Connecting Ballarat

A proposal for
Direct, frequent buses
Connecting key destinations in Ballarat

PTUA
PUBLIC TRANSPORT USERS ASSOCIATION

Executive Summary

Ballarat's population has grown from 73,000 in 2001 to 100,000 today, and is expected to reach 160,000 by 2040. If Ballarat is to continue to be a vibrant, livable regional city it cannot remain dependant on cars for its transport needs - our environment, our communities and our local economy will need high-quality public transport to connect key destinations.

In late 2019, construction of the Ballarat Line Upgrade (BLU) project will be completed, after which it is anticipated Ballarat will have a 20 minute peak/40 minute off-peak V/Line rail service. This presents a challenge for coordinating buses, as it does not easily align with the existing 30/60 minute bus frequencies; however it also presents an opportunity to increase bus frequencies, to both maintain connectivity with train services and provide a more attractive service that can gain serious mode share for other trips.

The 2017 changes to Ballarat's bus network made great strides in straightening out bus routes in the suburbs, and providing a broadly more direct and rational network. This provides a good basis for further changes, which can address the problems in central Ballarat, where paths are still indirect, counterintuitive and inefficient. Connecting routes on the opposite sides of town in order to provide easier cross-town travel and a faster, more direct and more efficient path through the CBD, will mean a quicker, more legible and more attractive network for passengers; and more efficient use of driver time and taxpayer resources.

Now that the new network has been running for many months, it has become apparent that there are many inefficiencies in the timetables; most routes have excessive padding on their outer sections, which mean buses arrive at timing points early and have to sit idle for several minutes waiting for the timetable to catch up. This represents a significant and obvious waste of time for passengers, adding both to the reality and the negative perception of buses as a slow alternative to driving; and represents a significant waste of driver time and therefore taxpayer resources. Tightening up these timetables to more accurately reflect normal travel times would therefore be a win-win for passengers and taxpayers alike.

It is also apparent that the current span of hours does not meet the needs of Ballaratians – whether they are commuting by train to Melbourne, or going out for dinner, drinks or evening events in Ballarat itself. Most bus routes shut down around 7-7:30pm weeknights, which mean that shoulder-peak commuters from Melbourne will not have a bus available by the time they get back to Ballarat – this is a major contributor to parking pressures at Ballarat and Wendouree Stations. Similarly, people going out for dinner or to the movies in Ballarat will not have a bus to take them home when they're finished, which restricts access

to that night life and has negative impacts on Ballarat's economy. Extending the bus network's operating hours to run at the same frequencies until 9pm, and lower frequencies until 11pm, would help address all these issues, and increase patronage.

We recommend a comprehensive reform of Ballarat's bus network, to expand on improvements already delivered to buses, and capture the value of the current investment in rail. A network that is faster and more legible, and runs more frequently for a longer span of hours, will attract people out of their cars, increase fare revenue and have a transformative effect on the way people move around Ballarat.

We also recommend that any new buses procured to implement this plan be electric buses. Electric bus technology is now mature enough that buses have sufficient range for the rigours of revenue service, and are economically superior to diesel buses over the life cycle of the vehicle. They also reduce noise and particulates for the people living near them, and reduce greenhouse gases for the planet at large.

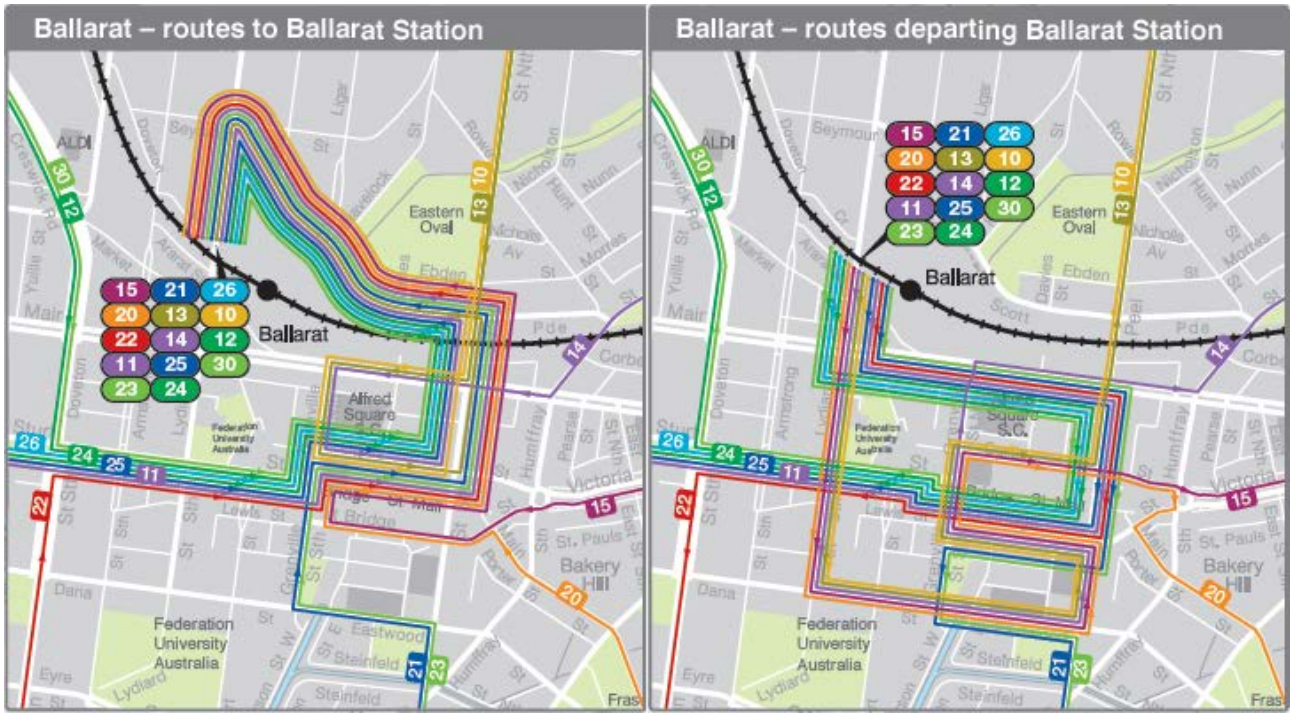
Ballarat is growing fast, and its transport network is experiencing growing pains. The City of Ballarat is making admirable attempts to better manage its parking assets, but many citizens respond to these attempts by pointing out that they currently have to drive, because the current bus network is not a viable alternative for them. The time is ripe for the government to improve the network, increase frequencies and span of hours, and provide people with a genuine alternative to driving. The travelling and voting public are crying out for these improvements, and we call on all political parties to hear their voices.

Contents

The current network

The new bus network and timetables introduced in Ballarat in January 2017 has improved many aspects of the old system. Outside the CBD, most routes are much more direct, with routes straightened and large unidirectional loops eliminated. This helps facilitate a quicker journey that is more time-competitive with a car, and provides a much more legible network for casual users. Compared to the old system, many more routes run to higher frequencies and run on weekends, which makes the buses much more useful for a wider range of people and trips. However, these improvements have been let down by a few systemic issues.

The first main issue is that while routes are much straighter and more legible outside the CBD, the opposite is true within the CBD. Routes twist back on themselves in order to call at specific interchanges in a specific order, as shown below.



Current bus route paths through Ballarat CBD © PTV

PTV's rationale for these paths through the CBD, as communicated at consultation sessions prior to implementation, was that they would ensure all routes in central Ballarat called at Bridge Mall, and terminated or originated at Ballarat Station; and that they would allow for "simple instructions" for how to get somewhere (eg "To get a bus to the station, go to the Curtis Street Interchange"). The stated priority was legibility for casual users.

Experience since implementation has shown that the paths through the CBD have failed to deliver this legibility. Because they take a path that no sensible driver would take, they are

extremely counterintuitive to casual users. For example, in order to catch a bus heading to a southeastern part of Ballarat, one must catch a bus heading west along Little Bridge Street (which will soon twist back on itself). Similarly, if a person is at Bridge Mall and wants to head northwest to Ballarat Station, they must get on a bus heading east. This makes no sense to the casual user, and has caused considerable confusion amongst potential passengers.

In addition, this path through the CBD requires many more route-kilometres than a more direct path would; it requires more right-hand turns on busy intersections than a direct path would; and because all inbound routes call at Bridge Mall before arriving at the station, and all outbound routes call there after departing the station, a passenger interchanging between routes has to pass through Bridge Mall twice. All of these inefficiencies with the path through the CBD waste the time of passengers and drivers alike. Fixing them would make taking the bus quicker and more attractive to passengers, increasing mode share and fare revenue; it would also save the time of drivers (and therefore the resources of PTV and taxpayers, which can be diverted to increasing frequencies or span of hours).

The second main issue is with the timetable. Outside the CBD, there is excessive padding in the timetable; even in the worst traffic conditions during the peaks, the timetable dramatically overestimates how long it will take for a bus to travel between two points. It is common on all routes in the Ballarat network for the bus to need to sit idle at timing points, in many cases for several minutes, waiting for the timetable to catch up. This is a very apparent waste of passenger time, increasing both the reality and the perception of buses as slow alternatives to driving. It is also a significant waste of driver time; and given that driver wages are by far the largest ongoing expense of running a bus service, this represents a significant waste of taxpayer money. By trimming the fat from these sections of the timetable, these wasted resources could be diverted to increasing frequencies or extending hours of operation.

