



InfrastructureSA

Mount Barker Mass Transit Study

Summary Report & Recommendations

January 2022



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Cover image: Google Maps street view, Mount Barker



Executive summary

Study objectives and scope

The South Australian Government requested that Infrastructure SA (ISA) provide a holistic, independent view and direction for options to address passenger transport issues from Adelaide to Mount Barker.

This strategic assessment responds to concerns raised by local councils and the Adelaide Hills community regarding congestion and safety along the existing road corridor, particularly in peak commuter periods.

The significant growth experienced in Mount Barker and surrounds over the past decade has exacerbated concerns and it is unclear how the transport needs of Hills residents will be met into the future. The possibility of reinstating a passenger rail service in the Hills has been raised repeatedly and this study examines the viability of such a service as well as other mass transit options.

Both current road and rail corridors are utilised by freight; however, freight movements were not within the scope of this study and are not considered in detail.

Growing but diverse catchment

Mount Barker is one of the fastest growing areas of Greater Adelaide and has many years of growth ahead. The population of the Adelaide Hills is expected to peak at around 107,000 including an additional 30,000 Mount Barker residents. Infrastructure planning needs to catch up with this growth as no long-term mass transit solution was planned when 1300 hectares were zoned for development in 2010.

The Hills region is set apart from other growth areas because, apart from Mount Barker, it consists of several smaller townships that account for a relatively dispersed, low-density catchment. While a significant number of residents commute to metropolitan Adelaide for work, relatively few actually commute to the Adelaide CBD (at the last census this totalled 5,500 Adelaide Hills residents – comprising 1,000 residents in Mount Barker) and 43% worked in the Hills region itself.

Current transit options

The South Eastern Freeway (SEF) offers the most direct route from Mount Barker and many other Hills townships to metropolitan Adelaide and is also the primary freight route from Adelaide to Melbourne and to the South East. The SEF carries about 50,000 vehicles a day (2018). While the number of vehicles travelling on the SEF during peak times is expected to increase with population growth, it has enough capacity to meet projected demand out to 2036. The current capacity issue is limited to Glen Osmond Road and the Tollgate intersection, both of which operate at capacity in peak periods and impact the SEF upstream.

It is the frequent incidents on the SEF that cause the greatest time variability and uncertainty for users. The 12 months to November 2021 saw 200 partial closures on the SEF and two full closures. There is a lack of viable alternative routes in the event of an incident which compounds the issue for Hills residents.

Bus services are the only form of public transport from Mount Barker and have around 3,000 boardings a day (August 2021). Peak period express bus services from Mount Barker to Adelaide take 50–60 minutes and run at about 60% capacity. While buses are subject to the delays and travel time variability of the SEF, the Hills Area Bus Contract has the best (97%) on-time running of all metro area bus contracts. Public transport usage is lower in Mount Barker (6% of trips) compared the metropolitan Adelaide average (9%) but the recent success of the on-demand Keoride service has demonstrated a willingness to use public transport where the service meets the need.

Rail as mass transit

Passenger trains ceased operating beyond Belair in 1987 due to low passenger numbers yet rail tracks are prevalent around Mount Barker and other parts of the Hills and community perceptions of underutilisation are understandable. ISA supports optimising current assets as a general principle of efficient infrastructure planning. There are, however, significant physical barriers that limit the potential for a compelling passenger rail service on the current track alignment, which are outlined below.

- The 55 km rail corridor from Adelaide to Mount Barker follows a circuitous alignment and train speeds are restricted to 25–40kph due to the corridor’s sharp curves and steep topography.
- The single track from Mount Barker to metropolitan Adelaide prevents an express service and requires passing loops for bi-directional travel. Having trains waiting on passing loops makes journey times less reliable.
- Interacting with freight trains on the existing line would add to journey times and unreliability. Freight trains travel at very slow speeds, can be up to 1800m long and utilise the track during peak commute times. Any passenger services on this line would be limited in frequency and speed by freight services, likely spending extended time waiting on passing loops.
- The track beyond Belair is a single standard gauge track owned by ARTC. The entire Adelaide Metro system operates on broad gauge. Various options have been considered to address this incompatibility, but they all come with different costs and operational issues that would make providing an efficient service challenging.
- Running additional trains on the line will present other operational challenges such as signalling upgrades, upgrades of up to 26 level crossings and the fact that Adelaide Railway Station is already operating at near capacity.

Options considered

ISA engaged independent engineering firm WSP to conduct a thorough review and technical assessment of investigations and options developed to date.

The Department for Infrastructure and Transport (DIT) has completed a number of studies on various elements of the corridor and considered a number of alternative solutions including rail services on the existing corridor, rail services on a new corridor, a new light rail corridor and several bus rapid transit (BRT) options. The cost for the BRT solutions were broadly in line with WSP estimates. The costs for rail solutions were conservative but not unreasonable considering the challenging terrain and operational environment and recent experience nationally with cost overruns on rail projects.

ISA and WSP undertook a multi-criteria analysis of 48 mass transit configurations and created a shortlist of six options for comparison of relative viability including high-level costs estimates and a rapid cost benefit analysis. It should be noted that these costings are high level (with a +100%/-50% confidence band) for comparison purposes only and should not be regarded as project estimates.

