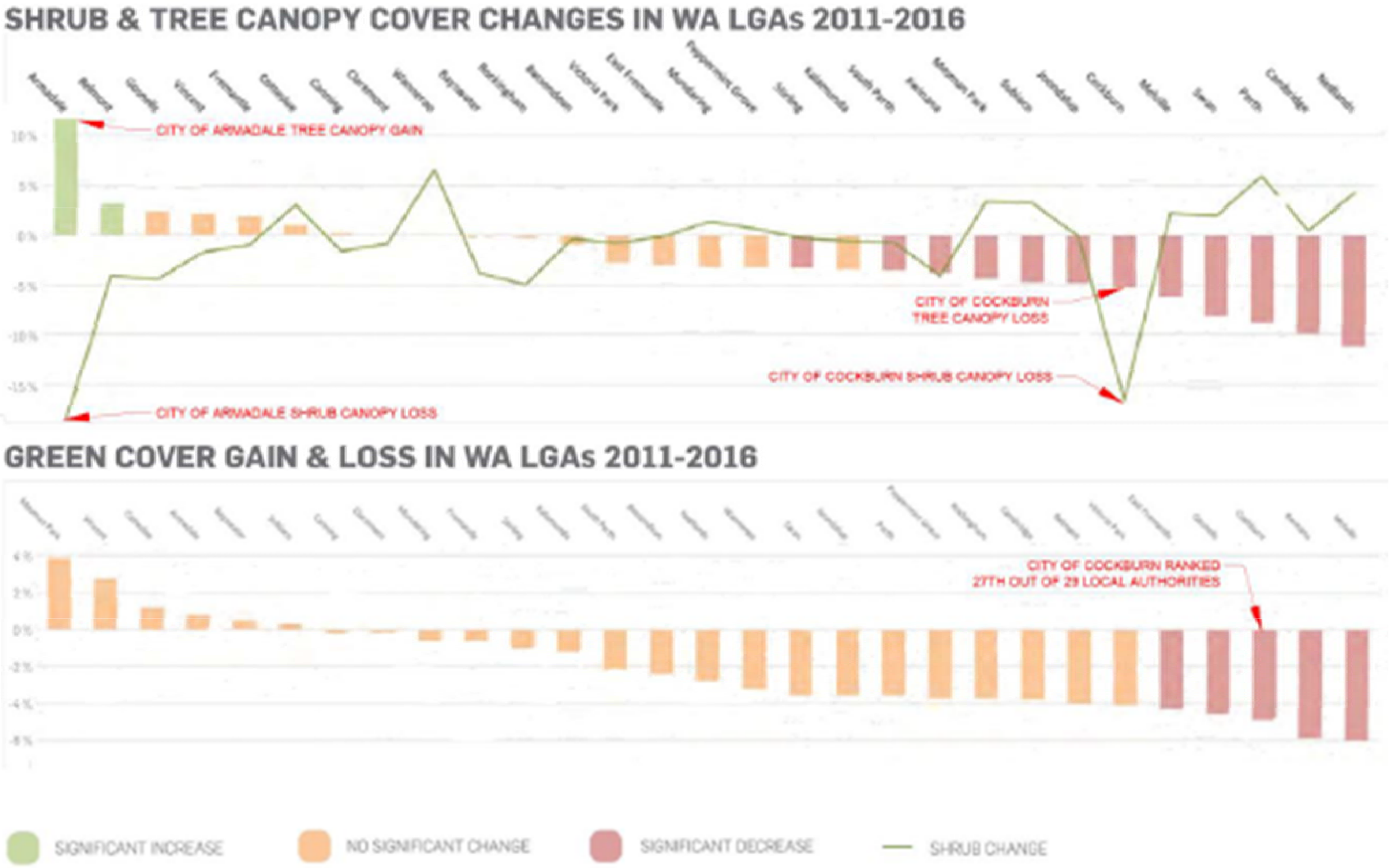
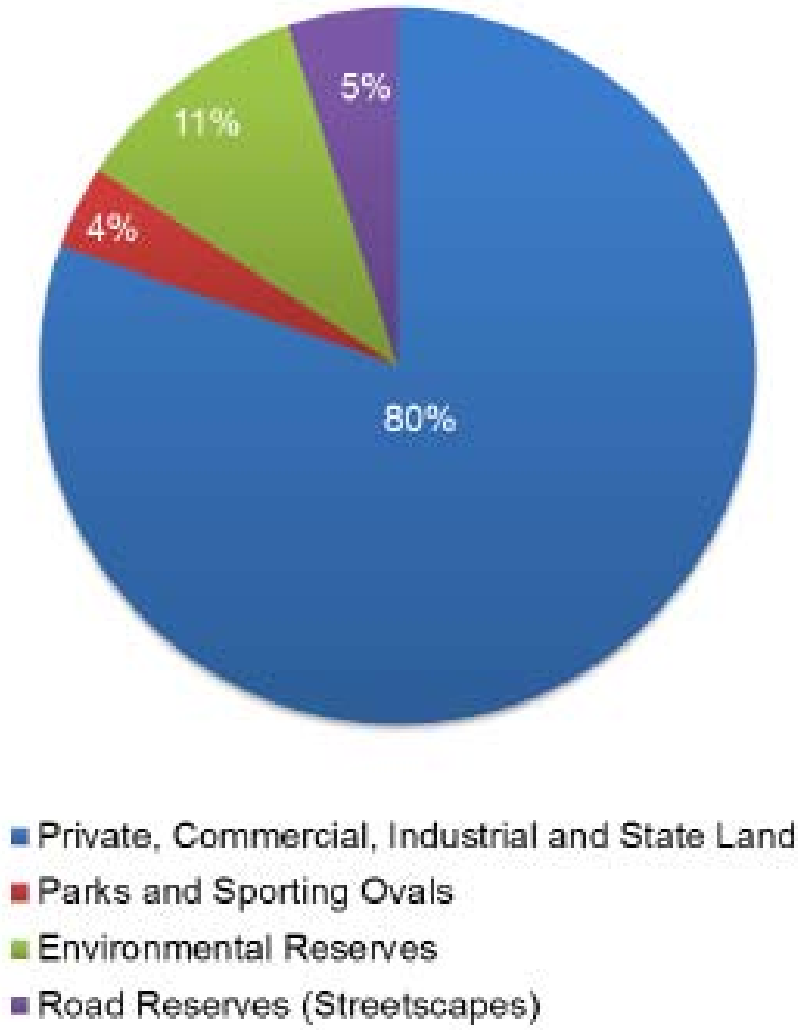
City of Cockburn

Urban Forest Plan



Deforestation by Local Government Area. 202020 Where Should All the Trees Go?

Vegetation cover by land classification.



CSIRO's Urban Monitor used to identify

- **26%** of Cockburn's land area is vegetated
- Only **11%** of the land area is shaded by tree canopy (>3m above ground level).

So what is the best we can achieve, and how do we achieve that?

Adopted principles.

- Direct our efforts to where the City has most influence.
- Tackle the source of problems as well as the symptoms.
- Plan for success, avert failure early.

