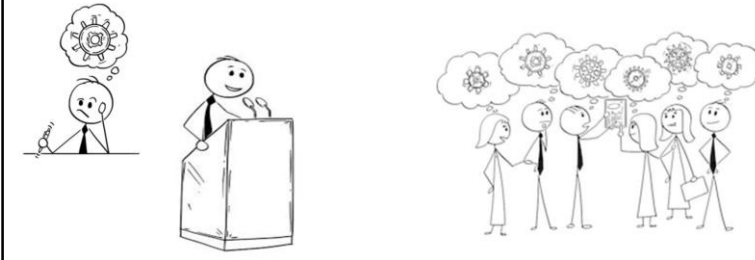




This pilot project was funded by the Office for Ageing Well in South Australia in 2018. Dr Helen Barrie and Professor Veronica Soebarto were the CIs leading this project – which is now the subject of a larger ARC Discovery application.

What is Citizen Science?

Citizen science involves public participation and collaboration in scientific research with the aim to increase scientific knowledge



In recent years, we have witnessed important changes in the relationship between science and society; the discussion has moved away from a classical **“public understanding of science” approach**, aiming at transferring knowledge about scientific processes to the public, to a **“science in society” approach**. One practical approach to engaging citizens in the scientific process is co-design, which we hear a lot more about recently, and another is ‘citizen science’.

The term citizen science is used in different ways. For the purpose of this research we view citizen science as a partnership between professional researchers and volunteers ***in which the volunteers implement tasks which have traditionally been implemented by scientists***. This cooperation is meant to serve two goals. ***First, it should create new scientific insights, most importantly by gathering large-scale or hidden data, which the researchers alone could not access or generate by themselves. Secondly, the partnership should produce an educational outcome for the participants, such as increasing knowledge and scientific interest.***

So, citizen science employs a cooperative approach to research.....and there are three possible models of cooperation that have been identified: in the ***contributive model***, volunteers contribute to data collection only (this may also be called ‘crowd sourcing’ data) – note that this is different from researchers merely collecting data from or about participants; in ***collaborative models*** they may also get engaged in data analysis and interpretation; in ***co-created projects*** the volunteers assist in defining the research questions and the research design and as such are involved in all stages of the scientific process.

For this pilot study we are utilising a co-created model – with citizen scientists not only collecting data but also engaged in some of the analysis stage and most importantly contributing feedback and ideas on the process and the design of the project.

Citizen Science: Natural vs Social Sciences

Of the 615 projects listed on the Australian Citizen Science Association website - <https://citizenscience.org.au/> - only 7 could be said to be related to social science



What science could you do with **10,000** volunteers?

While citizen science research is well established in the natural sciences, it remains difficult to find evidence in mainstream social sciences and is almost non-existent in the built environment and/or social gerontology literature. For example....looking at the Australian Citizen Science Association website..... Read from slide

This is in part because much research in the natural sciences is empirical in nature, while social science often uses a more constructivist approach. Social Science is usually not like counting yellow footed rock wallabies – did you see one or not. In social sciences there will always be a diversity of opinion and perceptions; for example, there will be a wide variety of social and living experiences and life histories that influences perceptions and opinion of spaces and places. The tricky part is understanding and interpreting that diversity and as much as possible supporting those pluralist interpretations of places. The value of the citizen science approach for social science is that it can help illuminate that diversity of opinion.

*****There is huge potential to collect innovative, large scale data that may solve important scientific and social questions.***

So why look at green spaces, public spaces for ageing well?



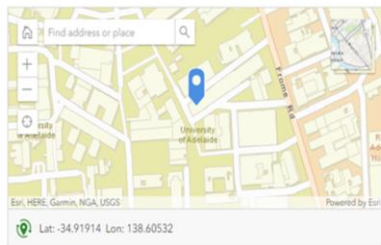
The built environment - the outdoor and indoor spaces where we interact and live our lives - have major impacts on health, mobility, independence and quality of life but the design and quality of public spaces and green spaces has thus far mostly been measured and determined by 'expert' assessments.