Case Study: Timetable padding

Prior to implementation of the new network in 2017, Route 10 was timetabled to take 11 minutes to travel between FedUni's Mt Helen campus and Sovereign Hill. Route 21, which replaced Route 10, allows 18 minutes to make the exact same trip – a 64% increase in estimated travel time.

In practice, it is very common for the bus to need to stop at timing points along the way, and sit idle for several minutes to wait for the timetable to catch up. Even a bus that leaves FedUni several minutes late will usually be able to catch up so easily that it still needs idle time at Sovereign Hill.

Given prior issues with punctuality, it was prudent to allow slightly more time in this section, however a 64% increase seems to have been wildly excessive.

There does, however, seem to be the opposite problem on the inner sections of routes; it is very common for buses to take several minutes longer than expected to get through the CBD, and indeed the padding in the outer sections may be partially designed to compensate for this while maintaining punctuality targets. In the absence of route reform that straightens out the paths through the CBD, comprehensive timetable reform would therefore require a mixture of cuts and expansions, depending on the section; but would nonetheless result in significant savings overall.

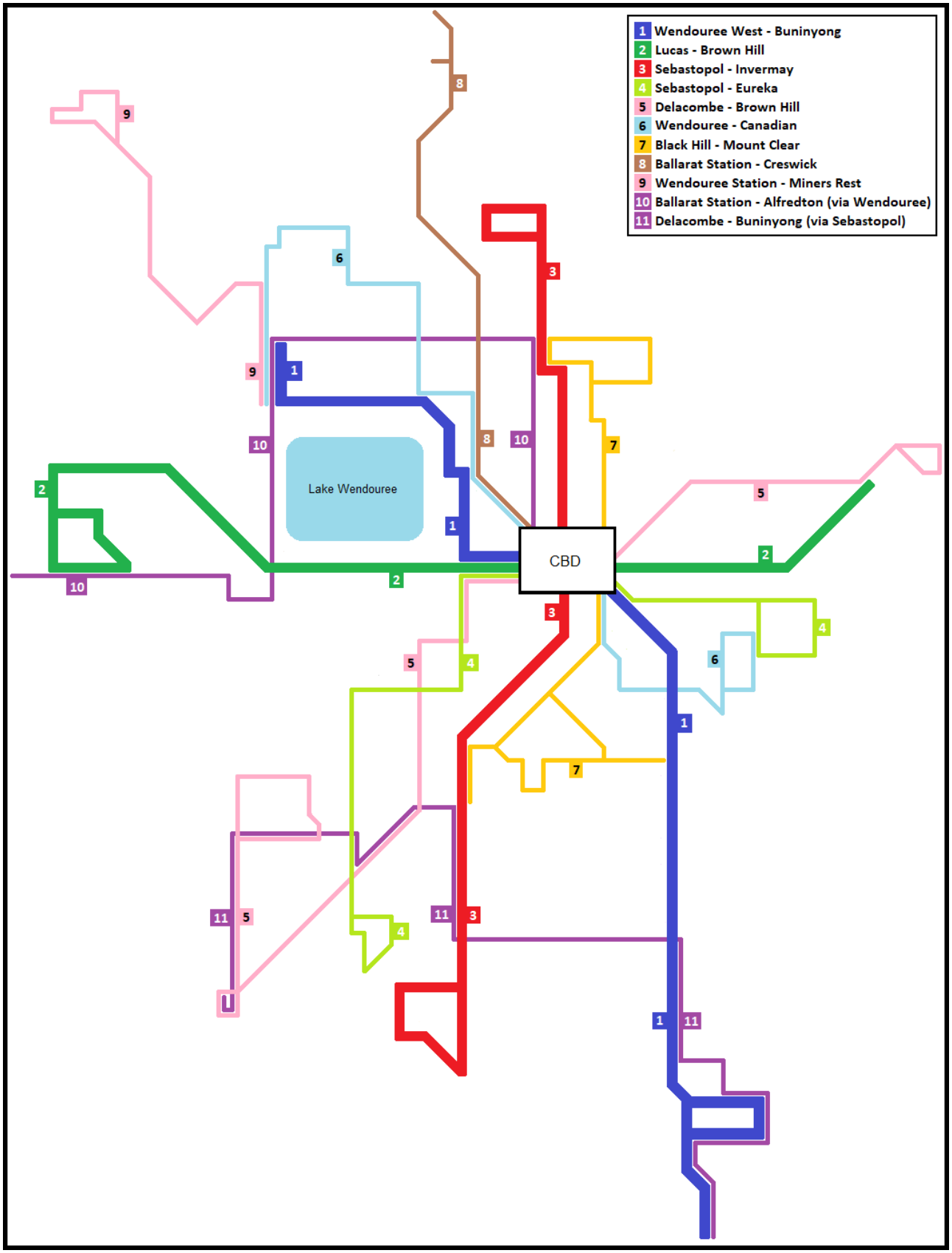
Case Study: Early, then late

Route 21 has many issues with timetable padding in its outer sections, but still commonly arrives at Ballarat Station late.

Students who catch the 3.16pm bus from FedUni expect to arrive at Ballarat Station at 3.45pm, in time to catch the 3.52pm train to Melbourne. This bus generally leaves FedUni a few minutes late, but because of excessive padding, tends to catch up to its timetable by Sovereign Hill, and needs to sit idle.

By the time it has gone through the relatively busier inner section of the route, with more frequent stops to drop off & pick up, and four signalled intersections, it has often lost several minutes. It is common for this bus to arrive at Ballarat Station just as the train leaves – meaning the students need to wait over an hour till the 5.15 coach, which gets them to Southern Cross 2 hours later than the train would have.

Proposal


1 Wendouree West - Buninyong
2 Lucas - Brown Hill
3 Sebastopol - Invermay
4 Sebastopol - Eureka
5 Delacombe - Brown Hill
6 Wendouree - Canadian
7 Black Hill - Mount Clear
8 Ballarat Station - Creswick
9 Wendouree Station - Miners Rest
10 Ballarat Station - Alfredton (via Wendouree)
11 Delacombe - Buninyong (via Sebastopol)
Lake Wendouree
CBD

The PTUA proposes a comprehensive reform of the Ballarat network. The central concept of this proposal is to link routes on opposite sides of town together, to provide longer cross-town routes – much like Melbourne's cross-town tram routes.

These cross-town routes would travel to Ballarat Station and Bridge Mall in the order that is most direct and convenient for that particular route, thus providing a more logical and more efficient path through the CBD.

PTV's stated priorities with the previous round of bus reforms were:

- a straighter and more efficient network
- a more legible network for casual users
- for buses to share common paths that would allow for traffic prioritisation
- maximum connectivity with Ballarat station
- increased connectivity with Wendouree station

The current network does go a long way to achieving these goals, and our proposal would retain its successes. But it also falls short in many ways, and our proposal seeks to address these issues.

In addition to linking routes together for improved paths through the CBD, we propose some changes to suburban sections of routes, to build on previous changes. These changes are broadly designed to make the routes straighter, more legible and more efficient, but in some cases this does mean reducing their coverage area. As such, the proposal includes a small number of additional routes, which can ensure these areas are still covered by the network.

It is proposed that the new network would run to higher frequencies than the current network – in part to ensure connectivity with trains is mantained, but also to allow for more freedom when travelling around Ballarat, particularly when changing between routes is required.

