

Australian Government

Department of Infrastructure, Transport, Regional Development and Communications Bureau of Infrastructure and Transport Research Economics

Review of the National Cities Performance Framework – Consultation paper



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Consultation questions

The Australian Government is committed to continual improvement in our cities. The National Cities Performance Framework (NCPF) provides the data needed to measure performance in Australia's largest cities and support evaluation of City Deals. The NCPF dashboard covers over 50 indicators for Australia's 21 largest cities (with populations above 80 000) plus Western Sydney. The NCPF allows users to view information for each city and compare across a range of nationally consistent indicators.

The NCPF is a living resource with the aim to improve continuously. In establishing the NCPF the Government committed to review the Performance Framework every 3-years. This paper represents the start of the public information gathering process for the initial 3-yearly review.

Stakeholders are invited to provide input to the review either by addressing the questions posed in the survey found at <u>https://www.bitre.gov.au/national-cities-performance-framework/review</u>, or by providing a written submission to NationalCitiesPerformanceFramework@infrastructure.gov.au. The closing date for feedback is 12 February 2021.

The feedback received from stakeholders will inform the final 3-year review report to be released in the second quarter of 2021. Changes arising from the review will be progressively implemented in the 2021 and subsequent NCPF updates.

Purpose and use

Issue 1 – Relevance of NCPF

Is there an ongoing need for the NCPF?

• Does the NCPF add value to other data products you use?

Issue 2 – Purpose of the NCPF

Is the current stated purpose still appropriate for NCPF?

• What else do you use NCPF for? What would you like to use the NCPF for but currently cannot?

Which of these purposes should be the primary focus of the NCPF dashboard? (Please choose one)

- Measuring and comparing the performance of cities using the latest available data?
- Monitoring how the performance of a city is tracking over time?
- Supporting the selection, focus and evaluation of City Deals.

What should be the role of the NCPF for City Deals?

• Is the current balance between NCPF and other data sources appropriate for monitoring progress?

Structure of the NCPF

Issue 3 – Contextual indicators

What is your view on removing the contextual indicators as a separate theme?

Issue 4 – Visibility of Sustainability

What is your view on promoting the Sustainability sub-theme to a theme?

Issue 5 – Representing Liveability

What is your view on how well Liveability is represented in the NCPF?

What other suggestions do you have to highlight liveability? What sub-themes or indicators would you consider liveability?

Issue 6 – NCPF themes

Would you suggest any further changes be made to the NCPF themes or policy priorities?

City geographies

Issue 7 – City inclusion

Should the scope of the NCPF be expanded to include smaller cities?

Should the NCPF population threshold be retained at 80 000 or should it be lowered? And if so, what should the new population threshold be? What are the potential benefits of such a change? What issues would arise? How much of a priority is expansion of the NCPF to include smaller cities?

Issue 8 – City boundary definitions

Do the existing city boundary definitions meet your needs?

• If not, what geographic boundary is preferred for your city? Would it make sense to use that alternate geography more widely within the NCPF?

Issue 9 – Sub-city data

Should the NCPF present sub-city indicators for the 5 mainland state capital cities (Sydney, Melbourne, Brisbane, Adelaide and Perth)?

• What are the benefits of such a change? Is a map-based presentation preferred over a chart or table-based presentation? Are there other locations for which sub-city indicators should also be provided? How much of a priority is expansion of the NCPF to present sub-city data?

Which sub-city geography would you prefer be used to present NCPF indicators? (Please choose one)

- Statistical Area Level 4 (SA4)
- Statistical Area Level 3 (SA3)
- Statistical Area Level 2 (SA2)
- Local Government Area (LGA)

Improvement of existing indicators

Issue 10 – More frequently updated indicators

Do you have concerns about any of the existing indicators? Please describe.

• What alternatives would you suggest?

Consultation questions

January 2021

Issue 11 – Indicator removal

Are there indicators which could be removed?

• Are there too many indicators? Is there a preference for a smaller set of indicators?

Issue 12 – Refine Indicators

Are there indicators which could be refined?

Identifying new indicators for inclusion

Issue 13 - New Liveability indicators

What new liveability indicators should be included in the dashboard?

• How does this indicator contribute to measuring the performance of cities? How might we access data for that indicator?

Issue 14 – New Sustainability indicators

What new sustainability indicators should be included in the dashboard?

 How does this indicator contribute to measuring the performance of cities? How might we access data for that indicator?

Issue 15 – Digital opportunities

Issue 16 – Planning

What new planning indicators should be included in the dashboard?

• How does this indicator contribute to measuring the performance of cities? How might we access data for that indicator?

Issue 17 – Tourism

How useful would a tourism spend per capita indicator be?

Are there are there any other new indicators that should be considered for inclusion in the NCPF?

• How does this indicator contribute to measuring the performance of cities? How might we access data for that indicator?

NCPF platform

Issue 18 – NCPF delivery

How would you prefer to access the NCPF? (please choose one)

- Statistical reports in PDF
- Data download in spreadsheet or related format
- Dashboard
- Other format (please specify)
- I don't interact with the NCPF

Issue 19 – Platform performance

Potential extensions of the NCPF

Issue 20 – Time series data

Should the NCPF dashboard be extended to present time-series data for Australian cities?

• What are the benefits of such a change? What issues would arise? Should the dashboard be redesigned to make time-series data the principal focus (rather than comparing cities at a point in time)?

Issue 21 – International benchmarking

Which of the following possible extensions of the NCPF is the highest priority to you?

- Extending coverage to include smaller cities
- Presenting data for city subregions
- Including time-series data
- International benchmarking of Australian cities.

Introduction

The Australian Government is committed to continual improvement in our cities. The National Cities Performance Framework (NCPF) provides the data needed to measure performance in Australia's largest cities and support evaluation of City Deals. The NCPF dashboard covers over 50 indicators for Australia's 21 largest cities (with populations above 80 000) plus Western Sydney. The NCPF allows users to view information for each city and compare across a range of nationally consistent indicators. It is available at http://www.bitre.gov.au/national-cities-performance-framework

The NCPF's intention is to help governments, the private sector and interested members of the community to better understand issues facing our cities by providing quality information. The NCPF is designed to measure how major Australian cities are performing in six policy priority areas:

- Jobs and skills
- Infrastructure and investment
- Liveability and sustainability
- Innovation and digital opportunities
- Governance, planning and regulation and
- Housing.

The 3-year review

The NCPF is a living resource with the aim to improve continuously. In establishing the NCPF the Government committed to review the Performance Framework every 3-years:

The Government will review the Performance Framework every 3-years in consultation with state and local governments, industry and the community, starting in 2020. The review will include an assessment of the Performance Framework purpose, policy priorities, coverage and indicators. It will consider the need to include additional cities and sub-city level information where this is identified as a priority by stakeholders, and data is available. The review will also consider the potential for international benchmarking of Australian cities to help policy makers to better understand how our cities are placed to compete in the global economy. (Australian Government 2017, p.33)

This consultation paper represents the start of the public information gathering process for the initial 3-yearly review.

The review is covering a range of topics; from the purpose of the NCPF to assessing individual indicators. In this paper each topic is discussed and issues that represent decision points are identified. The issues are collated in *Consultation questions* at the beginning of this paper. Some of these issues are included at the request of government, such as in the *Building Up, Moving Out* report (House of Representatives Standing Committee on Infrastructure, Transport and Cities 2018). Other issues were identified through a review of the relevant documentation, academic literature, and discussions with stakeholders. BITRE has presented the proposed approach for each issue, and posed questions for stakeholders to inform the final decision.

Like issues are organised into topics with one topic per chapter, as outlined in Table 1. The paper concludes by outlining how to make submissions and how your inputs will contribute to the review.

Introduction

Chapter topic	Issues
Purpose and use	1 – Relevance of the NCPF
	2 – Purpose of the NCPF
Structure of the NCPF	3 – Contextual indicators
	4 – Visibility of Sustainability
	5 – Representing Liveability
	6 – NCPF themes
City geographies	7 – City inclusion
	8 – City boundary definitions
	9 – Sub-city data
Improvement of existing indicators	10 – More frequently updated indicators
	11 – Indicator removal
	12 – Refine indicators
Identifying new indicators for	13 – New Liveability indicators
inclusion	14 – New Sustainability indicators
	15 – Digital opportunities
	16 – Planning
	17 – Tourism
NCPF platform	18 – NCPF delivery
	19 – Platform performance
Potential extensions of the NCPF	20 – Time series data
	21 – International benchmarking

Table 1Chapter topics and issues covered in this paper

Stakeholders are invited to provide input to the review either by addressing the questions posed in the <u>survey found on the NCPF dashboard</u>, or by providing a written submission to NationalCitiesPerformanceFramework@infrastructure.gov.au.

The consultation process will be open until 12 February 2021. A workshop will be held with invited stakeholders in March.

The feedback received from stakeholders will inform the final 3-year review report to be released in the second quarter of 2021. Changes arising from the review will be progressively implemented in the 2021 and subsequent NCPF updates.

A brief history

The NCPF was originally developed by the Department of Prime Minister and Cabinet, with the bulk of the data construction outsourced to a consulting firm. Following machinery of government changes, the cities function moved to the then Department of Infrastructure, Regional Development and Cities¹ in early 2018, with the then Bureau of Infrastructure, Transport and Regional Economics (BITRE)² taking on responsibility for the NCPF. The Digital Transformation Agency built the original NCPF dashboard and transferred responsibility of the dashboard to the Department later in 2018.

¹ The department is now known as the Department of Infrastructure, Transport, Regional Development and Communications, and is referred to as "the department" within this paper.

² BITRE is now known as the Bureau of Infrastructure and Transport Research Economics.

Upon gaining responsibility for the dashboard, BITRE undertook a comprehensive review and update of indicator methods so that they met BITRE standards and aligned with the methods used in BITRE's *Progress in Australian Regions Yearbook* (BITRE 2018b).

The data in the dashboard was updated in July 2019 and June 2020. With each annual update, around 20 of the indicators have been updated to reflect the latest available data. For some indicators, the methodology has been improved, while some indicators have been retired and several new indicators have been introduced. Full details are published in the *Data Dictionary*.

In 2020 the NCPF dashboard was rebuilt in Power BI to meet security requirements, and relocated to the BITRE website.

