

= Kwinana Freeway =

The Kwinana Freeway is a 72 @-@ kilometre (45 mi) freeway in and beyond the southern suburbs of Perth , Western Australia , linking central Perth with Mandurah to the south . It is the central section of State Route 2 , which continues north as Mitchell Freeway to Joondalup , and south as Forrest Highway towards Bunbury . A 4 @-@ kilometre (2 @.@ 5 mi) section between Canning and Leach highways is also part of National Route 1 . Along its length are interchanges with several major roads , including Roe Highway and Mandjoogoordap Drive . The northern terminus of the Kwinana Freeway is at the Narrows Bridge , which crosses the Swan River , and the southern terminus is at Pinjarra Road , east of Mandurah .

Planning for the Kwinana Freeway began in the 1950s , and the first segment in South Perth was constructed between 1956 and 1959 . The route has been progressively widened and extended south since then . During the 1980s , the freeway was extended to South Street in Murdoch , and in June 2001 , it reached Safety Bay Road in Baldivis . The final extension began as the New Perth Bunbury Highway project , constructed between December 2006 and September 2009 . In early 2009 , the section north of Pinjarra Road was named as part of the Kwinana Freeway , with the remainder named Forrest Highway . The freeway has been adapted to cater for public transport , with the introduction of bus priority measures in 1987 , and the 2007 opening of the Mandurah railway line , constructed in the freeway median strip .

= = Route description = =

The Kwinana Freeway is the central section of State Route 2 . It commences at the northern end of the Narrows Bridge , Perth , continuing south from the Mitchell Freeway , and terminates at the Pinjarra Road interchange at Barragup , where it then transitions to Forrest Highway . All intersections with the freeway are grade separated . The speed limit is 100 kilometres per hour (60 mph) north of Safety Bay Road and 110 kilometres per hour (70 mph) to the south . From Perth to Mill Point Road , the freeway has five lanes northbound and six lanes southbound . This includes a bus lane in each direction , except on the Narrows Bridge , which only has a southbound bus lane . South of Mill Point Road to Roe Highway the freeway has three lanes in each direction , without any bus lanes except for bus @-@ only ramps at the Canning Bridge interchange . Beyond Roe Highway the freeway has two lanes in each direction . The median strip of the freeway north of The Spectacles also houses the Mandurah railway line . A shared pedestrian and bicycle path is built alongside the freeway .

Main Roads Western Australia monitors traffic volume across the state 's road network , including many locations along the Kwinana Freeway . The busiest section is at the northern end , on the Narrows Bridge , which averaged over 93 @,@ 000 vehicles per weekday in 1979 . This increased to over 135 @,@ 000 in 1988 / 89 , 156 @,@ 000 in 1998 / 99 , and 160 @,@ 000 in 2007 / 08 . The volume generally declines as the freeway travels south , with the fewest vehicles recorded near the southern end . There were fewer than 46 @,@ 000 vehicles per weekday near the Canning Highway terminus in 1978 , while in 1998 / 89 there were under 45 @,@ 000 north of South Street . For 1998 / 99 there were fewer than 27 @,@ 000 vehicles per weekday north of Thomas Road , and during 2007 / 08 fewer than 38 @,@ 000 were recorded between Mundijong Road and Safety Bay Road . As of 2013 , the Kwinana Freeway is one of the most congested commuter routes in Perth , during peak traffic periods . The average speed when driving north from Cockburn Central was measured as less than 40 kilometres per hour (25 mph) during the morning peak . The slowest section was from South Street to Canning Highway , with an average travel speed of 24 kilometres per hour (15 mph) . During the afternoon peak , the worst segment was southbound between Manning Road and Leach Highway , with a 31 kilometres per hour (19 mph) average speed .

= = = Swan and Canning Rivers = = =

The Kwinana Freeway begins at the Narrows Bridge , and travels south from The Narrows

alongside the Swan and Canning Rivers . South of the bridge is a northbound exit to Mill Point Road , whilst the southbound exit and both entrance ramps to the freeway are located a further 600 metres (2 @, @ 000 ft) south . To the east of the freeway are residential homes in South Perth and Como , as well as the Royal Perth Golf Club . There is a southbound exit to South Terrace which provides access to the local area . Public access to the Swan River 's foreshore is available via footbridges that cross the freeway .

