

Proposed Local Structure Plan - Lots 569 & 1263 Baldivis Rd, and Lot 21 Sixty Eight Rd, Baldivis

TRANSPORT ASSESSMENT REPORT

Prepared for
ALCOCK BROWN-NEAVES GROUP

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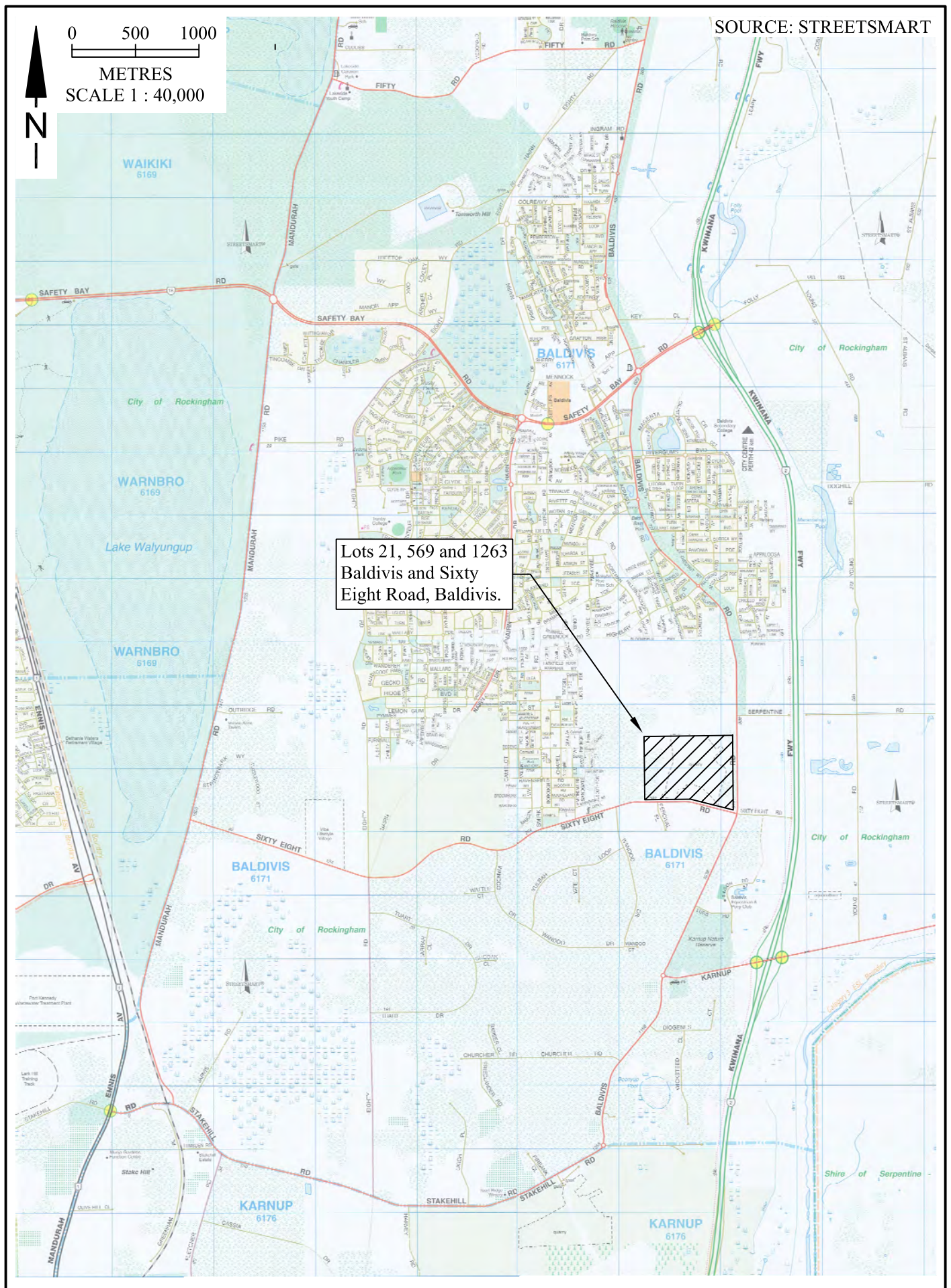
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1. INTRODUCTION

CLE Town Planning and Design has prepared a Structure Plan for Lots 569 and 1263 Baldivis Road, and Lot 21 Sixty Eight Road in Baldivis. The study area for the proposed Structure Plan is shown in the Locality Plan in Figure 1, while Figure 2 shows the Structure Plan location in the context of the Metropolitan Region Scheme.

Uloth and Associates has been appointed to prepare a Transport Assessment Report for the proposed Structure Plan to estimate future traffic flows within and adjacent to the study area, in order to confirm a proposed road network and road hierarchy and hence recommend appropriate road reserves.



Existing Road Network & Locality Plan
LOTS 21, 569 & 1263 BALDIVIS RD & SIXTY EIGHT RD, BALDIVIS