Purpose and use

The purpose of the NCPF was set out in the NCPF report, released at the time the dashboard was initially published in December 2017 (Australian Government 2017). The intended purpose is also evident in the design of the dashboard. This section outlines the NCPF's stated purpose and presents some evidence on how the NCPF has been used to date and the feedback received from users. Finally, it raises the questions of whether:

- there is an ongoing need for the NCPF
- the current stated purpose of the NCPF should be retained going forward.

Stated purpose

The NCPF report sees that the primary purpose of the NCPF is to

...help governments, businesses and communities better understand and measure the performance of our cities (Australian Government 2017, p12).

The NCPF will do this by meeting the following objectives:

- helping users to understand the context for the performance of cities
- helping users measure the performance of cities
- supporting the selection, focus and evaluation of City Deals

The NCPF helps users understand the context of cities through 14 contextual indicators. These indicators have their own separate theme – Context – but are all contained within the other themes of the NCPF as well. These indicators are important to understand the characteristics of a city, but are difficult to manipulate with local policies.

Knowing the starting position of cities and how they change over time is necessary to determine the need for policy interventions and assessing whether they were effective. Performance frameworks need data that is consistent across time and between cities. The NCPF contains a range of indicators across the 6 priority objectives. The indicators are reviewed for their fit for purpose later in this report.

Figure 1 below illustrates how data is presented in the NCPF. Data is presented on a consistent basis for the NCPF cities, based on the latest available data. The presentation of data within the dashboard helps users measure and compare cities at a particular point in time, but does not support monitoring of changes in cities over time.

The first two of the objectives listed above are internal to the construction of the NCPF. The third, as input to the City Deals, relates to how the NCPF is intended to be used by its core stakeholders, and is discussed below.



Source: BITRE's National Cities Performance Framework 2020 update <www.bitre.gov.au/national-cities-performance-framework>

How is it used?

Web analytics

Web analytics are presented for the period 1 July 2019 to 30 June 2020.³ The web analytics are available for both pages and users.

Pages

Over the year the NCPF received a total of 31 378 page views, and 23 378 unique page views. However, the bounce rate of 46% indicates nearly half of the page views were not intending to view the NCPF. A unique page view is calculated when a user visits a page during the one session, but it is

³ This period was chosen as it represents the only reference period that data is available. Prior to March 2019 the NCPF was hosted by the DTA. At the end of June 2020, the NCPF update was released as a Power BI dashboard. This format means that individual views within the dashboard are not currently visible to the web analytics, however Power BI does have the capability to produce usage metrics if configured appropriately.

not accumulated. So if a user visits a page it counts as only one unique page view regardless of how many times they visit during the session. A session is usually counted as 24 hours.

As the NCPF launch page, the '/all-cities/overview' page received the most unique page views, at 5 524 views. The most popular pages are detailed in Table 2 below. The all-cities pages all received more unique page views than any of the city specific pages. The ranking of the topic areas changes for each city, indicating the different priorities of the cities.

	de page views for the NCFT
Page	Unique page views
/all-cities/overview	5 524
/all-cities/context	1 105
/all-cities/liveability	1 039
/all-cities/housing	802
/all-cities/infrastructure	727
/all-cities/jobs	687
/all-cities/innovation	477
/all-cities/planning	469

Table 2	Number of unique	page views	for the NO	CPF pages
-			•	

Source: BITRE analysis of web analytics data.

Users

Australian users represented nearly two-thirds (63%) of all users, followed by the United States (5%), China (5%), Japan (4%), India (3%) and the United Kingdom (2%) (Table 3). There was a large difference between the number of Australian users and the number of sessions for those users, indicating that those users often visited the NCPF more than once. The number of pages by session indicate that Australians were interested in a number of pages, and not just a single statistic for a location.

The high bounce rate and low average pages by session for the top 3 countries after Australia indicates that these countries did not engage with the NCPF after their initial page load. However, India and the United Kingdom were more interested in the NCPF and show engagement characteristics similar to the Australians.



Country	New Users	Sessions	Bounce rate	Pages/session
	(total)	(total)	(average)	(average)
Australia	3,672	6,631	41%	3.61
United States	304	344	77%	1.70
China	279	306	80%	1.97
Japan	233	244	89%	1.23
India	193	339	44%	3.33
United Kingdom	91	114	45%	2.96
All	5,850	9,526	46%	3.29

Table 3 Number of NCPF users for the top 5 countries and Australia

Source: BITRE analysis of web analytics data.

There is little difference in usage characteristics in the users from the states when compared to the Australian average, with the exception of the ACT. The number of sessions for the users from the ACT are nearly 3 times higher than the number of users (compared to nearly twice nationally). This makes sense when you consider the ACT's unique role as the home of the Australian Public Service, and its interest in Australian cities.

The web analytics data is unable to tell us what type of organisation users come from, and how they are using data obtained from the NCPF. Information on organisation type will be sought in the consultation questionnaire to help fill this gap in our understanding.

City Deals

_ . . .

City Deals are a partnership between the 3 levels of government and the community to work towards a shared vision for productive and liveable cities.

Eight City Deals have been agreed to date (Table 4). Negotiations are underway for new City Deals in South East Queensland and North West and South West Melbourne.

Table 4 City Deal Timeline Events			
City	Date Signed	Implementation	Progress reports
		Plan Released	
Townsville	Dec 2016	April 2017	Mar 2018, Apr 2019, Feb 2020
Launceston	Apr 2017	NA	Jul 2018, Jul 2019, Sep 2020
Western Sydney	Mar 2018	Dec 2018	Oct 2019, June 2020
Darwin	Nov 2018	Nov 2019	July 2020
Hobart	Feb 2019	Oct 2019	August 2020
Adelaide	Mar 2019	Nov 2019	Sep 2020
Geelong	Nov 2019	Oct 2019	November 2020
Perth	Sep 2020	NA	NA

Similar to the NCPF, each City Deal has an agreement to undertake a 3-year review. The first of these reviews are currently underway in Townsville and Launceston. The purpose of the City Deals' 3-year reviews are to ensure the Deal is on-track to deliver on its intended vision. In part, this will be done by analysing data that provides insight into the delivery of the intended outcomes agreed by City Deal partners.

Each City Deal has its own set of objectives, tailored to the specific needs of the city. For example:

- the Adelaide City Deal is focused on building an innovation economy (including through investment in the Lot Fourteen precinct) and supporting stronger population growth (DITRDC 2019a);
- the Darwin City Deal is focused on revitalising the city centre, promoting visitation, and cooling the city (DITRDC 2018).

The indicators chosen to monitor progress need to be tailored to the specific objectives of each City Deal, with data for local priorities often able to be sourced locally⁴. As a result, there is considerable variation in the extent to which different City Deals have used the NCPF indicators to monitor progress up until now. The 3-year review reports currently being prepared have used NCPF data that are appropriate to the outcomes of the relevant City Deal, and will therefore contain a mix of NCPF data and other data sources. In particular, the NCPF has been used to compare cities with similar cities. The NCPF is best suited for monitoring performance against those objectives that cut across a number of City Deals, such as population and jobs growth, skills and the economic impact of tourism.

The Western Sydney City Deal (WSCD) has had a much greater connection to the NCPF than other City Deals from the outset, using many of the NCPF indicators in their reports (DITRDC 2019b). The WSCD is also unique in that it has recently constructed an evaluation framework which has used NCPF indicators as the core for ongoing monitoring of outcomes. One of the stated aims of the evaluation framework is to be applicable to other City Deals as they move into the evaluation phases.

The fact that the NCPF reports use statistical boundaries rather than City Deal boundaries does tend to constrain its usefulness for monitoring City Deals. For example, with the Darwin City Deal, the City of Darwin is the only LGA signatory, and the objectives are strongly focused on central Darwin. However, the NCPF reports for the Greater Darwin Capital City Statistical Area which extends well beyond the boundaries of the City of Darwin LGA. The geographic boundary issue is discussed in more detail in the *City geographies* chapter of this paper.

External feedback

The NCPF is globally unique in its goal of measuring the performance of cities and making the data accessible for all. In recognition of this, in 2018 the NCPF received a GovTech prize, specifically the Best Government Emerging Technologies Award (World Government Summit 2018). This is an award for governments that are experimenting with emerging technologies to provide government services more efficiently and effectively and that have proven results of how they have created greater public value and transformed the lives of people. The GovTech prize is an annual award designed to motivate government entities to promote creative smart government initiatives and partnerships with the aim of providing innovative smart solutions for common global challenges. The GovTech Prize is run out of Dubai.

Since the launch of the NCPF a number of stakeholders have provided feedback on issues that are important to them. This feedback generally relates to one of 3 broad topics:

- Inclusion of sub-city data
- Expanded indicator coverage

⁴ Launceston also has baseline metrics that have been developed to support monitoring of the Deal over the longer term – see https://www.launcestoncitydeal.com.au/projects/metrics_for_northern_tasmania

- January 2021
- Performance of the dashboard

These issues are discussed separately in other sections of this paper.

Issue 1—Relevance of the NCPF

The production of the NCPF requires significant resources to acquire and collate data and to publish within the dashboard. Many of the indicators are readily available from other sources (eg the *Progress in Australian Regions Yearbook* (BITRE 2019) and ABS' (n.d.) *Data by Region*) and others are available from commercial entities for a fee.

One of the advantages of the NCPF is the consistency of the data, which allows comparison across the cities. This consistency comes at the cost of providing tailored data which may suit some cities better. Many of the indicators are derived from the Census and so are only able to be updated once every 5 years. This makes them unsuitable for seeing yearly changes but better suited to long term monitoring.

BITRE is seeking feedback from users as to whether there is ongoing value in the NCPF.

While the dashboard is the public face of the NCPF, it is separate to it. Questions about how the NCPF is delivered are asked in *Issue 18—NCPF delivery*.

Proposed approach

There are currently no plans to discontinue the NCPF.

Issue 2—Purpose of the NCPF

The NCPF is broadly meeting the originally stated purpose to help users better understand and measure the performance of cities, but is that purpose still appropriate?

Currently the dashboard presents data to allow comparison of cities, however understanding how cities change over time is not possible. The original NCPF report raised the question of whether time-series data could be included within future iterations of the NCPF (Australian Government 2017), and the issue is discussed in more detail in the chapter. The priority given to the inclusion of time-series data very much depends on whether stakeholders envisage a different or broader purpose than was built into the original design of the dashboard.

