CNU London Transportation Summit, November 2007

The West Australian
Liveable Neighbourhoods
Design Code and Policy

Incorporating a New Urbanist Street Design Manual for New Communities

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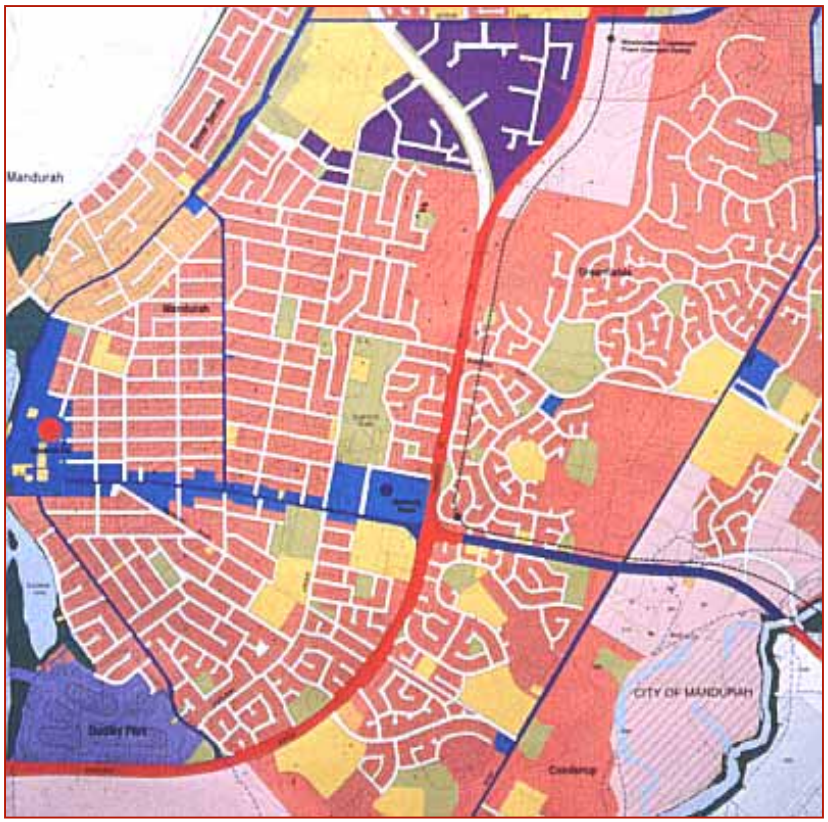
Western Australia…

a large state in Australia, with a small population (2m) and only one major city, Perth (population 1.5m).

Perth - clinging to the coast, and growing along it



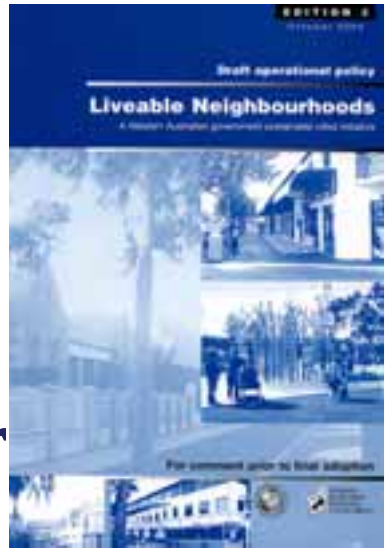
Mandurah in southern Perth: The traditional township

Western Australia…

“Best Planned Sprawl on the Planet”

Liveable Neighbourhoods Code

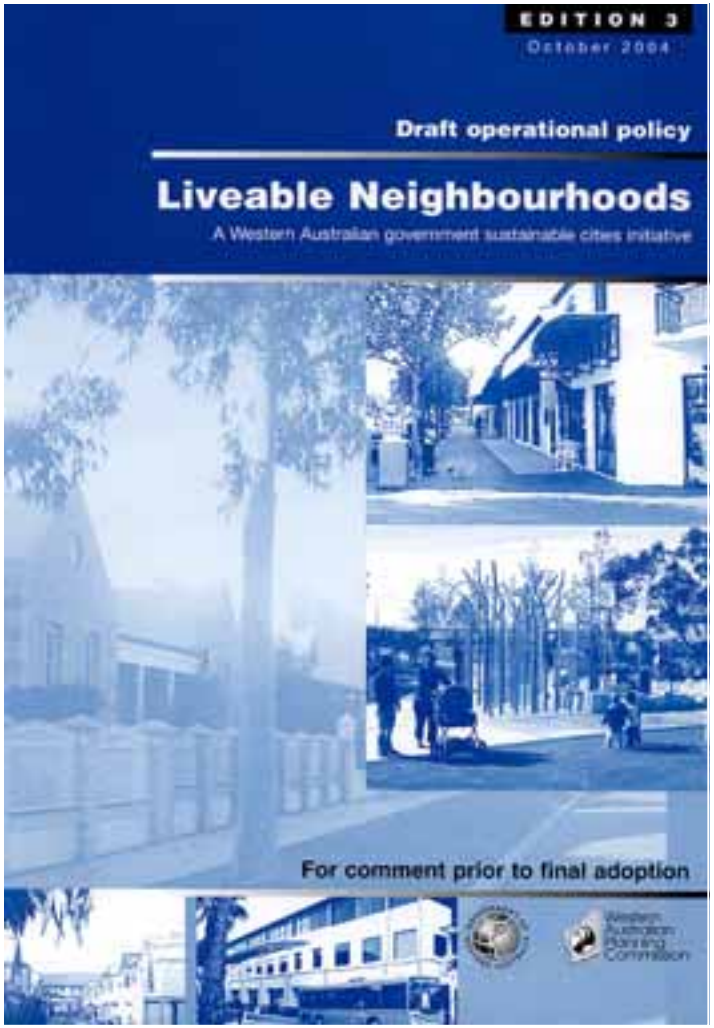
Overview



- Applies to new growth areas and is an antidote to sprawl.
- Requires new urban extensions to be higher density, mixed use walkable places, with highly interconnected streets and attractive street-frontage development.
- Aims to significantly reduce car travel demand and facilitate a significant increase in local jobs self-containment
- Is a key sustainable development initiative of the WA Government.

Liveable Neighbourhoods Code - What is it?

A Government code for regulating structure plans and subdivisions. Holistic… aims to create New Urbanist outcomes for all new urban extensions



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Code Design Elements

E1. Community Design

E2. Movement Network

E3. Lot Layout

E4. Public Parkland

E5. Urban Water Management

E6. Utilities

E7. Activity Centres & Employment

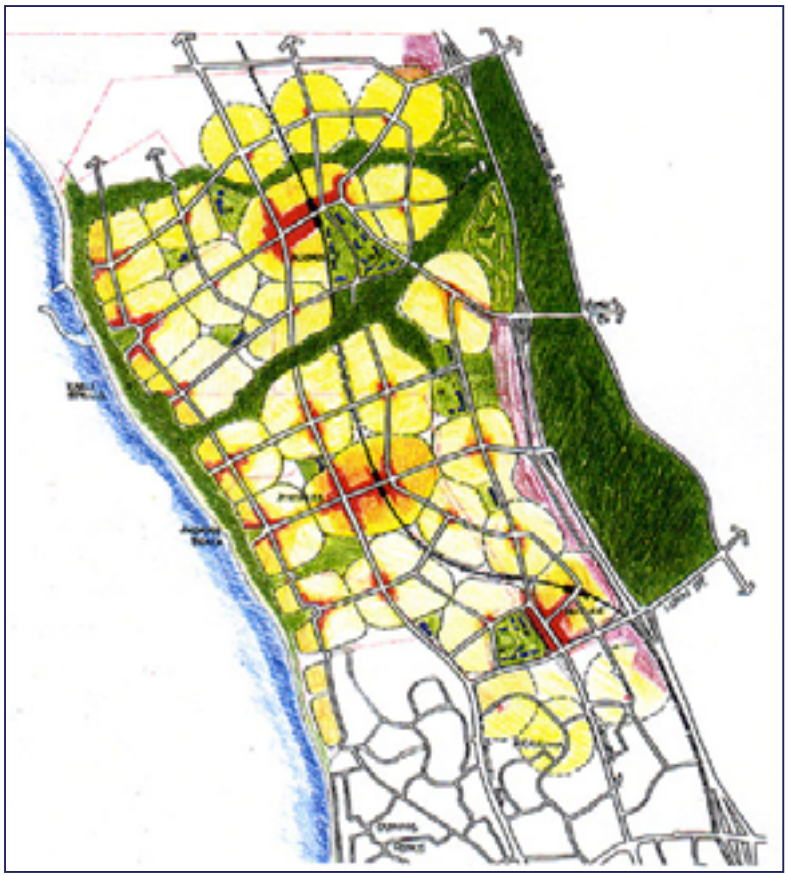
E8. Schools

CNU 2001 Charter Award winner

Liveable Neighbourhoods Code

Element 1. Community Design

sets the overall direction at all scales.



