How has the Metronet program impacted public transport accessibility in metropolitan Perth?

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In this blog post, we analyse the impact of the Metronet projects on Perth's public transport-land use system by comparing its performance in October 2025 to that in 2021, which has been documented previously[1] as part of our ongoing record-keeping in Australasian cities.

We identify where Metronet has created a more useful public transport system for Perth's growing population, and where the project has, instead, perpetuated a land-hungry, distance-intensive pattern of outer urban expansion.

Between 2022 and 2025, several rail extensions totalling 65 km of electrified double track and 15 new stations were opened in metropolitan Perth, adding to the existing five-line, 172 km suburban passenger rail network. The measures are part of the Western Australian government's Metronet initiative[2], initiated in 2017 by the incoming McGowan/Cook state government. As of October 2025, the route extensions (Bayswater to High Wycombe, Bayswater to Ellenbrook, Butler to Yanchep, Thornlie to Cockburn Central and Armadale to Byford) are substantially completed and operational. Also, part of the Metronet program are several station rebuilds, level crossing removal projects and additional stations on existing lines, some of which are still ongoing at the time of writing.

Metronet has been praised for bringing high-performing public transport spines to suburban areas traditionally dominated by high car use, and for a global best-practice approach in integrating rail and bus services[3] to create a user-friendly, multimodal network. Metronet has also been criticised[4] for contributing to further peri-urban sprawl by focussing its infrastructure on Perth's outer suburbs, and for including few effective initiatives for urban intensification around strengthened or new rail hubs in established areas.

In summary, our analysis shows that the Metronet rail projects and associated bus network reconfigurations have increased the number of Perth residents and workers within walking distance from useful public transport services – this has steered metropolitan Perth towards public transport-orientation as follows:

- The network is now better connected through thoughtful and effective integration of rail and bus services, building on a legacy that has been successfully pursued in Perth since the 1990s.
- Metronet has boosted the role of rail in Perth's public transport mix, and contributed to decentralising public transport movement possibilities away from the CBD area.
- Both of the above outcomes have 'future-proofed' the network towards greater efficiency and against congestion effects.

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[1] https://www.snamuts.com/perth-2021.html
[2] https://www.metronet.wa.gov.au/
[3] https://melbourneontransit.blogspot.com/2023/07/un-159-5-word-secret-to-faster-bus.html
[4] https://www.watoday.com.au/national/western-australia/sprawling-perth-needs-barcelona-suburbs-but-metronet-s-not-the-answer-20230530-p5dcgw.html

- Metronet has accentuated the distinction between two types of rail service in Perth. By bundling several lines on trunk services along inner-urban legacy routes to Claremont, Bayswater and Cannington, a metro-like, all-day-and-week, 'turn-up-and-go' service standard has been created there with only marginally higher service levels during peak hours. Conversely, the long north-south corridor between Yanchep and Mandurah targets CBD commuting more specifically, with far higher frequencies during peak hours than off-peak. In an integrated network, this differentiation creates resilience gaps that may work to the detriment of effective land use-transport integration policies across the metropolitan area.
- The Metronet projects position the core sections of the legacy rail lines to Claremont, Bayswater and Cannington for an urban intensification process which could enable those that choose to live and work with much lower car use.
- A second ring of station precincts (especially Warwick, Stirling, Glendalough, Canning Bridge, Bull Creek, Murdoch, Ballajura, Morley, Redcliffe and Thornlie) offers prime conditions for the consolidation of higher-density, mixed-use, rail-oriented middle suburban centres.
- In a metropolitan area that is anything but spatially compact, Perth's public transport network also became more spread-out as a result of the Metronet projects, further entrenching distance-intensive lifestyles and business practices.

In the following sections, we present and discuss the results of seven SNAMUTS indicators for 2025, showing the updated network diagrams alongside change maps that depict where and by how much public transport accessibility has either improved or deteriorated since 2021 as a result of the Metronet initiatives. Detail on the research approach, data and underlying assumptions is included in an appendix at the end of this blog.

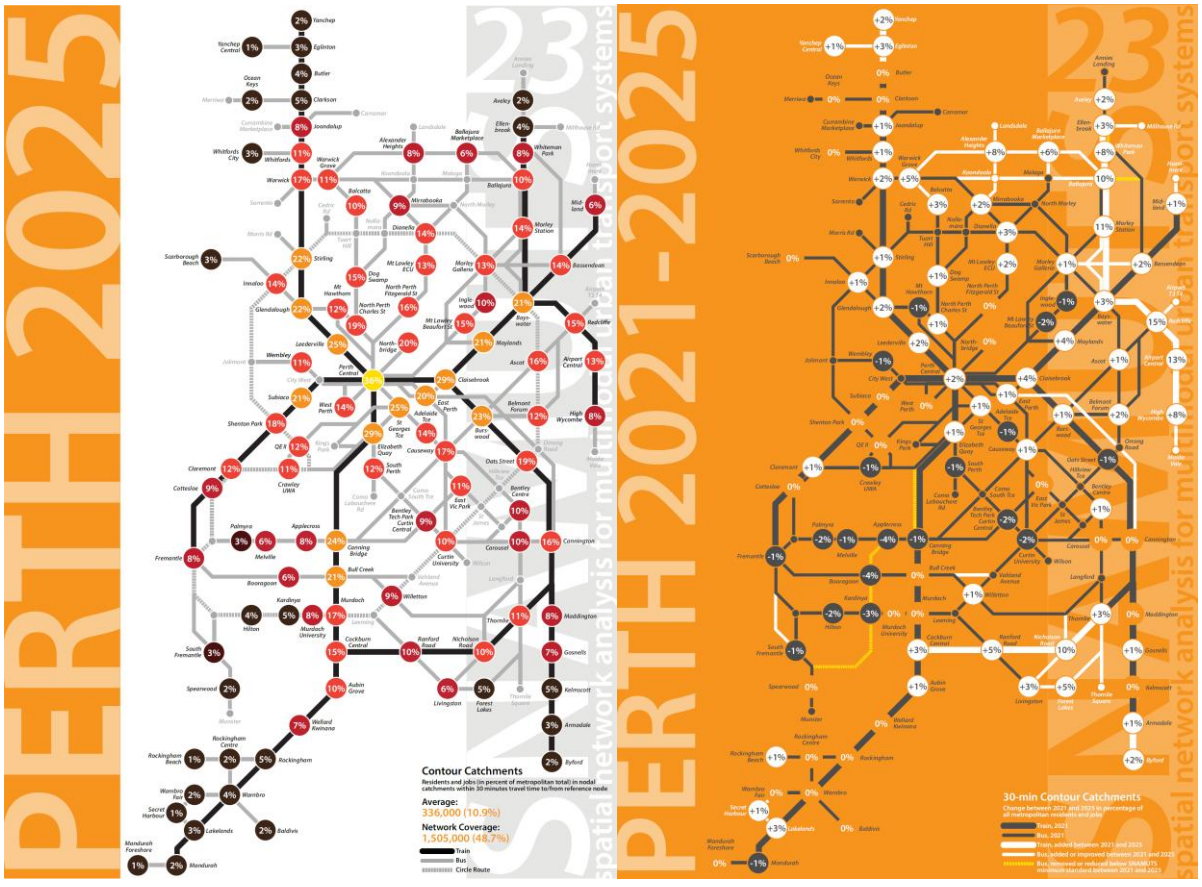
Network coverage and 30-minute contour catchments: who gets access and do public transport improvements help compress the time-space continuum in Perth.