Innovations

- The theoretical canopy size.
- Planning for trees.
- Projecting and tracking future progress.
- Future proofing.

The Arboricultural survey.

Remote sensing doesn’t identify

- permanency,
- effectiveness,
- life span and
- size of canopy at maturity.

Arboricultural surveys can fill this gap and are routinely carried out by many local authorities as a component of risk and asset management.

Theoretical canopy size – Arborist report.

STREET TREES	
Tree Number	10784
Address	37 Marvell Avenue
Address Verge	MARVELL AV
Suburb	SPEARWOOD
Date of Last Audit	**21/05/2013**
Inspector	**Phil Matthews**
Date of Most Recent Work Completed	
Quantity of Trees	1
Botanical Name	Olea Europaea
Genus	Olea
Common Name	Olive Tree
Species	Europaea
Family Name	Oleaceae
Type	Exotic
Power Lines	NONE
Approx Height m	2
Canopy Spread m	1.5
Canopy Height m	1.5
Diameter mm	40
Tree Age	YOUNG
Tree Health	GOOD
Tree Structure	GOOD
Tree Status	Existing
Verge Cover	TURF
Problems	F

Calc Size Tree Can	2.25
Useful Life Expect	4
Resid Life	
Imp of pos Landsc	3
Presen Other Trees	3
Relation Setting	3
Form	1
Special Factors	1
Report	

plugin2

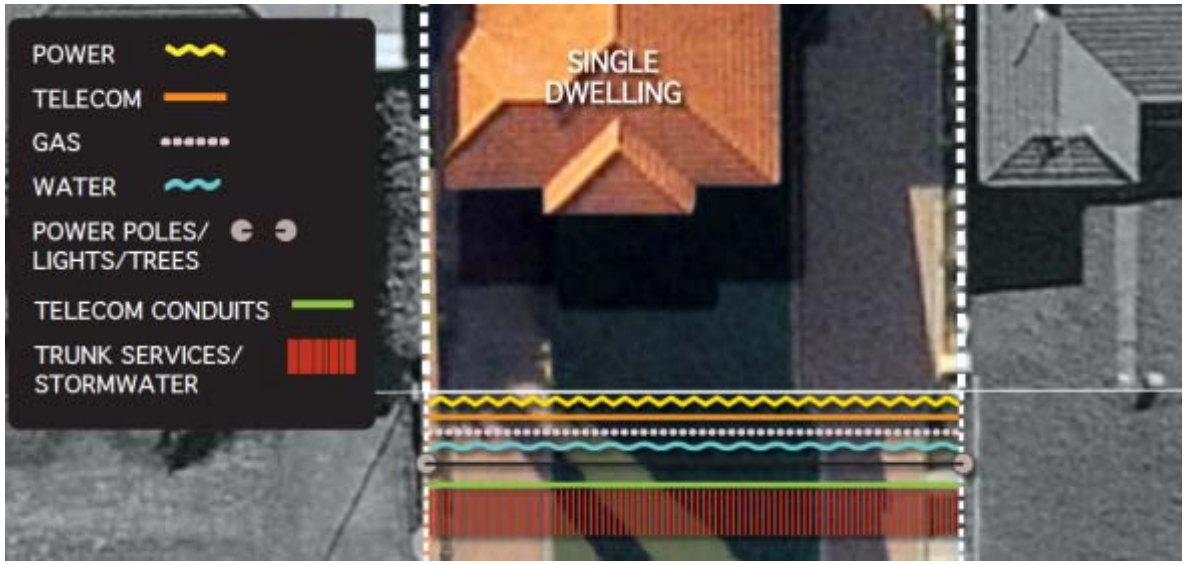
TREE_PROBLEMS	1 OF 1
Tree Number	10784
Problem 1	No Problem is recorded.

WORKS_REQUIRED	1 OF 1
Tree Number	10784
Comments	
Work Required 1	Tree_Stake_Removal

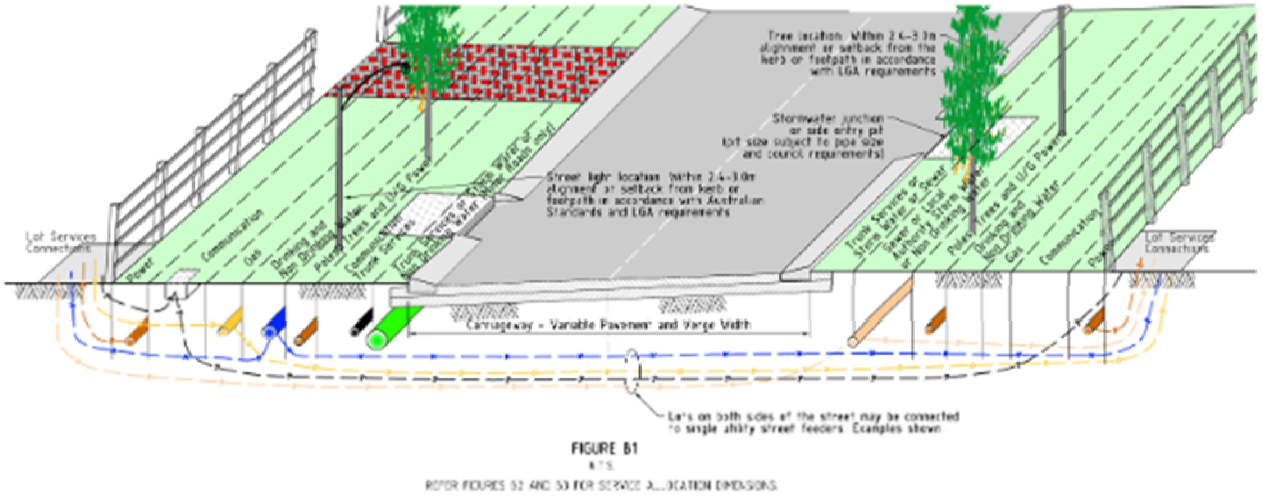
Theoretical canopy size.

- Laurina way appears reasonably well treed.
- Reduced set back distance results in selection of small tree species to avoid conflict with residents (gutters, verge paving and so on)