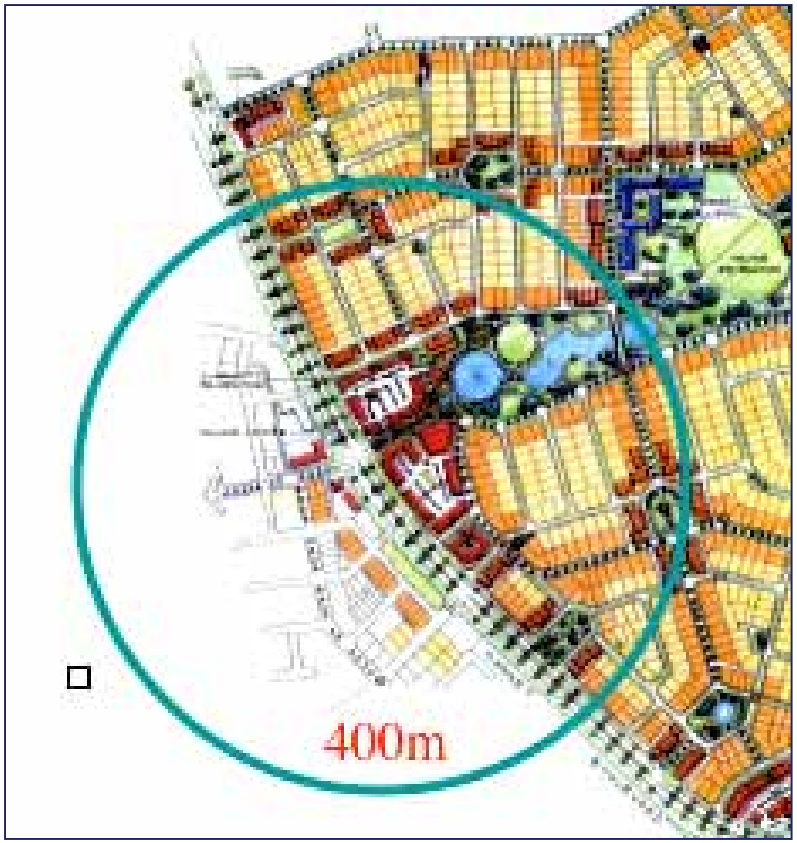
Sub-regional Structure Plan

Town and neighbourhood-scale District Structure Plan

Liveable Neighbourhoods Code

Element 1. Community Design

sets the overall direction at all scales.



Local Structure Plan

Subdivision Plan

… and there are also Detailed Area Plans for built form (not shown)

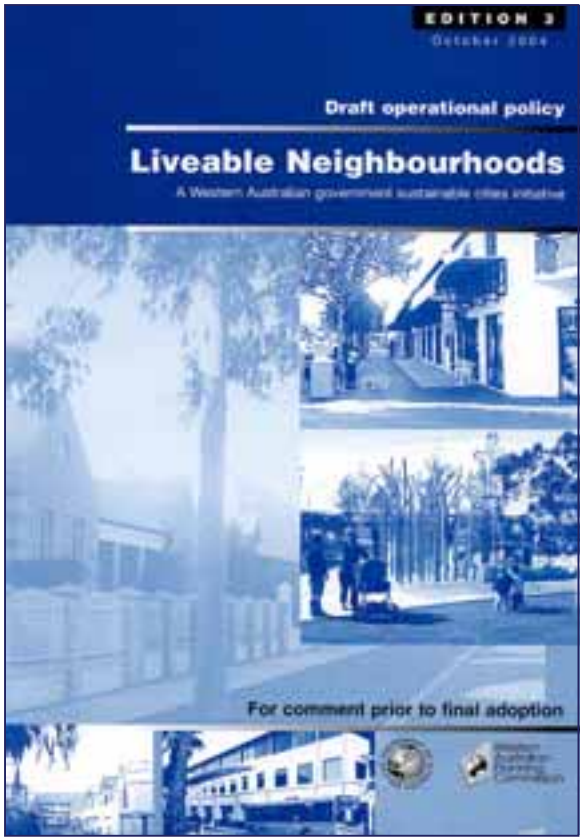
Liveable Neighbourhoods Code - History and Status

Edition 1 1997 Optional alternative to existing DC Policies (sprawl)

Edition 2 2000 Optional, partial use encouraged

Edition 3 2004 Preferred, but still optional; widespread use of most aspects

Edition 4 - due late 2007 - To be mandatory, except in a few circumstances



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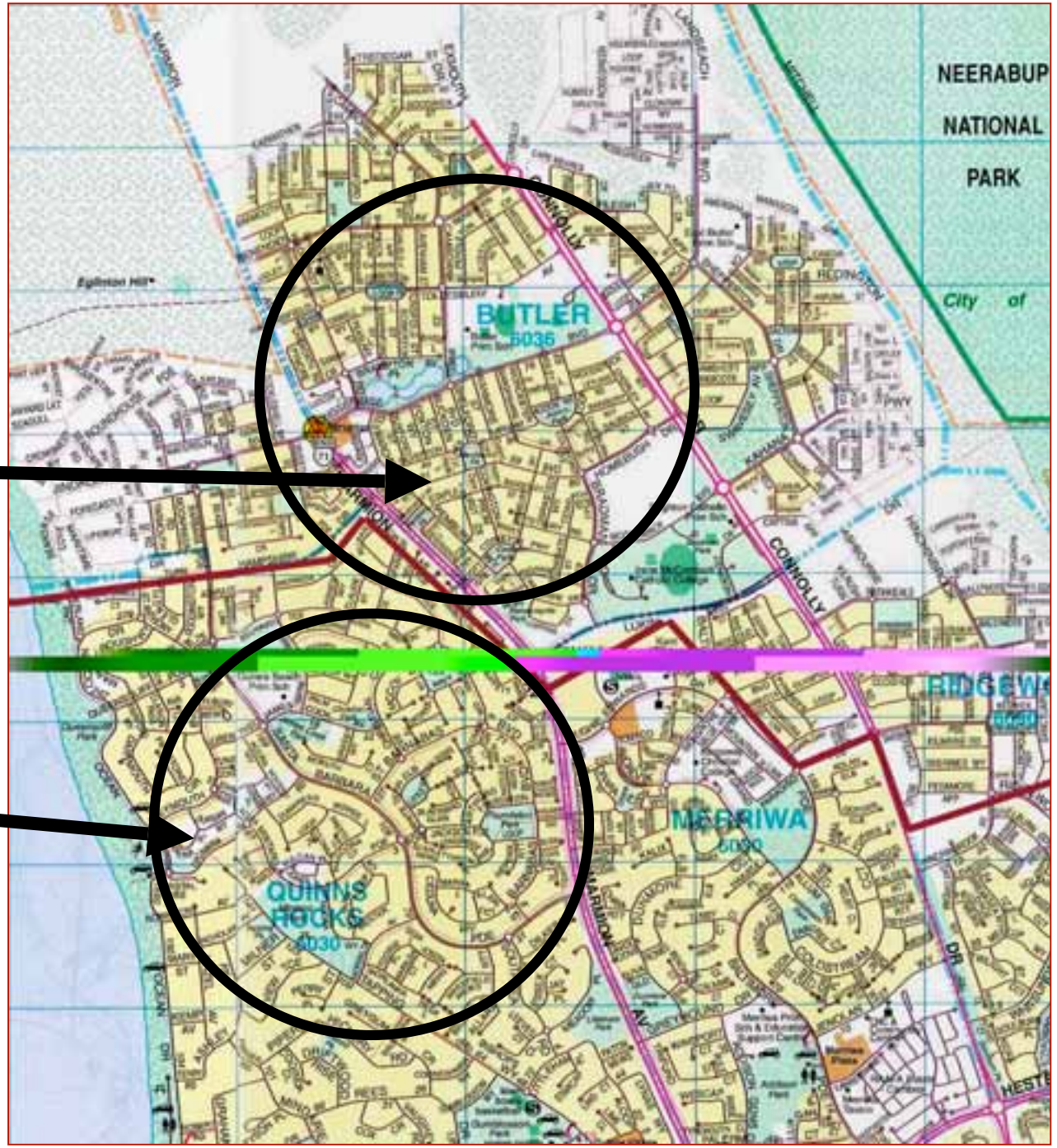
Ten years of gradual adoption and enforcement by the Government planning authority, the West Australian Planning Commission, which approves all structure plans and subdivisions.