FIG.
1

FIG.
2

2. STUDY FINDINGS AND CONCLUSIONS

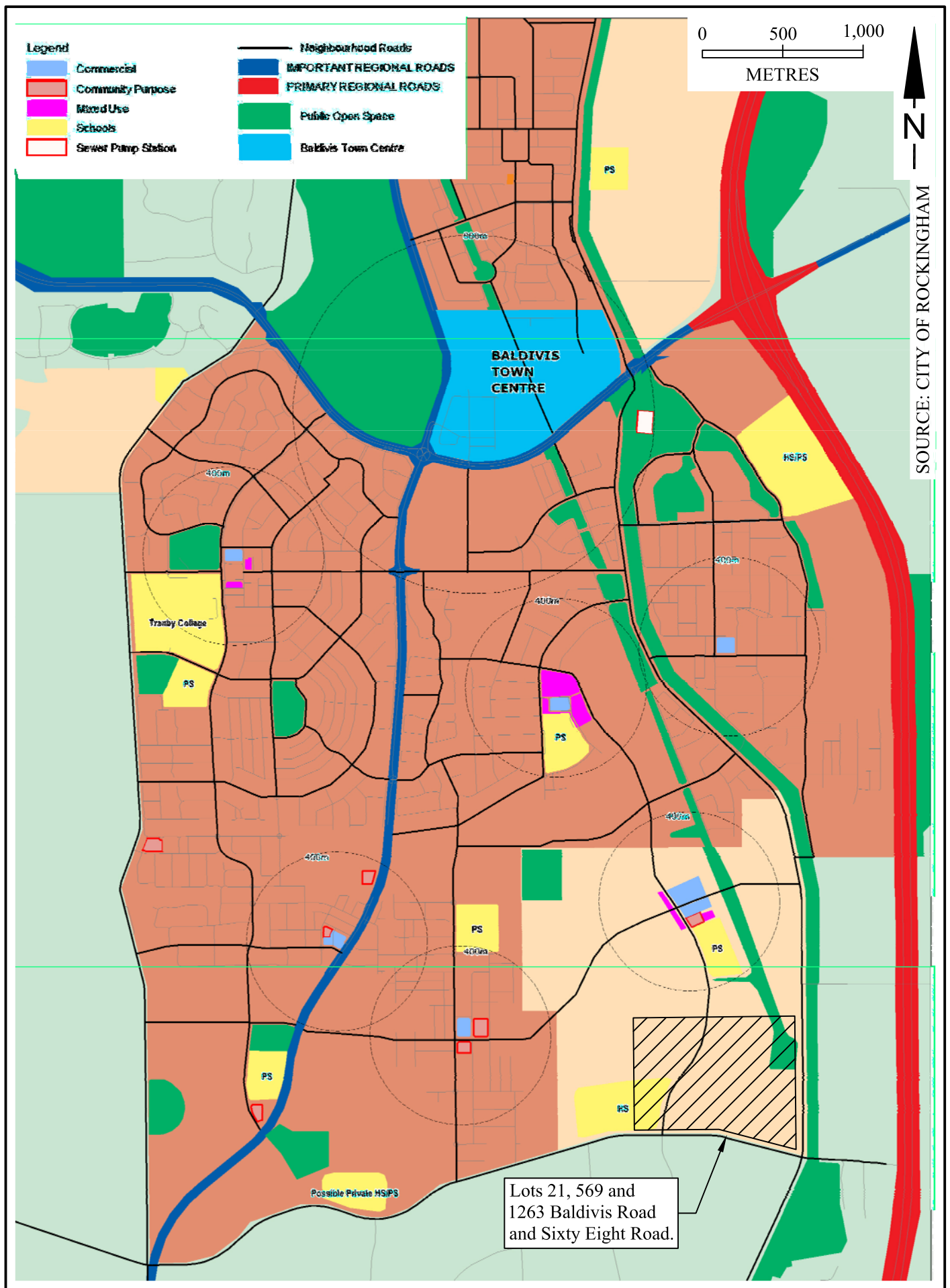
The study findings and conclusions regarding the proposed Structure Plan are presented in this Chapter.

2.1 EXISTING SITUATION

- It can be seen in Figures 1 and 2 that the proposed development is located at the north-west corner of the Baldivis Road-Sixty Eight Road intersection, with connections to Kwinana Freeway from Baldivis Road via Safety Bay Road in the north and via Karnup Road in the south.
- Baldivis Road is currently classified by Main Roads WA as a Regional Distributor adjacent and to the south of the site, but reducing to Distributor B just north of the site at Serpentine Road. It is a 2 lane undivided carriageway and provides north-south connections to residential development south of Safety Bay Road. Baldivis Road has a speed limit of 80km/hr adjacent to the site, reducing to 70km/hr further north as it approaches the first existing residential development.
- Sixty Eight Road is classified as a Local Distributor. It is a two lane undivided carriageway with a speed limit of 80km/hr.
- Traffic counts carried out by Main Roads WA show that Baldivis Road north of Sixty Eight Road carried 4,300 vehicles per day in May 2013.
- Existing bus services currently serve residential catchments north of the site (Route 567 via Baldivis Road and Rivergums Boulevard) and to the west of the site (Route 564 via Smirk Road and Arpenteur Drive). Both services run at 30-60 minute intervals providing connections between Baldivis and Warnbro, terminating at Warnbro Station.

2.2 DISTRICT STRUCTURE PLAN

- Figure 3 shows the approved South Baldivis District Structure Plan, which includes the area bounded by Safety Bay Road, Eighty Road, Sixty Eight Road and Kwinana Freeway. The proposed Structure Plan area for this current study is also shown, in the south east corner of the District Structure Plan.
- It is important to note that the District Structure Plan identifies a north-south Neighbourhood Connector Road on a curved alignment through Lots 21, 569 and 1263, linking to Sixty Eight Road at Percival Place. The plan also shows Sixty Eight Road and Baldivis Road as 'Neighbourhood Roads'.



Baldivis South District Structure Plan

2.3 PROPOSED LOCAL STRUCTURE PLAN

- Figure 4 shows the proposed Local Structure Plan for Lots 569 and 1263 Baldivis Road and Lot 21 Sixty Eight Road in Baldivis. It can be seen that the plan identifies a north-south 'Neighbourhood Connector' road at a location that is consistent with the Neighbourhood Connector road shown in the District Structure Plan, except that the proposed road now includes right-left staggered junctions rather than the curved alignment suggested in the District Structure Plan. The current plan also shows an east-west 'Neighbourhood Connector' linking from Baldivis Road through the site to the proposed High School on the western boundary, with roundabouts at the staggered junctions of the north-south road. The plan also includes a roundabout to be constructed at Sixty Eight Road - Percival Place, together with a future roundabout to be constructed at the existing intersection of Baldivis Road and Sixty Eight Road.
- It is understood that the staggered alignment of the north-south road is proposed in favour of the curved alignment suggested within the District Structure Plan in order to provide more regular lot sizes and orientations than could otherwise be achieved. From a traffic operational perspective, the staggered junctions are an acceptable treatment to accommodate the anticipated future traffic movements along this route, as noted below in Section 2.5.
- Table 1 shows the proposed land use for the Local Structure Plan, on the basis of the Traffic Zones shown in Figure 5. The overall study area is proposed to be predominantly R25, but with small pockets of R40 and R60 zoning, and a total indicative yield of 621 residential dwellings. The overall site also includes part of a proposed High School at the western end.
- Using an assumed long term traffic generation rate of 8 vehicle trips per dwelling per day for single lots and 6 vehicle trips per dwelling per day for the Grouped Housing component, it is expected that the Local Structure Plan area will generate 4,890 vehicle trips per day, plus additional trips travelling to and from the proposed High School.