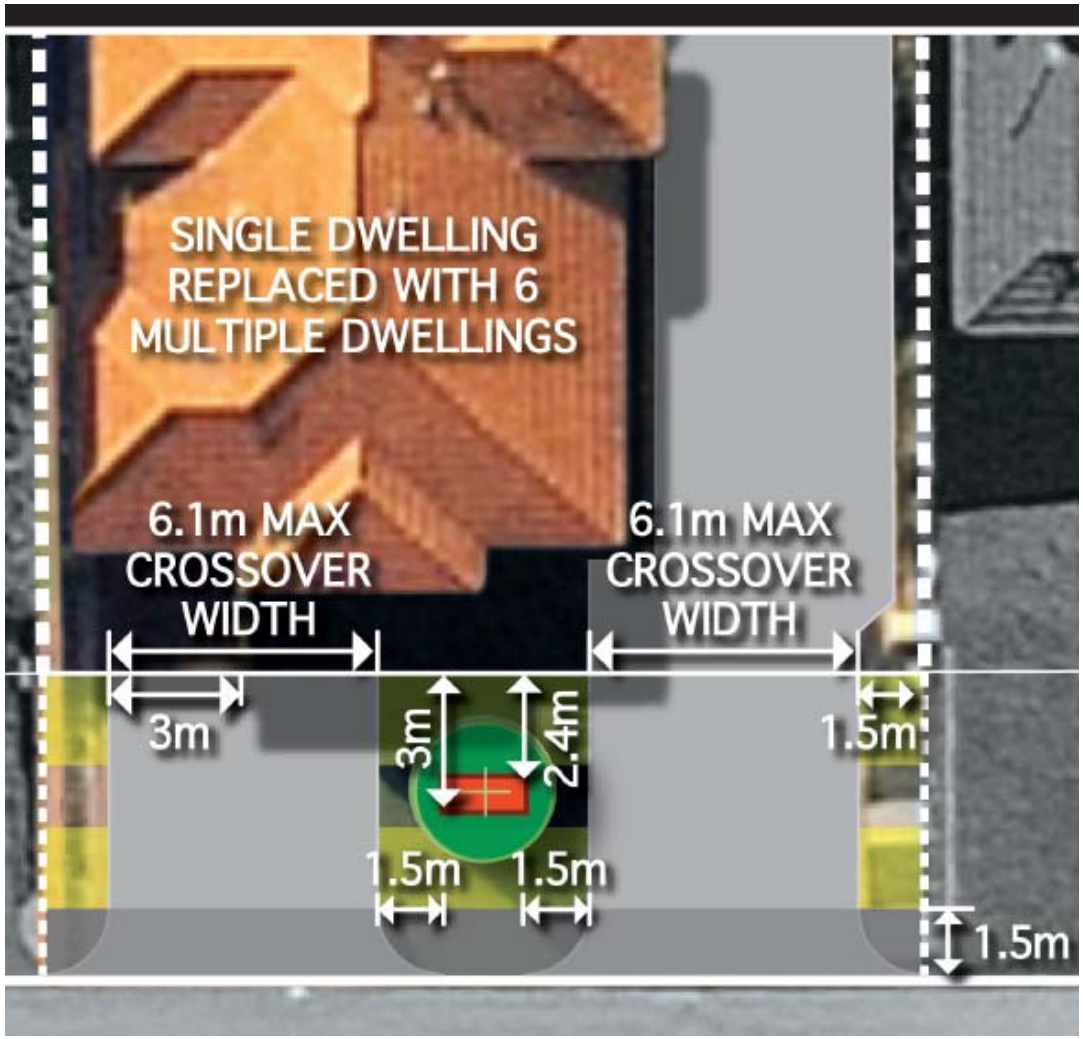
Planning for Trees – utility alignment.



WA Utility Providers Code of Agreement predicates alignment of utilities within the road verge.



Planning for trees – crossover alignment

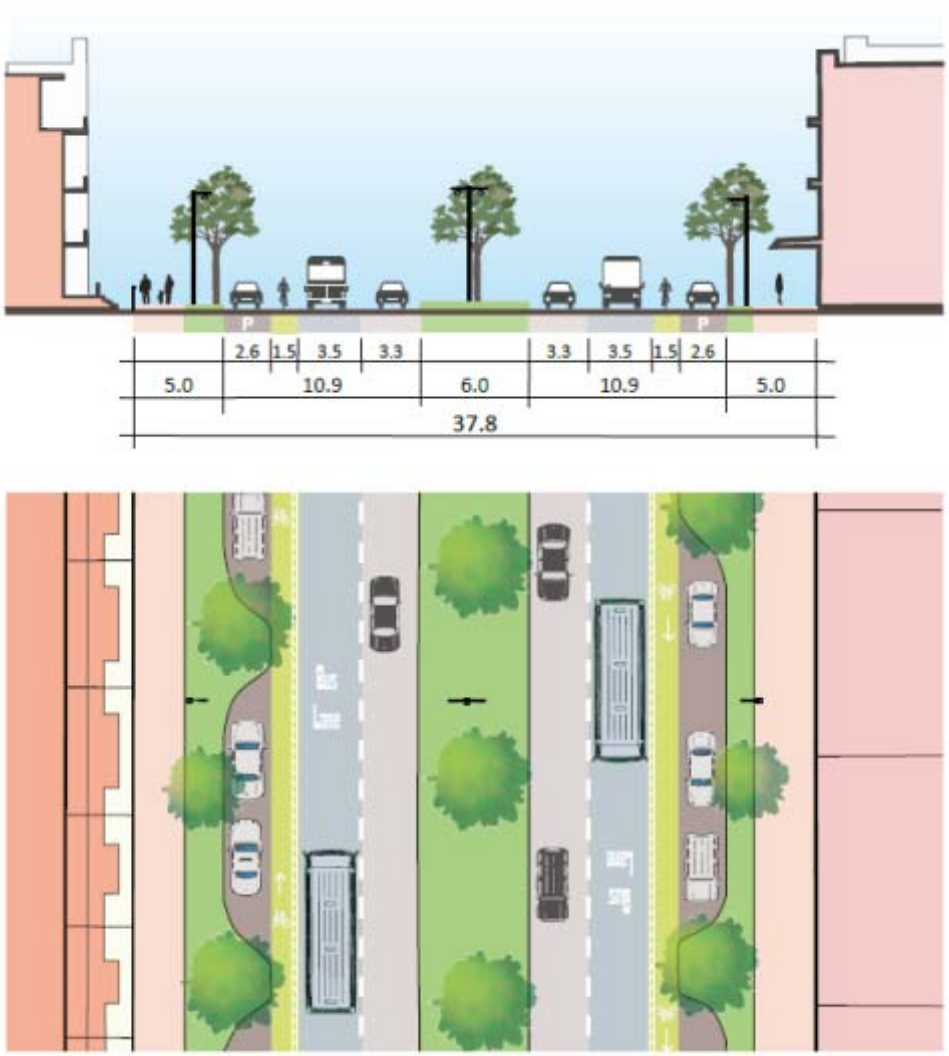


Local government are required to manage verge development.

Crossover locations and sizes are defined by the local authority in their Policy documents.

6m wide crossovers allow two cars to park side by side or to pass each other.

Planning for trees –structure planning



Transects are rarely drawn. Conflicts in plan view are consequently ‘glossed over’.

No consideration/indication given for

- Mature tree size.
- Utility alignments.
- Building set backs.
- Maintenance access

Achievable shade cover never considered or assessed.

Planning for trees –structure planning

Planning for trees – sub division design.

Compliance of the subdivision designs with structure plan street composition principles is not mandated .

