



Pop-up shows promise

This review uncovers the real benefits that community-centred urban greening projects can have for the community, the local economy, and the natural environment. The once plain and lifeless span of concrete has been transformed into an actively used and loved community greenspace which is also helping to reduce the urban heat island effect, urban water-use and landfill waste, and is providing habitat stepping-stones for native species.

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Cover Photo. The outdoor area of The Peartree, before (left) and 1 year after (right) installation of the Peartree Pop-up.

1. The Project

1.1 Objectives

This project had 3 main areas in which it focussed to define its objectives. These are **environmental**, **social**, and **biodiversity** impacts. The project objectives are as follows:

Environmental:

- Reduce local radiative temperatures by removing concrete and replacing it with soils and vegetation for shading
- Create a waterwise landscape which requires little irrigation and encourages permeable urban surfaces for on-site water infiltration
- Construct the project using as many recycled materials as possible to divert construction and demolition (C+D) waste from landfill

Social:

- Improve place aesthetic and experience
- Foster a sense of community among locals
- Stimulate the local economy through the business
- Serve as a demonstration site to educate the community about sustainable infill practices

Biodiversity:

- Achieve a high proportion of locally endemic plant species
- Provide habitat value for wildlife as a 'stepping-stone' which help to create urban wildlife corridors

1.2 Main findings

- The project has followed the latest research on urban greening for more sustainable urban design. It has reduced the proportion of concrete surfaces, increased vegetation cover, used a high proportion of locally endemic and waterwise plant species, and sourced a high percentage of materials from recycled sources.
- Business at the café has increased over the past year, stimulating the local economy.
- Although we are unable to draw statistically significant conclusions from the social impact survey, the results suggest that the greatest benefits, in terms of improving customer experience and fostering a sense of community, could be found in regularly engaged locals. The idea that these projects 'facilitate and improve' rather than 'create' communities has implications for the location and success of future pop-ups.
- The project has facilitated community cohesion and ownership in a variety of ways. For example, the community actively look after the space and use the blackboard for personal community messages and quotes, local artists have offered and placed their artwork in the space, and local bands play in the pop-up twice weekly.
- There is room for improvement in creating local awareness of the project's sustainable building practices. Future projects will have greater focus on effectively transferring this knowledge to communities.
- The project has successfully met the outcomes that City of Cockburn were seeking; providing valuable social, environmental, and economic outcomes for the money invested.
- We can deepen community benefits in the future via ongoing space activation.



Environmental

 **101 m²**
concrete removed

 **73 kL**
water captured
per year

 **12 t**
recycled C+D
waste used



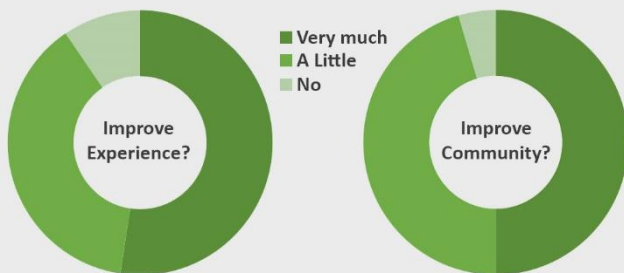
Sustainability features

- Removed concrete and added trees/vegetation in order to **lower local temperatures** and combat the urban heat island effect
- **Wastewise** construction: recycled brick mulch, recycled timber shading, recycled brick gabion walls, recycled artwork
- **Waterwise** landscaping: drought resistant plants and removal of concrete for on-site water infiltration



Social

Customer survey



The pop-up improved the experience at the cafe for **90%** of customers surveyed. The greatest benefits seem to be for regular customers.

Designing the pop-up to provide space for local bands and art has improved sense of community in **95%** of customers surveyed.