Metronet has achieved an important goal by increasing the number of people in Perth for whom public transport is available within walking distance from home or work. However, it is also true that more than half of all residents and jobs continue to remain outside this geographical range.

Network coverage is a measure quantifying who in a metropolitan area lives or works within 400 metres (trams, buses) or 800 metres (rail, ferries) of public transport at the SNAMUTS minimum standard and who doesn't. In 2021, this was true for 43% of all activities (33% or residents, 65% of jobs) in metropolitan Perth. By 2025, the measure had increased to 49% of all activities (38% of residents, 72% of jobs).[5]

The 30-minute contour catchment measure adds a qualitative dimension to the network coverage index by examining the extent to which a metropolitan area is penetrated by useful public transport travel opportunities. Useful in the sense of achievable within a limited time frame (30 minutes) and accessing a high number of potential origins and destinations (catchment density). Travel speed, frequency (waiting and transfer times) and the geographical directness of journey paths (network configuration and geography) play a role here.

Maps 1 and 2: 30-minute contour catchments in Perth in 2025, and changes over 2021



While at face value the average for all 30-minute contour catchments in Perth did not improve between 2021 and 2025 (it declined slightly from 11.1% of metropolitan residents and jobs to

[5] Note that the job figure might include a slight overcount in both years as the geographical units used (destination zones) are typically larger than 400/800-metre catchments in outer areas.

10.9%), in reality, in counting the new stations and bus feeders sees the average increase from 9.5% to 10.9% - a significant improvement in the order of 43,000 residents and jobs. This is based on counting the16 additional activity nodes around newly opened train stations and in suburbs where bus feeder services in the 2021 (with a zero score as they had no public transport at the SNAMUTS minimum standard then) rather than excluding them at 2021.

Contour catchment expansions are most conspicuous along the new Ellenbrook, Airport-High Wycombe and Thornlie-Cockburn Central rail lines and the bus-based nodes in their vicinity. The mid-northern suburbs around Alexander Heights and Ballajura in particular stand out here due to the creation of two new higher-frequency orbital bus routes between the rail hubs of Warwick and Ballajura (449 and 451), and the extension and consolidation of existing radial bus routes 970 and 360 into the area generate a multidirectional network that performs very favourably on this index. Tangible benefits are also evident at stations along the rail trunk line between Claisebrook and Bayswater. Conversely, the effect of outward rail extensions at the periphery (Butler to Yanchep, Armadale to Byford and Lakelands station) is more modest on this index, which is to an extent attributable to the very early stage of land use development in the vicinity of some of these stations. Some bus-based nodes in existing inner and middle suburbs suffered a contraction of their 30-minute travel contour between 2021 and 2025, partly due to a daytime frequency cut from 15 to 30 minutes on route 115 in the Booragoon-Kardinya-Coolbellup area, and partly due to the ongoing deterioration of scheduled bus travel times where general urban growth and intensification make the roads that buses use progressively busier and slower.

On balance though, the Metronet projects allow people in areas that already had useful public transport before to reach more destinations faster, while expanding walking-distance access to additional people, if mostly at a below-average standard of accessibility (see below).

Ease of movement: Is Perth's public transport moving towards a 'turn-up-and-go' system?

In relative terms, the Metronet program has spread the public transport-friendly components of Perth's land use-transport system more thinly over a larger area, with longer average travel times and very limited reductions of waiting times as measured by 'closeness centrality'.

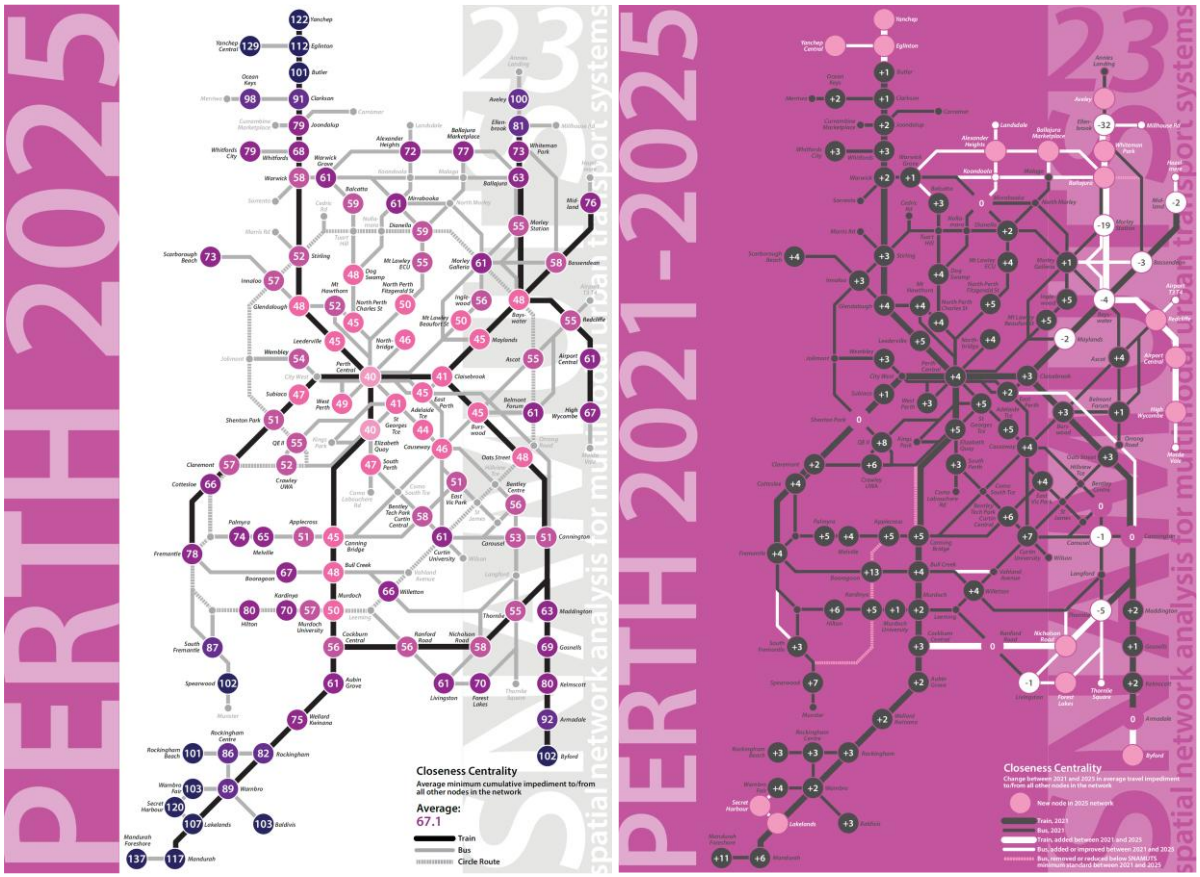
The closeness centrality index measures the ease of movement on a public transport network, taking in travel time and service frequencies as factors of spatial separation. Lower figures indicate greater centrality. The geographical spread of the network influences the results on this index, with a greater share of more distant peripheral nodes tending to inflate average figures.