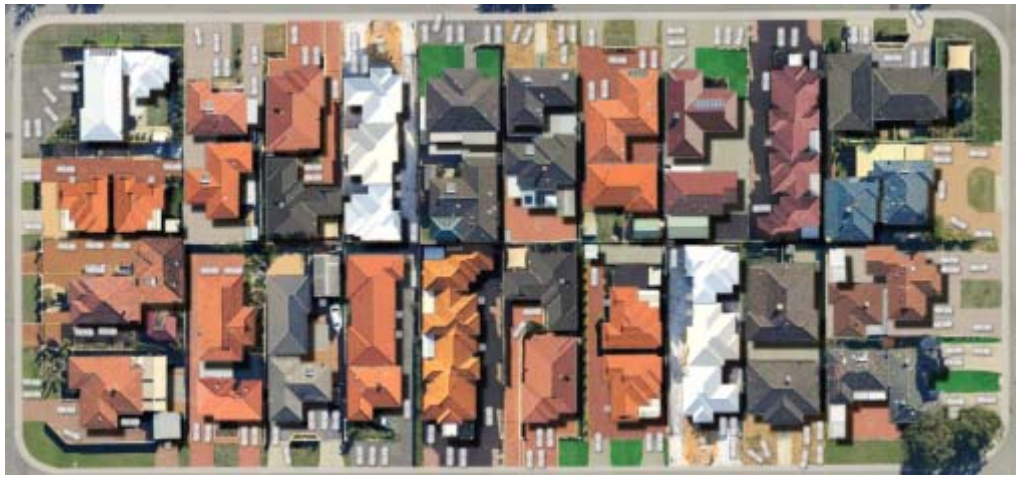
Design drawings omit to show:

- Utility alignment,
- Future building set back line,
- Light column positions,
- Street tree positions,
- Future crossover locations.

Planning for trees – subdivision and beyond.

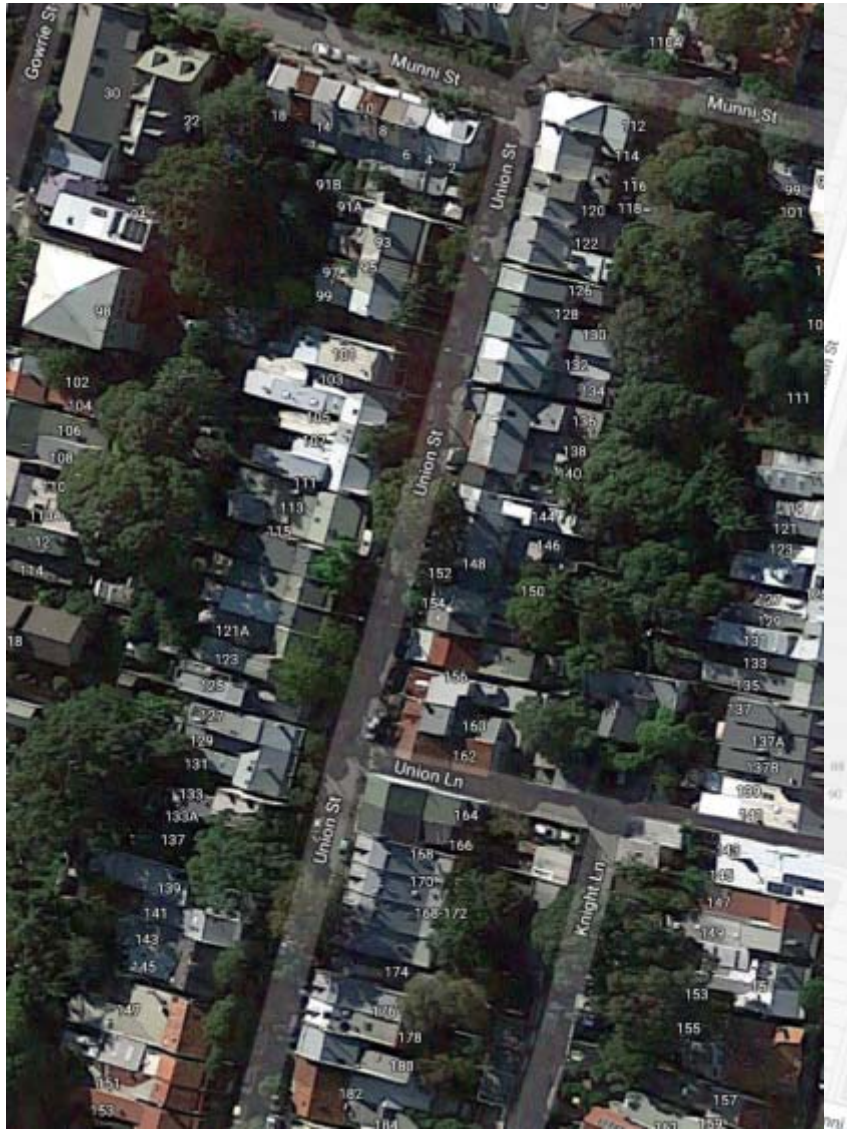
- Verge trees vulnerable to removal during construction works.
- Reduced verge width/depth leads to competition for kerb parking and verge paving.
- Trees removed, heat island effect exacerbated.
- Domino effect.

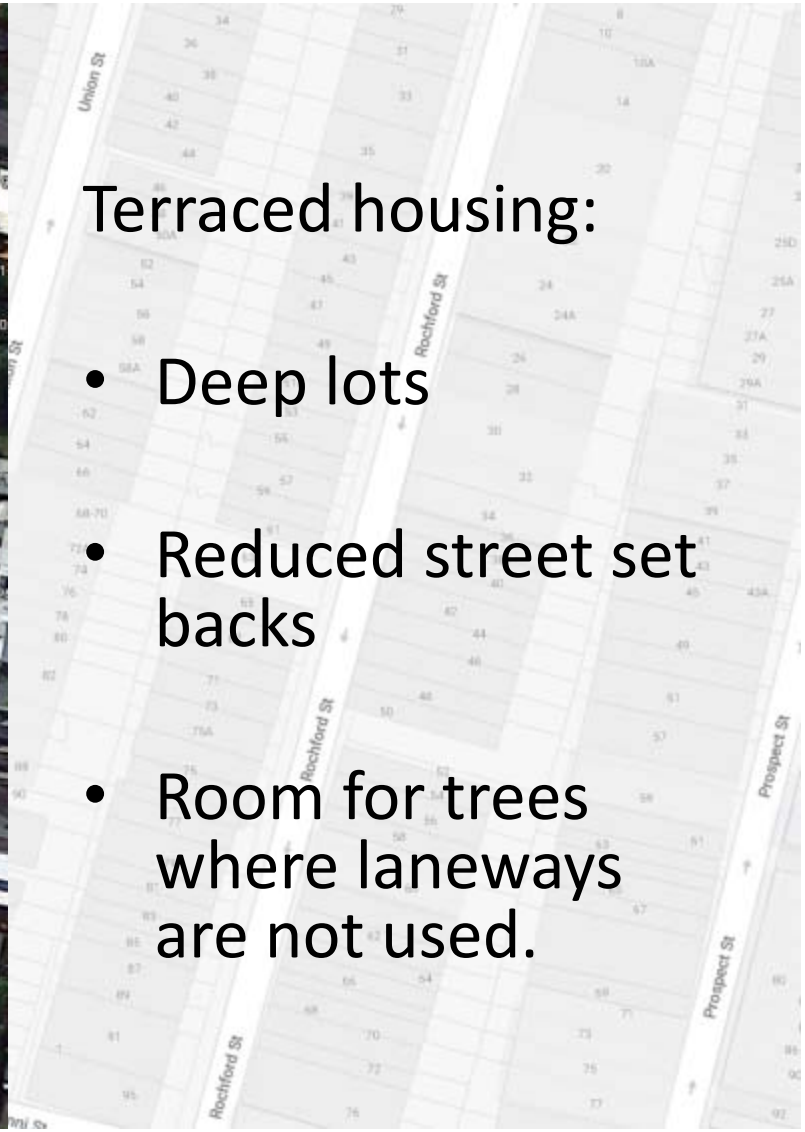
Planning for trees – R code reform.