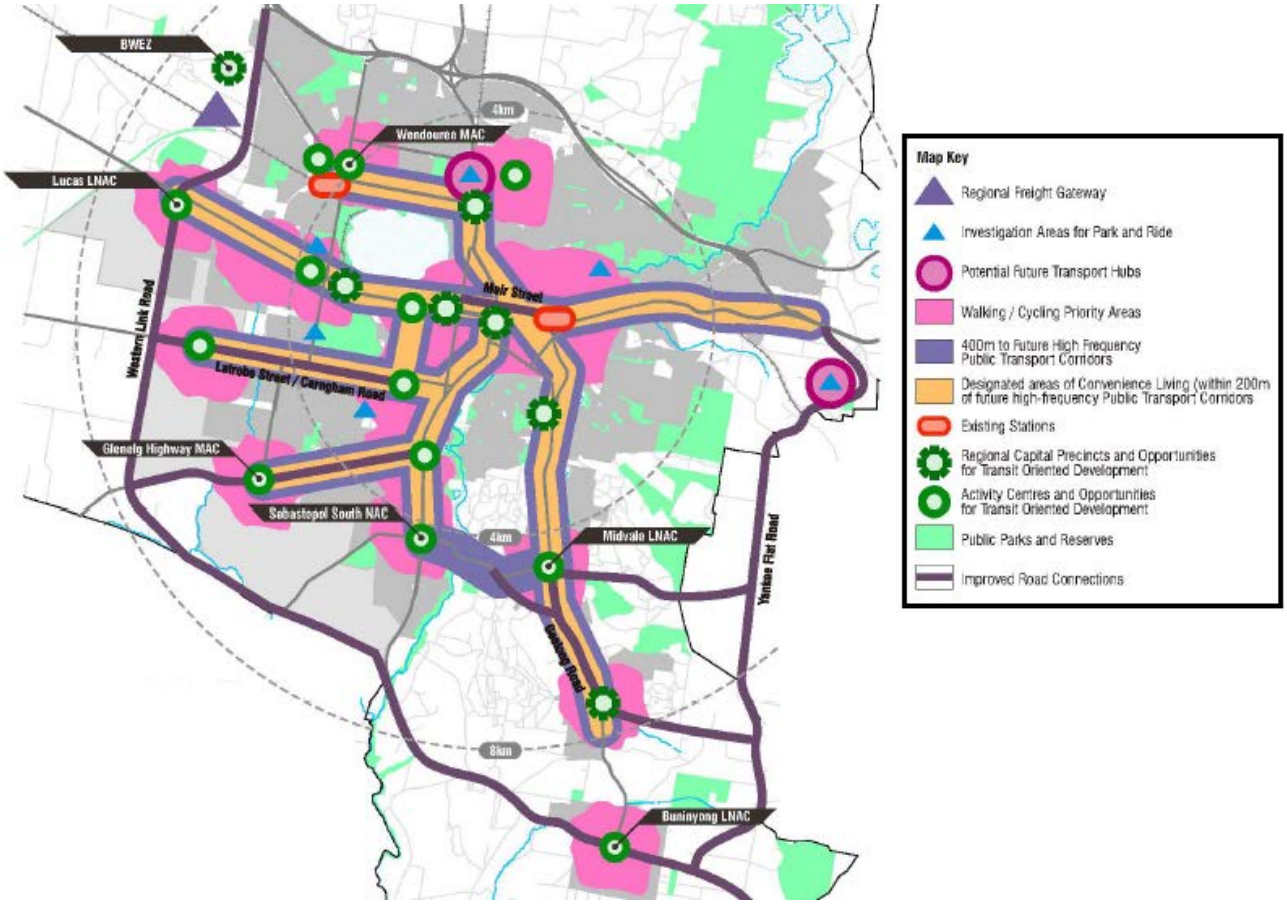
Proposed Routes

Find an interactive version of the map here

The proposal seeks to join routes on opposite sides of town, to allow for easier cross-town travel as well as a smoother path through the CBD. A key component of this would be to create three SmartBus routes, which would run to high frequencies and to a long span of hours, and would form the spine of a truly high-quality public transport network for Ballarat.

The cross-town routes, and particularly the SmartBus routes, would connect many important destinations to each other along a direct and sensible path, and provide a one-seat journey for many passengers. For those who do need to change buses, the speed and

efficiency of the routes will allow quicker journey times, as well as allowing higher frequencies than Ballarat has had up till now. This will keep bus travel relatively time-competitive even for two-seat journeys.

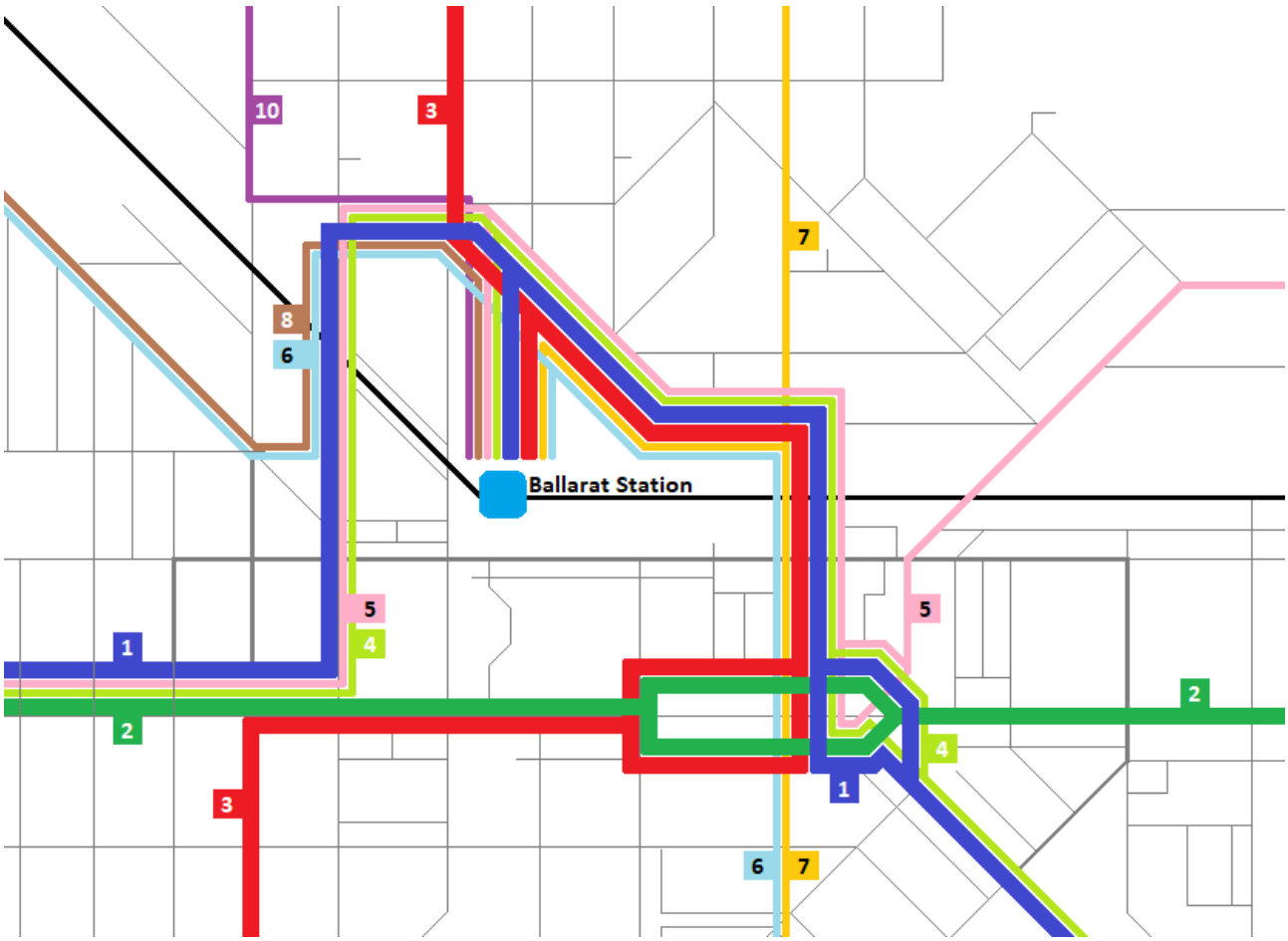


Proposed high-frequency public transport corridors the in Ballarat Strategy

The three SmartBus routes have been designed to broadly align with strategic high-frequency public transport corridors identified in the 2015 Ballarat Strategy, which is the City of Ballarat's overarching strategic document for 2040[1]. With a fast, direct, and frequent service, and service hours stretching into the evenings, it should be possible to live along these corridors and not own a car – getting around by walking, cycling, and a turn-up-and-go public transport network. In the medium term, having these clearly high-quality public transport services will encourage investment in medium-density housing and commercial developments along these corridors, further increasing ridership and justifying higher frequencies. In the long term, if the urban form changes and patronage grows in the right way, these routes could ultimately form the basis of a returned light rail network for Ballarat.

1 http://www.ballarat.vic.gov.au/pbs/city-strategy/ballarat-strategy.aspx

Key features

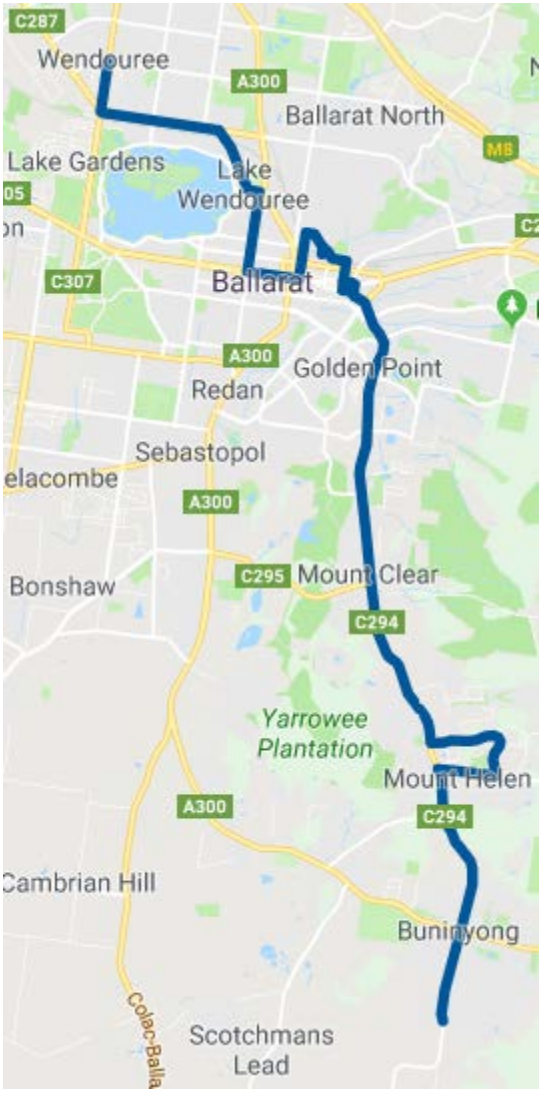


Detailed view of paths taken through the Ballarat CBD

Interchange will still be possible at Bridge Mall, and may be the preferred option for savvier users, but will require short walks between stops in many instances – for example, from Little Bridge Street Interchange to Curtis Street Interchange. Certainly, it is likely that the PTV Journey Planner, Google Maps and similar services, will suggest this for some trips; and wayfinding signage should be provided to facilitate this where possible. However, for casual users and those with limited mobility, Ballarat Station will be the primary interchange point. The station should have sufficient infrastructure in place to support this.

