

SUBMISSION

Review of bus services in Cardinia & Casey

seven day service

modern operating hours

direct & legible routes

high frequency

harmonised headways

serves major trip generators

better connections

area & corridor planning

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Introduction

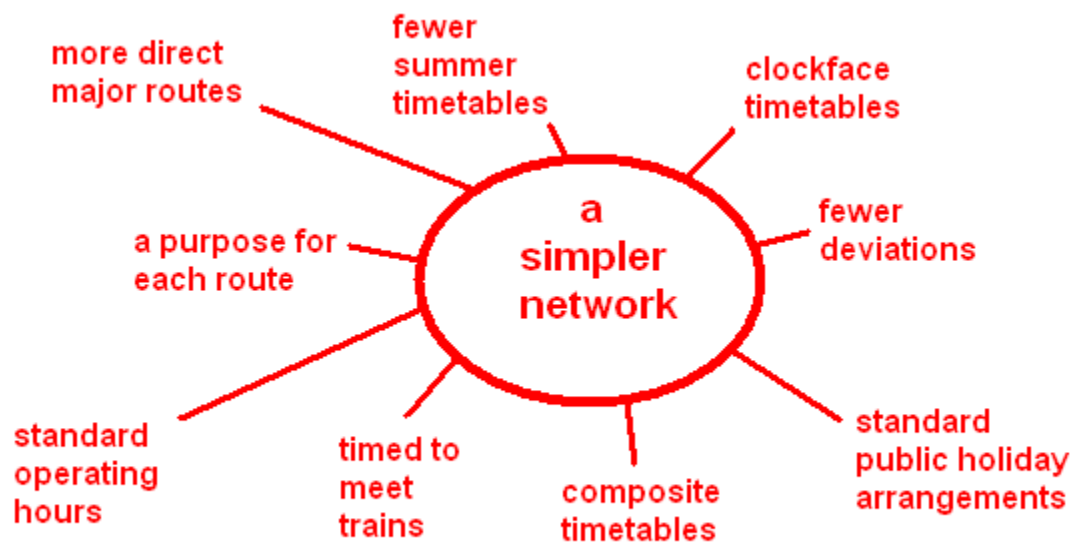
The recently-announced area reviews of metropolitan bus services are welcome. They potentially present a 'once in a generation' opportunity to make public transport a mode of choice for the sixty per cent of Melburnians beyond walking distance of fixed rail services.

This submission makes several recommendations to make buses in Cardinia and Casey simpler, more convenient and better connected.

The general recommendations advocate a network of major and local routes with a purpose and status for each. I advocate a simpler network with fewer variations in service levels and public holiday arrangements. Connections and frequencies are improved through headway harmonisation with trains and co-scheduling related routes along combined corridors.

This submission recommends improved access through local route changes which are listed in detail later. The biggest improvements are recommended to a dozen or so existing major non-SmartBus routes as increased services on these will be the major driver of future patronage growth.

Contained in the appendices is an introduction to the area, an approach to service planning, and a list of major trip generators.



General recommendations

The following six recommendations apply across the study area:

1. All timetables in the study area were reviewed. We found that the existing network is too complex and discourages passengers. The major sources of this were (i) indirect routes and (ii) occasional deviations or variations on a route. Some routes are not conducive to legibility and we recommend splitting them for clarity and better connections with trains. We found cases where removing deviations and modifying adjacent routes to make them more direct could make a simpler network without sacrificing coverage and provide examples later.

Recommendation 1: Untangle the existing bus network by straightening routes and reducing the number of route deviations.

2. Routes appear to have grown organically and their rationale for existence may have been lost or obscured by later alterations. Routes may also have multiple purposes incompatible with each other making it hard to provide a legible network or set an appropriate service level. A major part of this review should be to assign a function or purpose for each route (eg local service for suburb A connecting with B and C).

Recommendation 2: Each route has a purpose

3. At the moment there is no consistency between operating days, hours and service frequencies across routes. For example, one route might have service until late on weeknights but nothing on a Sunday, while another might run 7-days but not evenings. This confuses passengers and makes concise service information hard to provide. It also means that bus services are perceived as uniformly low quality when that is not the case.

We accept varying service levels as not all routes are equal. For example, a direct main-road route to a university or large shopping centre justifies more service than one serving a small residential pocket or semi-rural area. However the number of service variations needs to be cut from dozens to about three to simplify the network. We propose that the more important routes be designated 'primary' status. Most of the others would be labelled 'secondary'. A few routes that serve special needs (eg peak-only or serve an isolated pocket) would be 'tertiary' with a lower service level.