- R codes encourage deforestation.

Planning for trees – R code reform.

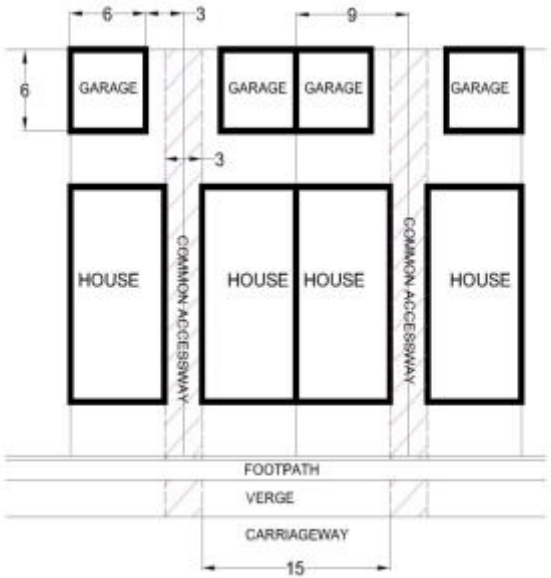




Terraced housing:

- Deep lots
- Reduced street set backs
- Room for trees where laneways are not used.

Planning for trees – the duplex.



Shared crossovers with on lot parking behind house:

More
- street trees/fewer crossovers
- passive surveillance

Less
- Asphalt.

Planning for trees – Scheme amendments.

City of Stirling and Fremantle – have deep soil provisions in their residential scheme text.

Peri-urban land values unlikely to support two story development - deep soil risks stifling development.

The jury is still out.

Planning for trees – Scheme amendments.

Commercial car parks create heat sinks.

Scheme wording and design practice typically very poor.

Planning for trees – Scheme amendments.

- Mandate medians with trees.
- Drain towards medians.
- Specify shade location within car park.
- Specify minimum ‘theoretical’ canopy cover as a % of asphalt.

Planning for trees – Scheme amendments.

- Illustrate the ideal outcome.
- This 6m grid efficient.
- Total canopy cover within 5 years.

City of Cockburn Good Design Guide to Commercial Development.

Planning for trees –Scheme amendments.

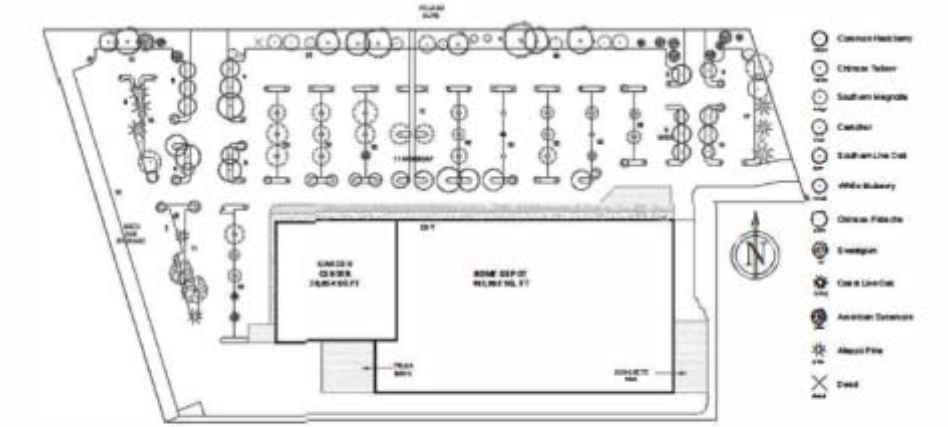
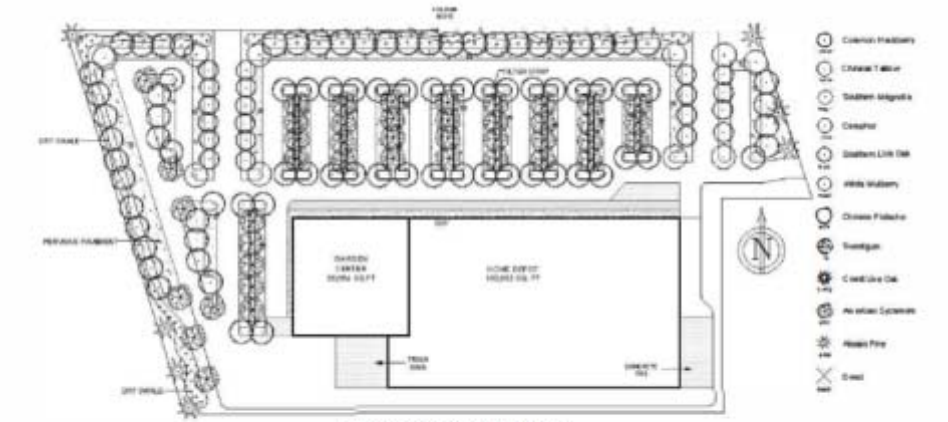


Fig. 4. Based on growth and condition at time of the survey, trees in the Home Depot lot were projected to shade only 29% of the PA after 15 years. The lot was 3-year-old when surveyed, had 1.9 ha PA, 528 parking spaces, and 156 trees that shaded 2.1% of PA. At the time of the survey 28 trees were stunted or dead, 83 required staking removal or adjustment, and 22 needed pruning (lifting or thinning). There were 24 more parking spaces than planned for, and stalls on the west side of the lot were seldom used. During the peak-period occupancy survey 50% of all stalls were vacant. Trees were planned to shade 42% of PA after 15 years.

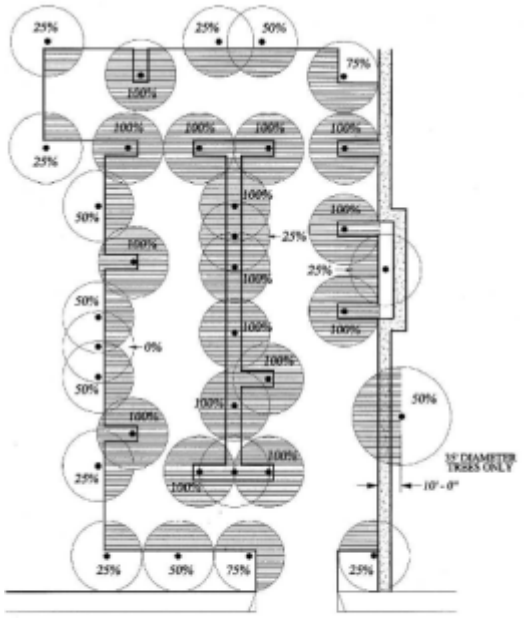


REDESIGNED PARKING LOT

Fig. 5. The redesigned Home Depot lot increases planned tree shade to 58% and pervious cover by 18%. There are 106 fewer parking spaces (20%), creating new areas for perimeter swales to reduce stormwater run-off. Interior planting islands replace tree wells and contain with filter strips over infiltration trenches. Pervious concrete is shown where cars park. Tree species that have proven to grow well in other Sacramento parking lots are featured in the redesign.