The first major interchange is with Canning Highway . National Route 1 is allocated to Canning Highway to the east , and to the Kwinana Freeway to the south of the interchange . The design is a diamond interchange , with additional bus @-@ only ramps connecting to the median lanes of the freeway . The Canning Bridge bus and railway transfer station is located at the interchange . A partial Y interchange with Manning Road , consisting of a northbound entrance ramp and southbound exit ramp , is located 400 metres (1 @, @ 300 ft) south of Canning Highway . These ramps merge with the ramps on the south side of the Canning Highway interchange , allowing access between the highway and Manning Road . The Kwinana Freeway continues south , with the suburbs of Manning and Salter Point to the east , and Canning River to its west . The freeway passes by Aquinas College , 1 @. @ 5 kilometres (0 @. @ 93 mi) south of Manning Road , and reaches the Mount Henry Peninsula after another 600 metres (2 @, @ 000 ft) .

The 660 @-@ metre @-@ long (2 @, @ 170 ft) Mount Henry Bridge carries the freeway across the Canning River , from Salter Point to Mount Pleasant . The freeway travels through the suburb for 450 metres (1 @, @ 480 ft) to Cranford Avenue , a half @-@ diamond interchange with northbound entrance and southbound exit ramps . The Kwinana Freeway continues south for another 600 metres (2 @, @ 000 ft) through Brentwood to Leach Highway .

= = = Southern suburbs of Perth = = =

Through the southern suburbs of Perth , the Kwinana Freeway travels south as the boundary between various suburbs . The Leach Highway interchange houses the Bull Creek train and bus interchange station , and the Murdoch Station is co @-@ located with the South Street interchange , 2 @. @ 2 kilometres (1 @. @ 4 mi) further south . Halfway between these interchanges , Parry Avenue crosses the freeway via an overpass , connecting the suburbs of Bateman and Bull Creek . Beyond South Street , the land east of the Kwinana Freeway , in the suburb of Leeming , continues to be residential , whilst to the west the freeway passes by educational and health care facilities in Murdoch . Challenger TAFE , Murdoch University , St John of God Murdoch Hospital , and Fiona Stanley Hospital are adjacent to the freeway , though there is no direct access . The next interchange , after 1 @. @ 4 kilometres (0 @. @ 87 mi) , is with Farrington Road , which marks the southern edge of Murdoch . This is a half @-@ diamond interchange that only serves traffic travelling to or from areas further north .

A free @-@ flowing trumpet interchange , 800 metres (2 @, @ 600 ft) south of Farrington Road , connects the Kwinana Freeway to Roe Highway . The interchange is situated between four suburbs : Leeming , (north @-@ east) , North Lake (north @-@ west) , Bibra Lake , (south @-@ west) , and Jandakot . Roe Highway is part of State Route 3 , Perth 's ring route , and is a major controlled @-@ access link to Perth 's north @-@ east . There are plans to extend Roe Highway west to Hamilton Hill , which would necessitate upgrading the interchange . Following Roe Highway , the freeway continues its journey south , between the residential areas of South Lake and Jandakot . Houses east of the freeway surround the Glen Iris Public Golf Course . After 2 @. @ 7 kilometres (1 @. @ 7 mi) there is a diamond interchange with Berrigan Drive , after which the freeway passes lower density lots in Cockburn Central and the industrial section of Jandakot . The freeway reaches the next interchange after 2 @. @ 1 kilometres (1 @. @ 3 mi) , connecting with Armadale Road to the east and Beeliar Drive to the west . The Cockburn Central train station is located in the freeway median , 300 metres (980 ft) north of the interchange . The freeway continues travelling south through the developing outer metropolitan suburbs of Atwell and Aubin Grove , east of the freeway , and Success and Hammond Park , west of the freeway . Here it connects to Russell Road and Gibbs Road via a diamond interchange after 3 @. @ 3 kilometres (2 @. @ 1 mi) , and to Rowley

Road after a further 2 @. @ 6 kilometres (1 @. @ 6 mi) .