Under *Liveable Neighbourhoods…*

North West Perth

2000's

1990's



North West Perth

The new…
Brighton (LN)

The old… before LN..
Merriwa

LN Element 2 Movement Network

Each Element contains:

- Introduction
- Key Differences from Current Practice
- Objectives
- Requirements
- Explanatory diagrams

Topics included in E2 Movement Network

- Street network design
- Street types and cross-sections
- Intersection controls
- Public transport
- Pedestrian movement and “pedsheds”
- Cyclist networks
- Trees in streets

LN E2 Movement Network

Key Objectives For the Street Standards

- **Deemed to comply ‘street standards’ applicable across all local governments in the state;**
- **Support sustainable urbanism/New Urbanism;**
- **Create opportunities for business establishment;**
- **Context-sensitive …. changing form along a street;**
- **Land-efficient… no wider than necessary;**
- **Enable urbanism to integrate across streets;**
- **Traffic speed control;**
- **Support walking, cycling and public transport.**

Street Design - Contrasting forms - Arterial road design

Divider arterial (before LN)

Isolating
Poor surveillance
No business opportunity
Boring pedestrian environment
Fast-moving traffic
Poor quality bus stop locations

Integrator arterial (as per LN)

Active frontage
Public transport
Trees
Pedestrian-friendly
Easy to cross
Good passive surveillance
Supportive of business

Contrasting forms - Residential street design and detailing

Wide local access road (before LN)

Typically 11m wide pavement

High vehicle speeds

Poor pedestrian safety and amenity

Lack of street lighting and shade trees

Large intersection radii

Rarely have footpaths

Traditional street (as per LN)

Slow traffic speeds created by on-street parking

Great pedestrian amenity- footpaths on both side of street, good street lighting, and trees for shade

Typically a 7.2m pavement (three lanes… a yield street)

LN E2 Movement Network

Components of the Street Standards

- **Arterial and local street cross-sections**
- **Junction-spacing tables**
- **Traffic lights spacing table**
- **Four-way intersection designs for local streets**
- **Footpath and shared path dimensions**
- **Service road design (along arterials)**
- **Kerb radii, splays and turning templates**
- **Traffic speed management requirements**
- **Clear zones to trees**

The Street Cross-Sections (12)

Integrator Arterials

- Integrator A - four lane arterials (3)
- Integrator B - two lane arterials (2)

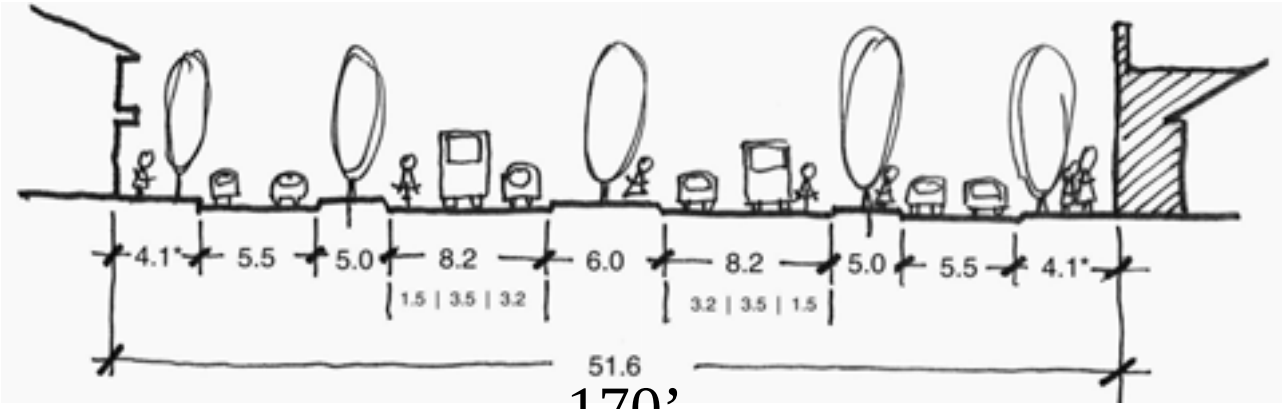
Local Streets

- Neighbourhood Connectors (2)
- Access Streets (4)
- Rear Lane (1)

Plus provision for Special Streets, e.g.:

- Extra town centre streets
- Streets in neighbourhood centres
- Streets abutting schools
- Site-specific streets

Integrator A (4-lane arterials)



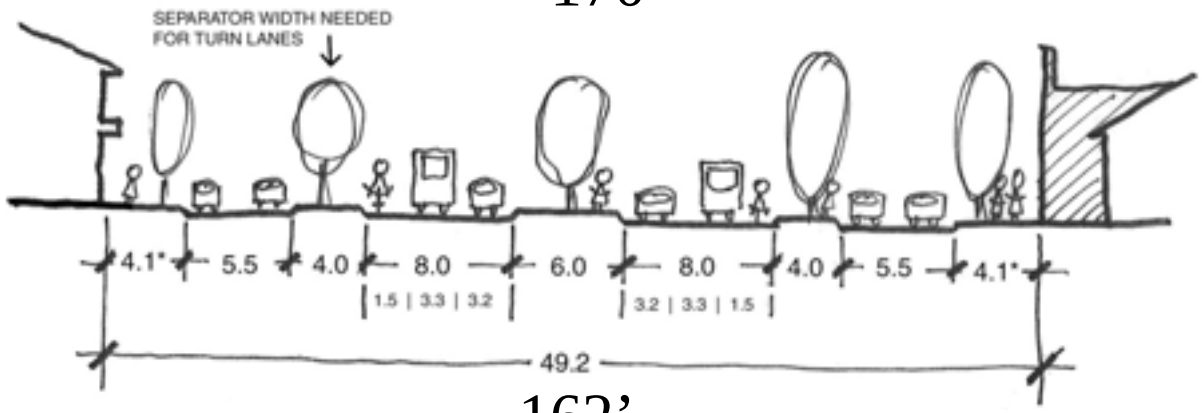
170’

Integrator A-70

42mph, 15-35,000vpd

2 x 27’ pavements plus 2 x 18’ service roads in 170’ ROW

Parking in service road



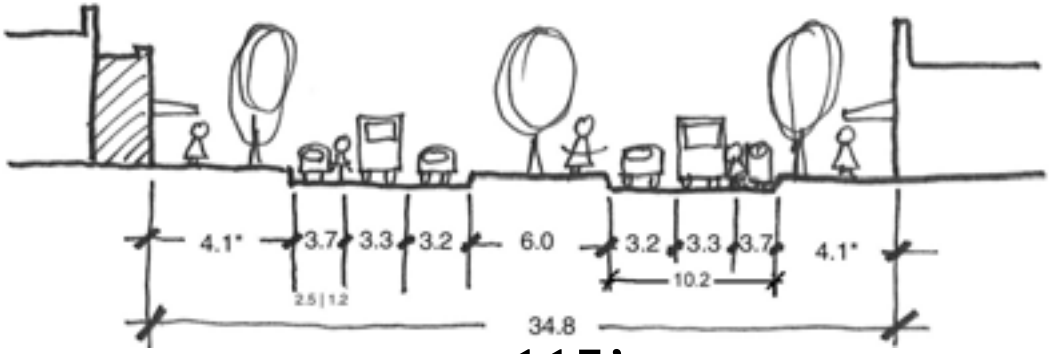
162’