Recommendation 3: Each route has a status: primary, secondary or tertiary

3. Once we know a route's purpose and status, we can then determine its service level, choosing from a small menu of spans and frequencies compatible with trains. As a general rule more direct routes and/or those serving major trip generators or corridors would have a higher status than local routes. Primary routes could be at train service frequencies to provide reliable connections while secondary routes could mesh with every second train as per the table below:

Suggested service frequency menu of bus routes by status

Route	M-F day	M-F even	Sat day	Sat even	Sun day	Sun even
Train	15	30	20	30	20	30-40
Primary	15	30	20	30	20	30-40
Secondary	30 or 60	60	40 or 60	60	40 or 60	40 or 60
Tertiary	varies	-	-	-	-	-

Spans: Primary: finishes midnight approx, Secondary: finishes 9pm (ie MOTC), Tertiary: varies

4. This submission recommends that spans would be broadly similar within each status group. The only exception would be for secondary routes that serve a major area that is very remote from trains or other primary routes; in this case some after 9pm services are recommended. There could be more flexibility with frequencies but they would almost always be from the above menu to properly connect with trains. For example, a popular secondary route serving a major shopping centre might run every 20 minutes on the weekends. Conversely two closely related secondary routes in low-density areas could each operate every 60 minutes, providing a combined 30 minute service in most areas. Service on the small number of tertiary routes would vary according to need.

Recommendation 4: Introduce consistent operating hours across primary and secondary routes with frequencies set to harmonise with trains. Operate primary routes to meet every off-peak train and secondary routes to meet every second off-peak train Monday to Sunday.

5. As part of this study, staffed suburban railway stations were audited for bus timetable availability. Across Melbourne, we found that 'in-stock' rates varied from 0% (Cranbourne), 40% (Box Hill), 60% (Broadmeadows) to 80% (Frankston). These results demonstrate that passengers would probably not be able to obtain a desired timetable. In addition the latest timetable was not always stocked. These statistics fall short of best-practice as seen in Perth where near 100% availability was observed during a transport study there in 2007.

Recommendation 5: A proper bus timetable distribution system backed by regular in-stock and currency audits be instituted at all premium and host railway stations.

6. Paper timetables examined were in either pocket or DL size. Pocket timetables pose considerable problems in storage and display for railway stations, and so are often concealed from passengers. Similarly brochure racks at community facilities almost invariably support DL-format but not any other size.

Recommendation 6: DL-format be adopted as the Melbourne-wide standard for all bus timetables, with all to be in that size from 2009.

a method of service review

- 1. identify major trip generators & nodes**
- 2. assess major routes & linkages needed**
- 3. examine local routes for coverage & directness**
- 4. give each route a purpose**
- 5. assign status - primary/secondary/tertiary**
- 6. set service levels based on purpose & status**

Recommendations by aim

This submission proposes the following to make buses more direct and provide a more effective network:

Aim of change	Achieved by
CARDINIA	
Provision of quality public transport services to a large area that doesn't have them.	<p>A new and direct SmartBus route operating between Dandenong – Endeavour Hills – Fountain Gate – Narre Warren Station with every second service extending to Cranbourne.</p> <p>Service to incorporate parts of 841 and 842.</p>
A connection for every train at Narre Warren Station to Fountain Gate Shopping Centre	<p>A high-frequency bus link between the two destinations.</p> <p>Provided through the above route, with short local shuttles where connections are poor.</p>
Better train connections	All bus routes to be headway harmonised with trains and connections optimised.
A more versatile network	Operating hours and frequencies boosted to at least MOTC minimum standards on local routes.
CASEY	
Provision of quality public transport services to a large area that doesn't have them.	A SmartBus service between Frankston and Cranbourne incorporating existing routes 789, 790 and 791.
Better train connections	All bus routes to be headway harmonised with trains and connections optimised.
A more versatile network	Operating hours and frequencies boosted to at least MOTC minimum standards on local routes.
ALL AREAS	
Create a grid of high frequency routes within 30 minutes walk of most residents by upgrading selected main road routes.	<p>Upgrade service levels on major non-SmartBus routes to primary level. Routes recommended for upgrade are identified as 'P' in the next section.</p> <p>Where no suitable primary routes are nearby, make use of two or more secondary routes to provide the required frequency and add some after 9pm services to the most important of these routes.</p>

Service co-ordination: The Werribee model

It's not necessary to travel to overseas or interstate to find good train/bus co-ordination as there are some examples closer to home.