The City of Sacremento car parking shade ordnance.

- Fully reviewed.
- Amended and road tested.
- Google it!



PARKING LOT

NOTES:
1. This diagram is intended to reflect the manner in which shade is credited under various conditions. It is not necessarily an illustration of 50% coverage.
2. Trees may receive 25%, 50%, 75% or 100% credit as shown.
3. Shade overlap is not counted twice.

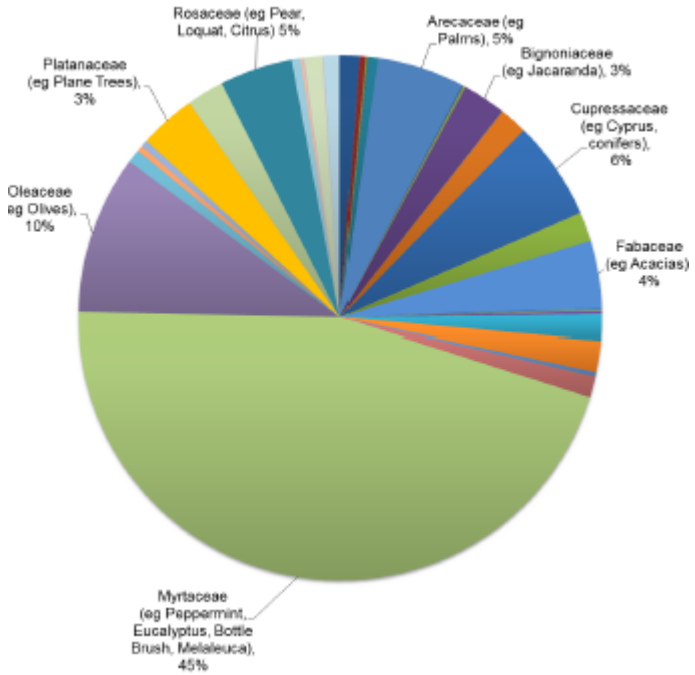
Future proofing.

Climate change is affecting:

- Pathogens.
- Aging.
- Public acceptance.
- Conflict and competition.

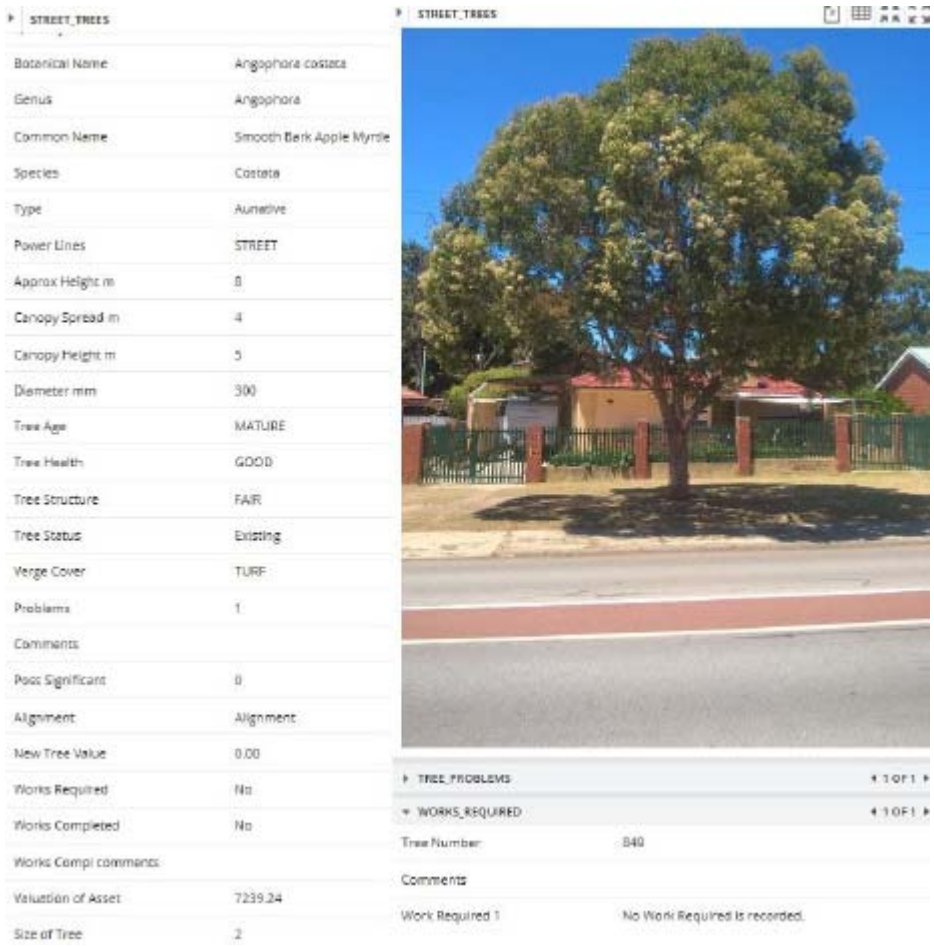
Understanding these demands and threats can create a more robust and effective urban canopy.

Future proofing - pathogens.



- 45% of street trees in Cockburn are from the botanical Family Myrtaceae.
- Myrtle rust disease threatens to wipe out this family.

Future proofing - aging.



STREET_TREES	
Botanical Name	Angophora costata
Genus	Angophora
Common Name	Smooth Bark Apple Myrtle
Species	Costata
Type	Aurelive
Power Lines	STREET
Approx Height m	8
Canopy Spread m	4
Canopy Height m	5
Diameter mm	300
Tree Age	MATURE
Tree Health	GOOD
Tree Structure	FAIR
Tree Status	Existing
Verge Cover	TURF
Problems	1
Comments	
Poss Significant	0
Alignment	Alignment
New Tree Value	0.00
Works Required	No
Works Completed	No
Works Compl comments	
Valuation of Asset	7239.24
Size of Tree	2