But these expert assessments often do not take into account the appraisals or perceptions of residents about their own neighbourhood environment. Daily experiences, often over long periods of time, mean older residents have acquired in-depth, first-hand knowledge of their neighbourhood, and thus, may be more qualified than experts to assess the qualities of these spaces. Most importantly, it is these older residents themselves that can tell us what makes a good green space or public space, how it is most likely be utilised, and how good public spaces may contribute to their health and wellbeing.

So, we wanted to hear from the true experts of their own neighbourhoods – we wanted to engage with as many older people as possible living in a variety of settings, about the green and public spaces they use as part of daily life.

This question records your current location. Click on 'Press to set location' and then select the 'Find My Location' icon to use your smartphone GPS, then press OK in the top right hand corner. Otherwise, use the map to find your current location.*

The 'Find My Location' icon looks like a target symbol. For help, please refer to the 'Survey Guide' provided at the information session.



Would you like to take/upload a photo?*

Select 'Yes' if you would like to take a photo of the survey location, or 'No' for the next question.

☒ Yes

☐ No - next question please

Please take/upload a photo of your chosen survey location

Use your smartphone camera to take a photo or you can upload a photo taken previously

[Click here to upload image file. \(<10MB\)](#)

Our Audit Tool for Citizen Science

- ESRI's Survey123™
- A 'one off' background data survey
- An on-going audit tool to be used for one month
- Collect data on public and green spaces that are part of everyday life
- Able to collect spatial data, audit data and photographic data
- Non-smart phone options

Recruitment and Training of Citizen Scientists

- Recruitment through OFTA Seniors Card 'Weekend Plus' magazine, COTA's 'Plug-in' and snowballing
- Training is face to face or over the phone
- 'Cheat sheet' for training
- On-going support service from project team



People over 60 years of age – living anywhere in SA for the pilot project (but in theory could be anywhere in the world)

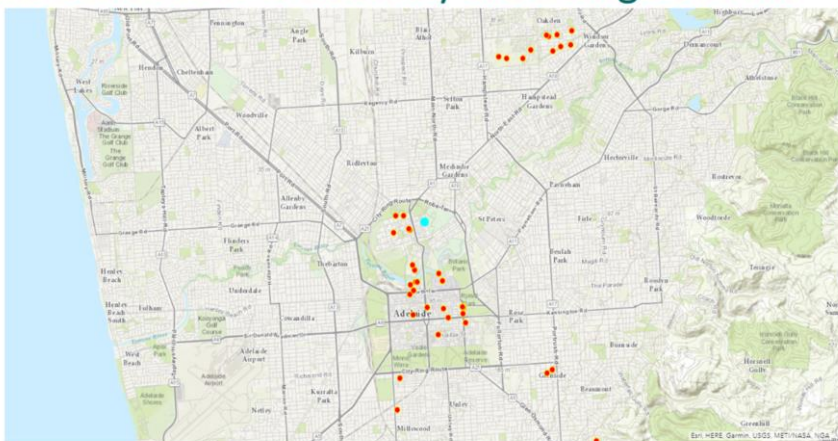
Do not have to be smart phone users but it helps

To date we have trained 15 citizen scientists (2 by phone, one face to face in her own home and the rest in small groups)

We have a further 20 citizen scientists waiting to be trained next week and we hope to recruit a further 20 or so before the end of the year.

Training took less than one hour and this included doing the preliminary survey together and a short presentation on what it means to be a citizen science. We have developed a 'cheat sheet' that has clear instructions on how to use the audit tool and we would like to trial some citizen scientists using this with no personal training to see how easy it is to pick up.

Data Collection: What they are doing so far....



This map shows the location of a portion of the audit data we receive from our citizen scientists so far. Every time they submit a new audit we get another dot on our map. Now at this point it just looks like a whole lot of dots on the map, but of course sitting behind those dots is a lot of other data, and the power of this ongoing spatial data collection is that we can do this for individuals, or for whole neighbourhoods or potentially for whole cities or regions to understand the utilisation and perceptions of public space and green space by older people. Volunteer citizen scientists can potentially use this app to collect data anywhere, anytime and as often as they want for as long as they want.