Testimonials

*"[The project] has **reached deeper into the community** and people are making a bigger effort on their own little bits. People feel a bit more proud of the area"*

- Ron (owner, the Peartree)

*"Cosmetically it's come out 100% ... it was all broken concrete ... it just really **brought it to life** ... now it's quite homely ... it's a lot greener and it's a lot more natural"*

- Daisy (front-of-house, the Peartree)

*"We've got an outcome that is beneficial to the community, to social and economic uplift, [and is] **driving that outcome we were seeking**"*

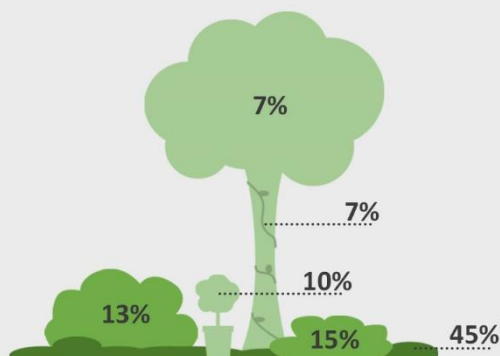
- Anton (Manager, Parks and Environment at City of Cockburn)



Biodiversity

30 new species planted

Vegetation structure*



*% species in each growth form category

56%
locally endemic

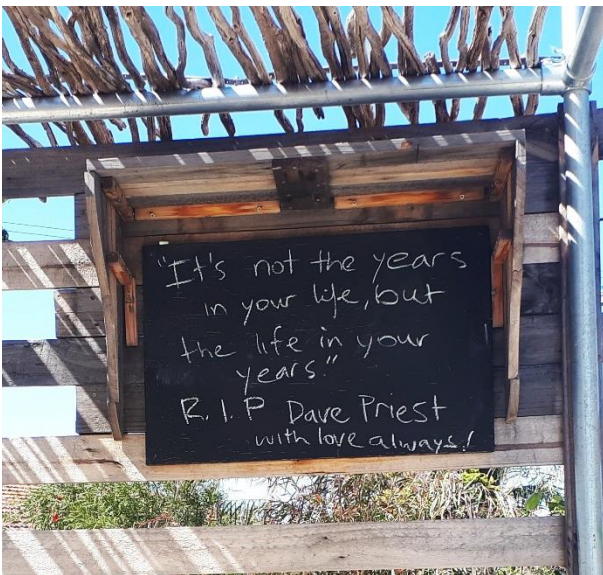
29%
native to Australia

15%
exotic

Habitat enhancement features

- High percentage of **endemic plant species** for native wildlife
- **Multi-layered vegetation** with groundcover, subshrubs, shrubs and trees provides diversity of opportunity for wildlife
- **Gabion walls** provide protection for small lizards and insects

3. Gallery



4. Impacts

4.1 Environmental Impacts

Mitigating the urban heat island effect

101m² of concrete was removed and replaced with soil and vegetation, helping to combat the urban heat island effect and reduce local radiative temperatures. Vegetation, especially trees, will provide greater urban heat island mitigation as vegetation and canopy cover grows, by shading greater areas of concrete and undertaking more evapotranspiration.

$$\begin{aligned}\text{Box in centre} &= 5.4\text{m} \times 5.4\text{m} = 29\text{m}^2 \\ \text{Total area} &= \text{approx. } 130\text{m}^2 \\ 130 - 29 &= \text{approximately } 101\text{m}^2\end{aligned}$$

Wastewise construction

Approximately **6 tonnes** of recycled C+D waste was used in the construction of the project. The choice of these materials promotes a circular economy and diverts a significant amount of waste from our landfills. Below is a list of recycled products used in the project.