Route designs also emphasise connectivity in other parts of Ballarat, to provide for much more direct trips by minimising the need for people to take long trips into the CBD and back out again. For example, someone wishing to travel from Alfredton to one of the medical clinics in the 1100 block of Howitt Street could interchange at the corner of Gillies and Howitt Streets; someone travelling from Mount Pleasant to Mount Helen could interchange at Zagames.

1. Wendouree West to Buninyong, via Ballarat Station



The first SmartBus route would travel from the northwest to southeast corners of Ballarat, via most of its key activity centres. Broadly, this route would be a merger of the existing Route 11 (Ballarat Station – Wendouree Station via Howitt Street) and Route 21 (Ballarat Station – Buninyong via FedUni), with some tweaks in central Ballarat to provide for a route that is direct while serving key destinations.

The route is also designed such that a third route, the existing Route 31 (Wendouree Station – Miners Rest) could easily be merged into this at a future date. As more housing and other destinations are developed at Miners Rest, and when the northern section of Ballarat West Employment Zone (BWEZ) comes online, it will make sense for these areas to have a higher-quality service. The design of these routes allows them to be merged with minimal inconvenience.

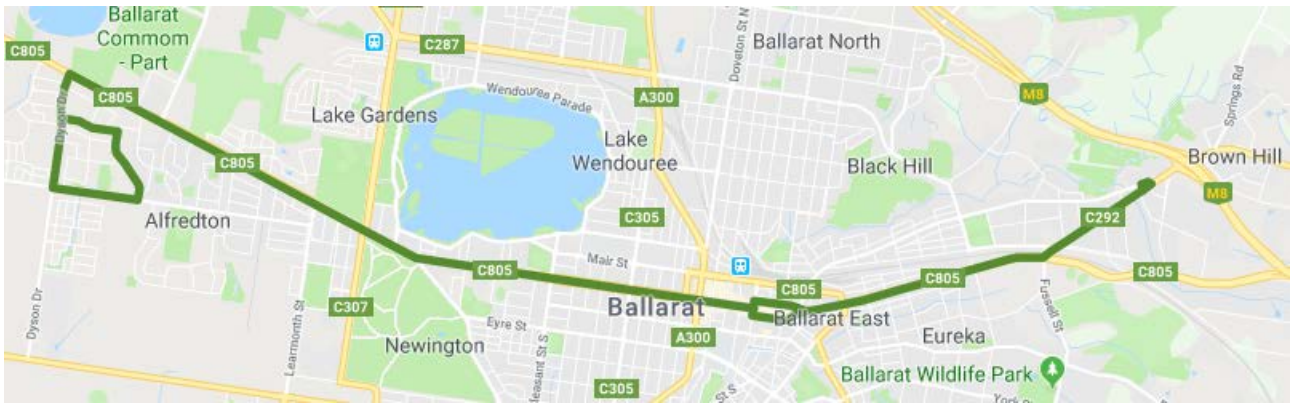
The initial Wendouree-Buninyong route would serve the following key activity centres with high-quality public transport:

- Wendouree Station
- Stockland Wendouree
- Howitt Street Shopping Precinct
- Australian Catholic University
- Ballarat Hospital Precinct
- Sturt Street Shopping Precinct
- Ballarat Station
- Bridge Mall
- Sovereign Hill
- Midvale Shopping Centre
- Federation University Mount Helen Campus & Technology Park
- Warrenheip Street Buninyong

Services should run to a clockface time, at the highest frequency possible within budgetary constraints. The specific timings should be coordinated with class and shift times at FedUni and the Technology Park, which start and finish on the half hour. Given anticipated bus travel times, and walking times between campus and the Ballarat Hospital stop, this should naturally sync fairly well with class times at ACU.

As noted above, after the completion of the BLU project, train headways are expected to improve to a 20-minute peak/40-minute off-peak frequency. If buses are to run to a 20-minute frequency, it will be necessary to also try to coordinate the timetables with trains, to allow for suitable connections. If buses run to 10-minute frequencies or better, coordinating specific connections will become unnecessary; for any train, there will be an appropriate connecting bus.

2. Lucas to Brown Hill



This SmartBus route would act as the main east-west spine of the network. It would broadly be a merger of the existing Route 26 (Ballarat Station – Alfredton) and Route 15 (Ballarat Station – Brown Hill), with four main differences:

- this route would originate at Raymond Crescent, Brown Hill, with another route servicing the areas beyond the Western Freeway
- it would travel directly along Victoria Street, with another route servicing Eureka
- it would not deviate to Ballarat Station
- the Alfredton section of the route would follow Route 10's path along Sturt Street, rather than Route 26's path along Cuthberts Road

This would provide a fast, direct, efficient bus that could be extremely time-competitive with cars for the people who live near the corridor. If run at a high enough frequency, and for a long enough span of hours, this route could attract serious mode share.

Most other routes on the network have some component in the northern part of the city, so calling at Ballarat Station can be done in a way that does not require excessive deviation; the amount of deviation is small and the benefits to connectivity make the deviation worthwhile. This route, however, travels purely east-west along Sturt Street, several blocks to the south of the station, so it would require significant deviation to call at the station. This deviation may not act as a significant deterrent to someone travelling all the way from Newington to Ballarat East, but it would act as a significant deterrent to those making tram-style hop-on-hop-off trips up and down Sturt Street, which would be a sizeable proportion of the route's target market.

Passengers along this corridor who want to travel to the station can either walk approximately 400m from the corner of Lydiard and Sturt Streets; or interchange with another route at Bridge Mall or Sturt Street which would drop them at the station.

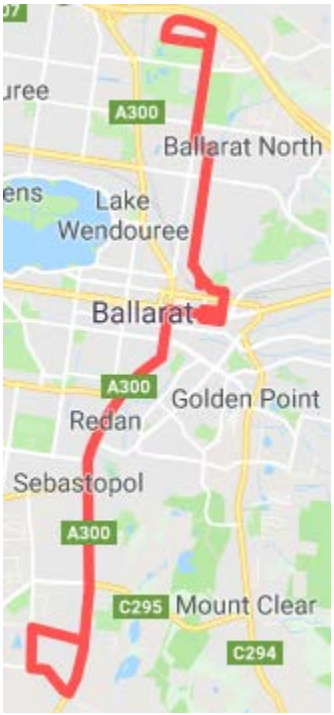
Case Study: City Circle Bus

In January-June 2016, City of Ballarat trialled a high-frequency bus along the Bridge Mall-Sturt Street corridor. The bus ran a constant loop from 8am-6pm and provided approximately a 10-minute frequency. It didn't use the low-floor myki-enabled buses of the PTV network, instead using a high-floor minibus, free to users.

Part of the rationale for the service was to act as a parking shuttle, reducing pressure on CBD parking. It was not successful in this; patronage was lowest in the 8-10am and 5-6pm periods, suggesting people were not using it for peak travel. Numbers were fairly steady from 10am-5pm, with a slight peak around lunchtime, indicating that the service was very popular and attractive for short trips up and down the retail and restaurant strip – but that the passengers had already driven or taken a PTV bus to the CBD.

These results suggest that a frequent bus along this corridor, better-integrated into the network and catering to several different trip types, would attract high patronage.

3. Sebastopol to Invermay, via Ballarat Station



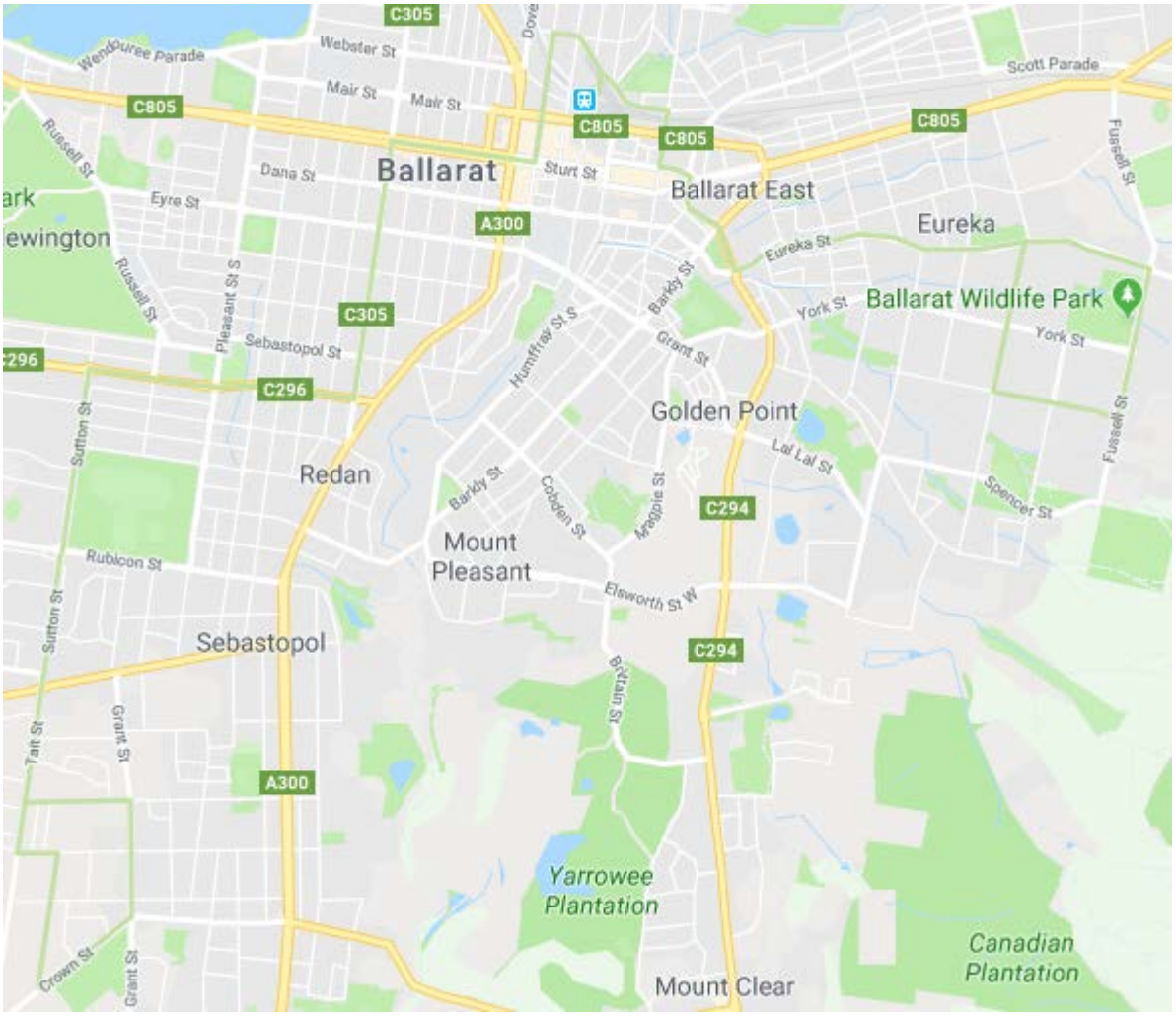
This route would combine aspects of the current Route 22 FedUni via Sebastopol with aspects of the former Route 2 Wendouree and Route 4 Invermay.