And we can explore the incoming data in a multiple of ways; we can create individual 'life space' maps that show the detail of one person's regular activities and engagement with their neighbourhood but we can also aggregate this data up and explore the built environment by gender, age, mode of transport, health, time of day, type of location, day of the week, weather, positive and negative perceptions and a multitude of other variables. We can create heat maps based on the number of times a place is accessed – either by an individual – or by a group of people in the same region.

So to date, our 15 trained participants have sent in over 100 public space audits in less than 2 weeks, we anticipate that by the end of trial our citizen scientists will have collected over 1,000 public space audits across South Australia.

Data Collection Example: ID 131, CBD Community Garden

How are you feeling today? **Very well**

How pleasing is the survey location to look at? **OK**

How well maintained/clean is this location? **Acceptable**

How safe/secure do you feel in this location? **Very safe**

How user friendly/welcoming is this location? **Very welcoming**

Is this a comfortable place to sit/stand/be? **Comfortable**

How busy is this location? **Quiet**

How green is this location **Somewhat green**

Why have you come to this location? **To meet others**

How often do you come to this location? **Infrequently**

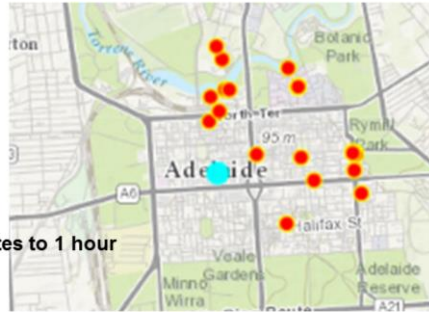
How long do you usually spend in this location per visit? **30 minutes to 1 hour**

How did you travel to this location? **Public transport**

Who are you here with today? **Myself**

What facilities exist at this location? **Café, Lights, Map/place directory, Park/gardens, Seating, Shelter (from the weather), Toilets**

How do you generally feel about this space? **Really like it**



So this slide shows the information we get back from each of those audits or red points on the map. Every time our scientists decide to audit a location they are asked to fill out a short audit form – this takes about 3 to 4 minutes and includes their unique ID identifier so we know who to link the data back to. The text on the left of the slide shows their responses to the questions in the audit form. Most of these are Likert scale questions or tick the box, multiple response questions. We tried to keep these brief so that the audit process did not become too onerous but comprehensive enough to tell us about the location and their perceptions and use of the space.

You can also see here a map with a blue dot on it. This shows us where the data for this audit was filled out. Obviously when viewing this online we can zoom in on that dot and see more detail about the space, where it is in location to where the person lives and what else is around there, we can use satellite imagery or road map imagery to build on our understanding of how this audit fits with surrounding built environment data, such as location of public transport, if the area is near other green spaces, surrounding land use and so forth.



Is there anything else you would like to tell us about your experience here today, or about the space itself?

This is an amazing place. It's a community centre with community garden, chooks, bike repair, repair workshop and cafe run by Aboriginal people. Not well known but only 500 metres from the popular Central Market.

And the final, more qualitative, component of the audit process is that our scientists can choose to upload up to two photographs that “say something” about the space with the final option being an open text section (unfortunately limited to 255 characters by the ESRI program) where they can tell us something about this space.

Each time they hit submit at the end of an audit the data is sent directly to us at the University. So we can see data coming in live. This way we can check for quality control (are they continually missing a question, have they put in their ID correctly etc.). We can also see who is not entering data and send gentle text message reminders that we haven't heard from them in a while or to check that all is OK. We also send little text messages to let them know that we like what we are seeing and to thank them for their contributions.

Data Collection Example: *ID 107, Bellies Park*

How are you feeling today? **Very well**

How pleasing is the survey location to look at? **Very beautiful**

How well maintained/clean is this location? **Very clean**

How safe/secure do you feel in this location? **Quite safe**

How user friendly/welcoming is this location? **Very welcoming**

Is this a comfortable place to sit/stand/be? **Very comfortable**

How busy is this location? **Busy**

How green is this location **Very green**

Why have you come to this location?