Trip time	Frequency (peak/off-peak)	Infra capex*	Net Present Value
Least-cost rail: Utilise existing ARTC line from Mount Barker Junction, transferring onto the Belair line into ARS			
71 minutes exc. waiting time on loops	Every 30 mins (peak)	\$250m	-\$711m
New heavy rail corridor: Heavy rail alignment from Mount Barker running adjacent to the SEF then via tunnel from Stirling, joining the existing line around Torrens Park, Lynton or Mitcham stations			
37.5 minutes	Every 15/30 mins	\$5,800m	-\$3,813m
New light rail corridor: Light rail adjacent to the SEF to Mount George, then via tunnel to Greenhill Road where it travels at grade, approaching the CBD from the east			
55 minutes	Every 8/15 mins	\$3,600m	-\$3,056m
BRT tunnel & busway: Glen Osmond Road BRT tunnel + dedicated at grade BRT busway from Tollgate to Mount Barker with new BRT tunnel at Heysen Tunnels			
33 minutes	12/3 buses per hour	\$4,000m	-\$2,884m
Full side-running BRT: Dedicated at grade BRT busway along Glen Osmond Road and SEF to Mount Barker			
36 minutes	12/3 buses per hour	\$1,800m	-\$1,323m
Least-cost BRT: Dedicated at grade BRT busway along Glen Osmond Road and SEF, merging with other traffic west of Heysen Tunnels			
39 minutes	12/3 buses per hour	\$300m	-\$144m

Table 1:
Options summary and rapid CBA findings

* Contingency of 70% has been included in line with Australian Government guidelines for early-stage estimates.

Source: WSP

Study findings

- Existing issues in the transport corridor will be exacerbated as growth in the region continues and private vehicles will continue to be the dominant form of transportation.
- An increase in public transport will ease pressure on the SEF as the population continues to grow.
- While re-establishing a rail service may seem self-evident, the constraints of the existing corridor keep it from providing a suitable service for the Hills community. These constraints can be highlighted by the fact that travelling by train to Adelaide Railway Station from Belair (10.5 km by road from Adelaide) takes approximately 40 minutes whereas the trip from Seaford (35 km by road from Adelaide) takes about 45 mins. The Belair Line is also the most unreliable rail line in the metropolitan network at 91% on-time running (compared to 97% for the Hills Bus Contract).
- Buses have the capacity to meet the forecast demand from the region and are better suited to meet the diverse origin and destination demands of the broader Hills catchment.
- Ultimately, an efficient public transport service is more contingent on the corridor than the mode of transport. The O-Bahn, for example, carries 32,000 boardings a day and demonstrates how efficient a bus service can be if it has a suitable corridor. A long-term solution will need to identify a more efficient corridor connecting Mount Barker to the Adelaide Plains but in the short term, a series of initiatives are required to improve public transport uptake and improve the reliability of the SEF corridor, which will benefit current and future users of the bus services as well as other users of the SEF, including freight.

ISA recommendations

Make public transport more convenient

The low level of bus patronage is potentially due to buses not adequately servicing the catchment area and destinations outside of the CBD, travel time relative to that by passenger car, suitability of current timetables and amenities of the current service. ISA recommends government:

- redesigns and reschedules current bus services to broaden catchment and destination options, increase frequency and integrate with Keoride and other services
- invests in Park n Ride facilities at strategic locations along the corridor
- prioritises renewal of Adelaide Hills bus fleet
- implements a regional bus stop improvement program to provide adequate shelter from Hills weather for all commuters.

Improve local road network to make public transport more accessible

A better functioning local road network would provide quicker access to Park n Ride facilities to reduce overall travel time via public transport. ISA recommends government:

- completes an Adelaide Hills roads study to improve connections to public transport
- addresses the infrastructure deed shortcomings to bring forward completion of Heysen Boulevard in Mount Barker.

Improve incident response to make the South Eastern Freeway more reliable

Operational measures and policy settings can improve incident response to minimise travel time delays. ISA recommends government implements:

- smart motorway technology and infrastructure along the SEF, such as automatic removable gates, to enable swift contraflow and open capacity in response to incidents
- a standby tow truck fleet located along SEF to address incidents and breakdowns without delay.

Targeted investment in Glen Osmond Road to improve efficiency and bus prioritisation

Ongoing investigations by DIT are focusing on improving bus transit along Glen Osmond Road as well as the Tollgate intersection. ISA recommends government pursues a program of targeted investment along Glen Osmond Road to improve traffic efficiency and bus prioritisation.

Identify the appropriate long-term corridor solution

ISA recommends government:

- undertakes a comprehensive corridor study that considers all modes of transport, including freight, that identifies the preferred corridor solution to enable more efficient and reliable access to Adelaide from the Hills for all modes of transport
- considers how an ultimate solution may be staged to incrementally realise benefits earlier.

Make decision-making more transparent

Improved and ongoing community engagement should be a key priority. ISA recommends government ensures affected parties are heard and remain informed of progress to address transport issues.

Study objectives and scope

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This strategic assessment responds to concerns raised by local councils and the Adelaide Hills community regarding congestion and safety along the existing road corridor, particularly in peak commuter periods.

The significant growth experienced in Mount Barker and surrounds over the past decade has exacerbated concerns and it is unclear how the transport needs of Hills residents will be met into the future. The possibility of reinstating a passenger rail service in the Hills has been raised repeatedly and this study examines the viability of such a service as well as other mass transit options.

Both current road and rail corridors are utilised by freight; however, freight movements were not within the scope of this study and are not considered in detail.



View of Adelaide from
the Adelaide Hills

Stakeholder consultation

Who we spoke to

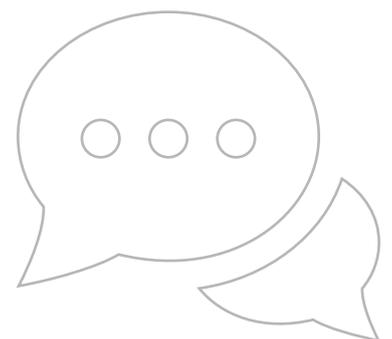
ISA has met with key Adelaide Hills community representatives to inform this study into public transport options for Mount Barker:

- The Federal Member for Mayo
- Member for Kavel
- District Council of Mount Barker
- Adelaide Hills Council
- Regional Development Australia Adelaide Hills, Fleurieu and Kangaroo Island
- SA Transport Action Group.