STREET_TREES

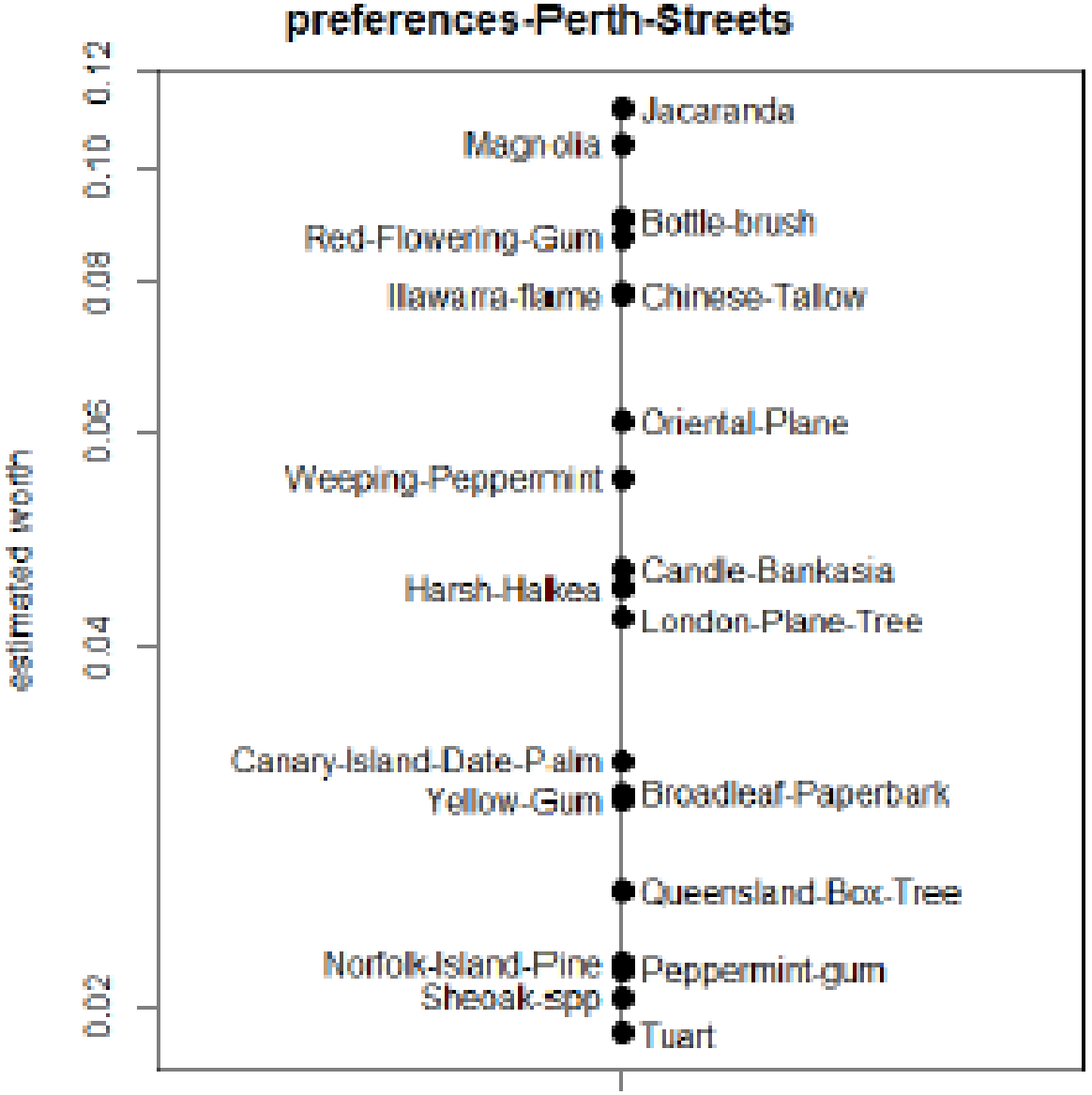
TREE_PROBLEMS 1 OF 1

WORKS_REQUIRED 1 OF 1

Tree Number	849
Comments	
Work Required 1	No Work Required is recorded.

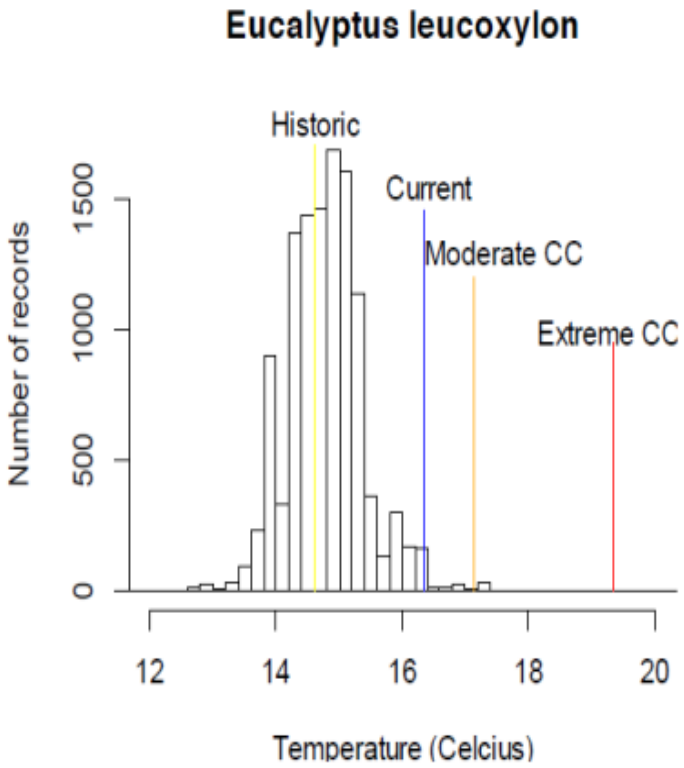
- Age profiling the City's trees will anticipate senescent decline.

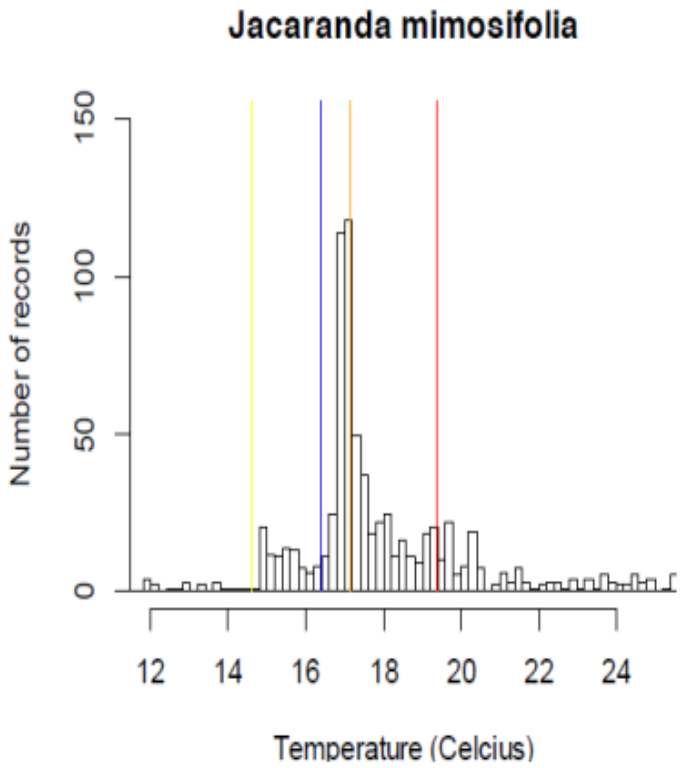
Future proofing – public acceptance.



- University of Western Australia study (*Ram Pandit et al*) indicates property value increased by about $17,000 per home with a street tree.
- The study identified acceptability of different species.
- Experience of City of Cockburn is that you cannot force people to accept trees.