TABLE 1
ANTICIPATED FUTURE LAND USE FOR PROPOSED LOCAL STRUCTURE PLAN
LOTS 569 AND 1263 BALDIVIS ROAD AND LOT 21 SIXTY EIGHT ROAD, BALDIVIS

TRAFFIC ZONE ¹⁾	NUMBER OF DWELLINGS			
	Single Lots	Grouped Housing	Total	Other
1	152	-	152	-
2	103	-	103	-
3	86	-	86	-
4	133	-	133	-
5	107	-	107	-
6	-	-	-	High School
7	-	40	40	
Total	581	40	621	

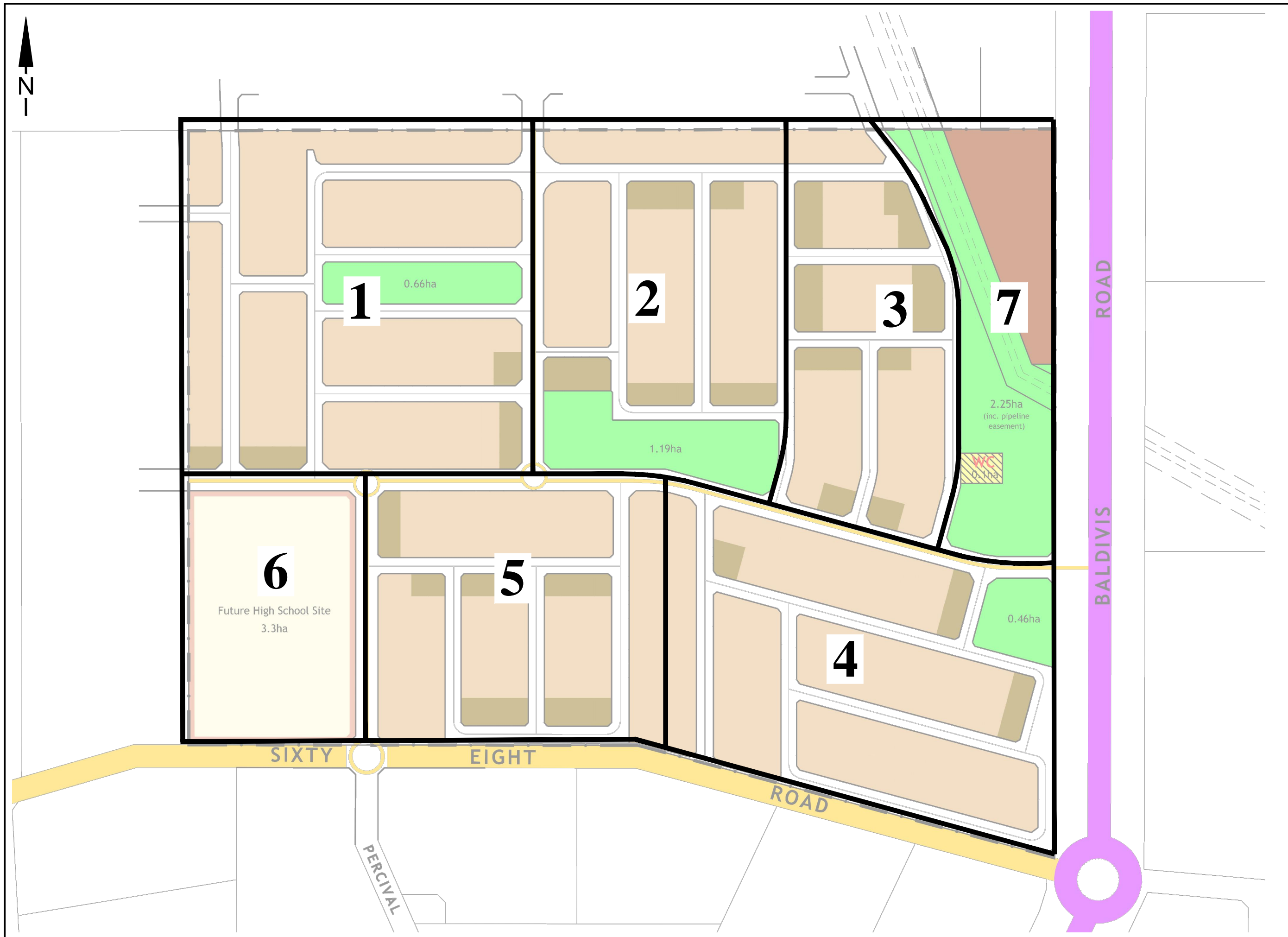
Note: 1) Traffic Zones are as shown in Figure 5.