These representatives have close ties to the community that span multiple years, if not decades. Each has provided detailed background on the longstanding issue of hills transport as well as important insights into current community perspectives on using the South Eastern Freeway and public transport within the region and into the Adelaide plains.

What we heard

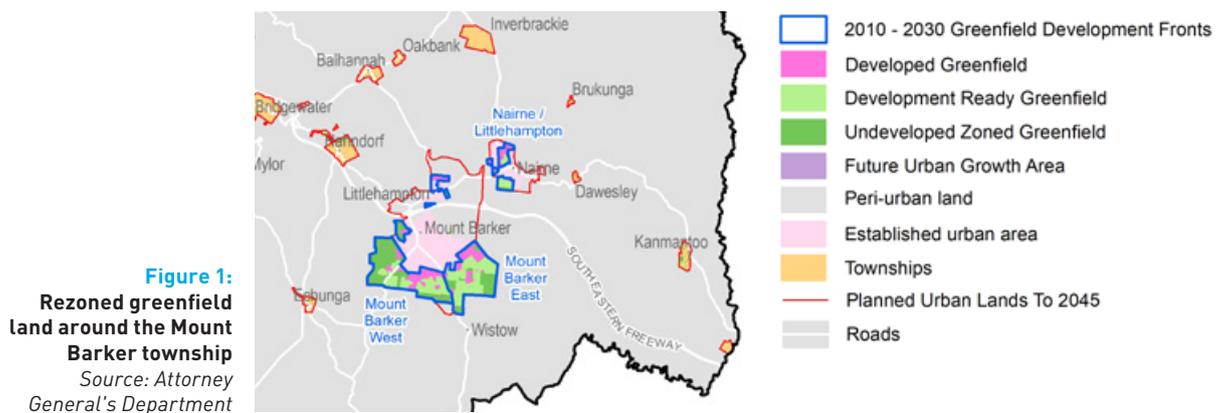
1. A high value is placed on the quality of service supporting an efficient commute across the region:
 - Peak hour public transport travel times need to be competitive with car travel.
 - Additional Park n Ride and improved stop facilities are needed to support public transport services.
 - Services need to connect well, with proper integration between different transport providers.
 - Smaller hills townships also need better access to public transport.
2. Existing rail infrastructure is seen to be underutilised.
3. Bus services are seen as adding to freeway congestion rather than alleviating it.
4. Slow-moving heavy vehicles compromises freeway efficiency, reliability and safety.
5. Good governance is needed.
 - Issue created by poor planning and lack of infrastructure support.
 - Greater transparency desired about options considered and reasons behind lack of progress.
 - The transit solution needs to be consistent with the longer-term vision for the region.



Defining the need

Inadequately planned population growth

Mount Barker is one of the fastest growing LGAs in South Australia and the population across the Adelaide Hills region is expected to reach 80,000 by 2036, the majority of which will reside in Mount Barker. This growth was facilitated by rezoning of 1,300 hectares of greenfield land around the Mount Barker township in 2010 but has not been supported by adequate infrastructure planning. Based on current zoning and land supply available, the total Adelaide Hills catchment population is expected to peak at about 107,000, which includes an additional 30,000 Mount Barker residents.



Low density catchments

Future growth will be quite dispersed because of the relatively low-density areas in the Adelaide Hills. Mount Barker SA2 has a population density of 3.7 people per hectare and this is expected to increase to 5 people by 2036. By comparison, Munno Para, another area in Adelaide currently experiencing high growth, has a density of 13.5 people per hectare. There is also a lack of other high population catchments en-route to Adelaide. For example, the Seaford train line directly intersects with several relatively high population centres such as Noarlunga and Marion, and includes the Tonsley trunk service, to increase the total service catchment to over 100,000. Further afield, Sydney's outer west and Blue Mountains line travels through Penrith and has an overall catchment of 330,000 people. Catchment size has a direct bearing on transport mode.

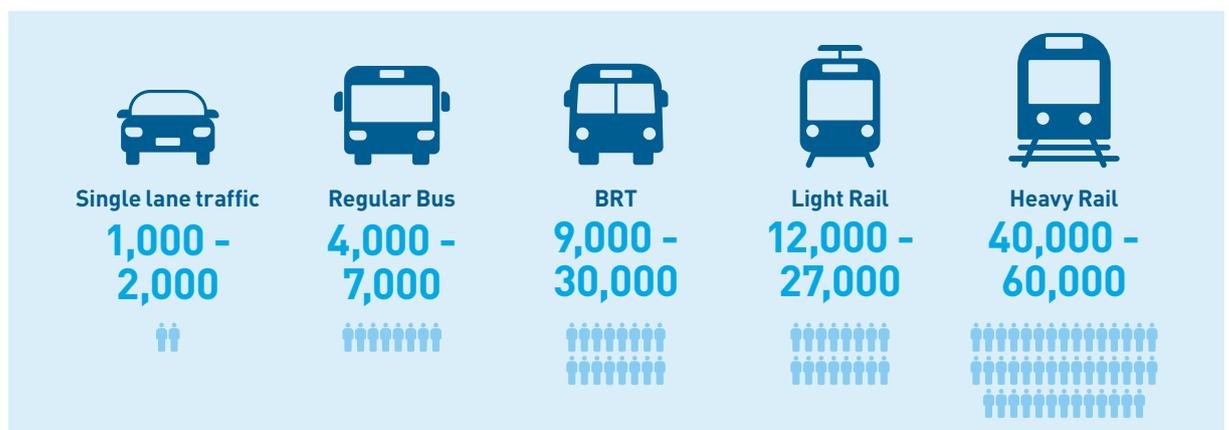


Figure 2:
Hourly person movement capacity by transport mode
Source: Department for Infrastructure and Transport (adapted from Urban Transit: Operations, Planning & Economics, V. Vuchic (2005))