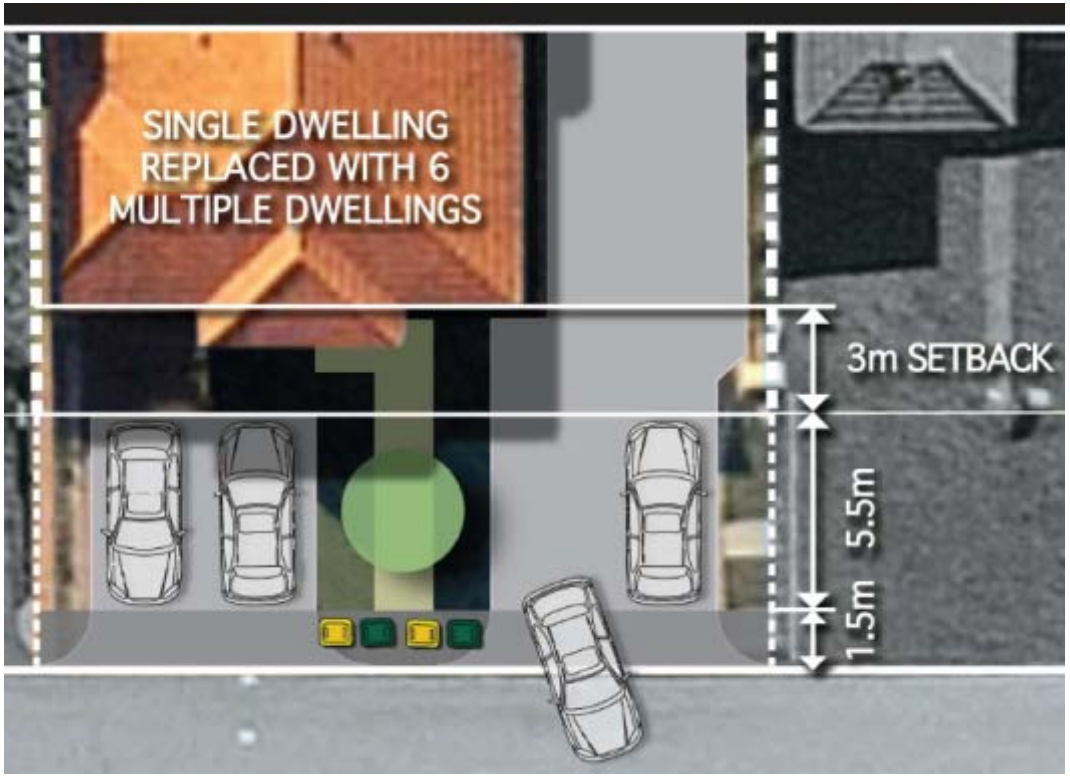
Future proofing – climate change.





- University Melbourne study 'The City of Melbourne's Future Urban Forest' identifies precarious state of current canopy.
- Trials of new hardier species required.

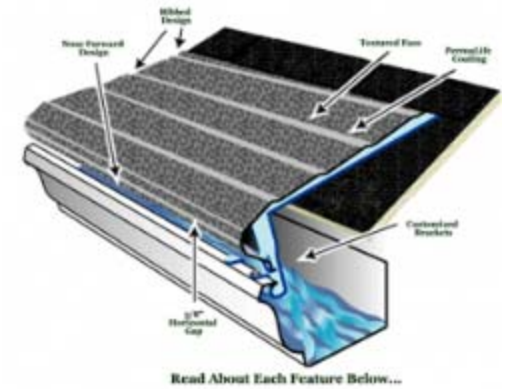
Future proofing – conflict.

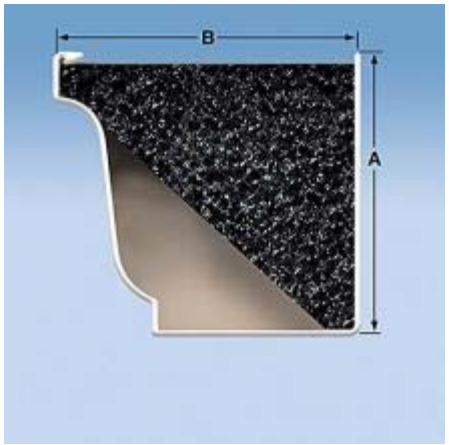


Competition for diminished verge space:

- Car Parking.
- Bin and bulk waste collection.
- Utilities

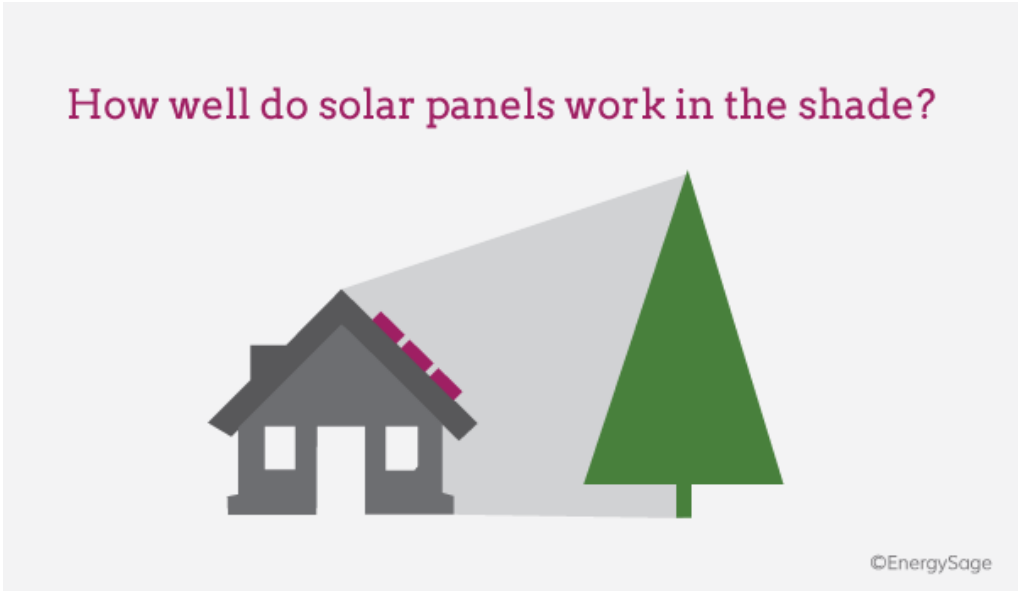
Future proofing – conflict.





Blocked gutters and rental properties.

PV cells and shade.



Future proofing – canopy modelling.

- Assign mature canopy size to each species.
- Rank species for robustness.
- Establish theoretical full canopy on a street by street basis.
- Track progress towards theoretical goal using above parameters.
- Seek feedback from users of the above.
- Correct practices.
- Seek further innovations.

Progress and roadblocks.

- Current Urban Forest Plan is a ‘road map’ scoping document.
- Funding for an Urban Forest Officer has not been made available.
- Seed funding ($100k) has been provided in next financial year to demonstrate the Plan warrants employing a permanent full time urban forest officer.