Source: CLE Town Planning and Design



FIG.
4

LOCAL STRUCTURE PLAN

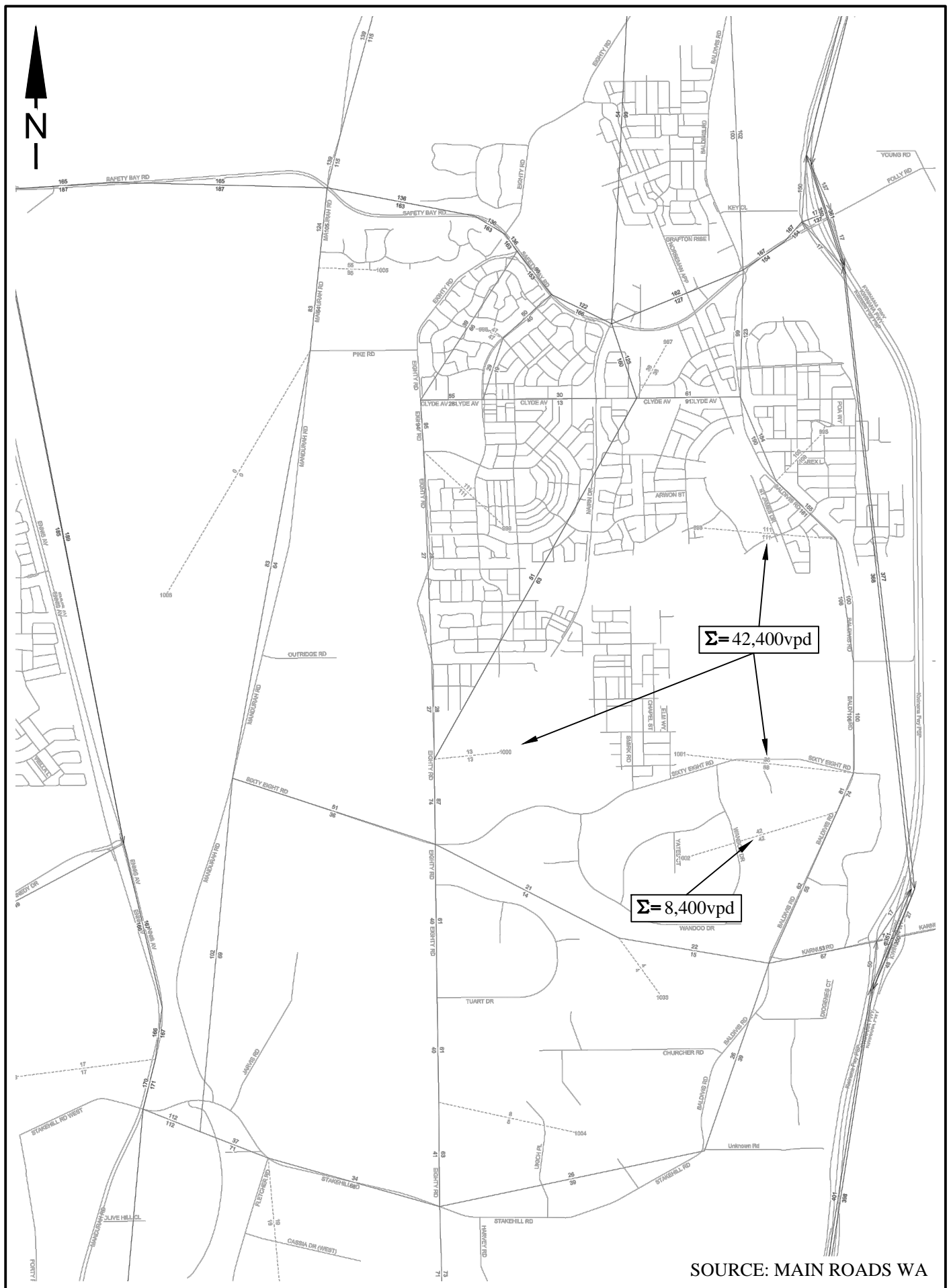


Future Traffic Zones

LOTS 21, 569 & 1263 BALDIVIS AND SIXTY EIGHT ROADS, BALDIVIS

2.4 FUTURE TRAFFIC FLOWS

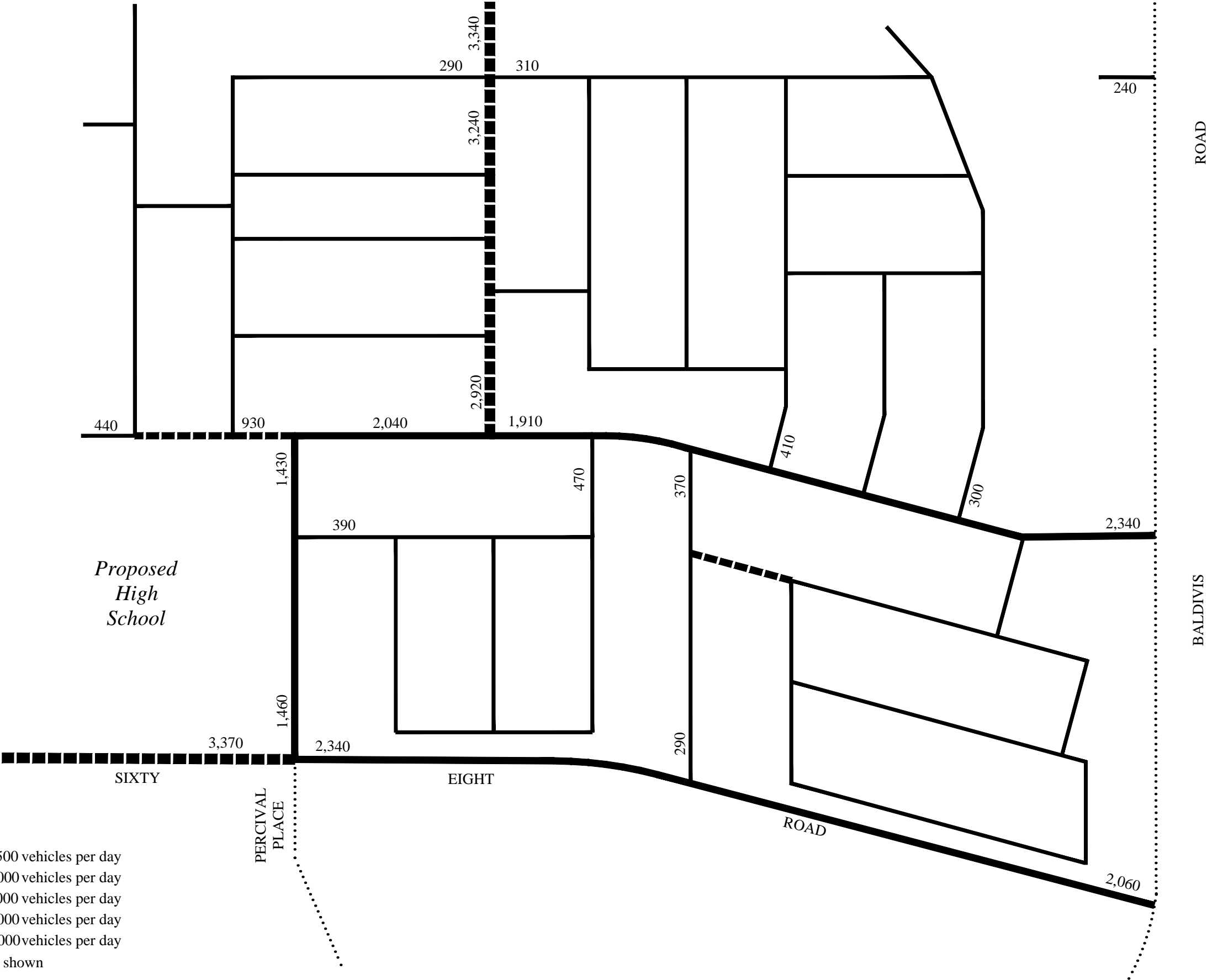
- In carrying out a traffic forecast for the proposed Local Structure Plan, it is estimated that 25 percent of all trips generated by the residential development will remain within the District Structure Plan area, accessing the Neighbourhood Centres proposed within the residential areas immediately to the north and west, as well as the local High School and Primary Schools. It is therefore estimated that 3,670 vehicle trips per day (75 percent) will travel to external destinations beyond the South Baldivis District Structure Plan area. Of these external trips, it is estimated 25 percent will travel to and from the Baldivis Town Centre, while 25 percent will travel to and from Rockingham City Centre and the Kwinana Industrial Area, with a further 30 percent travelling to and from Kwinana Freeway north, 10 percent travelling to and from either Kwinana Freeway or Baldivis Road south, and 10 percent travelling south or west via the Nairn Drive - Eighty Road - Karnup Road intersection. However, of the trips travelling to/from Kwinana Freeway north (30 percent), it is assumed that 10 percent (1 third) will do so via the Kwinana Freeway - Karnup Road interchange, while the other 20 percent (2 thirds) will travel via Safety Bay Road.
- On the basis of these assumptions, the 4,890 vehicle trips generated by the proposed Structure Plan have been assigned to the proposed road network, while an additional 600 trips anticipated to travel from the surrounding areas to the local High School have also been assigned.
- In addition, it is also important to consider trips from the surrounding residential areas that will utilise the Neighbourhood Connector roads within the Local Structure Plan and also trips using Sixty Eight Road. Traffic forecasting for 2031 was therefore obtained from Main Roads WA, as shown in Figure 6. In interpreting the traffic model, it can be seen that there are 3 centroid connectors representing the area bounded by Clyde Avenue, Nairn Drive, Sixty Eight Road and Baldivis Road, with a total trip generation of 42,400 vehicles per day. With an understanding of the District and Local Structure Plans and the Lot yields within the different precincts these overall traffic flows were re-allocated onto the overall network on the basis of the more fine-grained road network. A similar process was also carried out for the area south of Sixty Eight Road, which is assumed (in the Main Roads WA model) to have urban development with a total traffic generation of 8,400 vehicles per day.
- By assigning these flows in accordance with the external trip distribution above it is estimated that a total of 1,670 vehicles per day will travel north-south through Lots 21, 569 and 1263 from the various residential areas in the north to/from Sixty Eight Road, while an estimated 1,810 vehicles per day will travel east-west along Sixty Eight Road in addition to the local traffic flows generated by Lots 21, 569 and 1263.
- Taking all of the these items into account, the long term total weekday traffic flows within and adjacent to the proposed Local Structure Plan area are as shown in Figure 7. It can be seen in Figure 7 that the north-south Neighbourhood Connector Road is expected to carry 3,840 vehicles per day at the northern boundary, decreasing to 2,920 vehicles per day at the east-west road and 1,460 vehicles per day north of Sixty Eight Road. The east-west Neighbourhood Connector Road is expected to vary from 2,040 vehicles per day east of the proposed High School and up to 2,340 vehicles per day at Baldivis Road. It can also be seen in Figure 7 that Sixty Eight Road is expected to carry a maximum of 3,370 vehicles per day at its western end.
- On the basis of these traffic forecasts and the proposed overall road network, it is recommended that the northern portion of the north-south road should be classified as Neighbourhood Connector A, while the southern portion together with the east-west road should be Neighbourhood Connector B. Sixty Eight Road should also be classified as Neighbourhood Connector A adjacent to the proposed Structure Plan, with volumes in excess of 3,000 vehicles per day.