Despite many benefits in other areas of Ballarat, the current network serves Soldiers Hill very poorly. This is despite the area being well-suited to public transport, due to the prevalence of densely-packed terraces and an easily-walkable layout of streets. The Lydiard Street section of the former Route 2 Wendouree was reasonably well-patronised, but the existing routes through the area are circuitous and infrequent.

This reformed service would provide a fast, direct and frequent service for north-south travel via central Ballarat. It would serve key housing developments in southern Sebastopol; several supermarkets and shopping precincts along the Midland Highway; FedUni's SMB campus; Central Square and Bridge Mall; Ballarat Station; key terrace housing along Lydiard Street; Northway shopping precinct; and Invermay Park.

The route would not travel to FedUni, as the current Route 22 does; this function would be taken on by another, longer orbital route detailed below.

4. Sebastopol to Eureka, via Ballarat Station

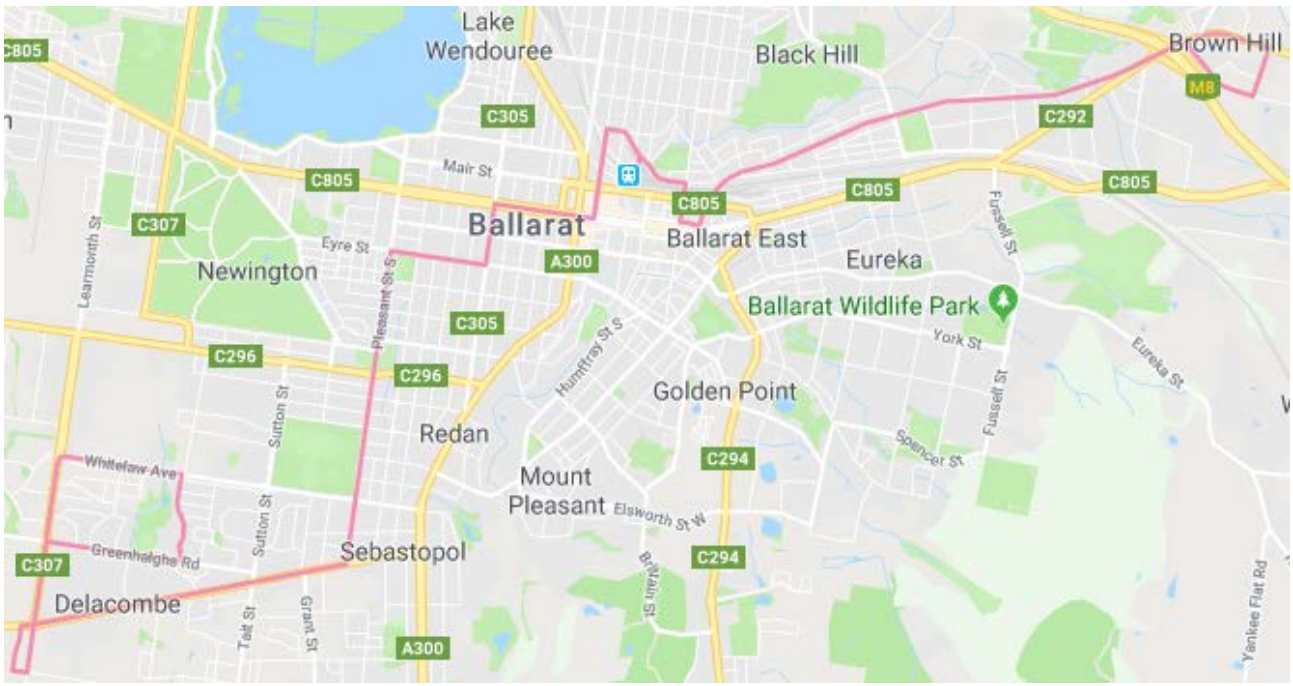


This route would largely merge the existing Route 24 Sebastopol with a newly-created route in Ballarat East. Under the recent reforms, Canadian lost most of its coverage, stranding many residents. The previously direct (albeit one-way) service along Victoria Street was also diverted to cover parts of Eureka; since we propose to straighten the route along Victoria Street, this route would travel along Eureka Street to compensate.

This route would service key housing areas throughout Sebastopol, Delacombe and Redan, with few changes from the successful existing route. After leaving Ballarat Station, the route would serve Bridge Mall & Main Road; the Eureka Centre; and Ballarat Wildlife Park. If and when a new station is opened at Warrenheip, this route could easily be extended along Eureka Street to connect with trains and other buses there.

Given the existing high patronage of Route 24, and the geographical areas it serves, this route is a leading candidate to become the fourth SmartBus route in the medium term.

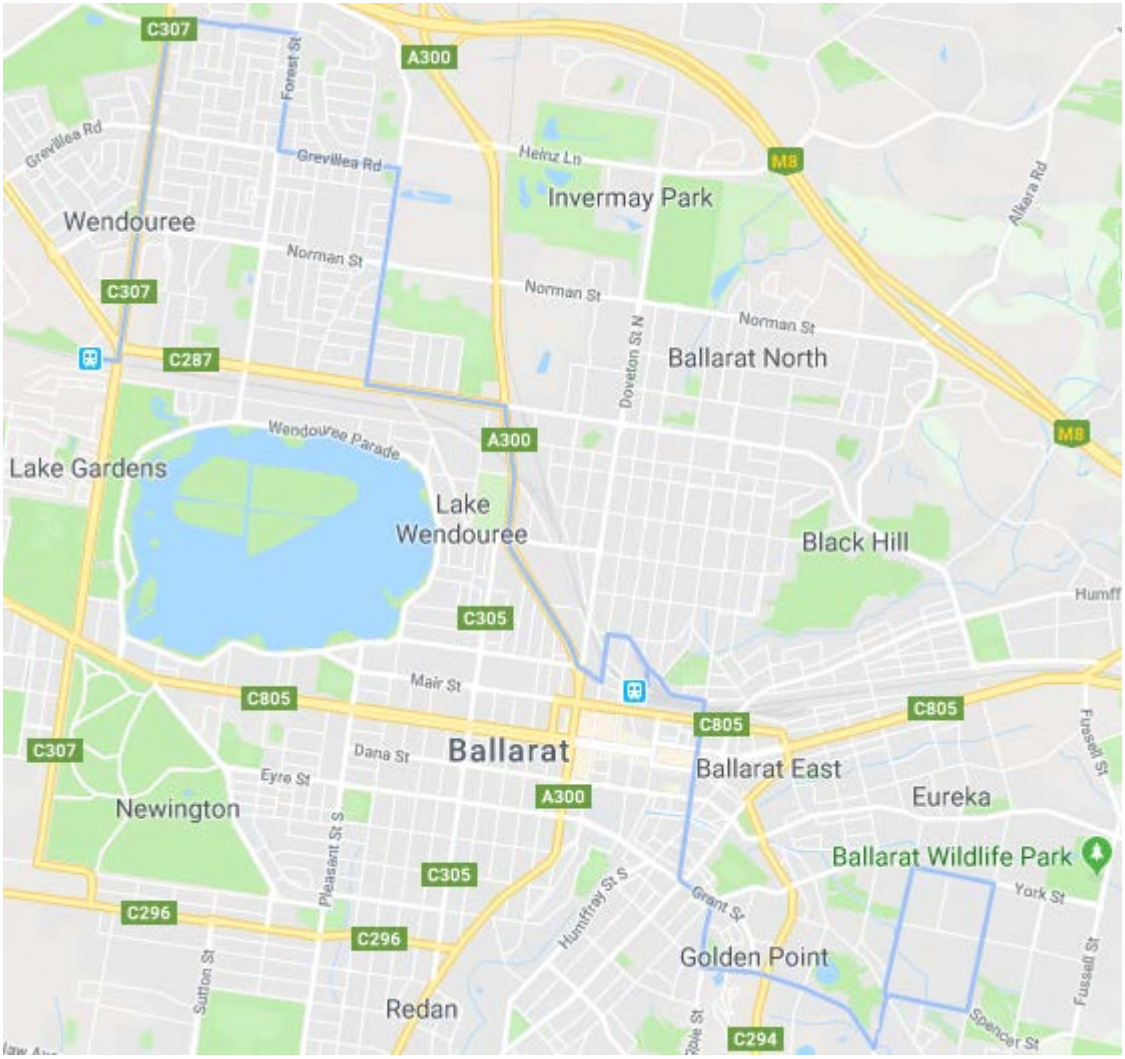
5. Delacombe to Brown Hill, via Ballarat Station



This route broadly combines the existing Route 25 Delacombe with aspects of Routes 14 Black Hill and Route 15 Brown Hill. It would serve Delacombe Town Centre; several aged care facilities and retirement villages; numerous sporting facilities on Pleasant Street; the La Trobe Street shopping precinct; Queen Elizabeth Centre; as well as many residential areas and smaller shopping precincts. It would also combine with other routes to increase capacity up and down Sturt Street, including the Hospital precinct.