Within DITRDC, the three stated objectives are seen as relevant, with some modifications. The important aspect of the NCPF is that it helps tell the context and the story of cities. The long term monitoring and evaluation of City Deals continues to be an important role for the NCPF along with local data.

BITRE is seeking feedback from users as to whether the dashboard's current focus on measuring and comparing cities using the latest available data remains the highest priority, or whether it should instead be replaced by a different primary focus, such as:

- monitoring how a city is tracking over time, or
- supporting the monitoring and evaluation of City Deals.

Proposed approach

There is currently no known drive to change the purpose (and hence use) of the NCPF and so no changes are recommended.

Questions for consultation—Purpose of the NCPF

Is there an ongoing need for the NCPF?

• Does the NCPF add value to other data products you use?

Is the current stated purpose still appropriate for NCPF?

• What else do you use NCPF for? What would you like to use the NCPF for but currently cannot?

Which of these purposes should be the primary focus of the NCPF dashboard? (Please choose one)

- Measuring and comparing the performance of cities using the latest available data?
- Monitoring how the performance of a city is tracking over time?
- Supporting the selection, focus and evaluation of City Deals.

What should be the role of the NCPF for City Deals?

• Is the current balance between NCPF and other data sources appropriate for monitoring progress?

Structure of the NCPF

The NCPF is currently structured around the 6 priority policy areas specified in the NCPF report (Australian Government 2017), called themes, and a context theme. There are 53 indicators in total with the 14 contextual indicators⁵ reported against the relevant priority policy area as well as under the context theme. The 7 main themes and their sub-themes are:

- Context
 - Planning (6 indicators)
 - Housing (5 indicators)
 - Liveability (2 indicators)
 - Jobs and skills (1 indicator)
- Jobs and Skills
 - Labour force (7 indicators)
 - Education (3 indicators)
- Housing
 - Housing affordability (7 indicators)
 - Living affordability (5 indicators)
- Infrastructure and Investment
 - Getting to work (6 indicators)
- Innovation and Digital opportunities
 - Innovation (2 indicators)
 - Digital opportunities (2 indicators)
- Liveability and Sustainability
 - Liveability (4 indicators)
 - Wellbeing (3 indicators)
 - Safety and support (3 indicators)
 - Sustainability (4 indicators)
- Governance, Planning and Regulation
 - Planning (6 indicators)
 - Local Government (1 indicator)

From this listing, it is evident that different themes have varying depth of coverage. In particular, the Innovation and Digital Opportunities theme is represented by fewer indicators than the other themes. While there are seven indicators allocated to the Planning theme, in contrast to the other policy priority areas, there are currently no performance indicators identified within Planning, only contextual indicators. Some potential planning performance indicators are considered later in the *Identifying new indicators for inclusion* chapter.

⁵ In the NCPF, there are two types of indicators: performance indicators and contextual indicators. Contextual indicators are indicators that help us understand what a city is like and why it functions like it does. Performance indicators are intended to assess city performance and cover aspects of cities that can be measured and tracked against policy priorities.

Figure 2 illustrates how the 7 themes are a core element of the dashboard's design.



Source: BITRE's National Cities Performance Framework 2020 update <www.bitre.gov.au/national-citiesperformance-framework>

Some of the feedback received in the establishment of the NCPF was that the list of indicators was too long and should be reduced to a much smaller number of headline indicators. However, others requested additional indicators be added. There are accessibility, system performance, and resourcing advantages to a shorter list, with fewer indicators being quicker to load for users and requiring less resources to update every year. However, a much smaller number of indicators would not capture the full diversity and complexity of issues that cities face.

Feedback to date on the structure of the NCPF has been focused on the Liveability and Sustainability theme. The two core issues identified that have been raised are the lack of visibility of sustainability indicators within the NCPF and concerns about the current representation of liveability. These issues are discussed below.

Issue 3—Contextual indicators

The contextual indicators are all duplicated within the main performance indicators. The contextual indicators are meant to support the interpretation of the performance indicators, but may still do this within the main structure. Removing the separate contextual indicators theme means that the data model is simplified, which in turn improves the performance of the dashboard.

If the contextual factors are not required to be separate to the performance indicators, they may be removed as a duplicate of indicators contained elsewhere in the NCPF. The indicators will still have their context flag within the dashboard.

Proposed approach

Remove the separate contextual indicators theme.

Issue 4—Visibility of Sustainability

Sustainability does not have its own theme in the NCPF, being a sub-theme within the Liveability theme, and is not as visible as other aspects.⁶ The growing availability of data and importance of sustainability means that the already large theme and sub-theme is only going to increase in size and difficulty to display. Indeed, there are potential new sustainability indicators discussed in the *Identifying new indicators for inclusion* section of this paper.

In the literature sustainability is often linked to liveability or even used interchangeably. The Brundtland Report (1987) defines sustainability as "...development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Sustainability is about time as much as place. Yet some liveability assessments emphasise the link by including sustainability indicators. (Lowe et al 2013). Others see the converse, that liveability is a subset of sustainability (Chiu 2019).

From the literature there is no clear reason to include sustainability, or indicators that are commonly associated with sustainability, as part of the Liveability theme. Given the support from several key stakeholders, it is recommended that the dashboard separates Liveability and Sustainability into two distinct themes. To separate the two when allocating indicators, we have adopted the idea that sustainability is more about time, and is system focussed (environmental or institutional), whereas liveability is more about the present and is human focused.

Proposed approach

Promote the Sustainability sub-theme to its own theme.

Issue 5—Representing Liveability

A range of stakeholders have made comments on how Liveability is presented in the NCPF. Many of the indicators in other themes can also be considered indicators of liveability and much of the feedback relates to moving indicators into the Liveability theme.

Liveability is a word popularly used in urban policies, both in Australia and overseas, but rarely explicitly defined. Where definitions exist they are not standardised or linked to theoretical frameworks. (Lowe et al 2013). Definitions range from the specific –

...safe, attractive, socially cohesive and inclusive, and environmentally sustainable, with affordable and diverse housing linked via public transport, walking, and cycling to employment, education, public open space, local shops, health and community services, and leisure and cultural opportunities. (Badland 2015)

- to the broad -

⁶ While the full theme title is 'Liveability and Sustainability', on the dashboard home page this is shortened to just 'Liveability' for reasons of brevity, as is illustrated in Figure 2.

...the combination of factors that contribute to people's quality of life and wellbeing (Commissioner for Sustainability and the Environment, 2015).

Liveability is often used interchangeably with other concepts such as 'quality of life' and 'wellbeing', or even simply 'community indicators' (Olesson et al 2012). As Chiu (2019) notes, liveability is a relative concept dependent on the needs and values of those doing the measuring, and that context is everything. As such, liveability in the NCPF needs to be driven by the purpose of measuring it, the cities policy and programs.

The literature has shown that the definition of liveability is subjective and changes according to the desired outcomes. The City Deals reflect this diversity. There are some common themes in the City Deals in relation to liveability:

- Amenity: ensuring public spaces are attractive and accessible, improving green spaces.
- **Community infrastructure**: access to sporting and cultural facilities.

The two key outcomes the Australian Government is aiming to achieve in cities are to increase productivity and liveability. Liveability impacts on productivity because it affects where people decide to live. Most of the NCPF indicators are more closely related to liveability than productivity. Consultation within the Department identified the five main aspects of liveability as being:

- Traffic congestion
- Housing affordability
- Access to amenities
- Access to green spaces
- Access to jobs.

Each of these topics are currently covered within the NCPF to some degree, but are generally captured within other NCPF themes (e.g. Housing, Infrastructure) rather than within the Liveability theme.

If the Sustainability sub-theme is removed (as proposed above), what remains under the Liveability theme are the Liveability, Wellbeing, and Safety and support sub-themes. Many of the indicators included under these sub-themes (e.g. life expectancy, median household income, suicide rates, road fatalities, feelings of safety) don't really fit within the concept of what is meant by liveability, and would perhaps be better represented by retitling the theme as 'Society'. BITRE is investigating a few options to better align the concept of liveability that is captured in the NCPF with that reflected in the government's cities policy and programs. The options being considered include

- Updating the explanatory text on liveability
- Consider having some indicators repeated under a liveability lens specifically indicators relating to traffic congestion, housing affordability, access to amenities, access to green spaces and access to jobs.
- Colour coding or some other reorganising of the dashboard.

In addition to considering new ways to represent liveability, BITRE is proposing the addition of new indicators of liveability outlined later in this paper.

Proposed approach

BITRE will rename the existing Liveability theme as Society to recognise it is only an aspect of liveability and seek feedback on ways to add a liveability lens to the NCPF.

Issue 6—NCPF Themes

The themes of the NCPF are drawn from the 6 policy priorities as set out in the NCPF report (Australian Government 2017). However, the dashboard may be more effectively structured another way, or these priorities may have changed over time. BITRE is proposing to restructure the Context, Sustainability and Liveability themes (see *Issues 3, 4* and *5* above). BITRE are seeking views on whether these changes to the current structure are sufficient or whether further changes are required.

Proposed approach

BITRE will make no further changes to the structure of the NCPF unless there is clear feedback that changes are necessary.

Questions for consultation—Structure of the NCPF

What is your view on removing the contextual indicators as a separate theme?

What is your view on promoting the Sustainability sub-theme to a theme?

What is your view on how well Liveability is represented in the NCPF?

• What other suggestions do you have to highlight liveability? What sub-themes or indicators would you consider liveability?

Would you suggest any further changes be made to the NCPF themes or policy priorities?

City geographies

The NCPF currently presents data for Australia's 21 largest cities and Western Sydney. The included cities are detailed in Figure 3.

The spatial extent of the cities are defined using the following geographical boundaries:

- Capital cities are based on the Australian Bureau of Statistics (ABS) Greater Capital City Statistical Areas (GCCSAs), as defined in the 2016 Australian Statistical Geography Standard (ASGS) (ABS 2016).
- Western Sydney is based on aggregating the eight NSW Local Government Areas (LGAs) that make up the Greater Sydney Commission's Western City District and the area of the Western Sydney City Deal—Blue Mountains, Camden, Campbelltown, Fairfield, Hawkesbury, Liverpool, Penrith and Wollondilly.