Main Roads WA Traffic Model
2031 FORECAST TRAFFIC FLOWS

LEGEND

- below 500 vehicles per day
- 500 - 1,000 vehicles per day
- 1,000 - 3,000 vehicles per day
- 3,000 - 7,000 vehicles per day
- above 7,000 vehicles per day
- traffic not shown



Future Weekday Traffic Flows
LOTS 21, 569 & 1263 BALDIVIS AND SIXTY EIGHT ROADS, BALDIVIS

2.5 PROPOSED ROAD NETWORK AND INTERSECTION SPACING

- With the north-south connector road proposed as staggered junctions it is important to consider the traffic patterns at the junctions and to assess their overall operation. On the basis of the assignment carried out, it can be seen from Figure 7 that the turning volumes at the staggered junctions will be well-balanced, with flows below 3,000 vehicles per day. It is therefore clear that acceptable operating conditions will be achieved with the proposed roundabouts.
- Intersection spacing along each of the Neighbourhood Connector roads should be a minimum of 40 metres, in accordance with *Liveable Neighbourhoods*, while intersection spacing along Access Streets can be as low as 20 metres.
- It is also important to take into account acceptable intersection spacings along Sixty Eight Road and Baldivis Road.
- In 'Guide to Road Design - Part 4A: Unsignalised and Signalised Intersections', Austroads specifies Safe Intersection Site Distance (SISD) as the minimum standard that should be provided on a major road on any intersection, in order to provide sufficient distance for the driver of a vehicles on the major road to observe a vehicle from the minor road moving into a collision situation and to stop before reaching the collision point. On the basis of this definition it is recommended that the SISD is a suitable measure to adopt for the minimum acceptable separation between intersections.
- The SISD for a design speed of 90 kilometres per hour is 226 metres, while the SISD for a speed of 80 kilometres per hour is 181 metres. Under the assumption that the speed limit along Baldivis Road will be reduced to 70 kilometres per hour once development occurs, it is therefore recommended to provide minimum intersection spacings of 181 metres.
- For Sixty Eight Road, with an assumed speed limit of 60 kilometres per hour, the minimum intersection spacing should be 151 metres in accordance with the SISD for a design speed of 70 kilometres per hour.
- It is important to note that a roundabout is also required at the 4-way intersection created at Sixty Eight Road - Percival Place as a result of the proposed Structure Plan. A standard local roundabout with an island diameter of 13 metres (and an outside diameter of approximately 27 metres) should be constructed, with Sixty Eight Road upgraded in accordance with the cross-section shown in the upper part of Figure 9 in Chapter 3 Recommendations. No further upgrades will be required, even if Sixty Eight Road is widened to the south, as also shown in Figure 9.
- City of Rockingham has also indicated that a roundabout will be constructed at the Baldivis Road - Sixty Eight Road intersection.
- It is also assumed that there will be a condition of subdivision requiring the adjacent roads to be upgraded from their existing rural standard to an appropriate urban standard.