With the accessibility and service boost provided by the Metronet projects to areas at the outer urban fringe of Perth, it is not surprising that average closeness results deteriorated markedly between 2021 and 2025, from a metropolitan average value of 61.9 to 67.1. The outward expansion of the network was not accompanied by strengthening its existing, inner section in terms of reduced travel times and/or higher frequencies. However, there are some important exceptions to this pattern, and these are clearly discernible on the maps:

- The introduction of the Airport line in 2022 doubled daytime frequencies on the rail trunk between Claremont and Bayswater, which the new line shares with the Fremantle and Midland lines.

- The 2024 opening of the Ellenbrook line increased frequencies by a further 50% on the Perth Central to Bayswater section. At 8 to 12 departures per hour per direction, seven days a week, these trunk routes can be seen as 'turn-up-and-go' services (as well as the Perth Central to Cannington section of the Armadale and Thornlie-Cockburn lines, where such frequencies predated the Metronet program).
- Simultaneously, the 15-minute base frequency of Perth's rail network continues to prevail on the critical 125-km north-south corridor between Yanchep and Mandurah, including on its busiest central section where higher daytime frequencies were operated in the past and cut back in 2009.

Maps 3 and 4: Closeness centrality in Perth in 2025, and changes over 2021



Transfer intensity: is the network making us change modes more often or less often?

Average transfer intensity across Perth's higher-frequency public transport network improved slightly between 2021 and 2025, from 1.05 to 1.04 transfers per journey. This is remarkable given the additional transfer needs invariably created by additional bus-based nodes at the urban periphery (Yanchep Central, Alexander Heights, Ballajura Marketplace, Aveley, Forest Lakes, Secret Harbour). Their effect has been more than compensated by the elimination of transfer needs enabled by the rail extensions, particularly at nodes that previously relied on bus-to-rail feeder services such as Ellenbrook, Morley Station and Ranford Road.

Benefits on this index also accrue along the length of the Armadale and Thornlie-Cockburn lines (due both to the route extensions and the harmonisation of stopping patterns, albeit at the

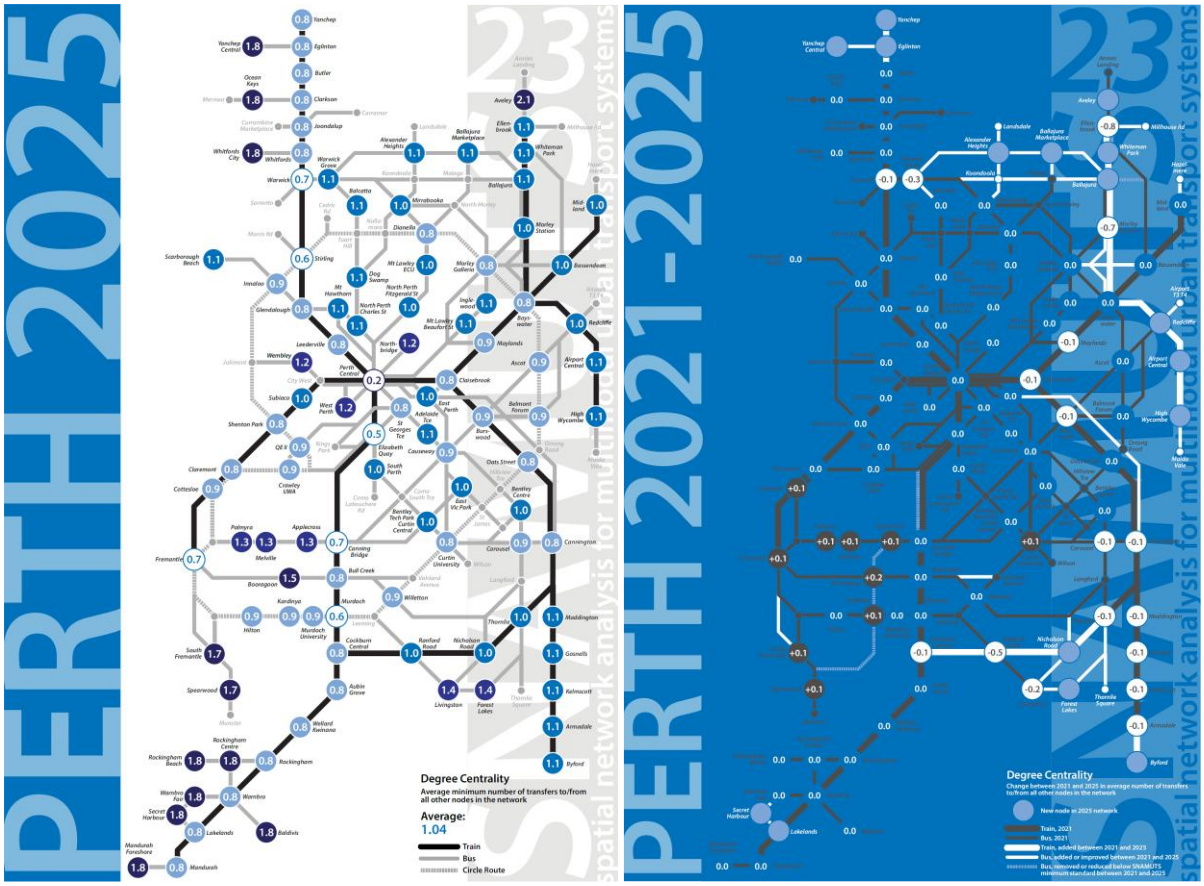
expense of a permanent station closure at Welshpool), and at Warwick station whose function as a multimodal hub was strengthened.