Integrator A-60

35mph, 15-35,000vpd

2 x 26’ pavements plus 2 x 18’ service roads in 162’ ROW

Parking in service road



115’

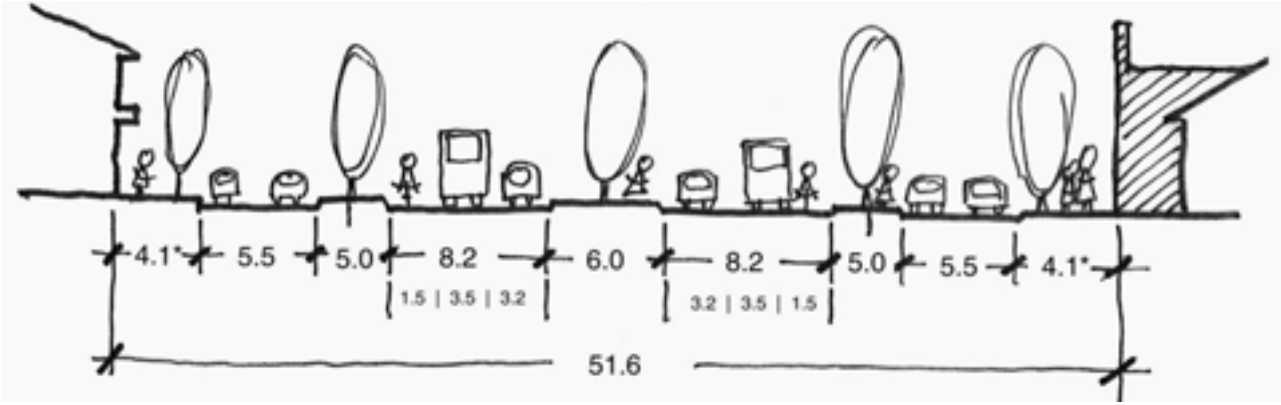
Integrator A-Centres

35mph, <25,000vpd, <800yards

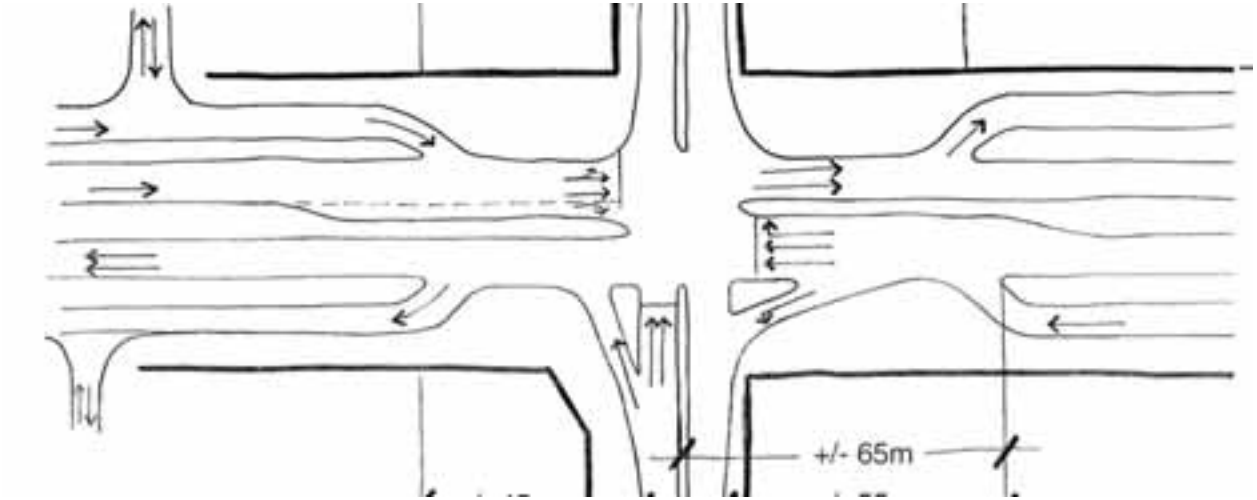
2 x 33.5’ pavements in 115’ ROW

On-street parking

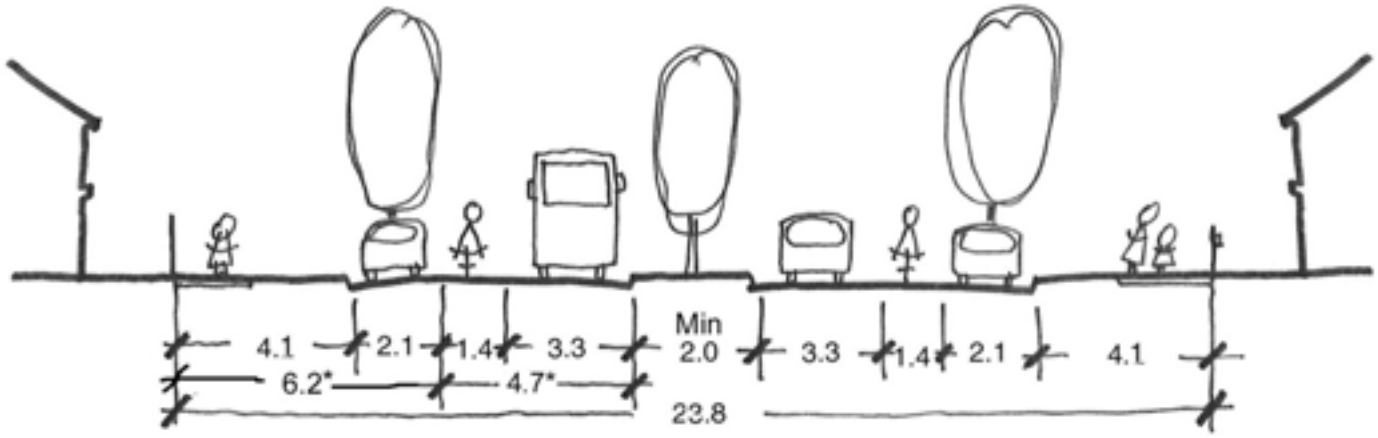
Integrator (Multiway): Section and Plan



170’



Neighbourhood Connectors

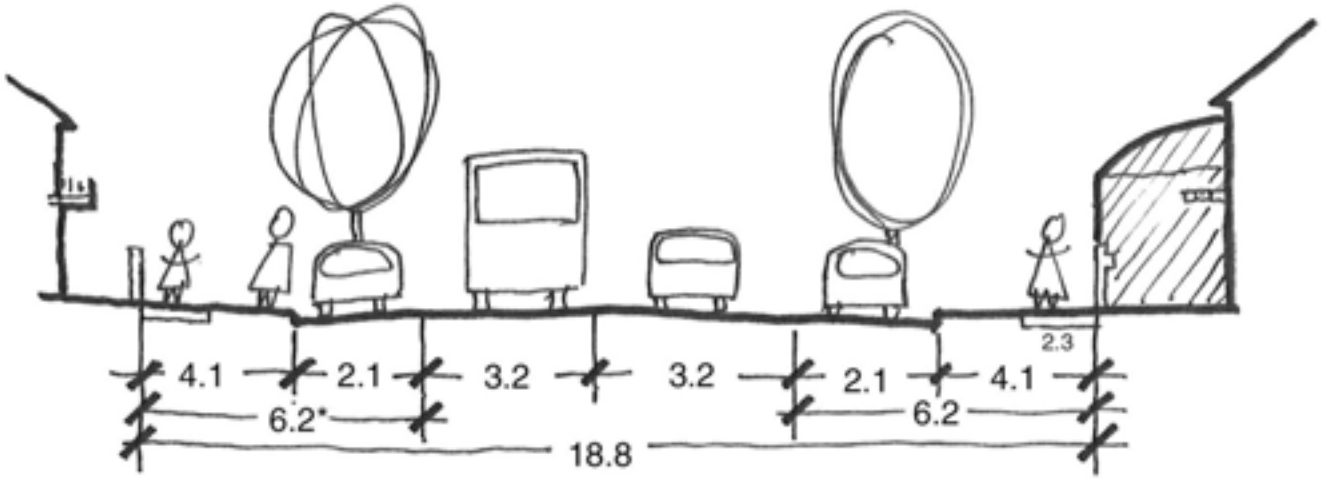


Neighbourhood Connector A

30mph, <7000vpd

2 x 22.3’ pavements in 78’ ROW,

On-street parking (may be indented)