All other cities are based on ABS Significant Urban Areas (SUAs), as defined in the 2016 ASGS (ABS 2017). Significant Urban Areas that are located within a Greater Capital City Statistical Area boundary do not qualify.



Figure 3 Map of cities included in the National Cities Performance Framework

Note: The NCPF defines Sydney based on the GCCSA boundary, which includes Western Sydney. While Western Sydney contributes to the indicators presented for Sydney as a whole, indicators are also presented separately for Western Sydney as it is the focus of a City Deal. Source: BITRE analysis of ABS 2016 GCCSA, SUA and LGA boundaries.

Wherever possible, the data reported in the NCPF is based on these geographical boundaries. However, there are some indicators for which the available data does not match these boundaries. An example is the air quality indicator, which is available for one or more points (air quality monitoring stations) within each city. Details of the geographic basis of each indicator and techniques used to convert data to NCPF geographies are detailed in the *Data Dictionary* (DITRDC 2020).

The underlying ABS geographic boundaries are updated once every five years, while LGA boundaries can change more frequently. When these underlying boundaries are updated, the new city geographies are implemented into the NCPF at the next available opportunity. For example, the first annual update of the NCPF in mid-2019 reflected the ABS's expansion of the geographic boundaries of the Newcastle-Maitland, Toowoomba and Geelong SUAs.

Table 5 lists the included cities and their estimated resident population as at 30 June 2019. Mackay is the smallest of the included cities with a population of just over 80 000, followed by Launceston with a population of 88 178.

City	Estimated resident population
Sydney	5 312 163
Melbourne	5 078 193
Brisbane	2 514 184
Perth	2 085 973
Adelaide	1 359 760
Western Sydney	1 124 200
Gold Coast – Tweed Heads	693 671
Newcastle - Maitland	491 474
Canberra	426 704
Sunshine Coast	341 069
Wollongong	306 034
Geelong	275 794
Hobart	236 136
Townsville	181 668
Cairns	153 951
Darwin	147 255
Toowoomba	138 223
Ballarat	107 652
Bendigo	100 991
Albury - Wodonga	94 837
Launceston	88 178
Mackay	80 264

Table 5	Estimated resident population of NCPF	cities, June 30 2019

Source: ABS Cat. 3218.0 Regional Population Growth, Australia, 2018-19

Issue 7—City inclusion

The NCPF currently includes Australia's 21 largest cities, which have a population of 80 000 or more. The NCPF also presents data for one sub-city region—Western Sydney—which is included because it is the focus of a City Deal.

Table 6 lists the largest Australian cities that are currently outside the scope of the NCPF. As of 30 June 2019, the city of Rockhampton in Queensland had a population of 79 081 (which is only 1 183 below the population of Mackay). It is likely that Rockhampton's population will surpass 80 000 in the next few years and it could also surpass Mackay's population. Should Rockhampton become one of Australia's 21 largest cities, BITRE will then consider incorporating the city into future NCPF updates. Since the ABS can sometimes significantly revise its regional population figures (particularly once census data becomes available), priority will be given to maintaining a stable set of cities within the NCPF, rather than reflecting year-to-year fluctuations. Other cities which lie just outside the current scope of the NCPF include Bunbury in Western Australia, Coffs Harbour in New South Wales, and Bundaberg in Queensland.

2019	
City	Estimated resident population
Rockhampton QLD	79 081
Bunbury WA	74 591
Coffs Harbour NSW	72 541
Bundaberg QLD	71 309
Wagga Wagga NSW	56 675
Hervey Bay QLD	55 345
Mildura-Wentworth VIC/NSW	52 176
Shepparton-Mooroopna VIC	52 104
Port Macquarie NSW	48 723
Gladstone-Tannum Sands QLD	45 631
Tamworth NSW	43 188
Traralgon-Morwell VIC	42 249
Orange NSW	40 804
Bowral-Mittagong NSW	40 411

Table 6	Estimated resident population of largest Australian cities excluded from NCPF, June 30
	2019

Notes: Populations are for SUAs. SUAs located within GCCSA boundaries are excluded. Source: ABS Cat. 3218.0 Regional Population Growth, Australia, 2018-19

At the time of the NCPF's initial release, it was pointed out that the 3-yearly review would consider the need to include additional cities, where this is identified as a priority by stakeholders and data is available (Australian Government 2017). Additional cities could be included in the NCPF either by lowering the population threshold, or by adding cities which are the focus of City Deals.

Western Sydney is a special case in the NCPF. It is a sub-region of Sydney, and was included in the NCPF to support ongoing monitoring and evaluation of the Western Sydney City Deal (DITRDC 2020d). All the other City Deals that have been signed to date relate to NCPF cities (e.g. Townsville, Launceston, Adelaide, and Hobart). However, as time progresses, new City Deals may be entered into for other sub-regions of cities. Negotiations are currently underway for a South East Queensland City Deal which could encompass multiple NCPF cities (e.g. Brisbane, Gold Coast, Sunshine Coast and

Toowoomba). When new City Deals are signed for city subregions or multiple-city regions, BITRE will aim to incorporate the city region into the NCPF during the following year's annual update.

The *Building Up, Moving Out* report recommended 'incorporating smaller regional capitals into the framework' (House of Representatives Standing Committee on Infrastructure, Transport and Cities 2018). According to Regional Capitals Australia, 'monitoring all regional cities will significantly increase the understanding of how these cities function' (ibid). In its response, the Australian Government noted this recommendation (Australian Government 2020a), stating that the feasibility and benefits of incorporating additional cities into the Framework would be investigated further through regular updates and reviews of the Framework.

If the scope of the NCPF were expanded to include smaller regional cities, there would be some clear benefits to the included cities, in terms of improved data availability and accessibility for their cities, and improved data comparability with other cities. Other potential benefits put forward by Regional Capitals Australia include improved recognition of the role these cities play and potentially bettertargeted government interventions (House of Representatives Standing Committee on Infrastructure, Transport and Cities 2018).

There is a related Departmental product, the *Progress in Australian Regions Yearbook*, which makes a range of progress and contextual indicators available for Australian cities with a population of 10 000 or more, using SUA boundaries (BITRE 2019).⁷ The Yearbook presents a more extensive set of indicators than the NCPF, and although there is significant overlap, not all indicators that are relevant to cities are contained in the Yearbook. A total of 29 indicators were reported for all Australian SUAs in the 2019 Yearbook, covering topics such as population, age structure, homelessness, building approvals, active travel, citizenship uptake, volunteering, qualifications and household income. In BITRE's view, the indicators already made available for smaller cities through this Yearbook are making a significant contribution to the objectives of improving data availability and accessibility for smaller cities, and improving data comparability with larger cities. The accessibility of this data for smaller cities will be further improved when the Yearbook is made available in dashboard form in the coming months.

If the NCPF were expanded to include smaller cities, a number of issues would arise:

- The availability of data is more limited for cities with smaller populations. While ABS *Census of Population and Housing* and *Estimated Resident Population* data is readily available and of good quality for smaller cities, quite a few of the other NCPF indicators are not currently available for smaller cities or are only available for some smaller cities. Examples include the NCPF indicators on access to public transport, access to public open space, traffic congestion, air quality, office building energy efficiency and 30 minute job access.
- Data quality issues are more frequent for cities with smaller populations. This is particularly an issue for indicators based on sample surveys, where estimates for small cities can have a relatively high margin of error (due to a small sample size), and can vary significantly from one update to the next. This issue is known to impact on the six NCPF indicators underpinned by the ABS *Labour*

⁷ The main Yearbook publication presents data for the 20 largest Australian cities and a range of other geographies (e.g. remoteness classes, SA4s). However, the web page makes available additional Excel files for 30 indicators which present data for all SUAs (BITRE 2019). The Yearbook publication and the associated spreadsheets were updated annually to reflect the latest available data, and the data is presented in time-series form. As of 2020, the publication will be produced by the Bureau of Communications, Arts and Regional Research (BCARR) and will be released as an online interactive dashboard. All available SUA data will be readily accessible on the new Progress in Australian Regions Dashboard.

Force Survey (i.e. unemployment rate, youth unemployment rate, labour force participation rate, employment growth, knowledge intensive services, sectoral employment split).

- Priorities are often different for smaller cities. Some of the NCPF indicators which are a priority for larger cities are of lesser relevance to smaller cities (e.g. traffic congestion, 30 minute job access, public transport use).
- The charts used to compare cities in the NCPF dashboard would become very cluttered if a significant number of additional cities were to be included. At the moment, the chart for each indicator compares the 21 cities and Western Sydney. A chart that compared 30 or more cities would not be very accessible for users.

The smaller the cities included in the NCPF, the more pronounced each of these issues would be.

Although smaller regional centres could be incorporated into the Framework, this would require additional resources to be invested in the annual NCPF update process. The impact would depend on how much the scope of the NCPF was expanded. For example, based on Table 6, a lowering of the population threshold to:

- 60 000 would involve reporting for only four additional cities, which would have a modest impact on the resources required for an annual update
- 40 000 would involve reporting all available NCPF indicators for a further 14 cities, which would have a significant impact on the resources required for an annual update.

Proposed approach

BITRE proposes incorporating new cities into the NCPF if they qualify as one of Australia's 21 largest cities or following the signing of a new City Deal for a city subregion or a multiple-city region.

BITRE proposes making no further change to the cities covered by the NCPF, unless there is clear feedback that expansion to cover smaller cities is a top priority, and appropriate resources can be secured to implement such a change.

Issue 8—City boundary definitions

As detailed at the beginning of this chapter, the NCPF cities (apart from Western Sydney) are defined using standard ABS statistical boundaries, specifically the GCCSA and SUA boundaries from the Australian Statistical Geography Standard (ABS 2016, 2017). Western Sydney is defined based on LGA boundaries, reflecting the LGAs that signed up to the City Deal.

The use of statistical geographies—rather than administrative geographies—to define the 21 largest Australian cities, reflects a number of advantages:

- ABS and many other data providers routinely publish their small area data using ASGS geographies
- ASGS boundaries remain stable for at least 5 years
- Should boundary changes be necessary, ABS makes correspondences available to support timeseries analysis
- A common set of criteria is used to define each statistical geography on a nationwide basis.

The use of statistical boundaries reflects the key purpose of the NCPF to understand, measure and compare the performance of cities at a point in time. The GCCSA and SUA statistical boundaries provide a valid basis for making statistical comparisons of Australia's largest cities.