Conversely, transfer intensity increased in several mid-southwestern suburbs on the territory of Fremantle, Melville and (western) Cockburn, especially at Booragoon whose only direct bus link to the CBD was reduced in frequency to below the SNAMUTS minimum standard.

Degree centrality measures the degrees of separation between origins and destination; in a public transport network, such degrees of separation are experienced as transfers. Lower figures indicate lower transfer intensity and can be read both as a successful quest for minimising the inconvenience of transfers for passengers, and as a sign of inefficiencies such as insufficient integration between modes or the failure to channel as much public transport movement as possible along the fastest and highest-capacity services.

Generally speaking, the Metronet rail infrastructure projects were accompanied by network reconfigurations that created a more 'lattice-shaped network' in middle suburban areas (the catchments of the Ellenbrook, High Wycombe, Thornlie-Cockburn and inner part of the Yanchep line) and limited or reduced transfer intensity. At the outer ends of the Yanchep and Mandurah lines, a tree-shaped network prevails that entrenches a higher level of transfer intensity for areas connected to rail by bus feeders.

Maps 5 and 6: Degree centrality in Perth in 2025, and changes over 2021

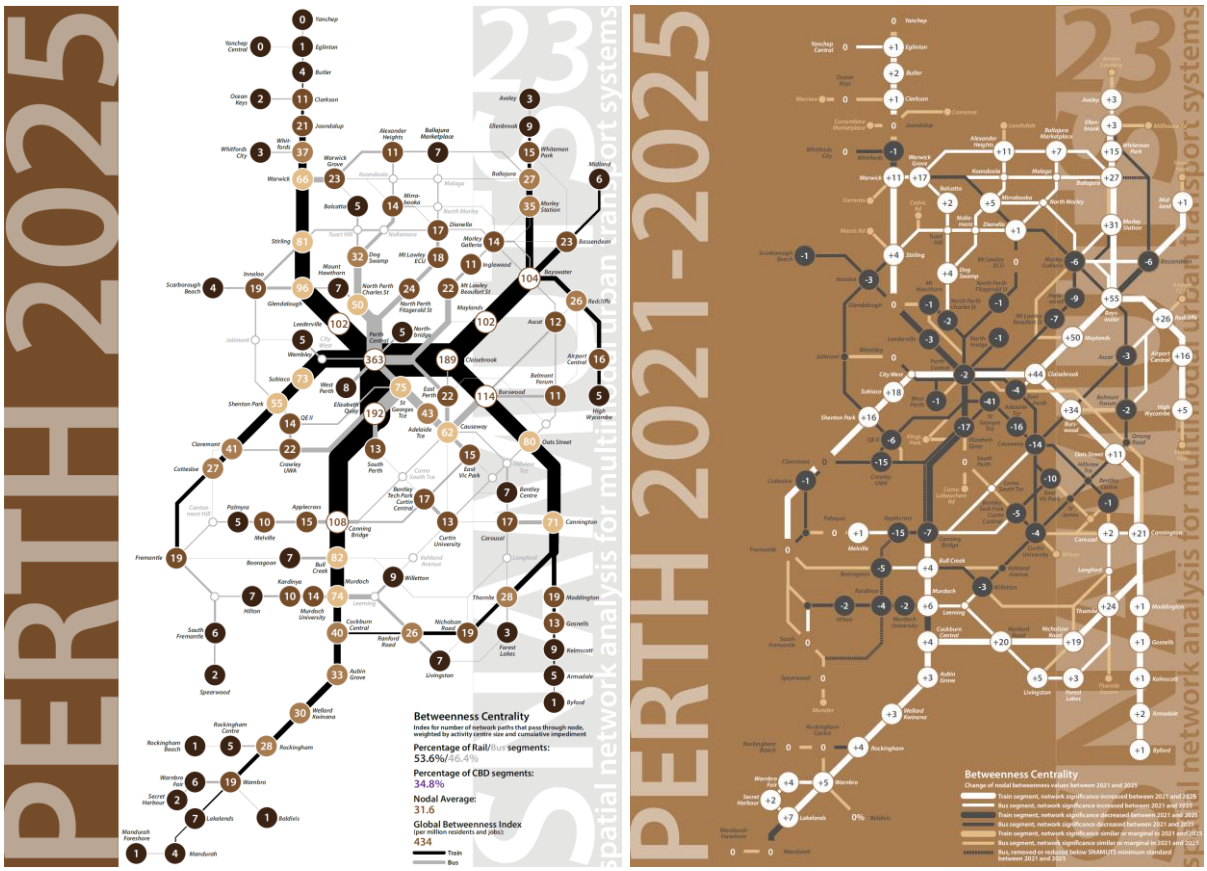


Betweenness centrality: how does the network channel public transport journeys?

The overall picture is one of spatial expansion of public transport, but not necessarily one of boosting its relative importance in Perth's mobility mix.

This index captures and visualises how travel opportunities flow across the network in geographical detail, and the volume they have, dependent on the ease of movement (closeness centrality, see above) and the spatial distribution of land use activities. A network-wide figure (global betweenness) aggregates all origin-destination values in relation to the number of metropolitan residents and jobs and thus attempts to quantify the overall presence of public transport movement opportunities within a city.

Maps 7 and 8: Betweenness centrality in Perth in 2025, and changes over 2021



In Perth, this figure increased modestly from a value of 424 to 434, a similar level to Adelaide and Brisbane but markedly lower than in Melbourne or Sydney. As Perth's network coverage increased by more than five percentage points (see above) and notwithstanding the disregard for post-2021 growth in population and jobs around the network in this assessment, this trend suggests the rollout of existing standards of public transport accessibility (15-minute rail services with integrated bus feeders serving mostly low-density urban fabric) over an expanding geographical area rather than a transformative process towards a more public transport-oriented city was under way. There has been an average decline in compactness for the network and the territory it serves. This impression is also supported by the decrease in the average nodal betweenness value from a level of 33.4 in 2021 to 31.6 in 2025.