Dispersed places of work

The Adelaide Hills region provides its fair share of employment, with the last available census (2016) data indicating that travel to work for 36% of Mount Barker residents and 43% of residents across the rest of the Adelaide Hills was limited to *within* the region. A higher proportion of people is expected to travel to and from Adelaide for work into the future as regional job growth is unlikely to keep pace with the forecast population growth; however, trips to metropolitan Adelaide are also not shown to be concentrated in any one area. As of 2016, 5,500 Adelaide Hills residents (comprising only 1,000 residents in Mount Barker) worked in the Adelaide CBD.



Figure 3a:
2016 Census – Place of work for residents of Mount Barker LGA
Source: WSP

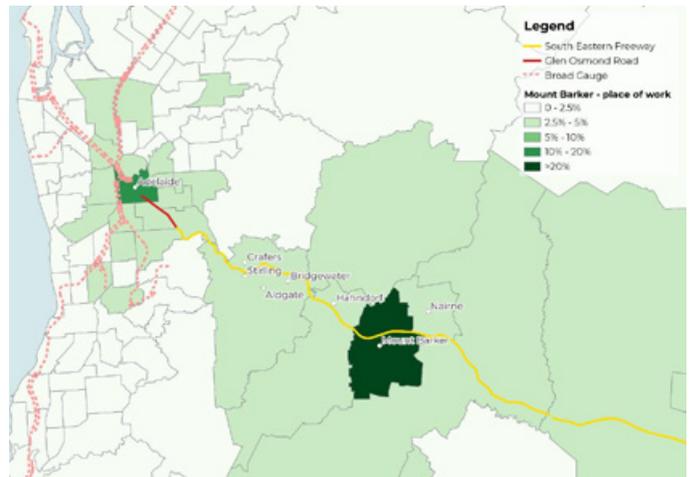


Figure 3b:
2016 Census – Place of work for residents of Mount Barker SA2
Source: WSP

Gawler Street, Mount Barker
Image courtesy of Orderinchaos,
Wikimedia Commons

Available transit options

Primary transport corridor to Adelaide

Journeys to Adelaide are typically undertaken via the South Eastern Freeway (SEF), which offers the most direct route from Mount Barker and many other Hills townships to metropolitan Adelaide. Travelling inbound, the SEF terminates at the Tollgate Intersection where traffic continues to Cross Road to the left, Portrush Road to the right and Glen Osmond Road straight ahead into the Adelaide CBD. Travel times by private vehicle range from 40–60 minutes from Mount Barker to the CBD. Several passenger bus routes service the Adelaide Hills region, linking dispersed townships with the larger commercial centres primarily via the SEF. Services are supported by Park n Rides at Mount Barker (2), Crafrers (1) and Aldgate (1), which are typically oversubscribed.

SEF can accommodate peak travel into the future

The SEF carries about 50,000 vehicles a day (2018). While the number of vehicles travelling on the SEF during peak times is expected to increase with population growth, the SEF has enough capacity to meet projected demand out to 2036. The current capacity issue is limited to Glen Osmond Road and the Tollgate intersection, both of which operate at capacity in peak periods and impact the SEF upstream.

Low public transport usage

Peak period express bus services from Mount Barker to Adelaide take 50–60 minutes and run at about 60% capacity. Uptake is low (and likely exacerbated by the pandemic) despite a relatively high number of peak hour services between Mount Barker and the Adelaide CBD in the morning (9) and evening (10) and the best on-time reliability (97.4%) of all Adelaide bus services. In fact, with around 3,000 daily boardings (August 2021), the share of the overall Hills commuter travel demand undertaken by public transport (bus) is just 6%, compared to about 9% for metropolitan Adelaide. However, success of the Keoride on-demand shuttle trial in the Mount Barker Council area suggests the community is willing to utilise public buses provided the service meets their specific transport needs.

Tram	99.5%
Bus	93.1%
Hills	97.4%
Outer South	96.7%
Outer North East	95.0%
North South	93.0%
Outer North	92.9%
East West	91.4%

Table 2:
Monthly on-time running by mode, June 2021
Source: Department for Infrastructure and Transport

Travel time variability

Frequent incidents

It is the frequent incidents on the SEF that cause the greatest time variability and uncertainty for users. The 12 months to November 2021 saw 200 partial closures on the SEF, which can take up to two hours to clear, and two full closures, which can take up to seven hours to clear. These incidents comprised 115 breakdowns, which are more common on the SEF than other arterial roads due to the higher stress its terrain imposes on vehicles. However, on a crash per kilometre basis, Glen Osmond Road has the highest rate of incidents (about 10/km) – nearly double that of the SEF – likely influenced by turning vehicles and frequent stops both mid-block and at traffic signals.