- Recycled brick/tile gabion walls (Red Sand Supplies)
- Recycled brick mulch (Red Sand Supplies)
- Recycled artwork (made by local artists)
- Salvaged scaffolding pipe (around 30%)
- Salvaged timber 'spears' used for shading

Waterwise landscaping

This project aims to contribute to a larger water-sensitive urban design movement which will reduce the load on our wastewater management systems and improve the health of our rivers and wetlands into the future. Roughly **73.5kL** of water per year hits the area which has been turned from impervious concrete into soils. The vast majority of this water is infiltrated and filtered through the soil on site, saving the pop-up from contributing to run-off pollution and increasing pressure on wastewater management systems. Additionally, **85%** of plant species on-site are endemic or Australian native, making this project a truly waterwise landscape in which plants require much less water than do many exotic species.

$$\begin{aligned}\text{Average Perth rainfall} &= 727.2\text{mm/yr (Average from 1994-2019 – Bureau of Meteorology)} \\ \text{Total rainfall volume} &= 0.7272\text{m} \times 101\text{m}^2 = \mathbf{73.45\text{m}^3 \text{ water per year}} = \mathbf{73.5 \text{ kL per year}}\end{aligned}$$

4.2 Social impacts

Testimonials

Ron Canty (owner at The Peartree):

- “It’s become a bit more of a hub for the community to meet...especially for live music”
- “It has definitely improved the business”
- “The anti-social factor in the community really stands out a lot more ... so it’s slowly pushed away”
- Has “reached deeper into the community and people are making a bigger effort on their own little bits. People feel a bit more proud of the area”

‘Daisy’ (front of house at The Peartree):


- “Cosmetically it’s come out 100% ... it was all broken concrete ... it just really brought it to life ... now it’s quite homely ... it’s a lot greener and it’s a lot more natural”
- “It’s really given [the music] a home to go to”
- “A whole lot of people have come together to bring it together ... it just brings a sense of community”

Anton Lees (Manager of Parks and Environment at City of Cockburn):

- “We know that [it’s] generated business for the owner, and that’s what we want to say because opportunity for us, the council, is huge”
- “We’ve got an outcome that is beneficial to the community, that social and economic uplift, [and is] driving that outcome we were seeking.
- “[Now we ask] where can we now apply this going forward? What other areas can we look at to try and get the benefits we are trying to achieve?”

Survey Methods

We surveyed 22 Peartree customers at random on a series of Tuesdays and Wednesdays around 12pm. The survey sheet they were provided with is below.


inspiring and empowering sustainable communities

1. How often do you visit the Pear Tree Café?

☐ I'm a regular! (at least once a week)

☐ Every now and then (at least once a month)

☐ Rarely (at least once a year)

☐ Haven't visited before

2. Are you aware of the pop-up forest project outside the café?

☐ Yes ☐ No

3. Do you like the pop-up forest space?

☐ Yes ☐ No ☐ Maybe: _____

4. Does it improve your experience when visiting the café?

☐ Don't know ☐ Not at all ☐ A little ☐ Very much

5. This pop-up tries to facilitate creative expression of local residents (e.g. local bands, art etc.). Does this improve your sense of community at the café?

☐ Don't know ☐ Not at all ☐ A little ☐ Very much

6. Are you aware of the sustainable practices that have been used to create this pop-up (either by word of mouth or the educational signage placed around the project)?

☐ Yes ☐ No (if so, we invite you to go and have a look!)

Thank you for your time!



Figure 1. The survey sheet handed out to customers of The Peartree.

Survey Results

Do people like the space?

20 out of 22 (91%) people surveyed said that they liked the space. *The small sample size makes it hard to draw conclusions about the underlying community (after running a 95% confidence interval, we know that the actual percentage of people visiting that like the space is somewhere between 71% and 98%), but the survey results suggest quite promising outcomes.*

Does the pop-up improve customer experience at the café?

Customer experience improved for the vast majority (90%) of customers surveyed after the installation of the pop-up. When stratified into groups of how often customers visited the café, some trends are noticeable but not statistically significant due to the small sample size. The graph seems to suggest that the impact was most noticeable for people who visited the café regularly (> once a week), which provides us with an indication of a potential trend in these kinds of projects – that benefits may be greatest for locals that are regularly engaged with the space.