This route is designed such that it can be extended as further housing developments are built in Brown Hill, beyond the Western Freeway.

6. Wendouree to Canadian, via Ballarat Station

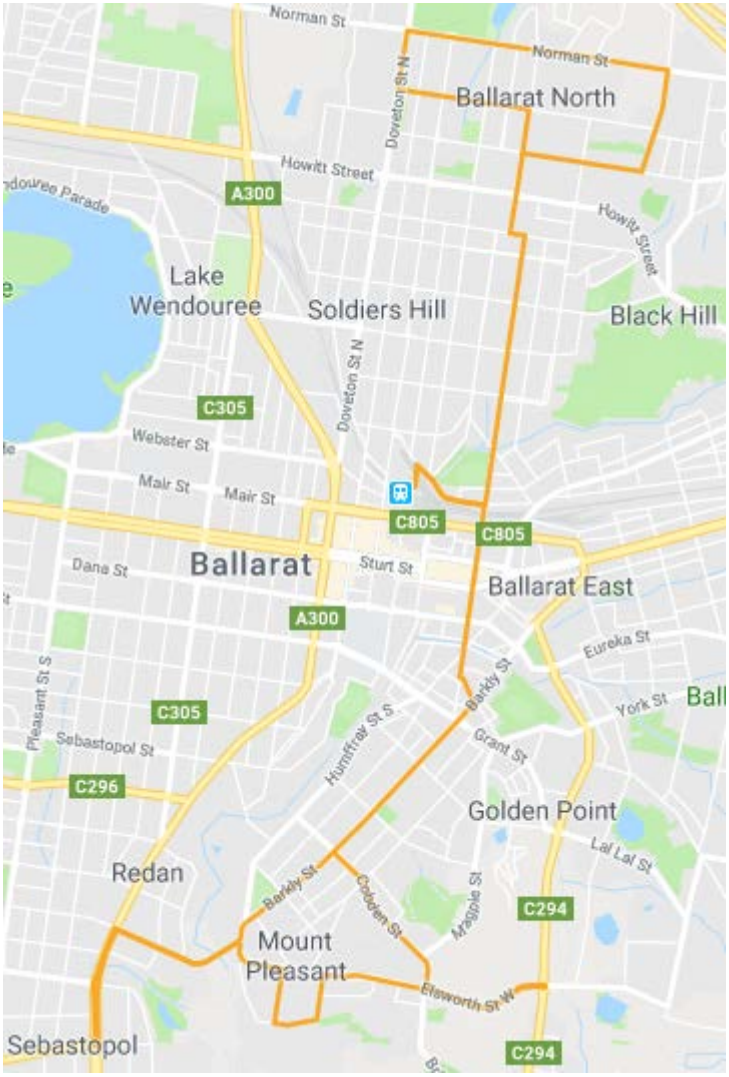


This route combines the very well-designed Route 12 Wendouree, with a newly-created route which borrows aspects of the existing Route 21 and the former Routes 8 & 9 (Eureka & Canadian). In doing so, it allows the new Buninyong route to take a more direct path along Main Road, as the former Route 10 used to.

While the last round of reforms absolutely did the right thing in getting rid of the large one-way loops of the former Routes 8 & 9, in doing so it removed coverage from areas that needed it. This reform would return coverage to these areas, in a fairly direct and efficient way that aligns with the spirit of the last round of reforms.

The route would serve Wendouree Station; Stockland Wendouree and adjacent Big Box retailers; residential northern Wendouree; the eastern end of Howitt Street precinct; Eureka Stadium; housing and retail along Creswick Road; the library & future GovHub; Ballarat Station; Bridge Mall; Sovereign Hill; and residential Canadian and Ballarat East.

7. Black Hill to Mount Clear via Ballarat Station



This route largely combines the old Route 5 Black Hill with the current Route 23 Mount Clear, to form a simple and direct north-south route covering largely residential areas.

The existing Route 14 Black Hill is very indirect and unattractive to riders (see Case Study: Faster to walk). A more direct route would be much quicker to operate, and use fewer resources than the current indirect one; and would be much more attractive to riders, increasing fare revenue.

At the northern end of the route, it would serve Northway shopping precinct, which would give quick and direct access to those who live in the area. It also allows for easy interchange with other routes at Northway.

The southern end of the route largely matches the time-honoured path Route 23 takes, however it does have two extensions to improve connectivity. It is proposed the route would have a short western extension to the Sebastopol shopping precinct, allowing access to these shops and for easy interchange with other routes; and it is proposed the route would have a short eastern extension to Zagames, to give access to the venue and interchange with other routes. These short extensions would only add a few minutes to the travel time for the route, but would massively increase the connectivity, and allow people who lived in the Mount Pleasant area to travel much further within a given period of time, by eliminating the need to head into the CBD and backtrack.

This route covers mostly residential areas and serves few key destinations, and has traditionally had relatively low patronage on the southern end. As such, it is anticipated it would be one of the lower-frequency routes on the network, at least initially.

Case Study: Faster to walk

The current Route 14 serving Black Hill is extremely indirect, going completely against the spirit of the reforms, and is therefore not attractive to anyone who has any alternative. The feedback we've received indicates that many regular bus users from Black Hill have abandoned the buses entirely, opting instead to drive

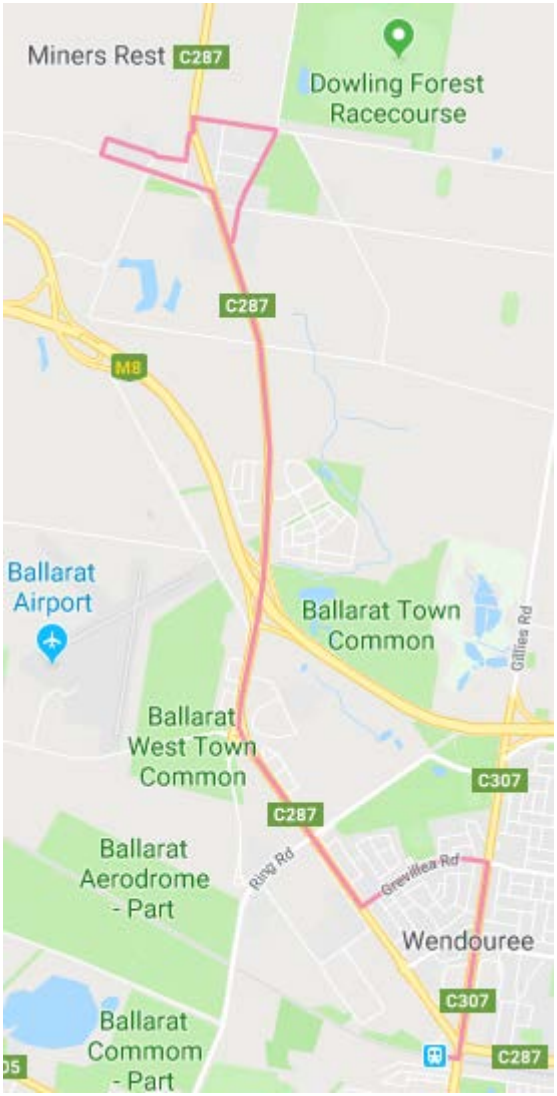
One former user who lives near Black Hill Primary School used to take the Route 5 Black Hill bus, which through-routed with the Route 10 Buninyong bus, which got him to his workplace. When the timetables changed so he no longer had a single-seat journey every time, this trip was still viable, so he stuck with the buses.

Under the new network, Black Hill's bus is so indirect it is unusable. This user noted that it would take him approximately 25 minutes to take the bus to Ballarat Station, whereas it takes only 20 minutes to walk there. This slow path, combined with the need to interchange, means the bus is no longer a viable option for him – so now he drives to work every day.