At a greater level of geographical detail, several further narratives emerge. Two trends stand out as a result of the Metronet projects:

- the role of rail increased by ten percentage points at the expense of buses on this index (from a ratio of 46:54 in 2021 to 56:44 in 2025),
- the reliance of the network to channel journeys through the CBD area decreased by more than five percentage points (from 40.5% of weighted journeys in 2021 to 34.8% in 2025).

Clearly, the network has evolved to shift more movement onto faster and higher-capacity services, and to offer more travel opportunities within and between suburban areas, not affecting or bypassing the CBD area.

The first effect is expected as a result of adding many kilometres of new rail lines, but it is notable that buses lost significance not merely along corridors where busy feeder bus routes were replaced or relieved by newly built rail infrastructure, a pattern that really only applies to the Ellenbrook and Thornlie-Cockburn lines. Instead, the attraction of travel opportunities to buses declined almost uniformly across Perth's central city and inner suburbs. The frequency increase on the Claremont to Bayswater rail trunk pulled travel opportunities away from parallel bus corridors such as Stirling Highway and Beaufort Street. The emergence of additional orbital travel opportunities also took pressure from the 998/999 bus circle route with the exception of shorter segments between Stirling and Dianella, and Murdoch and Willetton.

The second effect is partly a function of an expanding network, reducing the relative importance of the non-expanding CBD area, but it is also true that the improved rail network, despite continuing to be made up entirely of radial lines, offers more cross-suburban travel opportunities. This is especially the case between the three outer rail branches converging in Bayswater, and between the Mandurah and Armadale corridors through the new link between Cockburn Central and Thornlie. Conversely, gains in network significance remain modest towards the outer fringes of the network (Yanchep, Mandurah, Byford), and negative along the central part of the north-south rail corridor between Glendalough and Canning Bridge, which has now the lowest off-peak frequency of all CBD rail lines (though the opposite is the case during peak hours).

Network Resilience: can the public transport service offer cope with the role the land use system assigns to it?

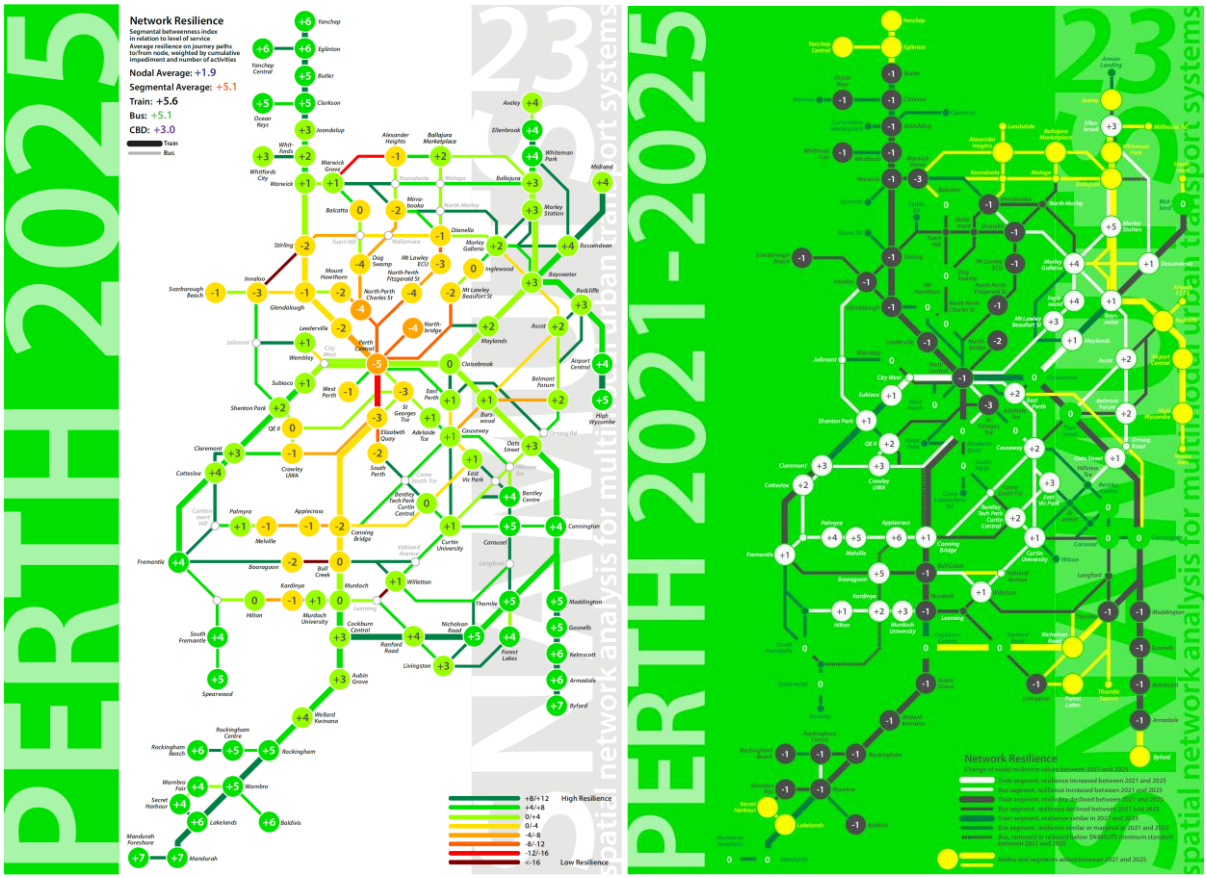
Metronet has made a tangible net contribution to future-proofing a fast-growing metropolitan region. During the last few years at least, Perth's public transport network and service levels have more than kept pace with the pressures originating from the land use system and its mobility needs. Perth's average nodal resilience value improved between 2021 and 2025 from a level of +1.0 to +1.9, following steady declines since 2006 (when it stood at +3.7). While this effect will likely be revised slightly downwards once land use effects are taken into consideration, it does signify a trend break.

This index can be understood as a troubleshooting tool for public transport networks. By calculating a ratio between segmental betweenness results and the actual passenger capacity offered on each route segment, and to and from each activity node, the service level on a particular network element can be determined to see if it is well-matched to its significance for metropolitan-wide movement, or whether (and to what extent) it falls short. Positive values, shown in green on the diagrams, indicate a good match. Smaller negative values (between 0 and

-12, shown in yellow and orange) indicate a measure of underperformance. Larger negative values (beyond -12, shown in red and maroon) indicate a more severe capacity constraint.