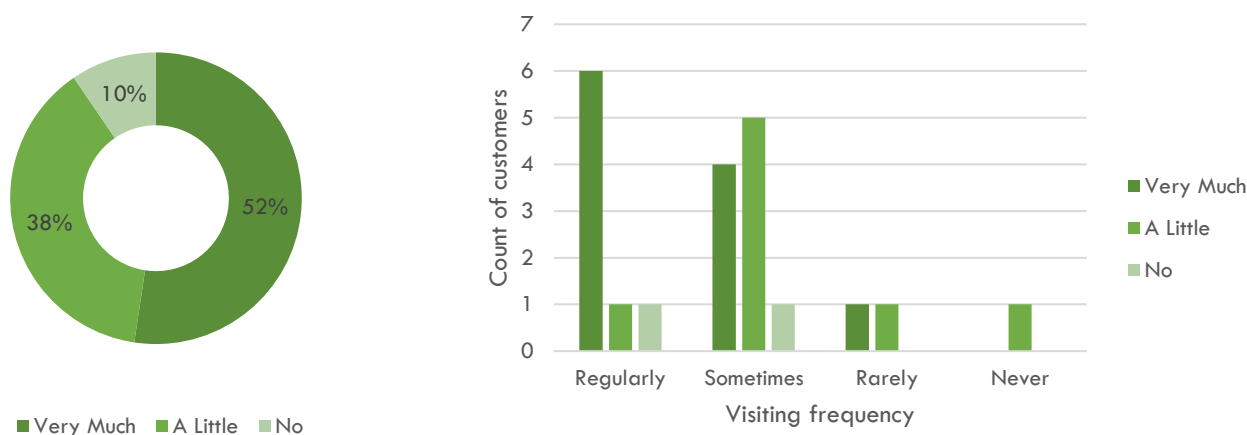


Figure 2. Survey results showing whether the pop-up has improved customer experience at the café. The pie chart (left) summarises all responses, while the bar chart (right) summarises responses depending on how often customers visit the café.

Does the emphasis on local engagement and artistic expression create a sense of community?

The facilitation of community activities and art improved the sense of community in 95% of those surveyed. The impact across the customers of the different visiting intervals also suggests a pattern that, again, is not statistically significant but is worth considering. When looking at the graph below, sense of community seemed to increase mostly 'very much' for regular customers, while it seemed to increase mostly 'a little' for those that visit 'sometimes'. Again, while the sample size was small, results still may provide some guidance in deciding where these projects will be most effective in the future.

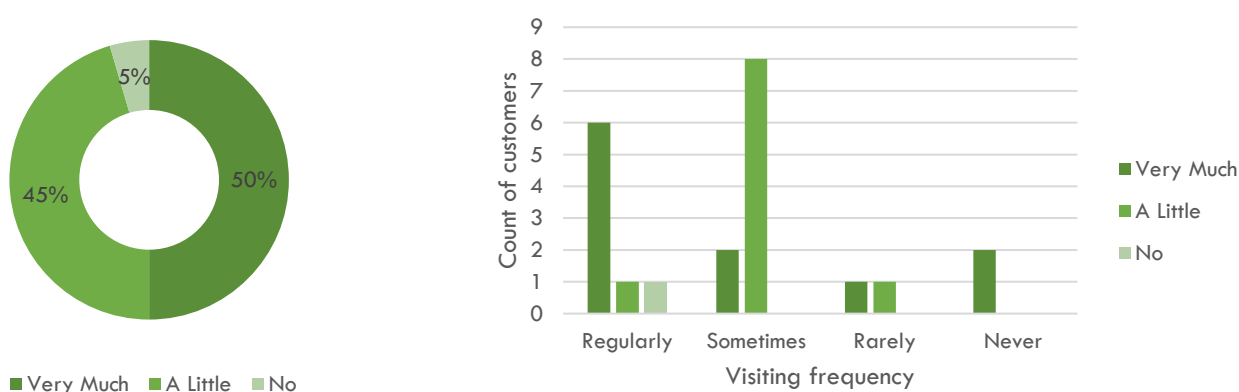


Figure 3. Survey results showing whether the pop-up has improved the sense of community in the space for customers. The pie chart (left) summarises all responses, while the bar chart (right) summarises responses depending on how often customers visit the café.

