Population (30 June 2016): 29,101 people
Estimating temporary populations – the power of aggregated mobile device data

Andrew Howe, Tricia Chester

Australian Coastal Councils Conference
Redcliffe, 5 May 2017
Official population measure – ERP
• based on usual residence

Is ERP relevant?
• regional populations vary – monthly, weekly, daily, hourly
• numbers and characteristics (age/sex) vary

ERP frequency and timeliness

Temporary population estimates
• major data gap

Solution?
• mobile device user data (aggregated & anonymised)
Pilot study – hourly population estimates

Trial engagement with telco company

Australian Capital Region
• ACT and surrounds

Geography: SA2s
• ACT suburbs, town centres
• NSW towns & regions

Age (18+) and sex breakdown

Hourly – around the clock

18 April to 1 May 2016
Hourly location data builds as mobile device users connect

Account for:
• multiple connections in hour
• no connection in past hour
• up to 24 hours previous

Users weighted and projected to actual population, based on:
• SA2 of residence
• age (18+)
• sex
**Method**

Hourly location data builds as mobile device users connect

Account for:
- multiple connections in hour
- no connection in past hour
- up to 24 hours previous

Users weighted and projected to actual population, based on:
- SA2 of residence
- age (18+)
- sex

Weighted (anonymised) counts allocated to surrounding areas
Weighted & projected population, 6pm

Method

Population

- Lowest
- Higher
- Highest
Validation

Weighted and projected counts by hour, East Melbourne, weekdays

1 April 2016@1950
Collingwood v Richmond
Crowd: 72,761

24 March 2016@1920
Richmond v Carlton
Crowd: 75,706
Weighted and projected counts by hour, East Melbourne, weekends
April 2016 (Pilot study period)

- **School holidays** on April 20 - 22
- **ANZAC day** on April 25
- **Long weekend** - April 23 - 24
- **Normal working days**
- **Normal weekend**
Australian Capital Region (Pilot study area)

- Batemans Bay
- Merimbula – Tura Beach
- Eden
Hourly Population Estimates, Australian Capital Region
Mon 18 April - Sun 1 May

Pilot study data

School holidays ↔ Long wkend ↔ Normal weekdays & wkend
Hourly Population Estimates, ACT vs NSW surrounds
Tuesday 19 April
Weekday populations

Belconnen Town Centre
Weekday populations

Hourly Population Estimates, Belconnen Town Centre
Mon 18 April – Fri 22 April

Population

12am 2am 4am 6am 8am 10am 12pm 2pm 4pm 6pm 8pm 10pm

Mon 18/04
Tue 19/04
Wed 20/04
Thu 21/04
Fri 22/04
ERP
Weekday populations
**Weekday populations**

**Scullin, Mon to Fri**

**Belconnen Town Centre, Mon to Fri**
Weekend populations
Weekend populations

Hourly Population Estimates, Batemans Bay
Mon 18 April – Sun 24 April

The graph above shows the hourly population estimates for Batemans Bay from 12am on Mon 18 April to 10pm on Sun 24 April. The population varies significantly throughout the day, with peaks occurring around midday and mid-afternoon. The estimates are split into days of the week, with Mon 18/04 in red, Tue 19/04 in purple, Wed 20/04 in orange, Thu 21/04 in teal, Fri 22/04 in light blue, Sat 23/04 in black, and Sun 24/04 in dashed black.
Event populations - Bruce

Hourly Population Estimates, Bruce
Mon 18 – Sun 24 April

Groovin the Moo (15,000 attendees)
Hourly Population Estimates, NSW Coast
Mon 18 April – Sun 1 May

Seachange area populations
Seachange area populations

Midday population, NSW Coast
By age, peak v non-peak times

- 65+
- 55–64
- 45–54
- 35–44
- 25–34
- 18–24

Population ('000)

Fri 29-Apr (non-peak)
Very promising results from pilot study

- Estimates based on this anonymised and aggregated data look good demographically
- Could fill the temporary population data gap

Uses for these hourly population estimates – lots!

- Planning and service provision
- CBDs, mining regions, tourist destinations
- Disaster preparedness
- Funding models etc
Future directions

Short term

• ABS Information paper, released in 2017
• Peer review and promote internationally

Long term

• Continuing discussions around future plans
Census release schedule 2017

11 April 2017

April

Typical Australian profiles – national and state/territory
### 2011 Census QuickStats

**All people - usual residents**

**Redcliffe (Qld)**

<table>
<thead>
<tr>
<th>People</th>
<th>9,201</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>4,413</td>
</tr>
<tr>
<td>Female</td>
<td>4,788</td>
</tr>
<tr>
<td>Median age</td>
<td>44</td>
</tr>
</tbody>
</table>

**Families**

<table>
<thead>
<tr>
<th>Families</th>
<th>2,425</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average children per family</td>
<td>1.7</td>
</tr>
</tbody>
</table>

**All private dwellings**

<table>
<thead>
<tr>
<th>All private dwellings</th>
<th>4,976</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average people per household</td>
<td>2.1</td>
</tr>
<tr>
<td>Median weekly household income</td>
<td>$882</td>
</tr>
<tr>
<td>Median monthly mortgage repayments</td>
<td>$1,733</td>
</tr>
<tr>
<td>Median weekly rent</td>
<td>$270</td>
</tr>
<tr>
<td>Average motor vehicles per dwelling</td>
<td>1.4</td>
</tr>
</tbody>
</table>

### QuickStats menu

- **People**: includes demographics & education, cultural & language diversity, employment
- **Families**: includes family composition, weekly incomes, employment status of couple families
- **Dwellings**: includes dwelling structure, household composition, mortgage & rent, number of motor vehicles
- **Aboriginal and Torres Strait Islander people**: includes selected people & dwelling characteristics
CENSUS DATA SEMINARS

From July 2017

Each capital city + regional locations

Content:
• key census results & region-specific data
• data quality information
• census data products and training

Data specialists available

Selected seminars webcast live, recording available later

Census release schedule 2017

11 April 2017
- Typical Australian profiles – national and state/territory

27 June 2017 – Main data release
- Person, family and household statistics
- Age, sex, religion, language, income and many more topics
- Community level data
- Estimated Resident Population update
- Post Enumeration Survey results
- Independent Assurance Panel report

October 2017
- Employment, qualifications and population mobility topics available