- 'GCCSAs have been designed to represent a stable and consistent boundary that represents the functional extent of each of Australia's capital cities' (ABS 2013). This definition includes those within the urban area as well as people who socialise, work and shop within the city, but live in surrounding rural areas and towns (ibid).
- SUAs 'represent significant towns and cities of 10 000 people or more' (ABS 2017). In addition to the developed urban area, they can also include some adjacent peri-urban or rural residential settlement and the area into which urban development is likely to expand (ibid).

While GCCSAs and SUAs are both designed to represent cities, GCCSA boundaries are more encompassing than SUA boundaries, as SUAs do not take into account the functional influence of the city. If SUAs are considered too narrowly defined, functional geographies such as BITRE's working zones represent a potential alternative geography for the non-capital cities.⁸

The GCCSA and SUA boundaries used in the NCPF may not meet the needs of all users. Some users regard the SUA boundaries as being too narrowly defined. Some would prefer the following geographies be adopted instead:

- Statistical Area Level 4 (SA4) boundaries from the ABS' ASGS
- LGA boundaries
- Other administrative boundaries, such as state government planning regions.

Unlike GCCSA and SUA boundaries, SA4 boundaries are not designed to capture a city. There are many SA4s located within Sydney and Melbourne. However, for the smaller cities, the SA4 can extend several hundred kilometres beyond the city's urban extent, and stretch well beyond its commuting zone. An example is the SA4 that includes Wodonga also captures other smaller regional cities such as Seymour (212km away), Wangaratta (69km) and Benalla (118km). While there are some cases where SA4 boundaries may provide a useful definition of a city and its hinterland, SA4s do not provide a universal basis for capturing or comparing the NCPF cities.

LGA and planning region boundaries are subject to similar issues in terms of comparability⁹. In addition, LGAs and planning regions may pose additional reporting issues, relating to boundary changes and limited data availability.

Valid arguments can be made that adoption of a different geographic boundary would better capture the functional urban area of a particular city. However, BITRE is not inclined to make ad-hoc

⁸ The ASGS does not include a geography that reflects the functional extent of non-capital cities, although such geographies have been developed by other parties. An example is BITRE's working zones (WZs), which reflect worker's commuting patterns (BITRE 2018a). Like SUAs, WZs are built up from Statistical Area Level 2 (SA2) boundaries, but tend to be more encompassing as they capture surrounding settlements that have significant commuting flows to/from the nearby city. For example, the Geelong WZ extends beyond the Geelong SUA boundary to include 5 additional SA2s (i.e. Bannockburn, Golden Plains South, Winchelsea, Lorne-Anglesea and Portarlington).

⁹ For example, the City of Brisbane LGA represents the majority of Brisbane's population, while other large cities contain many LGAs with the central LGA representing a relatively small share of the total population. The definitions of state government planning regions are likely to reflect different considerations and criteria in different jurisdictions.

City geographies

adjustments to individual city's geographic boundaries within the NCPF, preferring to retain consistency in how cities are defined, to support comparability.

Proposed approach

BITRE proposes retaining the existing city boundary definitions within the NCPF.

Issue 9—Sub-city data

The existing NCPF dashboard presents city-wide averages or aggregates for each indicator. It provides no information on how the indicator varies across different parts of the city.

When the NCPF was originally released in 2017, it was noted that the 3-yearly review would consider the need to include

...sub-city level information where this is identified as a priority by stakeholders, and data is available. (Australian Government 2017, p.33).

The discussion was focused on the potential inclusion of indicators that illustrated variation at the sub-city level for the five mainland state capitals (ibid, p.32).

Significant feedback has been received from users that they would like the NCPF to report indicators not just for cities as a whole, but also for particular sub-city regions. LGAs are the sub-city geography most commonly sought by users.

Data availability and reliability at a sub-city scale

The five mainland state capitals all contain multiple LGAs and SA4s (as well as a large number of SA2s and SA3s)¹⁰, and so these geographies provide a potential basis for reporting sub-city data, to complement the city-wide measures currently presented in the NCPF.

Many of the NCPF indicators are readily available at a sub-city scale, including all of the indicators drawn from the ABS *Census of Population and Housing* and *Estimated Resident Population* collections, and some indicators drawn from administrative sources (e.g. ABS' dwelling approvals, house and unit price data). Other indicators may not currently be available at a sub-city scale, but could potentially be constructed at a sub-city scale if sufficient resources were made available (e.g. dwelling price to income ratio).

Data availability is best at the SA4 scale, with fewer indicators available for LGAs and the finer ASGS geographies of SA3s and SA2s. An example is the ABS life expectancy indicator, which is published at the SA4 scale, but not at the LGA, SA3 or SA2 scale. Figure 4 summarises BITRE's preliminary assessment of how many NCPF indicators would be available at different geographic scales, with around 70 per cent of the indicators potentially being available at the SA4 scale for the 2022 NCPF release, compared to 55 to 60 per cent of indicators at the other geographic scales. Longer term, if sufficient resources were available for data development, as much as 85 per cent of the existing NCPF indicators could potential be made available at the SA4 scale.

¹⁰ In the ASGS, SA2s are designed as the primary output region for the release of non-census data. Their purpose is to represent a community that interacts together socially and economically. SA2s aggregate up to form SA3s. SA3s aggregate up to form SA4s, which in turn aggregate up to form GCCSAs (ABS 2016).

Data quality issues are more frequent for the more disaggregated geographies and for geographical units which have smaller populations. This is particularly an issue for indicators based on sample surveys, where if estimates are made available they can have a relatively high margin of error (due to a small sample size), and can vary significantly from one update to the next.¹¹ Survey-based indicators that are made available at the more disaggregated geographic scales are often modelled, as a solution to limited data availability and/or reliability.



Figure 4 Availability of indicators at different sub-city geographies

Source: BITRE analysis of 53 NCPF indicators from 2020 release.

It should be recognised that there are existing products that currently bring together sub-city indicators from multiple sources, including ABS' *Data by Region* (ABS nd) and the *Progress in Australian Regions Yearbook* (BITRE 2019)¹². Both of these products present data for SA4s, SA2s and LGAs and while they do not cover all of the NCPF indicators for which sub-city data is potentially available, there is considerable overlap. The fact sub-city data is available through these alternate products raises the question of whether there is significant additional value in also incorporating sub-city data within the NCPF.

Which sub-city geography?

There are not technical constraints that would prevent NCPF indicators being presented using more than one sub-city geography. However, constructing indicators on multiple geographies involves extra resources, and the expansion of the NCPF to present sub-city level indicators is more likely to be feasible if a single preferred sub-city geography can be identified.

One option is to use LGA boundaries to present sub-city indicators in the NCPF. This option has the advantage of best meeting the data needs of local government stakeholders. However, significantly fewer indicators are readily available and/or reliable at the LGA scale, compared to the SA4 scale (see

¹¹ This issue is known to impact on the six NCPF indicators underpinned by the ABS *Labour Force Survey* which are published at the SA4 scale, but can be volatile at this scale. The six indicators are the unemployment rate, youth unemployment rate, labour force participation rate, employment growth, knowledge intensive services, and the sectoral employment split.

¹² While the 2019 Yearbook was published as a pdf report (with related Excel tables presenting data for additional geographies such as SA2s and LGAs), the 2020 Yearbook will be published in dashboard form making all available geographies easily accessible.

Figure 4). LGAs are also highly variable in terms of size and population¹³, which impacts on the validity of comparisons. LGA boundaries are also subject to irregular changes.

Another option is to use SA4 boundaries. This option would maximise the number of NCPF indicators that could be constructed and presented at a sub-city scale (see Figure 4). Since SA4s are defined based on a consistent set of criteria across Australia, this option should maximise comparability of the sub-city estimates. However, there are questions as to the extent to which the SA4 option will meet user's needs for sub-city data.

The more granular SA2 and SA3 boundaries could also potentially be used to present sub-city indicators in the NCPF. However, data availability is more limited than for SA4s, and these options may not meet local stakeholders' needs as well as the LGA option.

Presentation of sub-city indicators in dashboard

If sub-city level data for the five mainland capitals were to be included within the NCPF dashboard, it could potentially be presented in chart form (like the city totals), in table form or in map form. BITRE would prefer to present the data in map form, as this would be more intuitive and accessible for users (particularly those who are not familiar with the geographic units) than a chart-based or table-based presentation. Visually mapping the indicator values for the capital cities would immediately show the end-user the differences in unemployment (or any other available indicator) across a city. The sub-city information that underlies the maps would also be made available in CSV format through data.gov.au.

The existing NCPF dashboard is built in Microsoft's Power BI software. Power BI has the capacity to include maps within a dashboard. There are several mapping options within Power BI and other map visualisations are being developed.¹⁴ However, there are some limitations on the mapping functionality within Power BI and BITRE will need to further assess its suitability for use within the NCPF dashboard.

Expanding the functionality of the NCPF dashboard so it also presents sub-city indicators for the five mainland capitals would have resource implications for BITRE. Only a subset of the NCPF indicators would be available for mapping (based on data availability). Any initial implementation would be restricted to presenting maps for Sydney, Melbourne, Brisbane, Perth and Adelaide.

¹³ For example, there are only 9 LGAs that fall partly or wholly within the Brisbane GCCSA, compared to 30 plus in each of the Perth, Melbourne and Sydney GCCSAs.

¹⁴ For example, the shape file map visualisation option is accessible as a preview feature while undergoing development, and potentially could be available in a year or sooner. The user can enable the selection zoom function by selecting a city. When the user hovers over a filled area of the map, a text box will appear and reveal the city, sub-city name, sub-city type, indicator and value. As appropriate, conditional formatting can be applied to colour code the filled map areas.

Proposed approach

BITRE proposes making no change to incorporate sub-city data in the NCPF, unless there is clear feedback from the review that this is a top priority and appropriate resources can be secured to implement such a change.

Questions for consultation—City geographies

Should the scope of the NCPF be expanded to include smaller cities?

Should the NCPF population threshold be retained at 80 000 or should it be lowered? And if so, what should the new population threshold be? What are the potential benefits of such a change? What issues would arise? How much of a priority is expansion of the NCPF to include smaller cities?

Do the existing city boundary definitions meet your needs?

• If not, what geographic boundary is preferred for your city? Would it make sense to use that alternate geography more widely within the NCPF?