= = = South of Rowley Road = = =

South of the Rowley Road diamond interchange , development is sparse , except in Bertram , southwest of the Thomas Road interchange . The freeway progresses through swampy rural land for 3 @. @ 4 kilometres (2 @. @ 1 mi) , passing by Lake Balmanup in Wandi on its way to the diamond interchange at Anketell Road . The Kwinana Freeway continues south along the edge of Jandakot Regional Park , near to The Spectacles Wetlands , reaching Thomas Road after another 2 @. @ 4 kilometres (1 @. @ 5 mi) . The Mandurah rail line deviates from the freeway median 1 kilometre (0 @. @ 62 mi) north of the interchange , thereafter travelling south @- @ west towards Rockingham . From Thomas Road to the next interchange at Mortimer Road , 2 @. @ 7 kilometres (1 @. @ 7 mi) further south , the land to the west of the freeway in Bertram has been developed into a residential area . After the latter interchange , development again becomes sparse , as the freeway travels south near swampland and bodies of water , including Folly Pool and Maramanup Pool . The next interchanges are with Mundijong Road after 4 @. @ 7 kilometres (2 @. @ 9 mi) , Safety Bay Road after another 3 @. @ 9 kilometres (2 @. @ 4 mi) , and Karnup Road following a further 5 @. @ 2 kilometres (3 @. @ 2 mi) . There is a pocket of newly developed urban land near Safety Bay Road , south of the freeway .

South of Karnup Road , the following two interchanges are constructed as dogbone interchanges , which use roundabouts instead of traffic lights to control the intersections between ramps . The Kwinana Freeway follows the Serpentine River southwards , with no interchanges for 7 @. @ 4 kilometres (4 @. @ 6 mi) . At this point , there is an interchange with Paganoni Road to the west and Vine Road to the east . After 5 kilometres (3 @. @ 1 mi) the freeway leaves the Perth Metropolitan Region , and encounters the next interchange with Lymon Road and Mandjoogoordap Drive . Lymon Road provides access to Stake Hill , whilst Mandjoogoordap Drive is a controlled access route into Mandurah . Following this interchange , the freeway turns south @- @ east , where it encounters a diamond interchange with Lakes Road after 4 @. @ 6 kilometres (2 @. @ 9 mi) . The freeway ends 7 @. @ 6 kilometres (4 @. @ 7 mi) further south , at the Pinjarra Road folded diamond interchange in Ravenswood . The road , and State Route 2 , continue south as Forrest Highway towards Bunbury .

= = History = =

The Kwinana Freeway began as a proposed controlled @- @ access road to link the Narrows Bridge in Perth with the developing area of Kwinana . Planning began in 1954 , after the concept had been announced by the Acting @- @ Premier John Tonkin on 24 July 1953 . The original route travelled through South Perth to Canning Highway , and included a new bridge over the Canning River . The planned route was later adjusted so that it crossed the river further south , due to the expected traffic volume , and difficulties in construction and traffic management at the existing Canning River Bridge .

= = Initial construction = = =

In 1956 , the Western Australian State Government decided to construct the first section of the freeway , between the Narrows Bridge and Canning Highway . An extension was planned to be constructed seven years later . This first stage was built alongside the Swan River , on the edge of South Perth . Undeveloped land was used where possible , and the edge of the river was filled in at various points . Access to the river was maintained via five pedestrian bridges over the freeway , leading to the existing Como Beach and Jetty , and new areas on the river foreshore created during the project . A significant change to the foreshore was the relocation of the South of Perth Yacht Club . In 1960 , the club moved from the Canning River 's eastern shore , at Olives Reserve in Como , to Coffee Point in Applecross , on the western shore . The termination of the Kwinana

Freeway at Canning Highway meant that the highway would be part of the main link between Perth and Kwinana , along with the freeway and Stock Road . Therefore , Canning Highway was upgraded to a dual carriageway . The upgrade works included the construction of a new bridge across the Canning River , next to the existing bridge , built in 1938 . This allowed for six lanes of traffic on Canning Highway . Construction of this stage was completed in 1959 , before the establishment of the Environmental Protection Authority (EPA) in 1971 . In 1974 , this first section was described by the EPA as " environmental desecration " . This was primarily due to the public being denied access to the foreshore environment . Pedestrian overpasses were described as ineffective for " obvious physical [and] psychological reasons " , and the impact on the riverfront was described as a " blight which has descended there " .