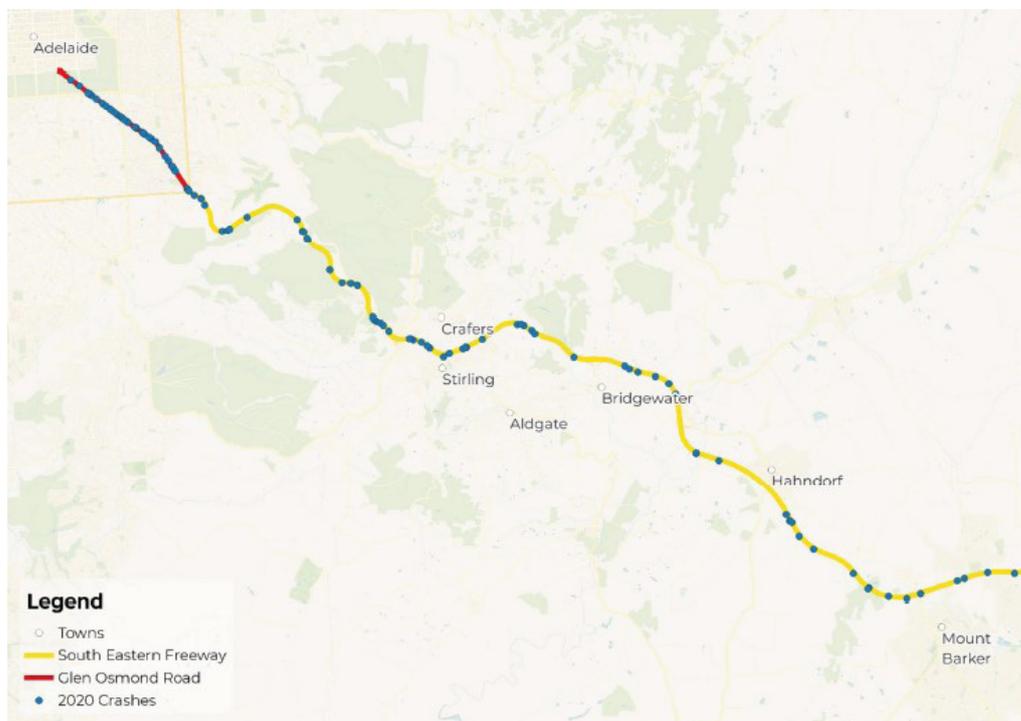


Figure 4:
2020 crashes on the South Eastern Freeway and Glen Osmond Road

Source: WSP

A key freight route

The SEF is a key freight route between Adelaide and Melbourne and Adelaide and the South East. Heavy vehicles account for 10.5% of total vehicles at the Mount Barker end of the freeway and are overrepresented in crashes (12% of vehicles involved in crashes between 2018–2020). Due to safety concerns associated with the steep descent from Crafers to Tollgate, they are mandated to travel in the left lane and restricted to a maximum speed of 60kph. This essentially provides only a two-lane route for light vehicles (which can travel at up to 90kph). Having vehicles travelling at different speeds on the same corridor adds to safety risks and limits the capacity of the corridor to some extent.

Hamstrung bus services

Buses are required to travel in the left lane with other heavy vehicles at a maximum speed of 60kph for the steep descent section of the freeway. With no priority or dedicated track along this primary road corridor, bus services are and will continue to be caught up in congestion and experience long delays and queues at Tollgate and other signalised intersections along Glen Osmond Road.

Lack of alternative routes

In the case of delays, there is no viable alternative route linking Mount Barker and Adelaide. Greenhill Road to the north and roads through Belair to the south are of a lower standard and too indirect for most Hills residents. As buses must generally travel a fixed route, they are more impacted by delays and closures than other vehicles that may choose to take alternative routes (provided they are not trapped between exits).



Bus in the main street of Stirling

Rail as a mass transit option

Passenger trains that operated between Adelaide Railway Station (ARS) and Bridgewater were withdrawn in 1987 due to low patronage, particularly once a faster, more direct route into Adelaide was provided by the SEF. Passenger trains now terminate at Belair, taking 37–44 minutes to traverse the 20.5 km rail corridor.

Perceptions of rail underutilisation

Railway tracks are prevalent around Mount Barker and parts of the Hills yet are only utilised by eight freight trains a day and two interstate passenger trains a week; meanwhile some sections are completely disused. Community perceptions of underutilisation are, therefore, understandable.

ISA supports optimising current assets as a general principle of efficient infrastructure planning. There are, however, significant physical barriers that limit the potential for a compelling passenger rail service on the current track alignment, which are outlined below.



Figure 5:
Existing rail line and gauges from Mount Barker to Adelaide Railway Station
Source: WSP

Current rail corridor unable to meet expectations

Travel time and reliability:

- The 55 km rail corridor from Adelaide to Mount Barker follows an indirect, undulating and winding alignment and train speeds are restricted to 25–40kph due to the corridor's sharp curves and steep topography.
- Depending on the solution, journey by rail may require interchanges to get to ARS or other commercial centres. Any interchange adds to journey times.
- The single track from Mount Barker to metropolitan Adelaide prevents an express service and requires passing loops for bi-directional travel. Having trains waiting on passing loops makes journey times less reliable; on the Belair line, this adds up to 10 minutes to travel times.
- Interacting with freight trains on the ARTC line would add to journey times and unreliability. Freight trains travel at very slow speeds, can be up to 1800m long and utilise the track during peak commuter times. Any passenger services on the existing line would be limited in frequency and speed by freight services (and interstate services to a lesser degree), likely spending extended time waiting on passing loops.

Comfort:

- Freight track is typically maintained to a lower standard than high frequency, higher speed passenger rail lines and further investment would be required to meet ride quality standards. Irregular operating hours for freight trains limit the time available to do track upgrades and maintenance.

Amenity and emissions:

- Electric trains are not suitable for the Hills corridor due to fire risk, so any train service would be reliant on outmoded and noisy rollingstock fuelled by emissions-intensive diesel. This is inconsistent with the clean, green living prized by Hills residents.

Operational constraints of rail corridor

- Different ownership and operation of the freight train track would require an access agreement with ARTC which will limit flexibility to manage Adelaide Metro train operations.
- Incompatible rail gauges prevent Adelaide Metro trains running to Mount Barker. Available options are to:
 - run a shuttle service from Mount Barker Junction that requires passengers to interchange to the broad gauge network
 - dual gauge either the ARTC line or Belair line to enable non-stop journeys, or
 - utilise gauge convertible trains.