8. Ballarat Station to Creswick

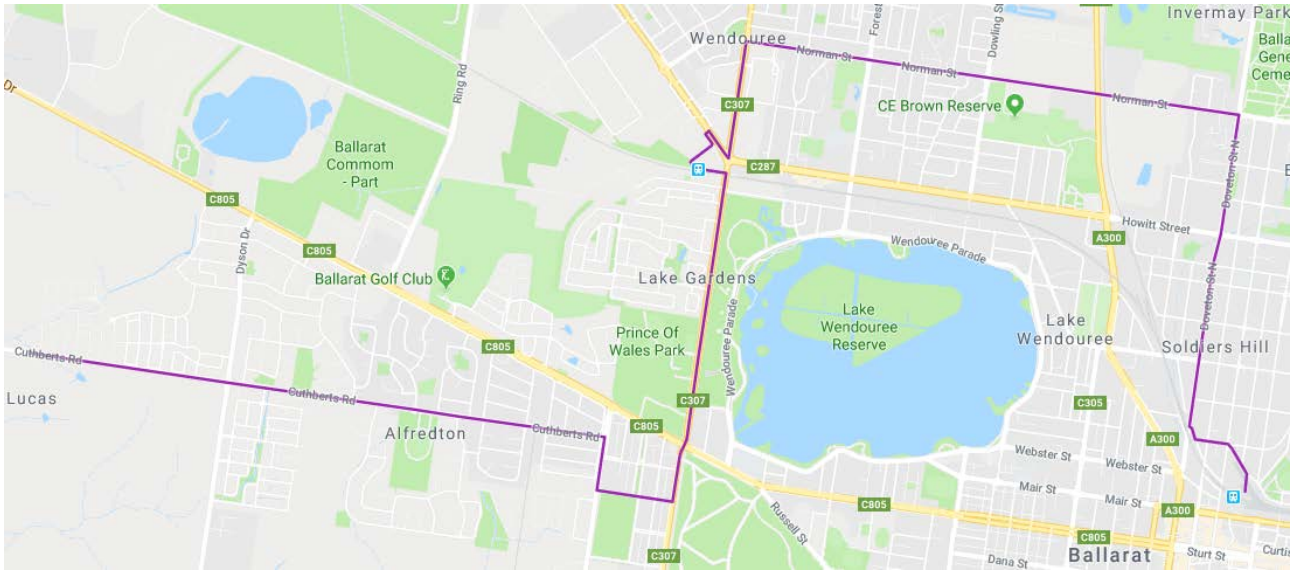
This route would not have a cross-town pair; it would largely remain the same as the existing Route 30 Creswick. It would terminate at Ballarat Station; travellers intending to go onto Bridge Mall or other destinations in the CBD will have a wide range of routes to take them there, and can therefore be assured they won't have to wait long for a connection.

9. Wendouree Station to Miners Rest



This route would largely follow the path of the existing Route 31 Miners Rest. It would not initially have a cross-town pair, but is designed to be easily incorporated into the Wendouree-Buninyong SmartBus route when the time comes.

10. Ballarat Station to Alfredton (via Wendouree)



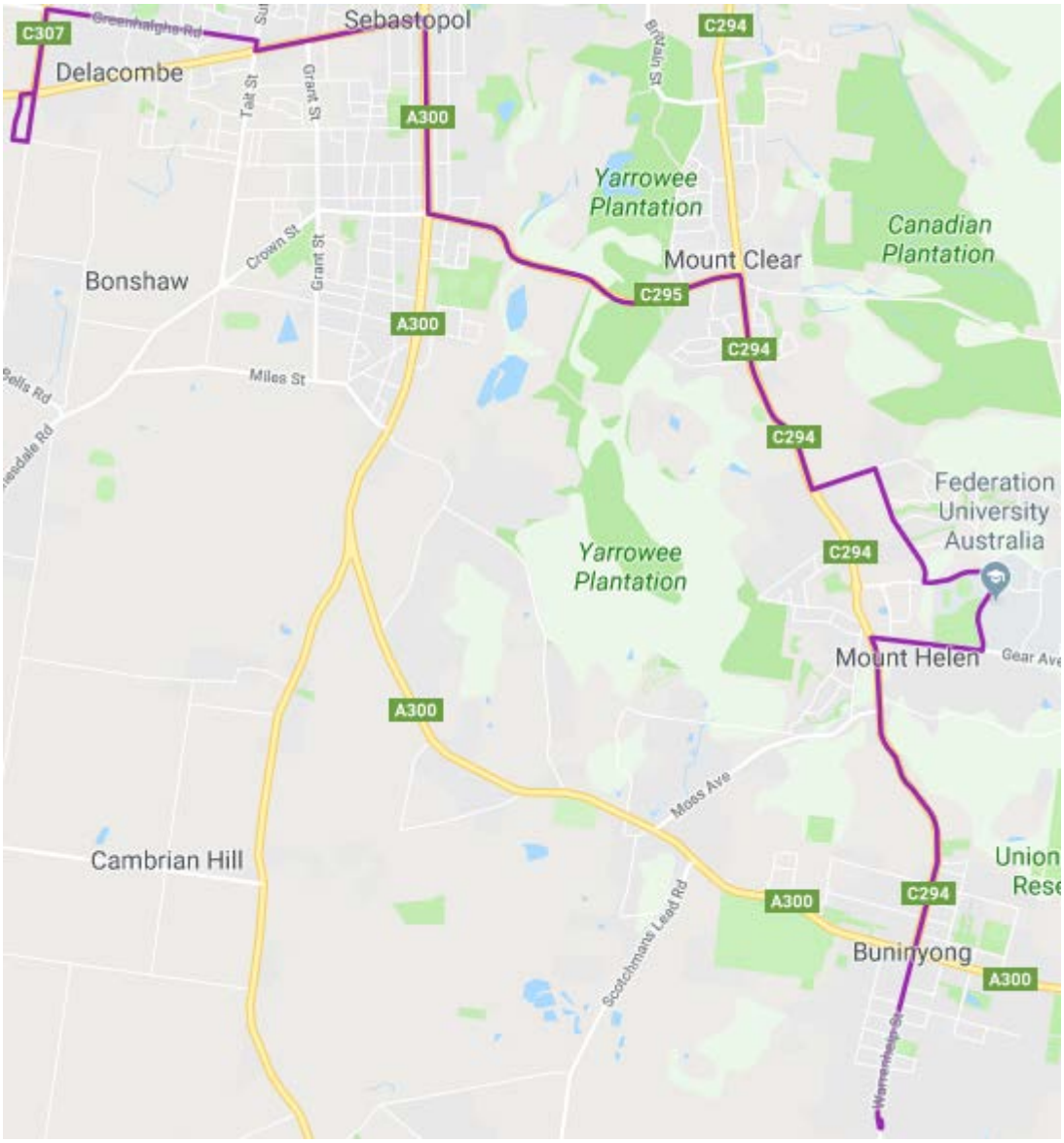
This route largely follows the same concept as the existing Route 10 Alfredton via Wendouree, but with a few tweaks:

- the Alfredton section is swapped with the Lucas-Brown Hill SmartBus route, so the SmartBus route can follow the main arterial
- the section through Soldiers Hill has been straightened out for a more efficient and attractive path

This route is designed to provide connectivity between the western suburbs and Wendouree, as well as providing a cross-town service between Ballarat North and northern Wendouree, and additional service from Ballarat North and Soldiers Hill to the CBD. It is not very attractive for people wishing to travel all the way from Alfredton to the CBD, because it is not designed to be – those wishing to travel to the CBD should either walk to the Route 2 SmartBus; or where this is impractical, interchange with the SmartBus at the corner of Gillies Street.

As such, it is essential that this route's timetable be aligned with train times at Wendouree Station, not at Ballarat Station.

11. Delacombe to Buninyong, via Sebastopol



This route combines aspects of the existing Route 22 FedUni via Sebastopol, with the former Route 19 Delacombe – Sebastopol West, to form a semi-orbital route that provides a direct path from the southwestern suburbs to the Mount Helen education and employment precinct, and connects with several other radial routes.

The current Route 22 does some of these things well, and others poorly. It serves the Sebastopol-CBD market very well, in concert with Routes 24 and 25, but the fact that it only skirts along Sebastopol's eastern edge means it has minimal catchment for those wishing to travel to Mount Helen. Those who live near Routes 24 and 25 must still travel all the way into the CBD before changing buses and travelling all the way back again. This proposed

route would alleviate this problem by providing a partial orbital route, that intersects with several radial routes for those who need to make multi-leg trips, while providing a direct service to Mount Helen for a much larger catchment of people. It also provides direct access to Delacombe Town Centre for the people of Mount Helen, Mount Clear and Sebastopol.

Another flaw with the current Route 22 is that it serves FedUni's campus, but not the adjacent Technology Park – despite travelling very close to it. The nearest bus stops are a long and fairly arduous walk from most of the workplaces in the Tech Park. The current timetabling of Route 22 also requires excessive idle time at FedUni itself, which is at least partially due to the need to align with class times (dropping students off a few minutes before the half-hour and picking them up a few minutes after the half-hour, and nothing to do in between). This idle time would be better spent in revenue service, so it is proposed that the bus does the FedUni-Buninyong leg to make better use of this time; give access to the Technology Park; and increase the frequency of buses to Buninyong.

Frequencies

During the main service hours of 7am-9pm, we propose that buses run to simple, easy-to-remember clockface times, that align as much as possible with both train times and with other key timings (such as shift and class times at universities and schools).

At the completion of the Ballarat Line Upgrade project, trains will run every 20 minutes in the peak, and every 40 minutes in the off-peak. 40 minute frequencies are not clockface times, and are both difficult to remember and difficult to coordinate with, so it is difficult to achieve this goal on all routes. Distinct from this bus proposal, we urge the government to commit to more track duplications which will allow a shift to 15/30 minute train frequencies as soon as possible; however in the meantime, the government must adjust bus frequencies to cope with the unusual train timings.