= = = First extension = = =

The first major work on the freeway after it opened was the construction of a new interchange in South Perth in the 1970s . The interchange included a complicated bridge design , which began at Judd Street , crossed over the freeway , and curved down to join the northbound carriageway . The \$ 2 @. @ 7 million interchange was opened on 13 December 1976 by the Minister for Works , Ray O 'Connor . This was followed by a southern extension , which would be constructed alongside the environmentally sensitive area surrounding Canning River . Preparation work included an extensive study on the effects on the environment and community , the most detailed to be undertaken in Western Australia thus far . The EPA recommended abandoning the concept of a freeway , for both the existing road and the first extension , to restore accessibility to the foreshore . The Main Roads Department disagreed that a lower standard at @-@ grade road would be sufficient , as large volumes of traffic were forecast , and any pedestrian access would be " extremely dangerous " . Main Roads contended that a grade separated road would be the safest and most efficient option for both pedestrian and vehicles . A botanical report on the extension found that no unique species or ecological unit would be under threat from the proposal , and the Swan River Conservation Board had no objections . The extension was then approved by the State Government in 1974 , and by the Federal Government in 1975 .

As part of the extension project , construction began in 1976 on the Canning Interchange at Canning Highway . This interchange included a flyover bridge from Manning Road , which utilised a curved design similar to the South Perth Interchange bridge . The Canning Interchange opened on 19 July 1979 . Construction works south of the interchange began in 1979 . The freeway was initially planned to terminate at Leach Highway , but was extended as far as South Street , at the request of the Melville City Council . The council wanted the extra length of freeway to alleviate congestion on its local roads , and contributed \$ 600 @, @ 000 to expedite the construction . This stage included construction of the Mount Henry Bridge across the Canning River . As of 1997 , it is Western Australia 's longest bridge , at a length of 660 metres (720 yd) . The 6 @. @ 5 @-@ kilometre (4 @. @ 0 mi) , \$ 35 @. @ 8 million extension was opened on 9 May 1982 by Ray O 'Connor , then Premier of Western Australia . Additional works undertaken to prepare for the opening included widening the existing stretch of freeway to three lanes in each direction , and reconfiguring the Narrows Bridge to include an additional central lane , reversible during peak traffic flows .

= = = Further extensions = = =

For the next stage of the freeway , an extension south to Thomas Road , multiple routes were investigated . The preferred route was selected based on the least impact from a combination of engineering , social , and environmental factors . The environmental factors considered were conservation areas associated with Thompsons Lake , west of the alignment , three " good quality " wetlands along the alignment , as well as patches of vegetation that were considered " nothing special " . The conservation of these areas and associated vegetation was considered desirable . This extension was completed in two stages . The first was a 7 @. @ 1 @-@ kilometre (4 @. @ 4 mi) extension to Forrest Road , which opened on 12 December 1991 , at a cost of \$ 36 @. @ 7 million .