Some physical constraints would need to be overcome to enable dual gauge tracks or gauge-convertible trains e.g. the existing metro line would need to be re-railed as the current rail is too heavy to allow dual gauging; various tunnels and structures may need to be adjusted to provide suitable clearances for trains running off-centre on dual gauge tracks; and reconfiguration of platforms and turnouts to enable dual gauge or gauge conversion for trains.

- Additional and bespoke stabling and maintenance facilities would likely be needed if different train sets are utilised.
- Running passenger trains on the existing freight track would require signalling upgrades and new passing loops strategically located to minimise disruption for both services.
- Increased frequency of services may require upgrades to any of the 26 level crossings along the line.
- ARS operates at near capacity and has limited ability to receive additional trains without a fundamental review of the entire rail network. Reconfiguring ARS to receive standard gauge trains would further complicate operations and restrict capacity.

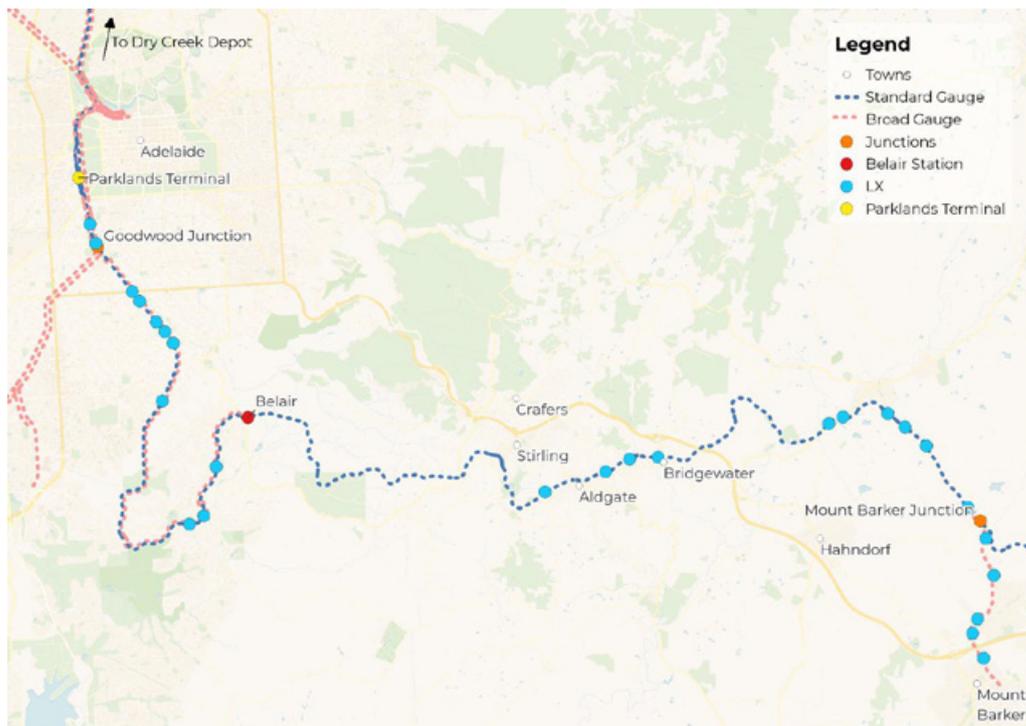


Figure 6:
Level crossings along train line from Adelaide to Mount Barker
 Source: WSP

Disused station at Mount Barker Junction

Options considered

Independent assessment and perspective

ISA engaged independent engineering firm WSP to conduct a thorough review and technical assessment of key reports, studies, investigations and proposals relating to the issue of Mount Barker mass transit. ISA and WSP undertook a multi-criteria analysis of 48 mass transit configurations and created a shortlist of six options for comparison of relative viability including high-level costs estimates and a rapid cost benefit analysis. It should be noted that these costings are high level (with a +100%/-50% confidence band) for comparison purposes only and should not be regarded as project estimates.



What is a BRT?

A Bus Rapid Transit service sees buses utilising a dedicated busway that provides priority over other road users.

In an open BRT model, frequent lower capacity suburban bus services originating from a wide catchment feed directly into the busway, reducing the need for interchanges and delays from boardings.

The O-Bahn BRT connecting north-east Adelaide with the CBD is highly successful, with up to 32,000 boardings a day:

- Up to 80kph on the track
- Reliable, high frequency service
- Large stop spacing.

DIT actively assessing options

DIT has completed a number of studies on various elements of the corridor. A number of priority initiatives along the existing road corridor have been identified such as more Park n Ride capacity, upgrades at key intersections (Tollgate, Glen Osmond Road/Fullarton Road), and bus priority improvements on Glen Osmond Road. A BRT planning study has been undertaken and DIT has identified preferred options for different segments of the corridor. DIT has also considered different possible rail options. These vary in scope and focus and lack a corridor-wide perspective; however, this work provides a basis for more detailed investigations examining corridor constraints, interrelation of freight and passenger transport movement, wider network issues and impacts and projected passenger demand.

DIT costings conservative but not unrealistic

In terms of costs, WSP's calculations for BRT options were broadly consistent with those provided by DIT and rail costings to date are not unreasonable. Considering recent cost escalations on rail projects nationally and the challenging terrain and number of operational risks, a conservative approach is appropriate until further work is undertaken to de-risk projects.

Community rail advocates

Four unsolicited proposals by community members advocating for a rail service to the Hills and beyond were also assessed. WSP found these to be very high level and contingent upon a series of assumptions that didn't fully address the challenges in the corridor and the wider road and rail network, including constraints posed by the existing freight service. Proponents are optimistic in their cost estimates, with rollingstock, operation, maintenance and stabling costs not being fully accounted for. Despite this, a least-cost rail option has been included in the shortlist.