Future proofing effects are not evenly distributed across the metropolitan area, and also not always the result of positive change. The Claremont to Bayswater rail trunk line with its much-improved service frequency stands out, as does the significant relief on parallel bus routes 950 and 995: here, travel opportunities were effectively redistributed from slower, lower-capacity buses towards faster, higher-capacity trains. Of the other Metronet measures, the Ellenbrook branch line records the most pronounced benefit to resilience, even though the bus services it replaced were far from the worst performers across pre-Metronet Perth. In the southwestern middle suburbs, the resilience gains shown are less the product of a more balanced network configuration than the result of cutting off significant catchment areas from useful public transport service through the frequency cuts on bus route 115. On the north-south rail line, whatever negative effect on resilience there has remained very modest, mostly owing to the Yanchep extension operating through areas in the early stages of urban development with very limited walking-distance catchments to date. Closer to the central city, this line records the poorest resilience performance on the rail network, again highlighting its inferior off-peak frequencies. A problematic picture is also apparent among the radial bus routes across Perth's inner north (950, 960, 970 and 990), an attractive urban intensification area largely away from the rail corridors and where mobility needs may be approaching the limits of being serviceable exclusively by low-capacity, low-speed buses. As a result, Perth's central rail and bus station has now become the node with the poorest resilience performance in the metropolitan area, suggesting that the next wave of major transport investment in the city needs to first and foremost address the inner area.

Maps 9 and 10: Network resilience in Perth in 2025, and changes over 2021

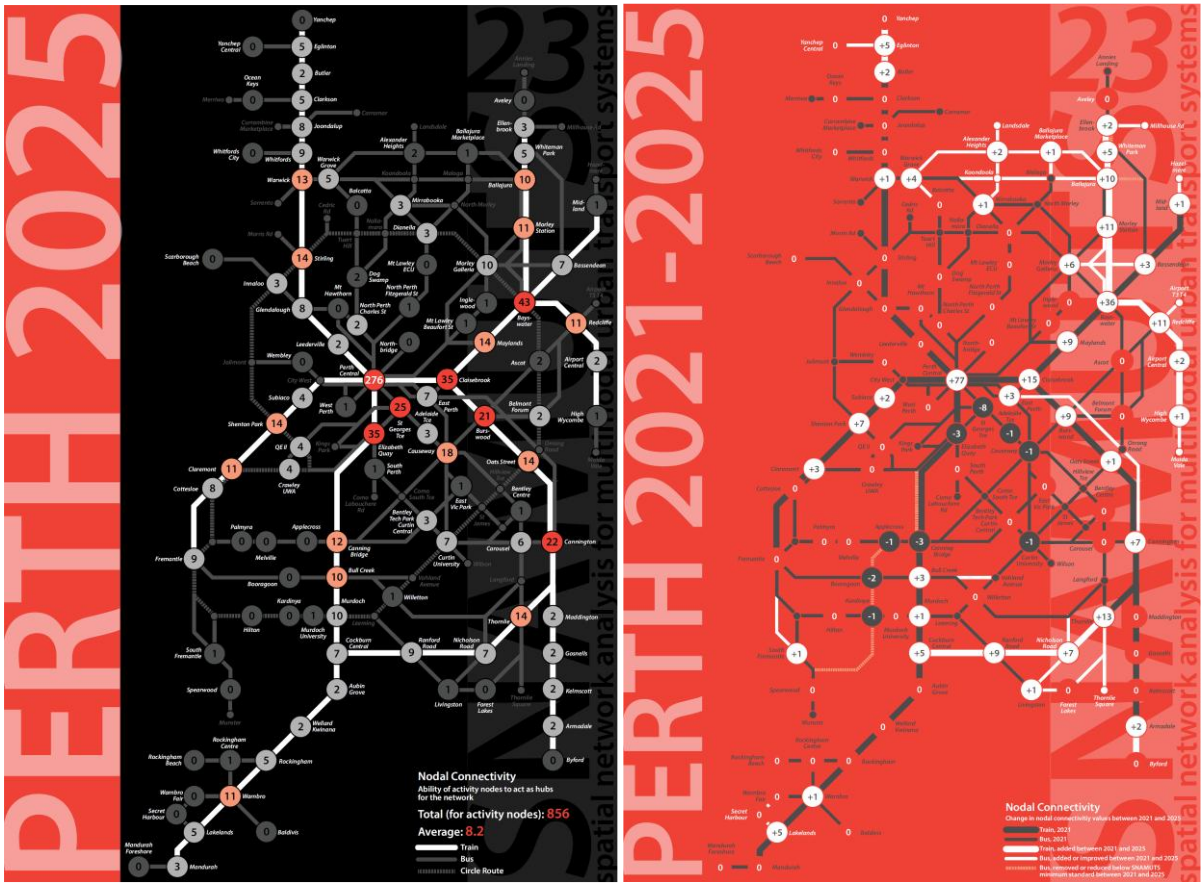


Nodal Connectivity: how freely can the public transport-land use system be navigated?

Although the Metronet project primarily targeted outer suburban areas where new rail infrastructure were built, it has also created a group of inner suburban corridors with 'turn-up-and-go services' on the core sections of the legacy network between central Perth and Claremont, Bayswater and Cannington. This is seen in average nodal connectivity in Perth increasing from 6.6 to 8.2 points as a result of the Metronet projects, and for the first time, connectivity hotspots (red dots) can now be found in areas outside the CBD (Bayswater, Cannington and Burswood). Bayswater and Cannington benefit from their new or strengthened role as middle suburban rail junctions with significant bus interchanges, while inner suburban Burswood had its rail frequency doubled (previously, only the Thornlie line would stop there, not the Armadale line), though its spatial configuration as a rail-bus interchange has much room for improvement. These three inner suburban corridors are obvious candidates for rail-oriented urban intensification.

The nodal connectivity index conveys a measure of how flexibly users can move to and from a particular node on the network, by counting the number of directions one can travel in, the number of departures per hour, and the capacity (average occupancy) of the different modes that converge in each location. This has a bearing on the perception of a location to support public transport-oriented lifestyles and business models, and in turn influences its attractiveness for transit-oriented development. 'Red dots' with a nodal connectivity score of 20 or above can be considered the hotspots of a network for these qualities.