Subsequently , the freeway was extended a further 11 @. @ 7 kilometres (7 @. @ 3 mi) to Thomas Road . Main Roads looked for opportunities to improve the environment during the planning of this segment . These included the establishment of a protected strip of vegetation alongside the freeway , and the preservation or enhancement of remnant wetlands under threat from urban expansion . The main negative impacts of construction would be controlled through vegetation reinstatement and drainage management plans , as well as the use of " standard techniques " for preventing pollution , which was recognised as a severe environmental impact . The proposed route had the least environmental consequences compared with viable alternatives , and was the Department of Environment and Conservation 's preferred route . The impact on wetlands was further investigated by the EPA in 1992 . The EPA estimated that 50 hectares (120 acres) of wetland habitat would be lost , including 20 hectares (49 acres) with conservation status . The EPA 's report concluded that the alignment was not ideal from an environmental standpoint , but recognised the social importance of constructing the freeway , which would facilitate development of the area . The authority was satisfied that the project 's environmental repercussions could be managed , with the key recommendation of replacing the function of impacted wetlands . This \$ 31 million section had three at @-@ grade traffic light controlled intersections , which were designed to be replaced by grade separated interchanges . Intersections were used to avoid delaying the extension , as Main Roads Western Australia considered the \$ 30 million cost for interchanges to be prohibitively expensive . The extension opened on 11 September 1994 ; the Town of Kwinana contributed \$ 1 million , per an agreement on completing the freeway prior to 1995 .

In 1988 , the State Planning Commission proposed defining a reservation for the extension of the Kwinana Freeway to the southern edge of Perth Metropolitan Region , north @-@ east of Mandurah . The northern and southern sections of the route were predetermined by factors including existing and proposed developments , power transmission lines , the location of wetlands and the Serpentine River , and required setbacks from an explosives depot at Baldivis . A number of routes were investigated for the central section , between Mortimer Road and Stakehill Road . The EPA found all proposed routes acceptable , and that the preferred route minimised environmental impact . A report for a later stage regarded the approval for this section as lacking strict stipulations for the management of environmental impact , which was attributed to the assessment of the era not being subject to recent environmental regulations and scrutiny . A 12 @-@ kilometre @-@ long (7 @. @ 5 mi) extension along this alignment , to Safety Bay Road in Baldivis , was opened on 23 June 2001 by Premier Geoff Gallop . This project also included grade separation of the existing at @-@ grade intersections . The Kwinana Freeway Bus Transitway was completed soon afterwards , in February 2002 .

= = = New Perth Bunbury Highway = = =

Construction of an extension to the freeway , initially known as the " New Perth Bunbury Highway " , began in December 2006 . The project consisted of a 32 @-@ kilometre (20 mi) freeway @-@ standard extension to Pinjarra Road and the Murray River at South Yunderup , and a 38 @-@ kilometre (24 mi) highway @-@ standard dual carriageway to Old Coast Road at Lake Clifton . It had undergone an environmental assessment by the EPA in 2000 . Main Roads proposed management plans for each environmental factor identified by the EPA . Only clearing of vegetation critical for road construction would be undertaken , and more vegetation would be replaced than the amount impacted , using local native species . A flora survey found no rare species , and only one priority species , *Lasiopetalum membranaceum* , near the southern end of the project . Road construction would impact one conservation class wetland , but no protected wetlands . To minimise impact , road drainage would be designed to contain spills , and prevent direct discharges into the surrounding environment . Noise levels would be contained to an acceptable limit in the road design , in accordance with the Main Roads traffic noise policy . The EPA concluded that the road could be designed and managed to an acceptable standard . Main Roads ' 2006 plan for environmental management of the project included numerous aspects , described as best management practices , which for the northern segment of the project were beyond the environmental approval requirements

. Specific plans were developed regarding fauna , vegetation , dieback and weeds , and revegetation and rehabilitation . Other areas with specific plans included topsoil management , drainage , construction (covering dust , noise , and vibrations) , foreshores , and both Aboriginal and European heritage . The actual road names were not known until early 2009 , when Transport Minister Simon O 'Brien revealed that the section south of Pinjarra Road would be known as Forrest Highway , with the section to the north to become part of the Kwinana Freeway . The route bypasses Mandurah by taking traffic around the eastern side of the Peel @-@ Harvey Estuary prior to joining the existing dual carriageway on Old Coast Road , reducing the journey time from Perth to Bunbury . The Kwinana Freeway extension and Forrest Highway were opened on 20 September 2009 , with a ceremony held at the interchange between the freeway , highway , and Pinjarra Road . The roads were officially opened by Premier Colin Barnett , Senator Chris Evans , Transport Minister Simon O 'Brien , Member for Canning Don Randall , and the previous Transport Minister Alannah MacTiernan .