Shortlisted options

1. **Least-cost rail:** Utilise existing ARTC line from Mount Barker Junction, transferring onto the Belair line into ARS.
2. **New heavy rail corridor:** Heavy rail alignment from Mount Barker running adjacent to the SEF then via tunnel from Stirling, joining the existing line around Torrens Park, Lynton or Mitcham stations.
3. **New light rail corridor:** Light rail adjacent to the SEF to Mount George, then via tunnel to Greenhill Road where it travels at grade, approaching the CBD from the east.
4. **BRT tunnel & busway:** Glen Osmond Road BRT tunnel + dedicated at grade BRT busway from Tollgate to Mount Barker with new BRT tunnel at Heysen Tunnels.
5. **Full side-running BRT:** Dedicated at grade BRT busway along Glen Osmond Road and SEF to Mount Barker.
6. **Least-cost BRT:** Dedicated at grade BRT busway along Glen Osmond Road and SEF, merging with other traffic west of the Heysen Tunnels.

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Table 3:
Options summary and rapid CBA findings

* Contingency of 70% has been included in line with Australian Government guidelines for early-stage estimates.

** Service costed out to Mount Barker Junction only.

Source: WSP

Google Maps street view of Heysen Tunnels,
South Eastern Freeway

Findings

Cost of doing nothing

Existing issues in the transport corridor will be exacerbated as growth in the region continues and private vehicles will continue to be the dominant form of transportation. Congestion on the corridor will continue to disproportionately impact bus services due to their lower manoeuvrability, lower speed limits and set routes that do not allow use of alternative routes (where available). This will further discourage people from using public transport. The SEF will continue to be a key freight route. Higher traffic volumes will reduce safety for road users and increase frequency of crashes, leading to more partial or full closures of the SEF. Worsening congestion along Glen Osmond Road will also adversely impact liveability and amenity for local residents and access to properties and businesses.

Point-to-point Hills mass transit is challenging

Greater mode shift to public transport would help address congestion issues; however, the nature of trip origins and destinations has been found to be more diverse than expected. Combined with a relatively small passenger catchment and constrained long-term growth, providing a public transport service that complements this dispersed pattern of movement is challenging. Any travel time saving delivered by the transport mode can be eroded by waiting times for the service, interchanges and travel to and from stops at the trip origin and destination. This accounts, in part, for why modelling on the six shortlisted options shows minimal mode shift to public transport for both a best-case bus ('BRT – Tunnels') and best-case rail ('New Rail Corridor') solution. There is, however, the need to develop a more nuanced understanding of the factors that influence mode shift. A bus network appears to be more suitable for meeting the dispersed travel need in the Hills as the service is able to traverse deeper into catchments and destinations. It also offers the flexibility to be adjusted to better complement travel behaviour once this is better understood.

The corridor is more important than the mode

ISA has deliberately adopted a mode-agnostic approach to this study, particularly in the context of the ongoing passenger rail versus passenger bus service debate distracting from arriving at a clear problem definition. Modelling shows the SEF has capacity out to at least 2036 (the latest available modelling timeframe) without any major works needing to be undertaken. The same cannot be said of the existing rail corridor.

Looking to proven results, an unequivocal mass transit success story has been the O-Bahn in Adelaide's north-east, attracting 32,000 boardings a day and outperforming private vehicles on peak hour travel time. The O-Bahn, which runs on both a dedicated busway and shared roads, shows that an efficient corridor can be the difference between a good and an excellent bus service.

The existing Hills bus service has capacity to cater for the projected growth in passenger demand. It can, however, be improved upon by increasing frequency and distribution of stops throughout the catchment. Combining these measures with a more efficient corridor could be a viable longer-term strategy.

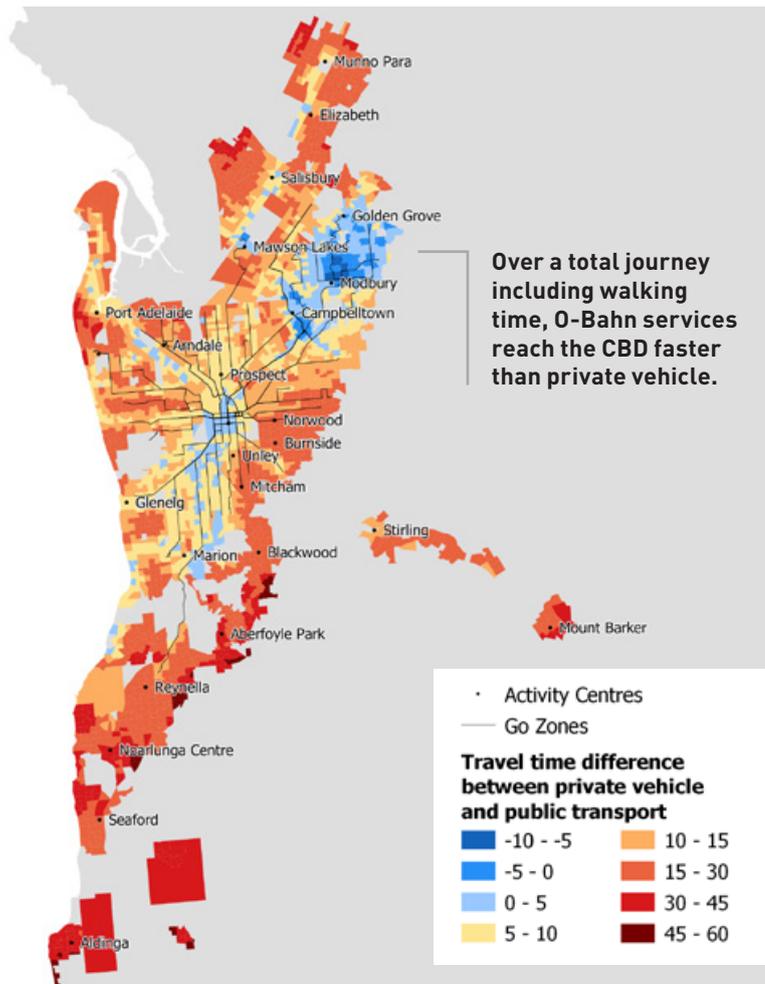


Figure 7:
Heat map of AM peak travel time difference between cars and public transport to CBD
Source: Department for Infrastructure and Transport