Should the NCPF present sub-city indicators for the 5 mainland state capital cities (Sydney, Melbourne, Brisbane, Adelaide and Perth)?

• What are the benefits of such a change? Is a map-based presentation preferred over a chart or table-based presentation? Are there other locations for which sub-city indicators should also be provided? How much of a priority is expansion of the NCPF to present sub-city data?

Which sub-city geography would you prefer be used to present NCPF indicators? (Please choose one)

- Statistical Area Level 4 (SA4)
- Statistical Area Level 3 (SA3)
- Statistical Area Level 2 (SA2)
- Local Government Area (LGA)

Improvement of existing indicators

Improvement of existing indicators

The NCPF contains over 50 indicators. This section examines: the existing indicators by reviewing which Census derived indicators have relevant alternate proxy data; indicators which will no longer be updated and need to be deleted; and how data can be refined. The full list of indicators contained in the NCPF is listed in *Appendix B: Indicator update schedule*

Indicator production

When responsibility for the NCPF moved to BITRE, a significant amount of work was dedicated to constructing an indicator production system. This system aligned with methods adopted within BITRE which ensured explanation for the exact calculations used for over 50 indicators. The indicator production system contains clear instructions for constructing indicators including the data source, geography and relevant method.

Following the annual NCPF updates, the Cities team conduct an annual internal mini-review which identifies the strengths and weaknesses of the annual update process. The mini-review is documented for implementation before the next annual update. The 2020 mini-review highlighted a number of actions including improvements to the indicator production in the R script, improving IT support, improving quality assurance and improving the performance of the dashboard within Power BI.

An example of a change identified through this internal mini-review process is the revision of the indicator for the Proportion of population that is Indigenous, which was revised with better data in the 2020 update. Previously, the Indigenous population was estimated using the ABS' *Census of Population and Housing* 2016 (ABS 2018c). The Census counts people who identify as Aboriginal, Torres Strait Islander, or both. The ABS estimates that the 2016 Census undercounted the Indigenous population by around 18 per cent (ABS 2018a). In 2018 the ABS published *Estimates of Aboriginal and Torres Strait Islander Australians* (ABS 2018b) which contains more reliable estimates, and in 2020 the NCPF changed to this source.

Issue 10—More frequently updated indicators

While 20 to 25 of the indicators are updated each year, around a third are derived from the ABS' *Census of Population and Housing* and are updated every five years. This section details the Census derived indicators for which alternate proxy sources could be found in between Census years. When considering the suitability of each indicator, the data must be available for the appropriate geographies. The indicators which will continue to be sourced from the Census five yearly cycle are listed in *Appendix A* on page 56.

Median annual household income

The ANU's Centre for Social Research and Methods model the median annual household income. The methodology is based on the Census data from 2001 to 2016 by applying a growth rate between 2011 and 2016 to forecast values. The growth rate is adjusted based on the ABS State National Accounts and National Accounts disposable income. This indicator is already used as an input in the affordable housing indicator, so using it in NCPF would require no additional resources. There is a possibility of producing the data from the ABS *Survey of Income and Housing* (SIH) every two years, giving a more transparent but less frequent dataset, however that would require significant staff time. Using this indicator is a trade-off between:

- More accurate and transparent data every five years
- Modelled data every year.

In consideration of the above factors it is suggested to move to the ANU median annual household income indicator.

Public and community housing

This indicator shows the share of the housing stock that is public or community housing, sourced from the Census. The Australian Institute of Health and Welfare (AIHW) conduct an annual data collection for public and state owned housing data which would be a suitable alternate proxy. It is the agreed data source for other national performance indicators including the *Report on Government Services* (Australian Government 2020b) and the *National Housing and Homelessness Agreement* (Australian Government 2018). The availability of the data for the NCPF would be dependent on approval from AIHW's data suppliers. The cost charged is dependent on the time needed to prepare the data for our purpose. If sufficient feedback supports an update between Census years, this could potentially be pursued.

Proposed approach

Subject to feedback from this consultation and data costs, the following indicators are proposed for revision with alternate data sources that can be updated more frequently.

- Median annual household income
- Public and community housing.

Issue 11—Indicator removal

Indicators were considered for removal based on whether data was going to continue to be available, timeliness, adequate city coverage, and quality concerns. There are two indicators being actively considered for removal.

Households with broadband

The Census question for the number of *Households with broadband* will be retired from the 2021 Census and will be removed during the 2022 NCPF update. Other potential indicators of Digital opportunities are being investigated to fill this gap, see Issue 12 – *Digital Opportunities*.

Gross regional product

The gross regional product indicator is sourced from the Department of Industry, Science, Energy and Resources (DISER), who rely on Census data to produce their estimates. Currently, the reference period is 2016–2017 and the next update is not expected until 2023, after the relevant 2021 Census data is released. It is unclear if the DISER will produce future gross regional product estimates. While many commercial providers can provide estimates, the results are not consistent across providers. It is proposed to retain this indicator for now, pending a decision by DISER as to whether they will produce gross regional product estimates using the 2021 Census data.

Proposed approach

BITRE intends to remove the Households with broadband indicator during the 2022 NCPF update. No further deletions are proposed at this time.

Issue 12—Refine indicators

Thirty minute job access

BITRE acknowledge that the two 30 minute job access indicators¹⁵ overstate job accessibility in the larger, more congested cities and will continue to work to improve these indicators. The NCPF data dictionary contains the limitations for each indicator and cautions users that the job accessibility in large cities has been over-estimated. To address this, in 2020 BITRE engaged HoustonKemp to revise and improve these indicators for the 2021 update. The updated methodology accounts for actual travel speeds on local roads in 2019, instead of using posted speed limits.

These indicators are subject to a continuous improvement process and will continue to be revised annually. BITRE is aware that the currently published data does not properly account for dwell times at intersections. The dwell time issue could not be adequately resolved this year due to the impact of COVID-19 on traffic flows and therefore on the Google travel time data. It is expected that the dwell time issue will be revisited for the 2022 update once traffic flows settle into a new normal.

Air pollution particles smaller than PM2.5

The air quality indicator is another indicator which can be improved. It is currently sourced from the World Health Organisation (WHO) website, which currently contains data up until 2016, and data is not available for all cities in the NCPF. Alternatively, the National Environment Protection Council (2019) publish an annual report which contains annual air quality measures with more recent data. Most NCPF cities contain more than one data collection location, for example Sydney contains 16 air quality measuring stations which will require an average of 16 locations for the Sydney GCCSA. Data is available for 16 of the NCPF cities for the 2021 update. Two additional measuring stations have been added in 2019 for Bendigo and Mackay, and a full year's data for these cities should be available for publication in the 2022 NCPF update. The NCPF cities without PM2.5 air quality locations are Ballarat, Cairns and the Sunshine Coast. Not all cities have a need for air monitoring stations, with the data collected in North Toowoomba between 2003 and 2007 showing no evidence of exceeding the PM2.5 emissions. BITRE proposes sourcing the air quality indicator from the *National Environment Protection Council Annual report*, supplemented by more recent data from the jurisdictional websites and data sourced directly from the respective Environment Protection Authorities.

Suicides per 100k people

The suicide rate is based on modelled data from the *Social Health Atlas of Australia* from the Public Health Information Development Unit (PHIDU 2020). This data is compiled from the deaths data published by ABS (2020a). The suicide rate indicator is an average over 5 years. The 2020 NCPF update contains data for the reference period 2011 to 2015, however the Social Health Atlas has been updated with estimated suicide rates for 2013 to 2017, and PHIDU are planning to release another update later this year with 2018 data. The ABS recently published a 2019 update of *Causes of Death*,

¹⁵ Number of jobs accessible by car within 30 minutes and Proportion of jobs accessible by car within 30 minutes.

Improvement of existing indicators

Australia which uses registered deaths from the eight individual state and territory Registrars of Births, Deaths and Marriages. This ABS publication does not contain data in the geography required for the NCPF, but data could be obtained for the relevant geographies for a fee and included in the 2021 NCPF update.

At this stage, the deaths data for 2016 is final, while the 2017 data is revised and the 2018 and 2019 data is preliminary. Data is preliminary whilst coroner investigations and reports are finalised. The proposed approach for the 2021 update is to continue updating using the readily available PHIDU data which will contain 2018 data, unless there is a case made to purchase the 2019 preliminary data from the ABS.

Proposed approach

BITRE intends to refine the following 3 indicators in future updates

- Number of jobs accessible by car within 30 minutes
- Proportion of jobs accessible by car within 30 minutes
- Air pollution particles smaller than PM2.5.

Questions for consultation—Improvement of existing indicators

Do you have concerns about any of the existing indicators? Please describe.

• What alternatives would you suggest?

Are there indicators which could be removed?

• Are there too many indicators? Is there a preference for a smaller set of indicators?

Are there indicators which could be refined?

Identifying new indicators for inclusion

The NCPF report that accompanied the initial release of the dashboard identified a list of possible future NCPF indicators (Australian Government 2017). Some of those indicators have already been incorporated into the NCPF, such as road safety and economic output per person (in the form of GRP per capita). The other listed possible future indicators have been revisited as part of this 3-yearly review, and where viable options have been identified they are discussed in more detail within this chapter.

Through ongoing processes of consultation with internal and external stakeholders, several priority areas have been identified for including new NCPF indicators:

- Liveability, particularly issues of access to services
- Sustainability
- Digital opportunities
- Planning
- Tourism.

Since the NCPF's release, a range of new data sources have been made available, with ABS releasing several new products to help understand the impacts of COVID-19 (e.g. payroll data). Cities policy priorities are also evolving and feedback is sought on whether the effects of the pandemic (such as changes to immigration, public transport use and working from home) have implications for what we should be measuring in cities.

Issue 13—New Liveability indicators

Following on from the discussion relating to Issue 5 *Representing Liveability*, several new indicators that expand the representation of liveability are proposed. These were identified based on a review of the literature on liveability and consultation with key stakeholders and data suppliers. Only two indicators are proposed for implementation at this stage and are discussed in more detail below. Other potential indicators were identified but are not proposed to be included at this stage. Those indicators are outlined in Table 7.