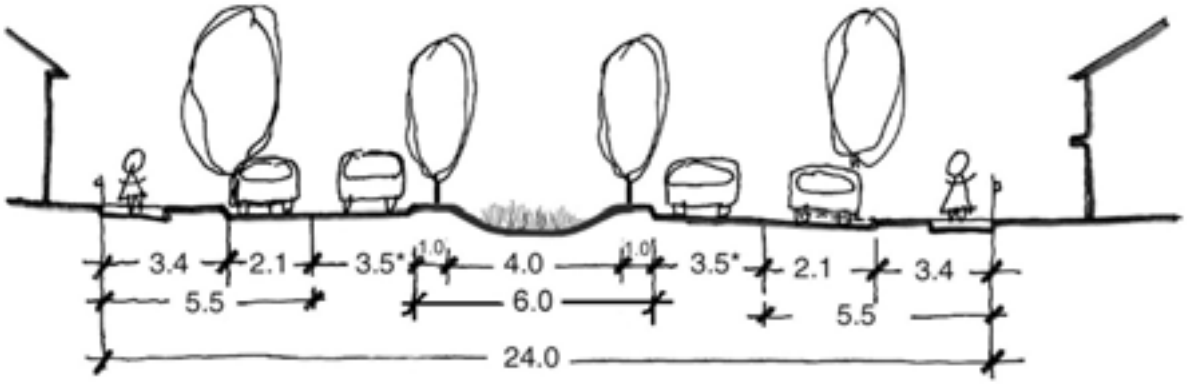
Neighbourhood Connector B

30mph, <3000vpd

35’ pavement in 62’ ROW

On-street parking (may be indented)

Access Streets (first pair of four)



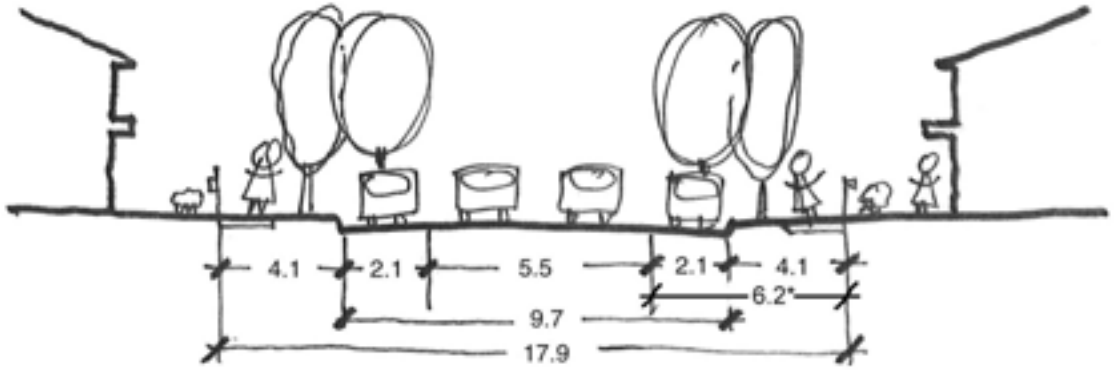
Access Street - A (Avenue)

25mph, <3000vpd

2 x 18.4’ in 79’ ROW

On street parking (may be indented)

Ideal for drainage swales



Access Street - B (Wider access street)

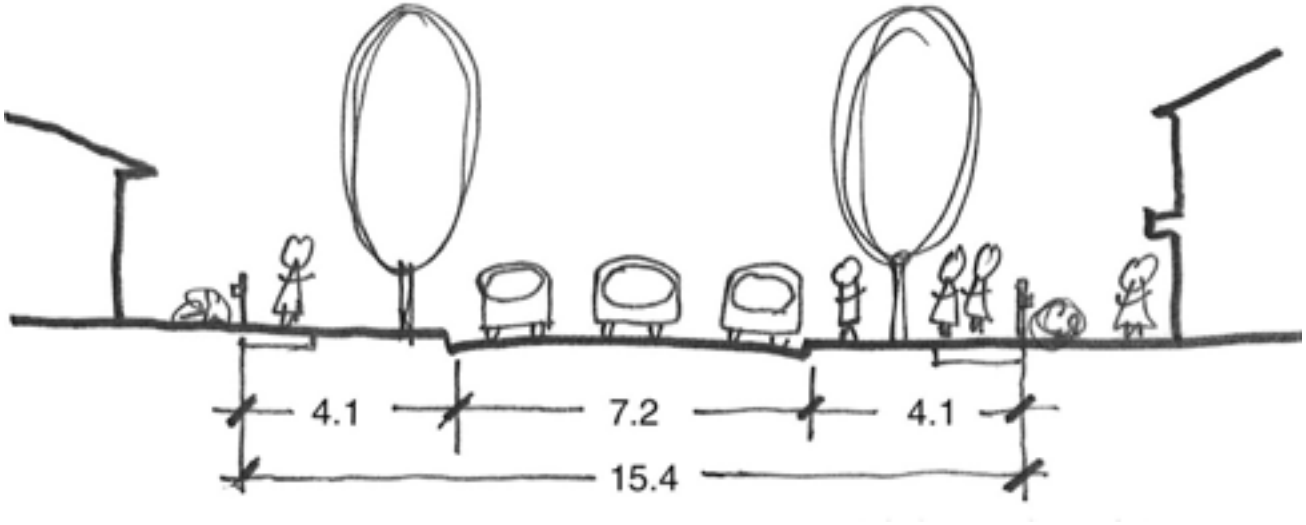
25mph, <3000vpd

32’ pavement in 59’ ROW

Two-travel lanes and on-street parking

Ideal for high parking demand

Access Streets (second pair of four)



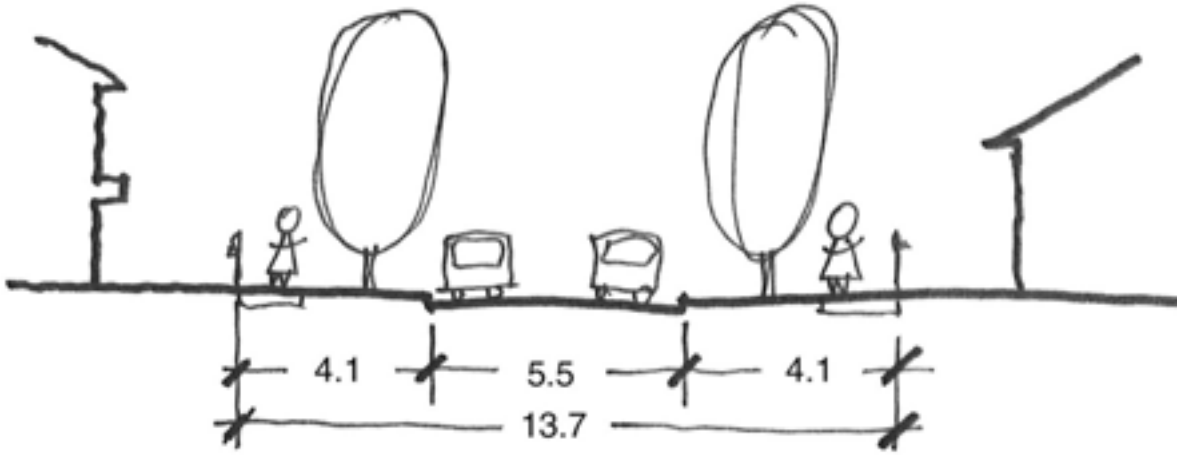
Access Street - C (Yield Street)