Physically constrained road corridor

The primary cause of delays on the SEF is the frequency of incidents that result in the temporary closure of one or more lanes. Operational improvements that enable a timely and flexible response to incidents could significantly reduce travel time delays and improve overall corridor reliability. However, to substantially increase capacity would be challenging.

Addressing peak hour capacity constraints on Glen Osmond Road through widening will entail extensive property acquisition and significant demolition works that will interrupt traffic flows for extended periods and cause considerable community disruption.

Any widening of the SEF to accommodate a BRT service would also be highly disruptive, with significant works required to blast and remove rock in the section between Tollgate and Crafers. It will also need to address the limited capacity of the Heysen Tunnels to avoid creating a choke point here.

Physically constrained rail corridor

All metropolitan passenger trains arrive and depart from ARS, which has 14 exclusively broad-gauge tracks leading to nine platforms. A standard gauge passenger service from Mount Barker would need to interchange onto the broad gauge network to reach ARS. Stations between Belair and Mount Barker would likely need to be rebuilt to meet modern building standards, signalling would need to be upgraded as could any of the 21 level crossings to Mount Barker Junction. Extending the service to Mount Barker township requires new stations, platforms and tracks and impacts an additional five level crossings along this stretch, with new services potentially creating local traffic issues.

The single bi-directional ARTC track from Mount Barker limits service frequency and the track condition and steep and winding path limits train speeds. Considering the potential level of service able to be provided by an inefficient rail corridor (Belair) compared to one that operates efficiently (Seaford), the estimated travel time of 70+ minutes for the Mount Barker service is reasonable and also a significant barrier to mode shift on any meaningful scale.

	Belair	Seaford	Mount Barker
Distance to Adelaide via road corridor	10.5 km	35 km	33 km
Distance to Adelaide via rail corridor	20.5 km	33 km	55 km
Track alignment	Single track	Dual track	Single track
Track use	Passenger only	Passenger only	Passenger and freight
Terrain	Steep and winding	Relatively flat and straight	Steep and winding
Rollingstock	Diesel	Electric	Diesel
Est. journey time by rail	40 minutes	45 minutes	70+ minutes

Table 4:
Comparison of rail corridor efficiency

Hills rail will not meet the commuter need

Although a rail service could be re-established in the Hills, the existing train line would not achieve travel times competitive with current bus services or cars, despite claims to the contrary. The small proportion of passengers who commute to the CBD will be required to use private vehicles to travel to stations at trip origin, interchange to a broad gauge service to reach ARS, then travel from North Terrace to their final destination, each element adding to the overall journey time.

No easy solution

This study has shown there is no easy or self-evident solution that establishes an efficient mass transit corridor from Mount Barker to Adelaide. Investigations to date point to the need for an integrated plan for a longer-term corridor solution; however, there is scope to improve how the corridor operates and responds to incidents to provide a more attractive public transport service to Hills residents in the shorter term.

Train coming out of a tunnel in the Adelaide Hills



ISA recommendations

Make public transport more convenient

The low level of bus patronage is potentially due to buses not adequately servicing the catchment area and destinations outside of the CBD, travel time relative to that by passenger car, suitability of current timetables and amenities of the current service. ISA recommends government:

- redesigns and reschedules current bus services to broaden catchment and destination options, increase frequency and integrate with Keoride and other services
- invests in Park n Ride facilities at strategic locations along the corridor
- prioritises renewal of Adelaide Hills bus fleet
- implements a regional bus stop improvement program to provide adequate shelter from Hills weather for all commuters.

Improve local road network to make public transport more accessible

A better functioning local road network would provide quicker access to Park n Ride facilities to reduce overall travel time via public transport. ISA recommends government:

- completes an Adelaide Hills roads study to improve connections to public transport
- addresses the infrastructure deed shortcomings to bring forward completion of Heysen Boulevard in Mount Barker.

Improve incident response to make the South Eastern Freeway more reliable

Operational measures and policy settings can improve incident response to minimise travel time delays. ISA recommends government implements:

- smart motorway technology and infrastructure along the SEF, such as automatic removable gates, to enable swift contraflow and open capacity in response to incidents
- a standby tow truck fleet located along SEF to address incidents and breakdowns without delay.

Targeted investment in Glen Osmond Road to improve efficiency and bus prioritisation

Ongoing investigations by DIT are focusing on improving bus transit along Glen Osmond Road as well as the Tollgate intersection. ISA recommends government pursues a program of targeted investment along Glen Osmond Road to improve traffic efficiency and bus prioritisation.

Identify the appropriate long-term corridor solution

ISA recommends government:

- undertakes a comprehensive corridor study that considers all modes of transport, including freight, that identifies the preferred corridor solution to enable more efficient and reliable access to Adelaide from the Hills for all modes of transport
- considers how an ultimate solution may be staged to incrementally realise benefits earlier.

Make decision-making more transparent

Improved and ongoing community engagement should be a key priority. ISA recommends government ensures affected parties are heard and remain informed of progress to address transport issues.

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