Time frame	Indicators
Short term (2021 to 2022)	Access to social infrastructure
	Walkability
Longer term (to be reconsidered	Access to fresh food
at next NCPF review)	Crime
	Social connection
	Long term health conditions
	Health risk factors

Table 7 Proposed liveability indicators to be included in the NCPF

Access to services sub-theme

The NCPF currently contains indicators of access to public transport and access to public open space. A new sub-theme should be created within the Liveability theme (to be renamed Society) to collate all existing access measures, together with any new access measures (such as access to social infrastructure and walkability).

Access to social infrastructure

This indicator emerged as the number one priority for inclusion in the NCPF through the departmental consultation process, as participation in and access to cultural activities is seen as a priority. RMIT's Healthy Liveable Cities Group have produced an indicator for all the NCPF cities, at BITRE's request, covering access to social infrastructure such as community centres, culture and recreation, education and health services. There was some discussion within the department that the proposed RMIT indicator may be too broad. There was interest in separating it out into two kinds of infrastructure: the institutional (health and education) and the community (arts, culture, sporting and other recreational). BITRE will follow up with RMIT about whether this separation is possible and costs. It is recommended to include access to social infrastructure in the NCPF in the 2021 update.

Walkability

Walkable neighbourhoods reduce motor vehicle use and increase active transport. This indicator was ranked as a moderate priority in our departmental consultation. RMIT's Healthy Liveable Cities Group have produced an indicator for all the NCPF cities, at BITRE's request, by combining dwelling density, street connectivity and access to amenities of daily living. As the data is already available it is recommended to include walkability in the NCPF in the 2021 update.

Proposed approach

BITRE proposes adding two new liveability indicators, measuring access to social infrastructure and walkability, in the 2021 NCPF update. A new access to services sub-theme is also proposed.

Issue 14—New Sustainability indicators

The current sustainability sub-theme, which will form the core of the new sustainability theme, contains the following indicators:

- Per capita greenhouse gas emissions
- Office building energy efficiency rating
- Air pollution particles smaller than PM2.5
- Dwellings with access to public open space.

In addition to the stated indicators, a number of other indicators can be seen to be contributing to sustainability, such as public transport. For the purposes of the NCPF it is proposed to maintain the current classification for such indicators. For the proposed new indicators and the remaining liveability indicators, there remains the question of what is liveability and what is sustainability? This paper adopts the approach that sustainability has a longer term and system focus, whereas liveability has a present day and people focus. Even so there are many potential indicators that could be considered both. For such indicators, the classification as one or the other is simply because the indicators need a home somewhere. Like most of the NCPF, the indicators can contribute to one, both, and even multiple other themes.

The 2017 NCPF report identified a few potential sustainability indicators that could be explored for inclusion in the future (Australian Government 2017). In addition, some topics have been raised by stakeholders and through the City Deals themselves. Each topic and the related indicators are considered below. Potential indicator topics that are not able to be addressed now could be

reconsidered in future years as new data becomes available. The priorities of each indicator are in Table 8 below.

Time frame	Indicators	
Short term (2021 to 2022)	Waste	
	Canopy cover	
Longer term (to be reconsidered at next	Household energy consumption	
NCPF review)	River quality	
	Water consumption	
	Disaster resilience	
	Commuting distance	
	Household solar generation	

Table 8 Proposed sustainability indicators to be included in NCPF

Waste

The volume of waste diverted to landfill per person was identified in the 2017 NCPF report as a potential indicator (Australian Government 2017). More recently the 2018 *Building Up, Moving Out* report (House of Representatives Standing Committee on Infrastructure, Transport and Cities 2018, Recommendation 9) recommended that nationally consistent measures of waste to landfill be developed and published in the NCPF. The Australian Government agreed in principle with this recommendation, noting that:

The incorporation of national waste target indicators into the National Cities Performance Framework will be investigated as part of the Framework's regular update and review process. (Australian Government 2020, p.10).

Waste generation is not only a measure of a problem to be solved, it is also an indicator of the community's attitude to sustainability (Innes and Booher 2000). Participants in the departmental consultation process felt waste was a high priority.

There is a national dataset on waste to landfill currently under construction. The Department of the Environment and Energy¹⁶ commissioned Blue Environment to consult with state and territory agencies responsible for waste management on waste reporting (Blue Environment and Department of the Environment and Energy 2018). The recommendations feed into the National Waste Report, to be published in late 2020. DAWE have secured funding over 4 years to deliver a Waste Data Visualisation Platform, with a proof of concept to be delivered by 30 June 2021 (using data currently available). Data from five priority regional areas will be included in the platform in the second iteration of the platform in 2021-22 with more regions added in the subsequent years. BITRE will continue to engage with DAWE to identify a preferred indicator of waste for Australian cities.

Canopy cover and heat vulnerability

This topic is of particular relevance to the Darwin City Deal, and the Greater Sydney Commission has adopted such indicators. In the departmental consultation, both canopy cover and heat vulnerability were considered a medium priority, but as a people-focused measure heat vulnerability could be considered more of an indicator of liveability than of sustainability. Heat vulnerability indices (HVI) are

¹⁶ Now known as the Department of Agriculture, Water and the Environment (DAWE)

usually a combination of temperature, built environment and social data. A handful of Australian cities, all capitals, have calculated a HVI for their cities, but they have not all used the same method. Including a HVI in the NCPF would require significant resourcing.

Canopy cover can be used instead of measuring heat vulnerability. Increasing canopy cover is the main way that cities reduce their heat vulnerability. The Clean Air Urban Living team have recently produced detailed indicators for canopy cover, and are developing a dashboard of that data. RMIT has indicated that they plan to include the headline canopy cover measure in the Australian Urban Observatory over the next 18 months. RMIT's canopy cover data has also been published on the *Greener Space Better Places* website (Horticulture Innovation Australia 2020). It is recommended that canopy cover be included in the NCPF in the 2021 update.

Proposed approach

Work with government agencies and academic partners to progress the development of new NCPF indicators of waste and canopy cover for Australian cities, for potential inclusion in the 2021 or 2022 NCPF updates.

Issue 15—Digital opportunities

The *Households with broadband* indicator will be retired from the 2021 Census and therefore will need to be removed from the NCPF. The Census question was for the share of households with an active broadband connection, defined as an access speed of 256 kilobits per second or faster. We have commenced work to seek a replacement metric with the aim to understand the degree to which households have access to internet of sufficient quality and reliability to enable an effective use for education, working from home and other business activities. Our interest is understanding the spatial variation across cities. Evidence suggests that digital opportunities and smart city performance varies across Australian Local Government Areas (Queensland University of Technology 2019).

Our Department has a strong interest in this area, including with respect to digital inclusion. The Australian Digital Inclusion Index (ADII) provides localised information on digital inclusion in Australia (RMIT and Swinburne University of Technology 2020). BITRE will further investigate the available measures of digital inclusion, including the ADII and its contributing measures, and assess their suitability for inclusion in the NCPF. BITRE is also exploring the potential use of National Broadband Network (NBN) data. It is understood that there may be some spatial bias for new suburbs and new developments as NBN Co is not the only provider. We are exploring potential indicators such as NBN take up rates, average network bandwidth congestion and total downstream network usage per capita. The intention is to publish one or more eligible indicators for the 2021 NCPF update.

Proposed approach

Include one or more replacement indicators of digital opportunities in the 2021 NCPF update.

Issue 16—Planning

The planning theme of the NCPF currently contains only contextual indicators (such as population growth, age structure and density) and includes no indicators that are intended to assess how the planning system is performing.

The urban planning system in Australia is the responsibility of state and local governments. Capital city strategic planning systems typically aim to encourage infill development and limit urban sprawl. One common issue is the length of time taken to assess development applications (the efficiency). Also relevant is the effectiveness of planning systems in achieving strategic objectives, such as whether planning ensures that new dwellings have access to the jobs, services and community facilities that households need to conduct their lives outside of the home.

Potential indicators of the efficiency of planning approval systems, such as development approval times, are not readily available on a comparable basis across cities. While the government is working with the States to develop consistent state-level metrics of the efficiency of the planning system, city and LGA scale data will remain a data gap into the medium term.

However, in the short term, it may be possible to add to the NCPF some indicators that assess the effectiveness of city planning systems in ensuring new residential development is aligned with urban planning goals to encourage medium and higher density development, limit urban sprawl and focus growth in areas that have good access to jobs and social infrastructure. BITRE is considering including the 4 indicators discussed below in the NCPF. While they are connected to existing indicators in the Housing and Liveability themes, the restriction to new dwellings means these indicators are aimed at measuring the outcomes of urban planning systems in terms of delivering residential development and contributing to liveability for future populations. It is recognised that these are partial indicators of planning system performance, but are being considered for inclusion in the belief they can go some way to filling a clear gap within the NCPF's Governance, planning and regulation theme. BITRE welcomes feedback on these new indicators, as well as suggestions about other potential indicators of planning system performance.

New dwelling mix

This indicator measures the proportion of new dwellings that are apartments or townhouses, based on ABS *Building Approvals* data, which is readily available for GCCSAs, SUAs, SA2s and LGAs. The indicator would be updated annually.

The mix of dwelling types is important for diverse populations. This indicator captures the extent to which new residential development in a city is oriented towards medium and higher density development. The major capital city strategic planning systems in Australia typically aim to encourage medium and higher density residential development and to limit urban sprawl, by placing constraints on low density urban fringe and/or rural residential development (BITRE 2013).

New dwellings have good access to social infrastructure

This indicator measures the proportion of new dwellings with good access to social infrastructure. The indicator involves combining ABS dwelling approvals data with RMIT's access to social infrastructure indicator (which was discussed within Issue 10 *New Liveability Indicators*).

This potential new NCPF indicator is intended to assess the effectiveness of city planning systems in delivering residential development in locations which have good access to social infrastructure, and thereby making a positive contribution to the city's liveability.

In constructing the indicator, a decision would need to be made as to what indicator value qualifies as 'good' access to social infrastructure. The indicator could potentially be constructed at the SA2 scale, as the ABS data is readily available at this scale, and the RMIT data is available at a cost. Because

access to social infrastructure can vary considerably within a SA2, further investigation is required to assess whether this indicator will deliver meaningful results at the city-wide scale, and whether options are available to construct it using more granular data.

New dwellings have good access to public open space

This indicator measures the proportion of new dwellings with good access to public open space. The indicator involves combining ABS dwelling approvals data with RMIT's access to public open space indicator, which is already included in the NCPF.