Are people aware of the sustainable building practices?

45% of customers surveyed were aware of the sustainability ethics and principles underpinning the construction of the pop-up (at 95% confidence, the actual proportion could be anywhere between 27% and 65%). Again, the desired outcomes (in this case, sustainability education) seem to be best instilled in those who visit the café regularly. This is likely due to their continual involvement with the café and their close relationship with the local community. The relatively low proportion of people aware of this aspect of the project suggests that there may be room for improvement in educating those who visit less often and are less engaged with the café as a local. A possible improvement may be more noticeable signage around the project.

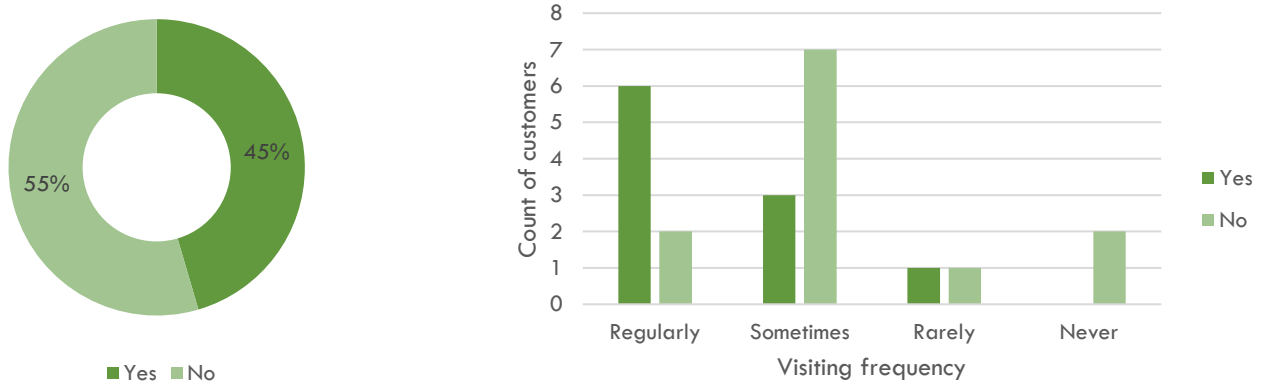


Figure 4. Survey results showing whether customers were aware of the sustainable building practices underlying the project's construction. The pie chart (left) summarises all responses, while the bar chart (right) summarises responses depending on how often customers visit the café.

4.3 Biodiversity Impacts

Species richness

30 species total were planted with an overall 71 plants. Below are the top 10 most common species.

Table 1. The 10 most abundant plant species at the Peartree Pop-up.

Species	Count
<i>Helichrysum</i> spp. (Everlasting flowers)	7
<i>Hemiantha pungens</i> (Snakebush)	7
<i>Carpobrotus virescens</i> (Native pig face)	6
<i>Kennedia prostrata</i> (Running postman)	6
<i>Dianella revoluta</i> (Blueberry lily)	5
<i>Myoporum insulare</i> (Common boobialla)	4
<i>Grevillea obtusifolia</i> (Obtuse-leaved grevillea)	3
<i>Lamandra longifolia</i> (Basket grass)	3
<i>Westringia fruticosa</i> (Coastal rosemary)	3
<i>Calothamnus quadrifidus</i> (One-sided bottlebrush)	2
... + 20 more species	...

Vegetation structure

Most of the species planted were groundcovers and shrubs. Only 7% of species planted were trees, but this will contribute to a large percentage of cover as the canopy develops, providing shade for the café and habitat for native birds and pollinators.

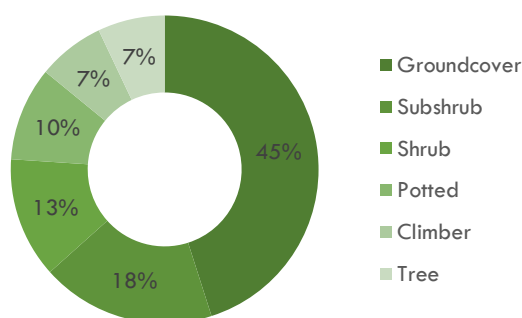


Figure 5. Flora survey results showing the composition of plant growth forms (percentage represents number of species in each category).