25mph, <3000vpd

The most common residential street

24’ in 51’ ROW

Parking both sides



Access Street - D (Narrow Yield Street)

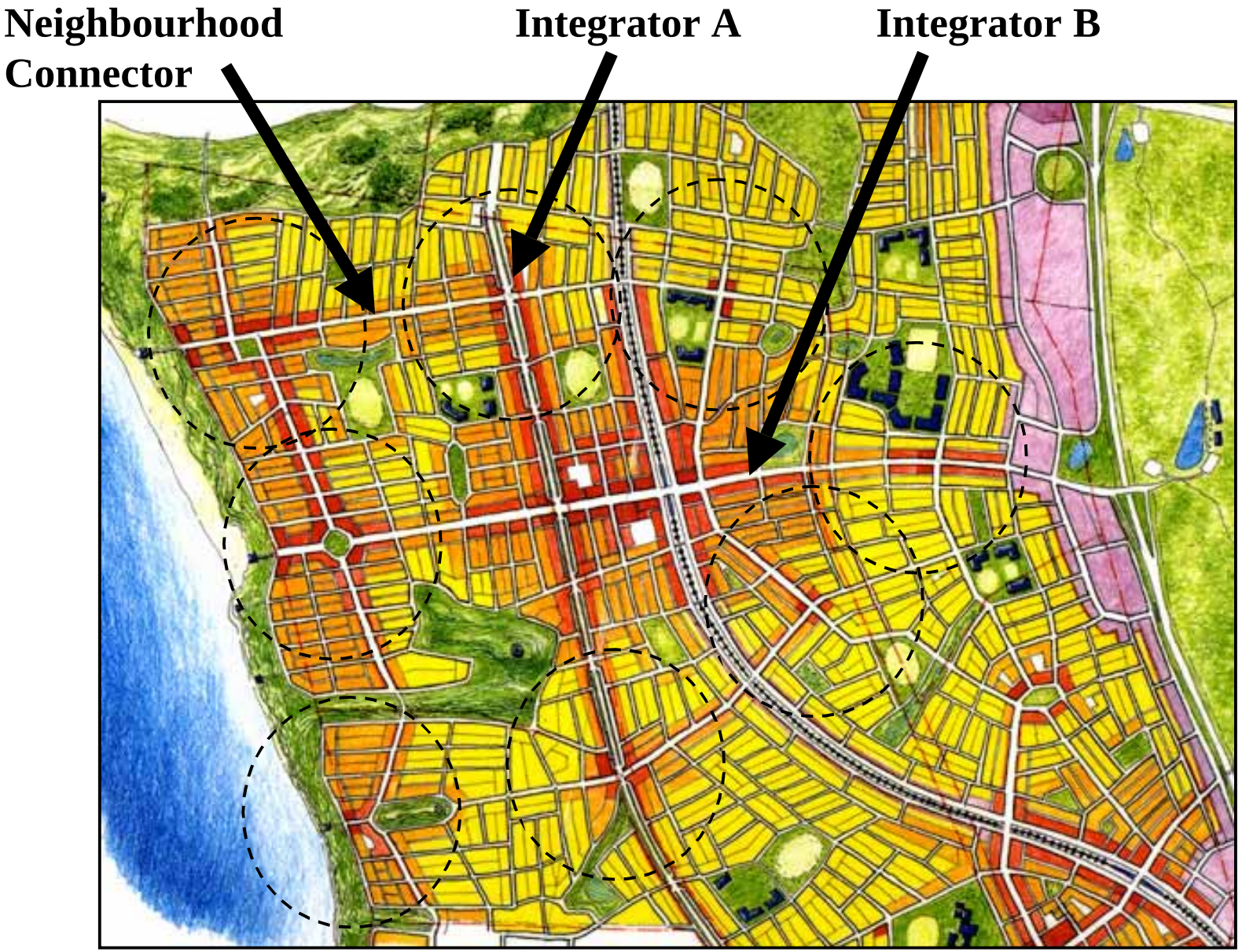
20mph, <1000vpd

18’ pavement in 45’ ROW

Intermittent parking both sides

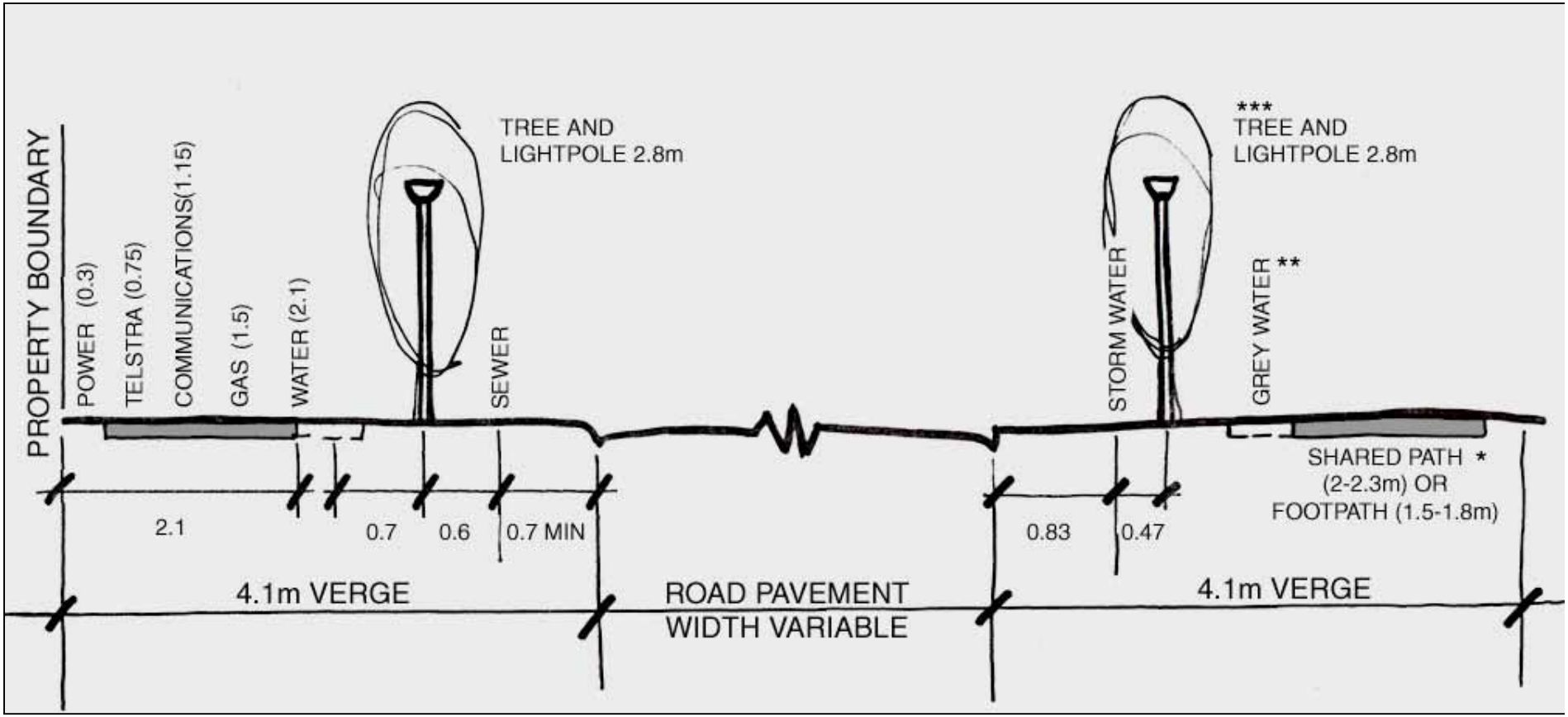
Suits lower density housing

Applying the Street Sections



Verge Details and Tree Clear Zones

Minimum width of verge, footpath or shared path, and services, plus location of tree zone for large shade trees