In Melbourne, Werribee/Hoppers Crossing is an effective model of a properly headway harmonised and co-ordinated intermodal network*.

Buses connect with every second train at either Werribee and Hoppers Crossing interchange. Buses arrive, exchange passengers with the train and then leave. Since this is rare in Melbourne, this needs to be explained so that the meticulous scheduling of the current Werribee/Hoppers Crossing bus network is preserved.

The first requirement is that services are headway harmonised, ie if trains are every 20 minutes, buses are either every 20 or 40 minutes. 60 minute buses can qualify but they do not reliably connect if some routes run every 40 minutes. Also two co-scheduled 60 minutes services would provide a combined 30 minute service – undesirable where trains run every 20 minutes. Hence 20 or 40 minute frequencies are the only harmonised choices except at night where 30 and 60 minute frequencies are preferable.

The second requirement is the actual times of buses compared with trains. Headway harmonisation is of little use if the bus leaves a minute before the train arrives.

Thirdly consideration needs to be given whether the same bus can be used for connections in multiple directions. This is easier at intermediate stations where up and down trains cross and termini where the bus and train can exchange passengers.

Fourthly, where buses serve two or more railway stations, trip lengths may need to be adjusted to provide good connections at both stations.

Inspection of timetables indicates that great care has been given to planning trip lengths. For example, short routes, eg 441 and 443, are timed to return to the terminus within 20 minutes of departure. This allows a potential service frequency of 20 minutes (meeting every train), though 40 minutes (every second train) is chosen to allow the bus to run another route (also co-ordinated with alternate trains).

Longer routes (eg 436, 437) serving both Hoppers Crossing and Werribee have run times of a little under 40 minutes. In conjunction with the standard 40 minute frequency this allows good fleet utilisation. It might not be an accident but it also happens that train/bus connections at both Werribee and Hoppers Crossing are consistently good – a rare achievement where routes serve two or more stations.

While the focus here has been on bus-train transfers, a timed transfer network as currently exists is also helpful for bus-bus transfers. While connection times may not be as consistently good between all routes at other interchange points (eg Werribee Plaza), headway harmonisation ensures that there are sufficient good and consistently occurring connections to for it also to form a useful interchange point.

The author supports its adoption for Greater Dandenong/Cardinia/Casey, which have similar demographics to Werribee. The only change required is that weekday services should operate to a 15/30/60 minute headway hierarchy due to different train timeables.

(*) Comments above mostly apply to Monday to Saturday daytime services. Sunday and evening services (where operated) are typically hourly and, despite headway harmonisation, good connections are less assured.

Recommendations by route

The following are some suggested amended and altered routes. The main thrust has been to provide more direct and frequent services between major centres, extend service to currently under-served areas and rationalise routes where these are considered too close.

Route	Purpose	Status*	Recommendations
695	Define as semi-rural service	S	Reduce confusion by allocating a different route number for Dandenong Market extension.
776	Defined as rural service between Frankston and Pearcedale	T	Consider extension to Cranbourne
789	Defined as SmartBus link Frankston – Karingal – Langwarrin - Cranbourne	P	Operate directly to Cranbourne Station via Cranbourne Shopping Centre.
790	Defined as SmartBus link Frankston – Karingal – Langwarrin - Cranbourne	P	Operate directly to Cranbourne Station via Cranbourne Shopping Centre.
791	Defined as SmartBus link Frankston – Karingal – Langwarrin - Cranbourne	P	Operate directly to Cranbourne Station via Cranbourne Shopping Centre.
795	Define as rural service	T	Make route more legible and eliminate am/pm variations.
796	Define as rural service	T	
797	Define as local service	S	
799	Define as local service	S	
827	Redefine as Hampton – Highett – Southland – Keysborough - Dandenong primary route (out of study area)	P	Split route at Dandenong for improved train connections. Portion east of Dandenong is renumbered 828.
828	Redefined as Dandenong – Fountain Gate – Pakenham Princes Hwy local route	S	Route comprises portion of existing 827/828 east of Dandenong Station joined to 929 to Pakenham. Provides strong Princes Hwy link timed to meet every second train at Dandenong.
834	Define as local service	S	
835	Define as local service	S	
836	Define as local service	S	
837	Define as local service	S	
838	Define as local service	S	Remove deviations and any express running.
839	Define as local service	S	
841	Redefine as SmartBus for Dandenong – Endeavour Hills – Fountain Gate – Narre Warren with every second	P	Make super route Dandenong – Endeavour Hills – Fountain Gate – Cranbourne. Run at train frequency between Dandenong and Fountain Gate (15 min weekdays, 20 min

