The West Australian

**Liveable Neighbourhoods**

Design Code and Policy

Incorporating a New Urbanist Street Design Manual for New Communities

Wendy Morris
Ecologically Sustainable Design
Melbourne, Australia
esdesign@netspace.net.au

and

Ellen Greenberg
Piedmont, California, USA
Ellen@ellengreenberg.com
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
Western Australia…

Mandurah in southern Perth: The traditional township

“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.

**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

[Link to WAPC WA website](http://www.wapc.wa.gov.au)
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

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

www.wapc.wa.gov.au
North West Perth

1990’s

2000’s

Under Liveable Neighbourhoods…
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)

Integrator A-70
- 42mph, 15-35,000 vpd
- 2 x 27’ pavements plus 2 x 18’ service roads in 170’ ROW
- Parking in service road

Integrator A-60
- 35mph, 15-35,000 vpd
- 2 x 26’ pavements plus 2 x 18’ service roads in 162’ ROW
- Parking in service road

Integrator A-Centres
- 35mph, <25,000 vpd, <800 yards
- 2 x 33.5’ pavements in 115’ ROW
- On-street parking
Integrator (Multiway): Section and Plan

170’
Neighbourhood Connectors

Neighbourhood Connector A
30mph, <7000 vpd
2 x 22.3’ pavements in 78’ ROW,
On-street parking (may be indented)

Neighbourhood Connector B
30mph, <3000 vpd
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

Neighbourhood Connector

Integrator A

Integrator B
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>
<thead>
<tr>
<th>Street type/Design application</th>
<th>Design parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local street</td>
<td>Design speed = Target operating speed (eg 30-40 km/hr desirable operating speed target on access streets) (table 2).</td>
</tr>
<tr>
<td>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.</td>
<td>Design speed = 85th percentile operating speed or legal speed limit (whichever is greater).</td>
</tr>
<tr>
<td>Approach Sight Distance (ASD) and Safe Intersection Sight Distance (SISD).</td>
<td>Design speed = 85th percentile operating speed or legal speed limit + 10 km/hr at interim stage or full build out (whichever is greater).*</td>
</tr>
<tr>
<td>Integrator A/B</td>
<td>Design speed = legal speed limit at full build out.</td>
</tr>
<tr>
<td>Approach Sight Distance (ASD) and Safe Intersection Sight Distance (SISD).</td>
<td></td>
</tr>
<tr>
<td>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)</td>
<td></td>
</tr>
</tbody>
</table>
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….
Conclusion

_Livable 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
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>
<thead>
<tr>
<th>Street type</th>
<th>L/R stagger (to avoid overlapping right turns)</th>
<th>R/L stagger (to provide for left-turn deceleration lanes arterials and to avoid corner cutting on local streets)</th>
<th>Junctions on same side of street</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LOCAL STREETS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laneway</td>
<td>NA</td>
<td>NA</td>
<td>20 m</td>
</tr>
<tr>
<td>Access street*</td>
<td>20 m</td>
<td>20 m</td>
<td>20 m</td>
</tr>
<tr>
<td>Neighbourhood connector</td>
<td>40 m</td>
<td>40 m</td>
<td>40 m</td>
</tr>
<tr>
<td><strong>ARTERIALS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrator B</td>
<td>60 m</td>
<td>40 m</td>
<td>40 m</td>
</tr>
<tr>
<td>Integrator A – 60 km/hr**</td>
<td>150 m</td>
<td>110 m</td>
<td>110 m</td>
</tr>
<tr>
<td>Integrator A – 70 km/hr**</td>
<td>190 m</td>
<td>130 m</td>
<td>130 m</td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th>Street type</th>
<th>Design speed (km/hr)</th>
<th>Frangible tree (Trunk &lt;100 mm)</th>
<th>Non frangible tree* (trunk &gt;100 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrator A &amp; Integrator B</td>
<td>70</td>
<td>2.5 m</td>
<td>2.75 m</td>
</tr>
<tr>
<td>Neighbourhood connectors and 50 km/hr Integrator Bs</td>
<td>60</td>
<td>2.0 m</td>
<td>2.5 m</td>
</tr>
<tr>
<td>Access street</td>
<td>50 or less</td>
<td>0.75 m</td>
<td>0.75 m</td>
</tr>
</tbody>
</table>

35-42 mph
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 case. This may be achieved by using signal spacings generally in accord with table 3A: Signalised junction spacings.

---

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

Target operating speeds and design speeds specified for all local streets

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