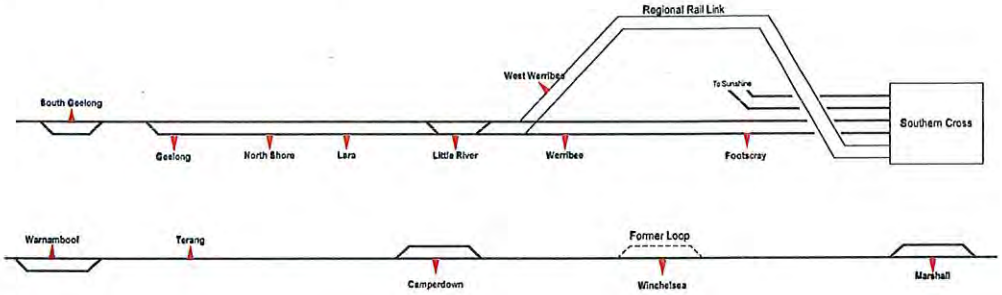
Year	Project	Need / Benefit
2014-2016	Partial track duplication between Geelong and Marshall from the down end of South Geelong to the up side of the Barwon River viaduct and from the down side of the viaduct to Marshall; construction of new platforms at South Geelong and Marshall; upgrade works at Geelong Station including the provision of DDA compliant access to platforms 2/3.	Enables higher service frequency to operate from Marshall and Waurn Ponds to cater for forecast high patronage growth in that area
2016-2018	Construction of new station at Grovedale; track duplication between Marshall and Grovedale; construction of stabling and maintenance facility beyond Grovedale	Enables higher service frequency to operate from Grovedale to cater for forecast patronage growth in that area. Construction of a new stabling and maintenance facility is expected to release land in central Geelong for alternative uses.
2018-2022	If not already completed, construction of Black Forest turn-back and supporting infrastructure for short starters	Enables implementation of two-tiered service on Geelong line with all services from Geelong running express through Tarneit section and Black Forest services stopping at intermediate stations.
2018-2022	Potential construction of additional stations between Black Forest and Deer Park	Improve transport access and travel times in Wyndham area and reduce loadings at neighbouring stations.
2022-2030	Optional construction of third and possibly fourth track between Black Forest and Deer Park	Protects travel times for Geelong services through Tarneit corridor section following the proposed construction of new intermediate stations and increase in service frequency from Black Forest
2022-2030	Implementation of higher capacity signalling system between Sunshine and Southern Cross	Patronage growth between Black Forest and Deer Park will necessitate in excess of 20tph to operate inbound from Sunshine
2030-2038	Electrification of RRL lines from Southern Cross to Black Forest	Enables higher capacity rolling stock to be operated on Black Forest short services to meet forecast patronage
2038+	Electrification from Black Forest to Geelong	Enables higher capacity rolling stock to be operated on Geelong services to meet forecast patronage

13. Network Constraints – South Western Corridor (Intercity)

13.1. Existing Conditions

Capacity on the 195 km Geelong- Warrnambool section of the line is currently constrained by long single line sections and a lack of crossing loops. This lack of infrastructure limits the ability to provide additional passenger services, and creates pathing constraints for freight services particularly if they are unscheduled.

13.2. Corridor Diagram



13.3. Active Projects

The Government has committed $10 million to fund the construction of a new crossing loop between Colac and Terang. The crossing loop will enable longer, more commercially viable freight services on the corridor. Detailed planning and design works for the project have commenced with construction expected to begin in 2012.

13.4. Demand Forecasts

Of V/Line's intercity corridors the Warrnambool line carried the highest number of customers in 2010-11. There is expected to be strong population growth along the corridor in the next fifteen years. The table below summarises data from the Department of Planning and Community Development regarding forecast population growth for the communities that this corridor serves.

Statistical Local Area	Serviced by	2006 Population	2026 Population	% change
Colac-Otway (Colac)	Colac	11,229	12,224	9%
Colac-Otway (North)	Colac, Birregurra	6,267	6,590	5%
Colac-Otway (South)	Colac	3,534	4,301	22%
Corangamite (North)	Camperdown, Terang	9,472	9,529	1%
Corangamite (South)	Camperdown	7,699	8,355	9%
Moyne (North East)	Terang	2,496	2,542	2%
Moyne (North West)	Warrnambool	2,883	3,128	9%
Moyne (South)	Warrnambool	10,623	12,287	16%
Surf Coast (West)	Winchelsea	9,004	9,992	11%
Warrnambool	Warrnambool	31,501	39,229	25%

Growth is forecast to be particularly strong in Warrnambool and Colac. The population growth is expected to lead to an increase in demand for rail services, particularly as it is likely to be a demographic generally more reliant on public transport.

It is expected that there will be an increase in demand for peak services from some locations on this corridor, particularly from Colac to Geelong and possibly on to Melbourne. A peak coach service is currently being offered as a trial to test the demand for these services.

13.5. Freight Operations

Warrnambool is served by five general freight trains per week. There is an argument that freight operation is currently constrained by the lack of suitable passing loops between Geelong and Warrnambool. However it must also be recognised that the rail service is subsidised and would not be in operation otherwise. Two trains per week call at the Waurn Ponds cement works on the outskirts of Geelong.

13.6. Proposed Timetable

There are currently three return services per day Monday to Saturday with two return services on Sundays (the third daily return service operating as a coach). It is expected that intercity services will run express between Southern Cross and Geelong and that they will operate in addition to the scheduled interurban off peak services (i.e. they will operate as the fifth service in the hour). The proposed changes to this timetable are outlined below.