Route	Purpose	Status*	Recommendations
	service extending to Cranbourne.		weekends) to meet every train at Dandenong and extend every second service to Cranbourne. Operating span would be superior to 'minimum hours' with the last departure from Dandenong no earlier than 11pm. Operate directly up Cranbourne – Narre Warren Rd and use 834/5 route to serve Darling Way and Fleetwood Dr (Narre Warren).
842	Abolish	-	Incorporated into improved 841 (above)
843	Define as local service	S	
844	Define as local service	S	
845	Define as local service	S	
849	Define as local service	S	
861	Define as local service	S	Renumber to 846 to conform with related routes in area.
892	Define as local service	S	
893	Define as local service	S	
894	Define as local service	S	
895	Define as local service	S	
896	Redefine as Cranbourne Station – Cranbourne CBD – Cranbourne East shuttle	P	Remove loop running to ensure constant travel time to and from station. Simplify the special late evening service
897	Define as local service	S	
926	Define as Pakenham local route.	S	
927	Define as Pakenham local route.	S	
928	Define as Pakenham local route.	S	
929	Redefine as major Princes Hwy route Dandenong – Fountain Gate – Pakenham	S	Through-route with modified Route 828 to provide a through service from Dandenong.

(*) Status key: P = primary, S = secondary, T = tertiary. Where routes are in a group the overall service status recommended generally relates the the entire group rather than each constituent route.

Other matters

Although this review concerns bus routes and services, several external matters impinge on bus service delivery and potential patronage. These include:

- Pedestrian access to bus stops. Due to road planning that favoured roundabouts over traffic lights, major roads have become a continual stream of cars, reducing access to many bus stops. Attention needs to be given to making every single bus stop quickly and safely accessible on foot at any time of day. A program to eliminate or modify roundabouts to improve pedestrian access to bus stops in both new and established areas is recommended. Use could be made of traffic islands, zebra crossings at roundabout entrances or lights with an emphasis on low cost and fast installation as hundreds of sites could be involved. The importance of this only increases if the review recommends more direct bus routes along major roads.
- Safety, amenity and efficiency. Especially in newer areas, the most suitable roads for direct bus routes can be unsafe, inaccessible and uninviting because of the trend to build these as controlled access highways faced only by walls. Local street layouts in post-1960s estates do not always allow efficient transit routing or pedestrian access. Redevelopment of older areas and the revision of urban design rules to prevent this occurring in new estates is recommended.
- Improved passenger information at interchanges. Metlink signage has given most bus stops a uniform 'look'. The next stage is local area transport information, particularly at interchanges.
- Extend Dandenong NightRider to at least Berwick and add extra services where required by capacity.

Conclusion

Described is an approach with suggested changes that would go a long way to improving public transport service quality and thus patronage in Casey and Cardinia. It advocates an integrated network of frequent routes between major trip generators and timetables that mesh with trains. Special attention has been paid in responding to modern travel patterns, serving local corridors and providing direct feeder services.

Appendix One: A general approach to bus route planning

This submission supports a key performance indicator for public transport service provision along the lines of the following:

- 80 percent of residents are within fifteen minutes walk of a public transport service that operates at least every fifteen minutes seven days per week.

As well as good frequency and operating hours, bus routes must be direct and serve major trip generators. This is both for the benefit of passengers (in reduced travel time) and the Department (in operating economies). From our current network (which includes many circuitous routes) it may be possible to extract an 'efficiency dividend' which can be used to provide more frequent services for more hours of the day over more days of the week.

Other planning principles include the desirability of providing access to nearby railway stations and regional shopping centres. Ideally routes should have trip generators at either end so that it can attract patronage in both directions. For example, a local route might operate between Dandenong, Endeavour Hills and continue to Fountain Gate.

Except to augment capacity on major corridors or provide short-distance travel in suburban activity centres, route duplications should generally be kept to a minimum. However where they exist there are major opportunities to exploit overlaps to provide a more frequent combined service.

An example would be staggering the timing of two 30 minute routes to provide an even 15 minute service over the combined section. If the combined section is near a railway station, this would result in buses meeting every train, thus strengthening their 'rail feeder' function. If connections are poor, this can be overcome by bringing all services forward or back by ten minutes or so.

Headway harmonisation has similar benefits. If all buses in the area are either every 15, 30 or 60 minutes this provides consistent connections that are not possible with a mix of 25, 40 and 60 minute services (which exists at the moment). Any excessive dwell time could be modified by shortening or lengthening the bus route.