Maps 11 and 12: Nodal connectivity in Perth in 2025, and changes over 2021



New rail stations in middle and outer suburbs also opportunities for urban development. However, Perth's track record on delivering transit-oriented development around rail lines opened since the 1990s is chequered at best. Joondalup and Cockburn Central are sometimes held up as positive examples, but their connectivity to the rest of the city on this index is below average. Ambitious programs to develop major suburban centres at Stirling and Murdoch (with slightly higher nodal connectivity scores) have thus far only delivered patchy development - with keystone land uses (council offices, hospital) that remain far from adding up to contiguously walkable station precincts. At Canning Bridge, a market-led process produced a cluster of high-rise buildings across the river from the train station during the past decade, albeit also with deficient pedestrian connections. At Leederville, the rail station sits in a freeway median adjacent to a street-based activity centre dating back to the early 20th century with some more recent intensification. At Butler, Clarkson, Aubin Grove and Wellard, the rail stations anchor minor retail precincts surrounded or interspersed by townhouses and low-rise apartments. Most of the remaining stations along the Yanchep and Mandurah lines are dominated by park-and-ride facilities and/or bus interchanges rather than land uses that differ fundamentally in density or configuration from what is typical for Perth's expansive car-oriented outer suburbs.

The nodal connectivity index suggests that the next layer of suitability for TOD-style urbanism beyond the core sections of the legacy rail lines might be found at stations with a rating score between 10 and 20, including Redcliffe, Morley, Ballajura, Warwick, Bull Creek, Thornlie as well as the already mentioned ongoing programs at Stirling and Murdoch. All these stations are well within a 30-minute travel time radius from central Perth and also benefit from multidirectional, higher-frequency bus connections. This helps residents, workers and visitors alike to have confidence that public transport will take them where they want to go at any time of the day or week.

SNAMUTS Benchmark Composite Index

Metronet offered the opportunity for an additional 100,000 Perth residents and workers to make life or business decisions not dominated by car use. Interestingly this has been achieved along the existing trunk lines where the improved network now provides metro-like service standards, rather than so much along the newly built outer rail extensions.

The SNAMUTS composite index takes in results from the component indicators of closeness centrality, degree centrality, contour catchments, betweenness centrality, nodal connectivity and nodal resilience and calibrates them on a scale from 0-60 (maximum 12 points for each component indicator except resilience, where negative values lead to deductions). It is primarily conceptualised as a visualisation tool to quickly identify areas of good, average and poor public transport accessibility on a metropolitan scale map, and to follow their evolution over time.

Numerically, the average composite score in Perth increased only marginally from 15.1 in 2021 to 15.2 in 2025. However, by calculating a 2025 average only for the group of activity nodes that already had SNAMUTS minimum public transport access in 2021, a figure of 15.9 suggests a more notable improvement and carried particularly by the yellow (above average) category. This category expanded along the core sections of the legacy rail lines as far as Shenton Park, Bayswater and Cannington following the frequency improvements there as additional rail lines where introduced. As we will explore in another blog post in the near future, this accessibility standard is associated with tangible adjustments in travel behaviour and car ownership rates. In other words,

Two other accessibility categories that expanded between 2021 and 2025, also by approximately 100,000 residents and jobs put together, are the dark orange (below average) and the red (poor) bracket. For the most part, this occurred in areas that had no public transport service at the SNAMUTS minimum standard in 2021 and thus constitutes an improvement. These two categories prevail along the outer ends of the Ellenbrook and High Wycombe lines, as well as across areas where new or improved bus feeders to new train lines or stations were introduced (such as Alexander Heights or Forest Lakes). This accessibility standard on public transport should not be associated with a significant reduction in car dominance across the affected areas, though it is arguable that it alleviates car dependence by providing viable travel alternatives for those unable or unwilling to use a car, or travelling to and from parts of the city where roads are more congested and/or parking is limited and pricey.