Within the main service hours, we propose a 3-tiered service:

- low-patronage routes should run at 40-minute headways, aligned with trains
- medium-patronage routes should run at 20-minute headways, such that every bus aligns with a train in the peaks, and every second bus aligns with a train outside the peaks
- high-patronage SmartBus routes should run at the maximum frequency the budget can allow; ideally 10-minute headways all day

Currently, buses run to much lower frequencies on weekends; some routes run only every 90 minutes, for example. It is currently unclear whether weekend train frequencies will be similar to weekday frequencies, or will remain hourly; but the same broad principles should apply. To make the bus network usable on weekends, bus frequencies need to be increased; and the frequencies and timings should allow connectivity with trains.

Outside the main service hours, from 5am-7am and 9pm-11pm, it is less necessary to have consistent, clockface frequencies. Patronage will be lower, and while some passengers will be getting around Ballarat, a large proportion will be commuters to and from Melbourne. As such, buses at these times should largely run to meet the trains, so that commuters can get to early services in the mornings, and home from later services in the evenings. Commuters will feel secure in leaving their cars at home, knowing that almost any train they catch home will have a connecting bus. Revellers and movie-goers within Ballarat will similarly know they'll have a service available, and can plan the end of their night accordingly.

Span of Hours

Ballarat bus at night (Creative Commons, jayessaitch)

Currently, commuters who wish to catch the 5:21am train from Ballarat station (as many do), cannot take the bus to the station – there is no route that runs early enough for this train. Several routes do not run early enough to catch the next train at 6:15am either; all routes are running by the 6:44am train. The lack of early morning services is a key contributor to the parking lots at Ballarat and Wendouree stations filling up around 7am – many commuters catching trains before then have no choice but to drive.

Commuters who catch the 5:10pm or 5:50pm trains in the evening can be reasonably assured of being able to get a connecting bus home by the time they get back to Ballarat; but commuters who catch the 6:23pm train, or any train after it, will not have a bus available by the time they get back to Ballarat. This is a key contributor to parking pressures at Ballarat and Wendouree Stations; people who cannot rely on a bus will inevitably drive.

Similarly, Ballarat's night life is experiencing a boom, with a fantastic restaurant and wine bar culture developing, but people are unable to use buses to access it. While frequencies would understandably drop after the evening peak, a usable service in the evenings would allow passengers to catch later trains from Melbourne, or eat and socialise in central Ballarat, before taking the bus home.

Even setting aside the tram and train lines that run well into the evenings, hundreds of standard (non-SmartBus) bus routes in Melbourne run until at least 9pm on weeknights – even in relatively low-patronage outer-suburban contexts. It is not unreasonable for people in a regional city like Ballarat to expect a bus service that does the same.

We propose that all routes run to a frequent, clockface frequency from 7am to 9pm, 7 days a week; and that in the early mornings and evenings, routes “meet the trains”. That is, instead of running to a clockface frequency, they just run at times that coordinate with trains, whatever they may be; but from first service till 11pm, whenever a train is running, there needs to be a bus to meet it. At least initially, frequencies in the early mornings and late evenings do not have to be high, they simply need to be available – it just needs to be possible to get an early bus to the train, or a bus home after the movies. As more and more people start to use these buses, higher and more memorable frequencies can be introduced.

In most cases, people need a bus to be reliably available for both legs of their trip; if it's available in the morning but not the evening, or vice versa, they will give up and drive for both trips. It is therefore extremely important that both sides of this equation be addressed; but it is also true that doing so provides twice the benefit. By introducing services in the evening that attract new passengers, PTV receives both the fare for the outbound evening trip, and a corresponding fare earlier in the day for their inbound trip.

Procurement

Electric bus in Germany (Creative Commons, Lord Alpha)

Implementing this plan could largely be done using existing assets, however the increase in frequencies is likely to require some procurement of new buses. We recommend that any new buses procured be electric battery-powered buses, rather than diesel buses.

Electric buses are being deployed internationally:

- A partnership between Siemens & Volvo has been introducing electric bus systems in Hamburg, Stockholm and Gothenburg.[2]
- In Luxembourg six Volvo buses and four ABB automatic e-bus chargers will be integrated into the country's urban public transport system by 2016.[3]
- Recent technological advancements show that battery longevity is no longer an issue: Proterra's new electric bus drove 258 miles on a single charge in a recent test[4]
- In 2015 Brightsun's all-electric bus travelled 1,018km from Melbourne to Sydney, setting a new world record for the greatest distance covered by an electric bus on one charge.[5]

2 http://www.siemens.com/press/en/pressrelease/?press=/en/pressrelease/2015/mobility/pr2015010104moen.htm&content[]=MO

3 http://reneweconomy.com.au/2015/abb-microsoft-launch-robotic-fast-charger-for-electric-buses-55767

4 http://www.fastcoexist.com/3051475/meet-the-electric-bus-that-could-push-every-other-polluting-bus-off-the-road

5 http://reneweconomy.com.au/2015/australian-all-electric-bus-drives-into-record-books-1018km-on-one-charge-39659

The move to electric buses would address many community concerns:

- eliminating noise, odour and diesel particulate pollution for those who live near where buses run, or idle at termini
- eliminating fumes for those walking or cycling near buses
- dramatically reducing greenhouse gas emissions, even on the existing Victorian electricity grid's mixture of renewable and non-renewable energy
- allowing a much easier transition to zero-emissions travel, as the proportion of renewable energy in Victoria's grid increases

As the results of the recent Parliament of Victoria Inquiry into Electric Vehicles showed[6], an electric bus is cheaper over its life cycle than a diesel bus, but the split between upfront and ongoing costs represents a barrier to operators transitioning their fleets. Electric buses are significantly cheaper to run and maintain, but are more expensive to buy upfront. Similarly, while bus operators already have the infrastructure and workforce in place to fuel and maintain diesel buses, most would need to buy new plant and equipment, and either retrain existing workers or hire new workers, to maintain and charge electric buses.

There is therefore an important role for government to play in kick-starting the transition to electric bus fleets, taking a longer-term view of the community and environment's best interests. For example, the government could provide grants for the purchase of the buses or for retrofitting depots; or subsidise training to update the skills of bus maintenance workers. Building these electric buses locally could also provide a massive boost to job numbers and the local economy.

6 https://www.parliament.vic.gov.au/images/stories/committees/SCEI/Electric_Vehicles/EIC_58-13_Text_WEB.pdf

Supporting Evidence

Evidence clearly shows that well-planned bus services that connect places in a timely manner are rewarded with high levels of patronage on these services and the public transport network generally. In Melbourne, the strong patronage growth on the orbital SmartBus routes 901, 902 and 903[7] are testimony to that fact, as is the success of the DART services 905, 906, 907 and 908 from Manningham to Melbourne CBD.

The 401 service, introduced in 2008, between North Melbourne railway station and the Melbourne University precinct in Carlton is also a major success[8]. The 401 service provides a convenient and efficient cross-linkage from the western and north-western suburbs direct to Melbourne University and other nearby destinations on the northern perimeter of the city, highlighting the value of strong bus connections between heavy rail stations and key destinations like Universities and hospitals.

Other success stories from bus improvements abound just in Melbourne:

- Recent reform to Brimbank's bus network, featuring more direct and frequent services, as well as better connections with trains and key local destinations, saw 10% patronage growth within the first six months.
- Williams Landing station in the rapidly growing City of Wyndham opened in 2013 with reconstructed route bus services, to Point Cook and Sanctuary Lakes (Routes 494, 495, 497) with peak hour headway between 10 and 20 minutes, witnessed significant patronage growth with the connecting bus services providing much of this growth.
- Bus improvements to 15 minute frequencies or better have generally demonstrated a 'patronage elasticity' greater than 1 - meaning 10% growth in route-kilometres provided leads to more than 10% growth in patronage. In the case of the 508 route from Moonee Ponds to Alphington, a doubling of Sunday frequencies led to a tripling in patronage.
- Route 601 connecting Huntingdale railway station with Monash University Clayton, Monday to Friday, with 4 minute headway for much of the day, is one of the most heavily utilised services in the Melbourne metropolitan area.

Furthermore, Geelong's new Route 1 (North Shore Station to Deakin University via Geelong City) has proven a great success in a similar environment to our proposal for Ballarat.

Access to Ballarat's CBD is currently a hot topic among residents. Council is currently

7 Bus patronage rose 29% in the three years from 2006 to 2009, a result attributable to the rollout of the orbital SmartBus routes in 2006 with 15-minute frequencies. Patronage grew twice as fast (4% versus 2% per year) on routes with full-time operation (7 days until at least 9pm) than on routes without evening or weekend services.

8 Most recent publicly available data shows annual patronage on route 401 grew from just under 2 million in 2010/11 to over 3.5 million in 2011/12.

considering the implementation of a new parking plan, and improvements to cycling and walking infrastructure are slowly being introduced. Significant state government investment at the Civic Hall and Ballarat Station Precinct will increase pressure on parking, and provide further impetus to increase public transport's mode share. The public is hungry for viable alternatives to driving, and improvements to public transport would be very well-received by the travelling and voting public.

Public transport has enjoyed strong community support for a long time but real improvement in bus service quality over recent decades has been minimal. The huge success of V/Line passenger services, with immense year-on-year passenger growth, shows what happens when governments invest in providing serious, high-quality public transport – build it, and they will come. It is time for buses to receive the same approach as trains.