Harmonised headways are no cure; unless all services are frequent some connections may be poor. However this would be a lower risk for connections with major routes (due to their frequency) and at least it would be consistent. In addition there is the possibility of remedy if the connection is deemed important enough. Opportunities for bus to bus connections potentially exist at any point where two routes intersect, but are greatest at railway stations and near major shopping centres.

The following steps are advocated:

1. Identify key regional trip generators, interchanges and corridors
2. Identify the community's transport needs and undeveloped patronage opportunities.
3. Assess the strengths and weaknesses of the current network in relation to needs.
4. Design a network of 'primary' routes between major nodes, providing fast and frequent links from early morning to late at night.
5. Design a local network of well-connected 'secondary' routes catering for trips outside the primary network
6. Examine means to provide superior service. Possibilities include co-scheduling overlapping routes (ie timing two less frequent routes to provide a more frequent combined service), introducing a harmonised headway hierarchy, designing and exploiting connection opportunities, making routes more direct and extending service to a nearby interchange.

The role of various routes is shown in the table below:

Route type	Role	Days & Span	Frequency
<p>Primary</p>	<p>Links key railway stations, major activity centres, regional shopping centres and large education campuses.</p> <p>Also a feeder for major suburban areas remote from railway stations.</p> <p>Fast and direct along main roads.</p>	<p>Early morning until midnight seven days per week.</p> <p>NightRider services may overlap some primary routes, providing later services.</p>	<p>Peak: 10 or 15 min Day: 15 or 20 min Night: 20 or 30 min</p> <p>Services are train frequency or better at all times.</p>
<p>Secondary</p>	<p>Links residential suburbs to local railway stations and shopping areas.</p> <p>As direct as possible between and within suburbs.</p>	<p>Early morning until 9pm seven days per week.</p>	<p>Peak: 20 min Day: 20 (or 40) min Night: 30 or 60 min</p> <p>Consistent connections with every train or every second train.</p> <p>Headway harmonised.</p>
<p>Tertiary</p>	<p>Serve localities or destinations that are poorly served by primary and secondary routes.</p> <p>Circular, loop and/or unidirectional routes allowed.</p>	<p>Five or six days per week.</p> <p>Normally between morning and afternoon peak periods only</p>	<p>Every 40, 60 or 120 minutes.</p> <p>Between 2 and 10 services per day.</p> <p>Connections with selected trains only.</p>

Appendix Two: Historical, social and transport overview of Cardinia and Casey

Casey is located on Melbourne's south-eastern outskirts about 40 kilometres from the CBD. It is a designated growth area and regularly features in the list of Australia's fastest growing local government areas. Settlement has spread from Berwick and Cranbourne to most areas in between. Retail is dominated by Fountain Gate Shopping Centre supplemented by smaller centres at Endeavour Hills, Cranbourne, Cranbourne North and Narre Warren South. 'Main street' shopping is weaker than in inner suburbs but exists at Cranbourne, Narre Warren and Berwick. Casey has more younger families, more affordable housing, more first homebuyers and more cars per household compared to the Melbourne average.

Transport in Casey is provided by the Cranbourne and Pakenham rail lines (trains every 30 – 60 min) supplemented by local buses. Major hubs are Berwick, Narre Warren, Cranbourne and Fountain Gate. Cranbourne is one of two areas with a TrainLink bus, meeting every train.

Cardinia is based around Pakenham, 55 kilometres from Melbourne CBD. Like Casey it is a designated population growth area with much new housing. Being mainly a residential area there is a high commuting population, with Casey and Greater Dandenong being major trip generators. Retail for all but everyday needs is dominated by Fountain Gate, located in Casey. Again there are more young families, cheaper homes and first homebuyers than the Melbourne average.

Appendix Three: Key trip generators in and near Cardinia and Casey

The following table shows current transport provision to key trip generators and transport nodes within and adjoining the review area.

	Train	SmartBus	Min hours bus (9pm finish Mon - Sun)	Limited bus (<9pm finish)
Berwick Marketplace	< 1km		✓	✓
Casey Central SC			✓	✓
Casey Hospital	< 1km			✓
Centro Cranbourne			✓	✓
Endeavour Hills SC				✓
Fountain Gate SC			✓	✓
Monash Berwick	✓		✓	✓
Pakenham CBD	✓		✓	

This submission supports seven day service and increased frequency to improve links between these key trip generators.