2.6 RECOMMENDED ROAD RESERVES

- Road reserves for the proposed structure plan should initially be specified in accordance with the standard provisions in *Liveable Neighbourhoods*, as follows:
 - Neighbourhood Connector A: 24.4 metres
 - Neighbourhood Connector B: 19.4 metres
 - Access Street C: 15.4 metres
 - Access Street D: 14.2 metres
- However, *Liveable Neighbourhoods* acknowledges that “verge widths (including parking) can often be reduced from 6.2m to 5.5m with indented parking ...” for a ‘Neighbourhood Connector’, thus reducing the overall road reserve by 1.4 metres. It is therefore suggested that a reduced reserve width of 18 metres could be provided for the eastern portion of the east-west Neighbourhood Connector B road, on the basis that there will be no need for full parking lanes along this section of road. It is acknowledged, however, that parking will be required at the High School, so the standard road reserve width of 19.4 metres should be adopted immediately adjacent to the High School and between the staggered junctions of the north-south road.
- In spite of the above discussion City of Rockingham has advised that they require a 19.4 metre reserve for the full length of the east-west Neighbourhood Connector B road, as shown in Figure 8 in Chapter 3 Recommendations.
- *Liveable Neighbourhoods* also suggests that a Neighbourhood Connector A could be reduced by 2 metres in some circumstances by omitting the median, resulting in a road reserve width of 22.4 metres for the northern portion of the north-south Neighbourhood Connector A road. However, City of Rockingham has advised that this road should also be 19.4 metres, consistent with previous approvals for the Structure Plan immediately to the north. It is also important to note that a splitter island will be required at the southern end, at the junction with the east-west road, in order to ensure that vehicles do not cut the corner at this junction, as noted above in Section 2.5.
- Remaining streets within the Local Structure Plan are all classified as Access Streets, with significant local streets classified as Access Street C with 15.4 metre reserves, and all remaining streets being Access Street D with 14.2 metre reserves.
- It is important to note that *Liveable Neighbourhoods* also allows all of these road reserve widths to be reduced by 1.0 metres adjacent to public parkland, as also indicated in Figure 8.
- It should also be noted that all of the above road reserves are indicative only, and it may be possible to justify alternative road reserve widths on the basis of detailed engineering advice.

2.7 PUBLIC TRANSPORT AND PEDESTRIAN/CYCLIST FACILITIES

- As urban development within the area continues to expand, it is expected that the existing bus routes to the north and west of the site could be extended into Lots 21, 569 and 1263, particularly to service the new High School. With both the north-south and east-west roads classified as Neighbourhood Connectors, they will each be suitable for possible bus routes, and bus stops can be allocated accordingly.

- The Neighbourhood Connector roads should provide footpaths or shared paths on each side, in accordance with *Liveable Neighbourhoods*, while Access Streets should provide a footpath or shared path on at least one side.

2.8 OTHER CONSIDERATIONS

2.8.1 Impact of Not Extending Karnup Road

- The MRWA traffic forecast shows 3,700 vehicles per day on Karnup Road east of Baldivis Road in 2031. If Karnup Road has not been constructed then this 3,700 vehicles per day would likely be added to Sixty Eight Road, bringing total traffic flows to approximately 7,000 vehicles per day, which is still acceptable for a Neighbourhood Connector A road.

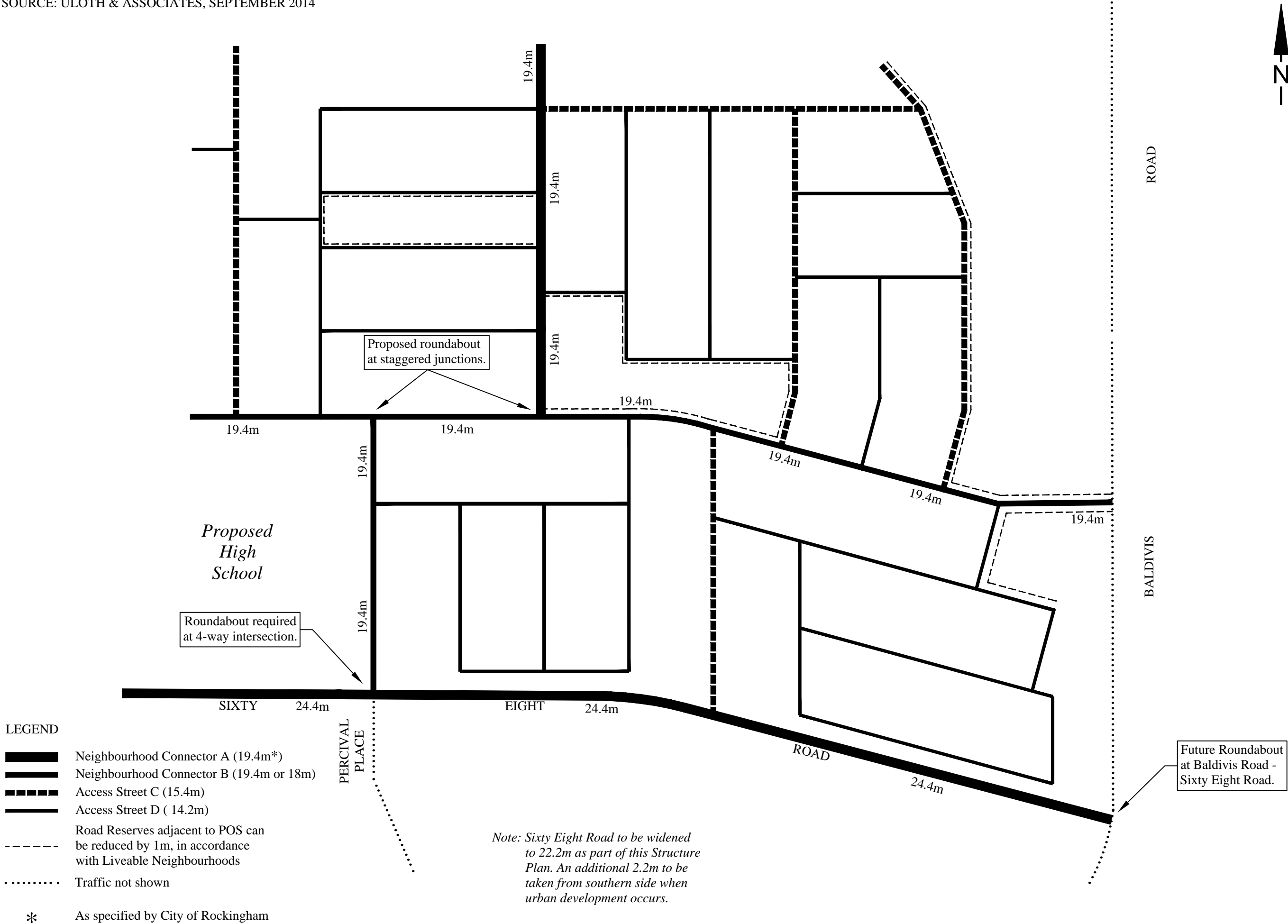
2.8.2 Future Development South of Sixty Eight Road