Plant locality

A focus of the project was to choose predominantly endemic plant species in order to contextualise the space within its local ecology. Some species were native cultivars which provide aesthetic or functional value such as increased drought resistance. Exotic species were mainly potted or edible, such as passionfruit and rosemary.

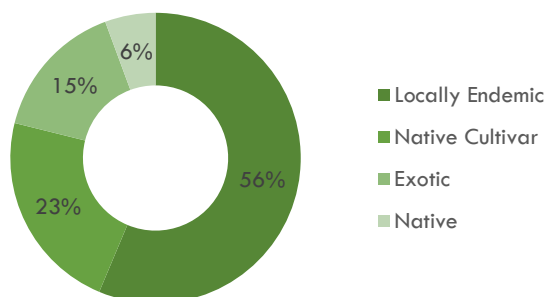


Figure 6. Flora survey results showing the composition of plant locality (percentage represents number of species in each category).

5. Where to From Here?

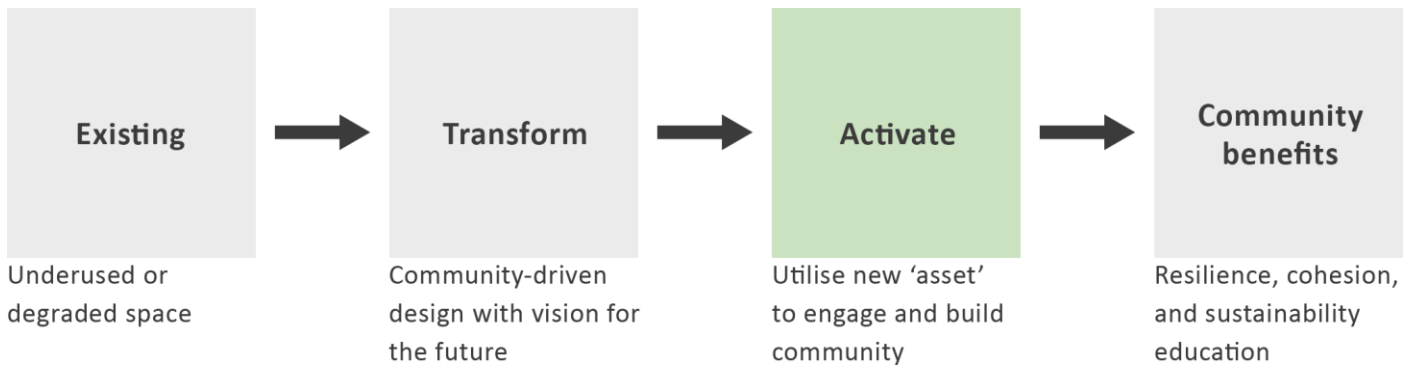


Figure 7. Action plan schematic for creating community resilience, cohesion, and sustainability education through the Peartree Pop-up.

Since the Peartree Pop-up has been installed, regular engagement with the pop-up has continued for over a year, with local bands playing twice a week. There is, however, further opportunity to expand and deepen the community benefits through a variety of community-building events. Further activation of different varieties can help to secure this site as a local asset and build a stronger, more connected community within the suburb.

Potential place-activation and community engagement events that would work in this space that can be provided by The Forever Project and other community change agents are listed below.

- Pop-up pep talks: a series of short talks on inspiring and empowering topics from the community or professionals.
- Food theatres: live demonstrations that motivate and educate the community on healthy, eating, good nutrition and how to grow your own food.
- 'Battle of the bands': an opportunity for school or community bands to show off their skills in a series of performances.
- Repair cafés: a place to bring broken household items to get fixed and to learn some handy skills along the way – a possible collaboration with the local Men's Shed.
- Educational workshops: on the topics of resilience, gardening, and at-home sustainability.