- **On my way to somewhere else**
- **Relax**
- **To shop - run errands**
- **Just because I can**

How often do you come to this location? **Daily**

How long do you usually spend in this location per visit? **15 to 30 minutes**

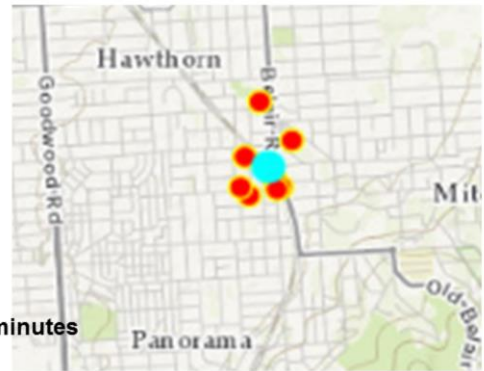
How did you travel to this location? **Walked**

Who are you here with today? **Myself**

What facilities exist at this location? **Lights, Park/gardens, Seating,**

Shelter (from the weather), Toilets, Car park

How do you generally feel about this space? **Really like it**



This is just another quick example of one audit entry....



Is there anything else you would like to tell us about your experience here today, or about the space itself?

Bellies Garden is a brilliant demonstration of community. It is well cared-for and the traffic on busy Belair Rd becomes secondary.

Summary of selected data so far....

- Very mixed responses to how busy the space was from very quiet to very busy
- 57% of spaces were considered 'green' or 'very green'
- Mixed responses to purpose for visit but 'on my way somewhere else', 'exercise' and 'meeting others' were the top responses
- 25% of visits were daily but a pretty even spread from daily to 'infrequent or 1st visit'
- 35% said they spend less than 15 minutes in this space* but next highest was more than an hour
- Over 53% of spaces were accessed by walking, with the next highest response being public transport at 24%
- Over 45% of spaces were visited alone, with a further 37% with a spouse

So for us there are two levels of data that are of interest – one is the individual level, where life spaces for a person tell us a lot about how they use their neighbourhoods. But also we are interested in the aggregate data . And quite frankly at this pilot stage we are keen to know if it even works and which bits work well and which bits not so well!!

The first most significant result for us is that so far there have been no skipped questions – suggesting the audit tool is not too long or not too complicated to navigate.

The second important observation is that 87% of audits have included at least one photo, with all our scientists to date having uploaded a photo to at least one audit; suggesting that people are pretty comfortable using the technology to audit their communities.

60% of audits describe the space as beautiful or very beautiful
87% describe the setting as safe or very safe
75% of spaces were welcoming or very welcoming
77% of spaces felt comfortable or very comfortable

Ongoing engagement with our citizen scientists

- Continuous feedback and encouragement during data collection
- Some trials at further analysis with individual data – a work in progress!
- Co-design through feedback and discussion with all citizen scientists around how to improve the process and future potential



So I mentioned at the beginning of this presentation that this pilot study is using a collaborative model of citizen science, where our citizen scientists are not only collecting data but also engaged in some of the analysis stage and most importantly contributing feedback and ideas on the process and the design of the bigger project. ****Certainly at a one-to-one level we are trying to learn as much as possible** from our citizen scientists but we are still, quite frankly, working out how and to what level our citizen scientists can be, or want to be, engaged in the analysis of data..... This can be tricky! We want our scientists to feel they can be engaged beyond simply collecting lots of data but we are not sure what that might look like at this stage. We certainly feel that there is an obvious 'next step' with their own individual life space data – where we can feed back to them a 'life space' map and get them to reflect on the spaces and places they did like, and why and the same for the spaces and places they don't like...but also very importantly why there may be neighbourhood spaces and places they don't use.

But we are also contemplating if we can get clusters of scientists to be engaged in this kind of process for (de-identified) amalgamated neighbourhood data – or perhaps to go out and 'ground truth' unfamiliar areas, or fill in the gaps for certain neighbourhood spaces.

Where to from here?

- Explore options for the analysis stage with our Scientists
- Finish the pilot study!
- Fine tune the methodology and the audit tool
- ARC Discovery planned to roll out a national project
- Some interesting new applications of senior citizen science with global appeal.....watch this space!



We can see some exciting applications for both this type of audit tool and the citizen science approach to social science and in particular for examining the built environment. Because at the end of the day what we want to do is create great spaces and places to grow older in – and we want that to be based on the lived experiences and expertise of as many older people as possible – they are after all, the true experts about their life spaces and how they want to use them.

Thankyou

For further information about this project:

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