- The traffic forecasts described above in Section 2.4 include the likely future urban development of land south of Sixty Eight Road. It is therefore reasonable that the proposed widening of Sixty Eight Road by 4.4 metres to 24.4 metres should be evenly balanced on the northern and southern sides.
- The proposed Structure Plan for Lots 21, 569 and 1283 therefore includes a widening of 2.2 metres on the northern side of Sixty Eight Road. This will allow Sixty Eight Road to be constructed in accordance with Figure 17 of *Liveable Neighbourhoods*, except with no parking on the south side and with a verge width of 4.0 metres as shown in the upper part of Figure 9 in Chapter 3, with an initial road reserve width of 22.2 metres. The lower part of Figure 8 then shows the ultimate layout of Sixty Eight Road within a 24.4 metre road reserve, once development has occurred on the south side.

3. RECOMMENDATIONS

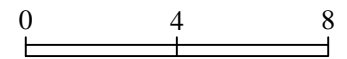
The following recommendations are made on the basis of the study findings and conclusions documented above in Chapter 2.

- The recommended road hierarchy for the proposed Local Structure Plan on Lots 569 and 1263 Baldivis Road and Lot 21 Sixty Eight Road is as shown in Figure 8. The recommended typical road reserve widths are also shown.
- It is recommended that the northern part of the north-south road through the Structure Plan should be classified as Neighbourhood Connector A under Liveable Neighbourhoods, but with a road reserve width of 19.4 metres, as shown in Figure 8, consistent with the approved road reserve for the continuation of this road further north.
- It is recommended that the southern part of the north-south road and the full length of the east-west road should be classified as Neighbourhood Connector B, with a road reserve width of 19.4 metres.
- It is recommended that Sixty Eight Road should be classified as Neighbourhood Connector A.
- It is recommended that the existing road reserve along Sixty Eight Road should be widened on the northern side of Sixty Eight Road to an initial road reserve width of 22.2 metres, as already indicated within the proposed Structure Plan. A further 2.2 metre widening should then also be taken on the southern side when urban development occurs, with recommended cross-sections as shown in Figure 9.
- It is recommended that two roundabouts be installed within the Local Structure Plan, at the 2 staggered junctions of the north-south Neighbourhood Connector. It is also recommended to install a roundabout, with an island diameter of 13 metres and an outside diameter of approximately 27 metres, at the 4-way intersection created at Sixty Eight Road - Percival Place, as noted in Figure 8 and as discussed in Section 2.5, which will also be suitable for future urban development south of Sixty Eight Road. City of Rockingham has advised that a roundabout will also be constructed at the Baldivis Road - Sixty Eight Road intersection.
- All other roads within the Local Structure Plan area should be classified as Access Street C or Access Street D, with typical road reserves as shown in the recommended road hierarchy in Figure 8.
- It is recommended to make provision for Bus Stops along the east-west Neighbourhood Connector road through the local structure plan, and either extend existing bus services or provide a new bus route to cater for the proposed residential catchment and proposed High School.
- It is also recommended to provide footpaths or shared paths along both sides of the 'Neighbourhood Connector' roads, but with a 2.5 metre path directly abutting the High School, while footpaths should also be provided along all other Local Structure Plan roads, in accordance with Liveable Neighbourhoods. Shared paths should also be provided along the northern side of Sixty Eight Road and the western side of Baldivis Road, abutting the proposed Structure Plan. The recommended path network for the proposed Local Structure Plan is shown in Figure 10.



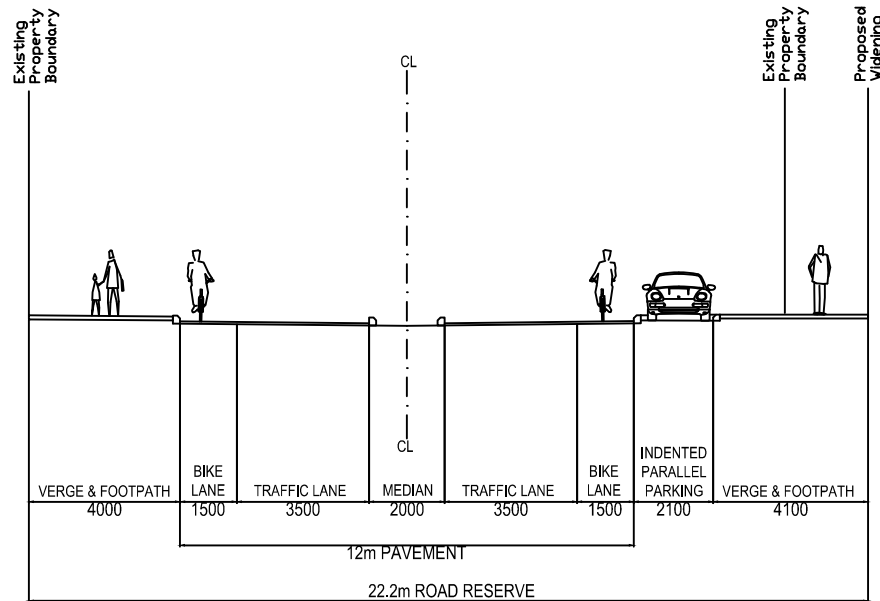
Recommended Road Hierarchy and Road Reserves
LOTS 21, 569 & 1263 BALDIVIS AND SIXTY EIGHT ROADS, BALDIVIS