= = = Bus transitway = = =

Dedicated bus lanes have existed on the Kwinana Freeway since the late 1980s , when a project was set up to decrease bus commuters ' travel times into Perth from suburbs south of the Swan River . In 1987 , Main Roads Western Australia and Transperth trialled a contraflow bus lane along the Kwinana Freeway , from the Canning Interchange to the Narrows Interchange . The lane operated between 7 : 00 am and 9 : 30 am , the period with the most traffic congestion on the freeway . After two months , the results were examined , and the agencies decided to build an additional bus lane on the northbound carriageway . The construction included bus @-@ only ramps at the beginning and end of the lane . The works were mainly funded by Transperth , which contributed \$ 8 @. @ 22 million out of the \$ 10 @. @ 23 million total cost . The remaining \$ 2 @. @ 01 million was provided by Main Roads Western Australia . The bus lane opened on 20 November 1989 , and received an Institute of Engineers award for engineering excellence .

In 1999 , the state government announced that a two way bus transitway would be built in the Kwinana Freeway median , to link Perth 's Esplanade Busport with the Murdoch station at South Street . Construction of the first stage , between the Narrows Interchange and Canning Interchange , began in September 2000 , and was completed in February 2002 . The bus transitway was replaced by the Mandurah railway line , constructed in the freeway median between May 2004 and December 2007 . After rail services commenced , most freeway bus services ceased ; however , dedicated ramps and short priority lanes remain for bus services between Canning Highway and Perth .

= = = 2005 flooding = = =

During the afternoon on 13 May 2005 , a water pipe burst near the southbound Mill Point Road entrance ramp in South Perth , releasing 7 megalitres (1 @, @ 500 @, @ 000 imp gal ; 1 @, @ 800 @, @ 000 US gal) of water and 60 tonnes (59 long tons ; 66 short tons) of sand . This caused widespread flooding in the area , submerged the southbound lanes of the freeway , and collapsed the ramp . There was traffic gridlock in the city and much of the metropolitan area , lasting throughout the afternoon and into the night . Repairs to the entrance ramp took more than a week to be completed .

= = = Widening = = =

In March 2011 , it was announced that the Kwinana Freeway between Leach Highway and Roe Highway would be widened from two to three lanes in each direction . The \$ 58 million project was brought forward to ease increased congestion on this part of the freeway . Construction began in July 2011 , with completion scheduled for May 2012 . The new southbound lane opened on 1 June 2012 . On 20 December 2012 , the State Transport Minister Troy Buswell , with Federal MP Gary

Gray and State MLA for Riverton Mike Nahan , officially opened the northbound lane . By May 2013 , all major construction works had been completed , including a pedestrian underpass at South Street , a new carpark and access road for Murdoch railway station , and noise walls . Remaining landscaping works were expected to be finalised in September 2013 , and the whole project had been completed by mid @-@ October .

= = Future works = =

Widening of the Kwinana Freeway with an extra southbound lane between Roe Highway and Armadale Road began in mid @-@ 2014 . The project aims to increase the freeway 's reliability , efficiency , and safety , as the current two @-@ lane configuration is subject to a large proportion of heavy vehicles and severe peak hour congestion . The project also involves the realignment of ramps at Berrigan Drive and Armadale Road , construction of noise barriers and noise walls where required , and installation of components for intelligent transport systems ? optic fibre communications , vehicle detection devices , and closed circuit cameras .

There are preliminary plans for a southbound entrance ramp from the Manning Road interchange . The land requirements have been included on the Perth Metropolitan Region Scheme ; however , the project is not a State Government priority , and no funds have been allocated for its design or construction . The City of South Perth considers the ramp a " major priority " that would increase its road network connectivity , reduce traffic congestion , and improve commuter safety . In 2001 , the City estimated the construction cost to be \$ 1 @. @ 77 million .

= = Interchanges = =