Typical minimum residential footpath width 1.8m/1.5m (6')
Typical minimum shared path width 2.3m/2.0m (7.5')

Street Speeds

Target operating speeds and design speeds specified for all local streets

Table 3B Target operating speed and design speed - applications and examples for the use of these different design parameters	
Street type/Design application	**Design parameter**
Local street	
Speed control through: Local Area Traffic Management (LATM) devices, lane and carriageway width, on-street parking, street leg length, road deflections and curvature, landscaping and supplementary speed camera enforcement.	Design speed = Target operating speed (eg 30-40 km/hr desirable operating speed target on access streets) (**table 2**).
Approach Sight Distance (ASD) and Safe Intersection Sight Distance (SISD).	Design speed = 85th percentile operating speed or legal speed limit (whichever is greater).
Integrator A/B	
Approach Sight Distance (ASD) and Safe Intersection Sight Distance (SISD).	Design speed = 85th percentile operating speed or legal speed limit + 10 km/hr at interim stage or full build out (whichever is greater).*
Intersection spacing ** (as determined primarily from deceleration + storage length requirements as set out in *Austroads Part 5, Table 5.6*) Street cross-section elements (eg lane width)	Design speed = legal speed limit at full build out.

Examples of LN streets in new communities

Knightsbridge Avenue, Brighton.. through new neighbourhood centre. **(Neighbourhood Connector A)**

Main Street, through new partially- main street-based Ellenbrook Town Centre…
(Similar to Neighbourhood Connector A)

Examples of LN streets (cont)

Plaistow St, Joondalup - the first 'demonstration' 6m yield street with footpaths, smaller lots, less front setbacks and rear lane. (Access St D)

Street in Joondalup mixed use precinct, typical of Access Street B (wider, typically 9.7m pavement, including embayed parking)

Royal Avenue, Claisebrook - special town centre street. (Integrator B Town Centre without median)

Rear lane in Subiaco

Examples of LN streets (cont)
Joondalup City Centre, NW Perth

Shared streets in centre

Residential streets with rear lanes

Grand Boulevard - An urban integrator arterial with frontage

Examples of LN streets (cont)
Joondalup City Centre, NW Perth

Residential streets with rear lanes

Conclusion

Liveable Neighbourhoods **represents a remarkable change in both neighbourhood and street design in WA. It has transformed virtually all development on the Perth urban fringe from sprawl to hybrids of New Urbanism.**

The fast growth of Perth enables new design outcomes to be seen and tested on the ground, providing positive re-inforcement for good outcomes. Market acceptance is evident, with excellent sales rates in the better new LN communities.

Element 2 Movement Network is a very useful street standards model for other communities and has been used across Australia and internationally. But it does need to be part of an overall urban philosophy of higher density, mixed use development.

There is still a way to go. LN is not yet mandatory… but the ten year transitional arrangement has worked reasonably well. Some street standards are not yet optimal for New Urbanism. And LN 4 may show some retreat….

The *Liveable Neighbourhoods Code, V3*
and its companion
Traffic Management Guidelines
are available on
www.wapc.wa.gov.au

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Junction Spacings and Intersection Controls

Between all street types… Table 3 and 3A

Intersection controls

Intersection design for vehicle and pedestrian safety needs to take account of traffic volumes and type of vehicles on each leg, likely traffic speeds and turning movements, topography and the need for the junction to act as a slow point in one or more directions.

Solutions may range from simple stop signs, narrowed throats and raised pavements, mini roundabouts, or occasionally more complex traffic management devices.

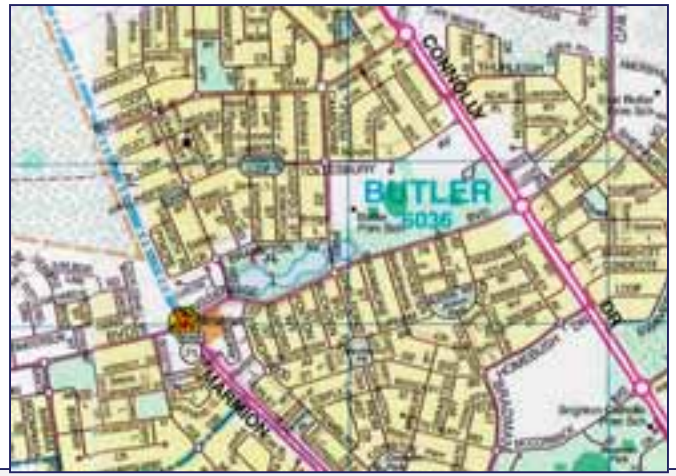


Table 3 – Junction spacing (measured from road reserve centreline to centreline of terminating street pavements)

Street type	L/R staggers (to avoid overlapping right turns)	R/L staggers To provide for left-turn deceleration lanes arterials and to avoid corner cutting on local streets	Junctions on same side of street
LOCAL STREETS			
Laneway	NA	NA	
Access street*	20 m	20 m	20 m
Neighbourhood connector	40 m	40 m	40 m
ARTERIALS			
Integrator B	60 m	40 m	40 m
Integrator A – 60 km/hr**	150 m	110 m	110 m
Integrator A – 70 km/hr**	190 m	130 m	130 m

Verge Details and Tree Clear Zones

Minimum width of verge, footpath or shared path, and services, plus location of tree zone for large shade trees

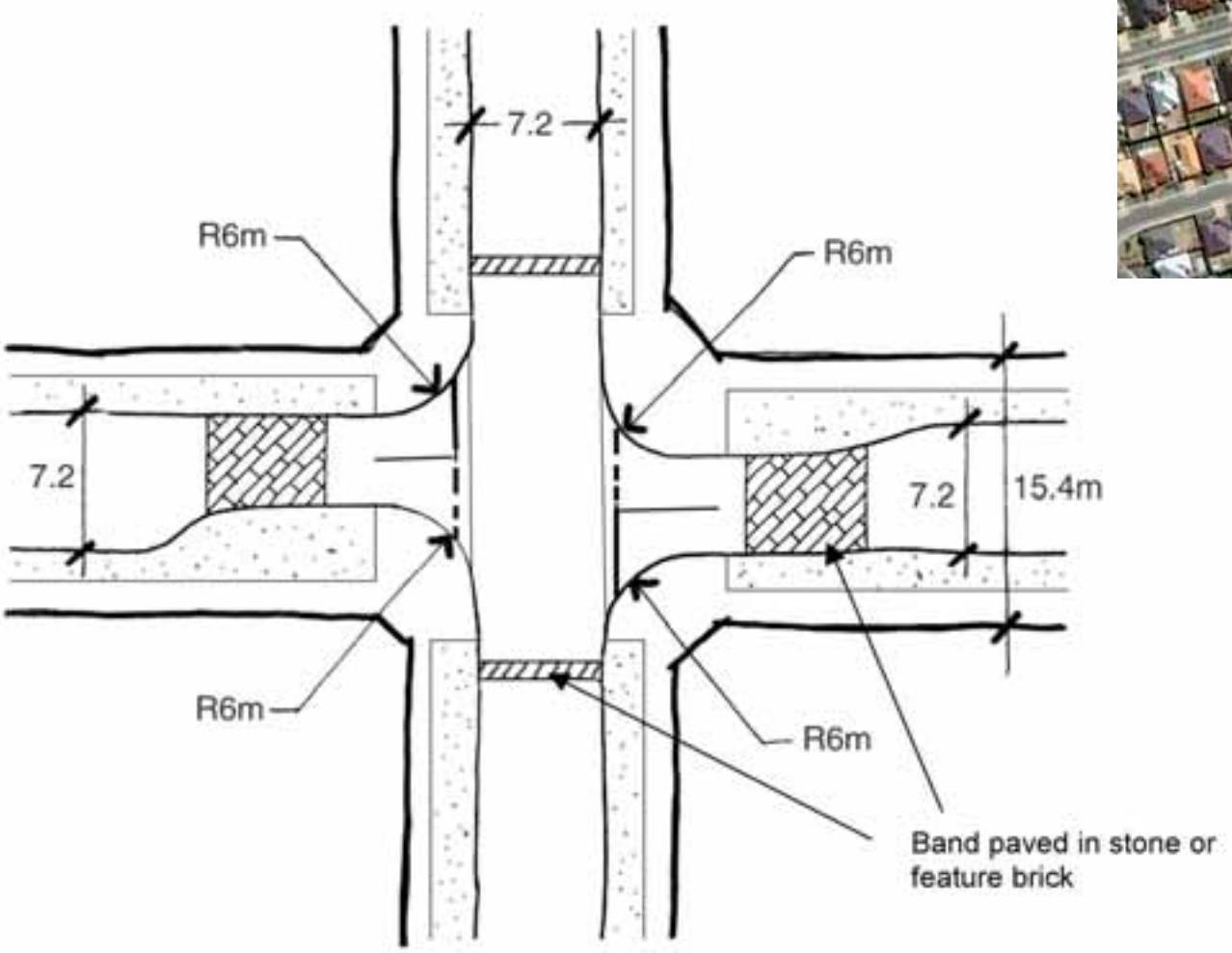
Table 5 - Tree clear zones - mainly relevant to achieving big trees in medians