Maps 13 and 14: SNAMUTS composite index in Perth in 2021 and 2025

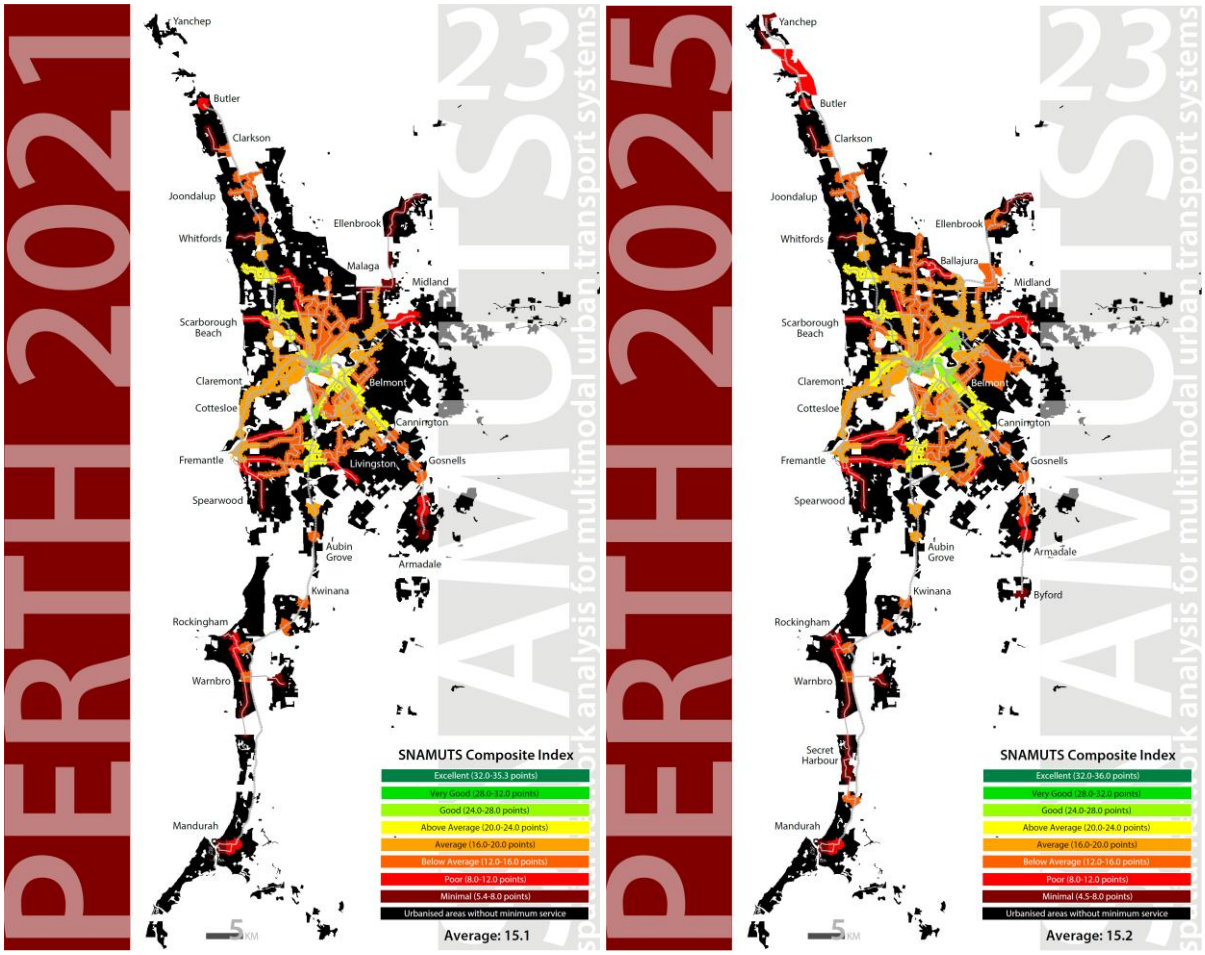
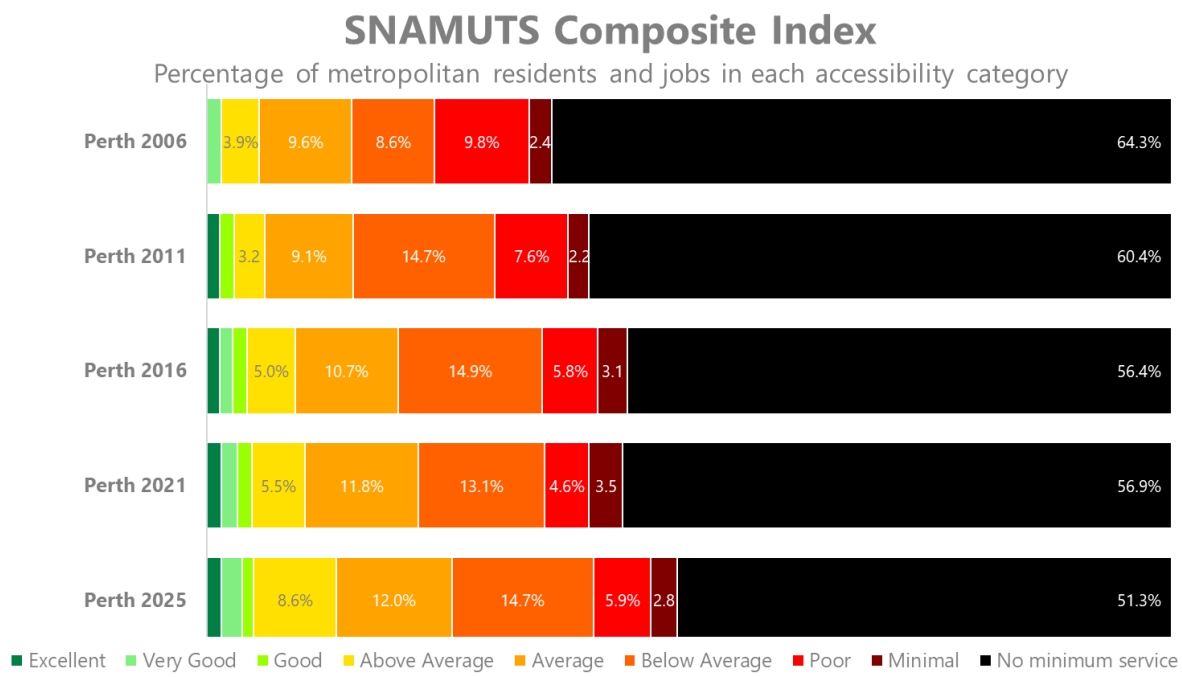


Figure 1: SNAMUTS composite index, relative size of accessibility categories, Perth 2006 to 2025


SNAMUTS Composite Index
Percentage of metropolitan residents and jobs in each accessibility category
Perth 2006
3.9%
9.6%
8.6%
9.8%
2.4
64.3%
Perth 2011
3.2
9.1%
14.7%
7.6%
2.2
60.4%
Perth 2016
5.0%
10.7%
14.9%
5.8%
3.1
56.4%
Perth 2021
5.5%
11.8%
13.1%
4.6%
3.5
56.9%
Perth 2025
8.6%
12.0%
14.7%
5.9%
2.8
51.3%
Excellent
Very Good
Good
Above Average
Average
Below Average
Poor
Minimal
No minimum service

Appendix

Research Approach

The 2021-2025 comparison is limited to the public transport network configuration and service levels: the land use figures (geographical distribution of residents and jobs), which also form part of the SNAMUTS analysis, have been held constant at those of the 2021 census. New figures of similar geographical detail will not become available until the 2026 census has been conducted and processed (around 2027/28), at which time it will be of interest to repeat the exercise and ascertain whether and to what extent land use trends support the additional public transport infrastructure and service upgrades.

The following SNAMUTS analysis refers to the service levels prevailing during the weekday interpeak period (approximately 10.00-15.00) and applies a minimum service standard in order to focus on those public transport services that have a full-time presence and allow for both planned and spontaneous trip-making for a variety of travel purposes. To enter the analysis, a rail service must operate at least every 30 minutes during the day on weekdays (all Perth's rail lines, with a 15-minute off-peak frequency seven days a week, meet this standard), and a bus service at least every 20 minutes during the day on weekdays and every 30 minutes on both Saturdays and Sundays. In Perth, all 900-series (high-frequency) bus routes meet this standard, as well as a range of others, in some cases as a combination of several lower-frequency services that share a common trunk line.

The 2021 network analysis is based on a matrix of 89 activity nodes (spatial clusters of trip origins and destinations at rail or bus stations, or at concentrations of land uses such as suburban centres, hospitals or universities). For the 2025 analysis, a further 16 activity nodes were added to this list to represent the majority of new rail stations (Yanchep, Eglinton, Whiteman Park, Ballajura, Redcliffe, Airport Central, High Wycombe, Byford, Nicholson Road and Lakelands) as well as bus-based suburban neighbourhoods made more accessible by improved feeder services to rail (Yanchep Central, Alexander Heights, Ballajura Marketplace, Aveley, Forest Lakes and Secret Harbour). The new rail stations at Ellenbrook, Morley and Ranford Road already had bus services at the SNAMUTS minimum standard in 2021 and thus already appeared as activity nodes in the analysis of that year. The new rail stations at Alkimos and Noranda were not included as activity nodes at this stage, as they offer no interchanges to bus routes at the SNAMUTS minimum standard and are not (yet) surrounded by land uses qualifying as significant clusters of origins and destinations.