SOURCE: ULOTH & ASSOCIATES



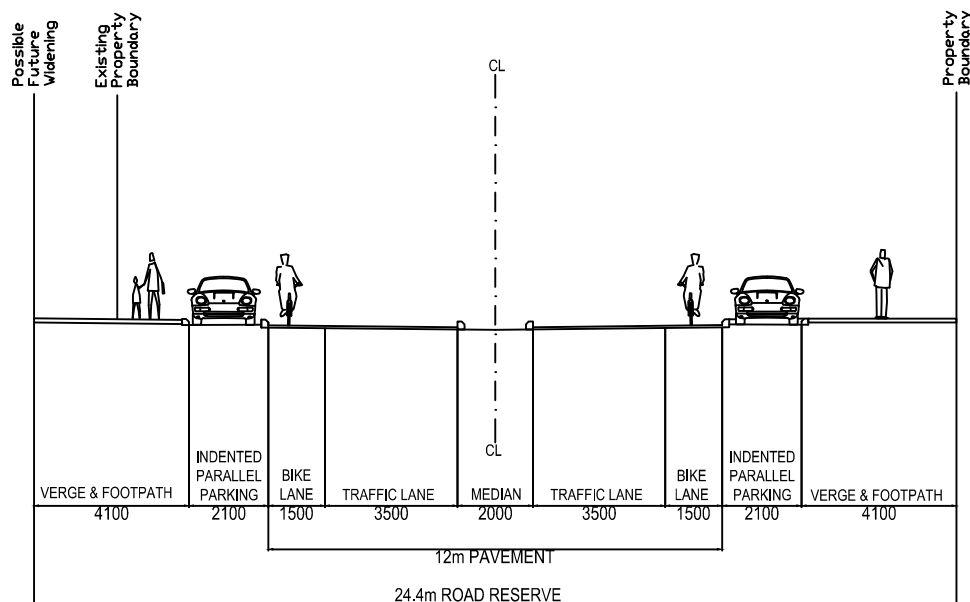
METRES
SCALE 1 : 200

SOURCE: ULOTH & ASSOCIATES



*Currently proposed
Structure Plan on
north side.*

RECOMMENDED STRUCTURE PLAN

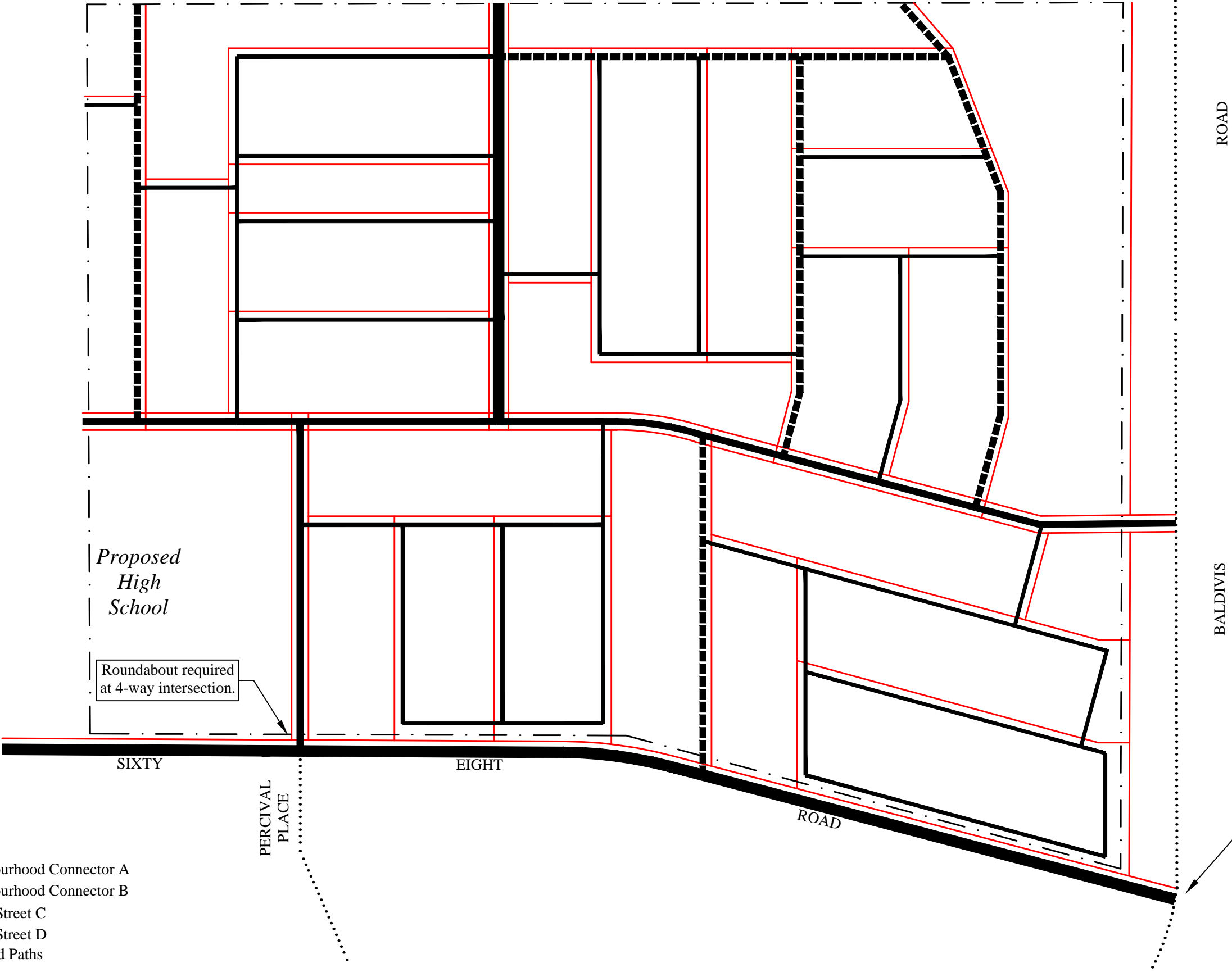


POSSIBLE LONG TERM

Recommended Cross-Section

SIXTY EIGHT ROAD WEST OF BALDIVIS ROAD

FIG.
9



LEGEND

- Neighbourhood Connector A
- Neighbourhood Connector B
- Access Street C
- Access Street D
- Proposed Paths

Recommended Path Network
LOTS 21, 569 & 1263 BALDIVIS AND SIXTY EIGHT ROADS, BALDIVIS