Table 5: Tree clear zone for urban streets (kerbed conditions)

Street type	Design speed (km/hr)	Frangible tree (Trunk <100 mm)	Non frangible tree* (trunk >100 mm)
Integrator A & Integrator B	70	2.5 m	2.75 m
35-42 mph	60	2.0 m	2.5 m
Neighbourhood connectors and 50 km/hr Integrator Bs	50	0.75 m	1.15 m
Access street	50 or less	0.75 m	0.75 m

Access Street/Access Street

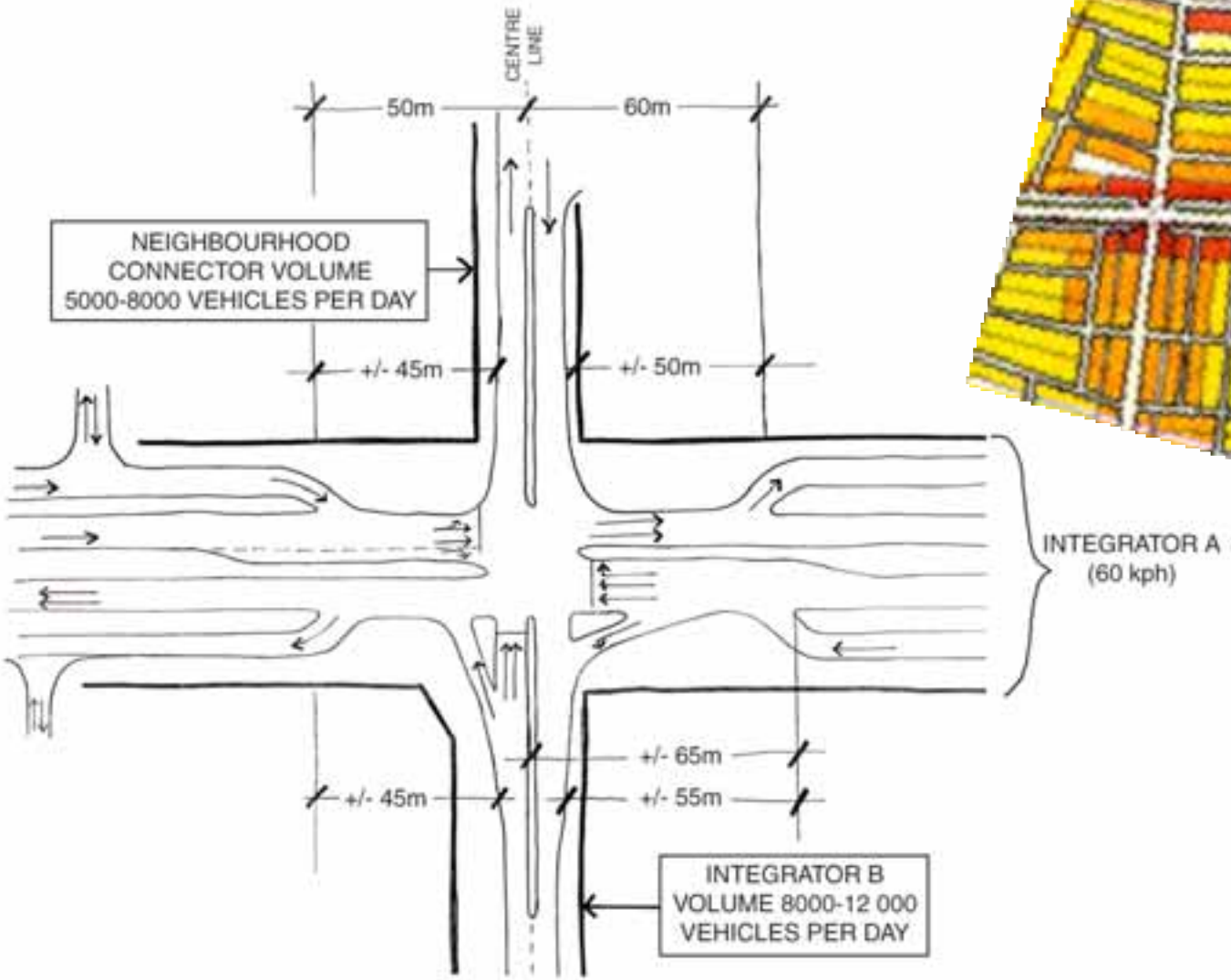
Basic four-way intersection treatment, without roundabouts or lights required



Australian traffic authorities had virtually banned four way local intersections as considered highly dangerous. There is not a culture of four way stops here, so this was a major battle.

Service Roads

Entry/Exit spacings from junctions with Integrator B's and Neighbourhood Connectors



Junction Spacings and Intersection Controls

Between all street types… Table 3 and 3A

R20 Traffic signals are to be located to balance movement for through traffic with local street access, bus stop access and pedestrian crossing ease. This may be achieved by using signal spacings generally in accord with **table 3A: Signalised junction spacings.**

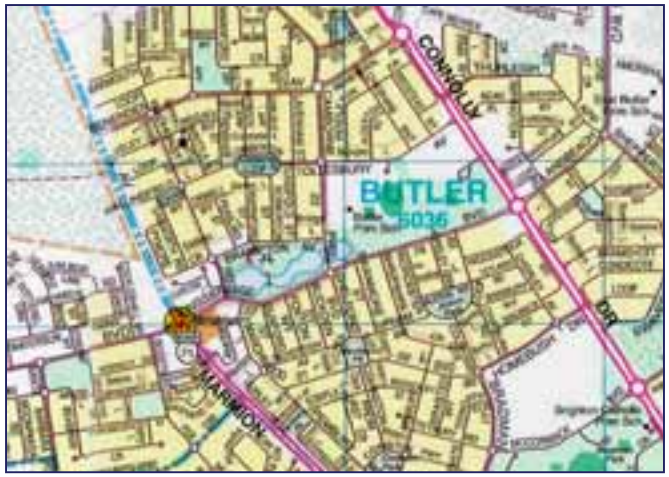


Table 3A – Signalised Junction Spacing

Street type	Minimum signal spacing (typically used in town centres/city centres)	Desirable spacing (value depends on signal cycle length and the need for two-direction signal coordination)
Integrator B	Typically 300m, but may be reduced to 150m in larger centres	400-500 m
Integrator A – 60 km/hr operating speed at full build out	350 m	500m-750 m
Integrator A – 70 km/hr operating speed at full build out	500 m	750-1 000 m

Street Speeds

Target operating speeds and design speeds specified for all local streets

Table 4: Street leg length and target operating speed

Street type	Target operating speed	Desirable leg length between slow points
Access street D* (6.0 m road width with parking on pavement)	30 km/h	70 - 80 m
Access street C* (7.2 m road width with parking on pavement)	40 km/h	100 - 130 m
Access street A & B (Avenue access street or Wider access street with travel lanes unconstrained by parking.	40 km/h	100 - 130m