This potential new NCPF indicator is intended to assess the effectiveness of city planning systems in delivering residential development in locations which have good access to public open space, and thereby making a positive contribution to the city's liveability.

In constructing the indicator, a decision needs to be made as to what qualifies as 'good' access to public open space, typically based on a distance criterion. Because access to public open space can vary considerably within a SA2, further investigation is required to assess what options are available to construct it using more granular data.

New dwellings have good access to jobs

This indicator measures the proportion of new dwellings with good access to jobs within a 30 minute drive. This indicator involves combining ABS dwelling approvals data with the data underpinning NCPF's existing 30 minute job access indicator, which is sourced from HoustonKemp.

This potential new NCPF indicator is intended to assess the effectiveness of city planning systems in delivering residential development in locations which have good access to jobs, and thereby making a positive contribution to resident's commuting times and the city's liveability.

In constructing the indicator, a decision needs to be made as to what indicator value qualifies as 'good' access to jobs. The indicator could potentially be constructed at the SA2 scale, as both data sources are readily available at this scale. This indicator may be less meaningful for the smaller NCPF cities which often have 100 per cent access to jobs within a 30 minute drive. Further investigation is required to assess whether this indicator will deliver meaningful results at the city-wide scale.

Proposed approach

BITRE intends to work with data providers to further investigate these 4 potential planning indicators. Subject to the results of this investigation and 3-year review feedback, one or more of these planning indicators may be included in the 2021 or 2022 NCPF updates.

Issue 17—Tourism

Tourism is important to the economy. It generates jobs, investment and contributes to a city's community. The coronavirus has clearly had a significant impact on both international and domestic travel in 2020 and tracking the tourism market will be of great interest in coming years. Tourism is also a significant focus within a number of City Deals, including those for Geelong (DITRC 2019c), Darwin (DITRDC 2018) and Adelaide (DITRDC 2019a). Departmental consultation also revealed strong support for a tourism indicator.

A range of tourism metrics relating to domestic and international visitors are available from Tourism Research Australia (TRA), but for the NCPF the primary interest is in understanding the overall economic impact of tourism on a city. TRA's measure of total tourism expenditure, when expressed on a per capita basis, provides a useful indicator of its economic contribution to a city. The indicator could potentially be updated annually, subject to costs. BITRE is negotiating with TRA regarding the methodology for constructing this indicator and potential limitations.

Proposed approach

Pending sufficient interest, the proposal is to purchase tourism spend for the NCPF cities for both international and domestic travel. The new metric for tourism spend per capita would be constructed using the estimated tourism spend per city per 10 000 residents.

Questions for consultation—New indicators

What new liveability indicators should be included in the dashboard?

• How does this indicator contribute to measuring the performance of cities? How might we access data for that indicator?

What new sustainability indicators should be included in the dashboard?

• How does this indicator contribute to measuring the performance of cities? How might we access data for that indicator?

What new planning indicators should be included in the dashboard?

• How does this indicator contribute to measuring the performance of cities? How might we access data for that indicator?

How useful would a tourism spend per capita indicator be?

Are there are there any other new indicators that should be considered for inclusion in the NCPF?

• How does this indicator contribute to measuring the performance of cities? How might we access data for that indicator?

NCPF platform

A platform is the technology that is used to present data. BITRE is currently using Power BI to visualise the NCPF and make it accessible to external users, and the underlying data is available in data.gov.au.

Issue 18—NCPF delivery

The dashboard is merely the public face of the NCPF. However, the dashboard is the way that most users interact with the NCPF. The dashboard presents the NCPF in an easily digestible format, (ie charts), but users who are looking for data may prefer to obtain it in spreadsheet format from data.gov.au. The dashboard requires a significant number of resources to maintain and update, and expertise is often brought in from outside the department to develop or make changes to the dashboard. There are other options for delivery that require fewer resources and may better suit user's needs.

Many BITRE statistical products are published as reports in PDF and spreadsheet formats. The annual data cycle for the NCPF means that these styles of publications can easily replace the dashboard.

Proposed approach

BITRE will continue to publish the NCPF data through the existing dashboard and data.gov.au unless there is clear feedback that other formats are preferred.

Issue 19—Platform performance

The original NCPF dashboard was constructed as a bespoke system by the Digital Transformation Agency (DTA) compatible with DTA systems. Responsibility for the NCPF dashboard was transferred to the department in 2018. In 2020, the system to deliver the dashboard was changed to Power BI for security reasons. BITRE already had a number of dashboards delivered by Power BI so there were existing expertise processes to draw from.

Since the change to Power BI, BITRE has received feedback on the performance of the NCPF, particularly on longer load times. BITRE is not able to change from the Power BI platform, however we are assessing the implementation and design of the NCPF dashboard to find a more efficient solution. A number of options have already been identified, and we are seeking advice on further gains.

Proposed approach

BITRE will rebuild the Power BI dashboard to a more efficient design as part of the 2021 update process.

Questions for consultation—NCPF delivery

How would you prefer to access the NCPF? (Please choose one)

- Statistical reports in PDF
- Data download in spreadsheet or related format
- Dashboard
- Other format (please specify)
- I don't interact with the NCPF.

Potential extensions of the NCPF

This section considers two possible extensions to the NCPF that were raised as potential future directions when the NCPF was first released (Australian Government 2017):

- the inclusion of time-series data
- international benchmarking of Australian cities.

The previous *City geographies* chapter discussed two other possible extensions to the NCPF, namely extending it to cover smaller cities and the inclusion of data for city subregions.

Issue 20—Time series data

The existing NCPF dashboard presents the latest available data for each indicator. It presents a snapshot of how cities compare at a particular point in time, which is updated annually. It does not present any historic time-series data that would enable users to assess how cities are tracking over time.

The NCPF's design reflects its principal purpose to provide a snapshot of the performance of Australia's 21 largest cities. However, the original NCPF report did highlight the need to consider the use of time-series data as a future direction for the NCPF (Australian Government 2017)

If the NCPF was extended to include time-series data, users could monitor how each city's performance tracks over time. This would be a potentially valuable addition. However, because time-series data was not part of the original NCPF design, if the dashboard's focus is to shift to presenting how an indicator is changing over time for a particular city (rather than comparing an indicator across cities at a particular point in time), the dashboard would need a significant redesign. Consultation within the department identified support for the inclusion of time-series data within the NCPF, but not if it comes at the cost of the current city comparison views.

Previously in this paper, *Issue 2* (p. 18) raised the question of what the principal purpose of the NCPF should be going forward. The feedback which is received on this principal purpose question through the 3-yearly review will inform any decision about the inclusion of time-series data in the NCPF. If a decision were made to include time-series data in the NCPF, several issues would arise:

- Data availability: Historic time-series data is available for many of the NCPF indicators. However, it is not available for some of the more recently developed NCPF indicators such as access to public transport, access to public open space and 30 minute job access.
- Length of time-series: The option of focusing on the last 10 years of historic data would provide sufficient data to identify medium-term trends, while minimising the impact of changes in geographic boundaries and underlying methods.
- Data frequency: Many of the NCPF indicators are not updated annually, but rather 3 to 5-yearly, and such partial time-series may have limited value.
- Changes in geographic boundaries: ABS updates its GCCSA and SUA boundaries every five years, meaning that historic data may need to be converted to current boundaries to support a valid comparison.
- Changes in indicator/survey methods: Changes to data collection and indicator construction methods over time can invalidate comparisons. New methods are typically introduced to improve current estimates, but will not always be backcast to historic data.

Changing the functionality of the NCPF dashboard so it presents time-series data for cities will have significant resource implications for BITRE in terms of:

- Accessing historic data for cities, and converting historic data to current geographic boundaries and indicator specifications
- Setting up new data processing and quality assurance systems for the time-series data
- Updating metadata
- Redesign of the Power BI dashboard so it:
 - is focused on presenting time-series data for each city, or
 - presents time-series data for each city, in addition to the existing chart-based presentation of how cities compare (based on the latest available data).

There is a related Departmental product, the *Progress in Australian Regions Yearbook*, which makes a range of progress and contextual indicators available in time-series form for the 20 largest¹⁷ Australian cities (BITRE 2019). The Yearbook presents a more extensive set of indicators than the NCPF, and although there is significant overlap, not all indicators that are relevant to cities are contained in the Yearbook. The Yearbook is updated annually to reflect the latest available data, and presents time-series data in table form. Where available, time series data from the last 10 years is presented in the additional excel files and associated data.gov.au dataset.

In BITRE's view, the time-series data already made available for Australian cities through this Yearbook goes a long way towards meeting user's needs to monitor city performance over time. The accessibility of this time-series data for Australian cities will be further improved when the Yearbook is made available in dashboard form in the coming months.

Proposed approach

BITRE proposes making no change regarding time-series data, unless there is clear feedback that the principal purpose of the NCPF should be changed to tracking city performance over time, and appropriate resources can be secured to implement such a change.

BITRE proposes that a link to the new Progress in Australian Regions dashboard will be included on the NCPF website so that users can more easily access time-series data for the 21 largest Australian cities.

Issue 21—International benchmarking

When committing to the 3-year review the Government undertook to investigate international benchmarking:

The review will also consider the potential for international benchmarking of Australian cities to help policy makers to better understand how our cities are placed to compete in the global economy. (Australian Government 2017, p.33)

This is an initial assessment of whether international benchmarking is feasible using the NCPF.

There are limited options for international data sets like the NCPF, and where such datasets exist, there is limited alignment with the suite of indicators contained in the NCPF. There are many

¹⁷ The *Progress in Australian Regions Yearbook* does not include Mackay in the Major Urban Area tables in the book version of the publication. However Mackay, along with the other SUAs, is available in the dataset and additional excel tables.

commercial entities who will prepare benchmarking reports for a fee, but few studies by government organisations. Most international comparisons differ by city size, with most benchmarking studies focused on big cities, not on peers to Australia's smaller cities, such as Bendigo. Although Australia's largest cities rank very highly in international indices, these indices were not designed to rank cities of one country against each other, but rather to compare the global cities where political systems, values and means may be vastly different from each other.

The Organisation for Economic Co-operation and Development (OECD) publishes data for 11 Australian cities, alongside data for hundreds of international cities, but this data is focused on broad demographic and economic indicators (OECD 2020). However, many of the indicators use different definitions to the NCPF, and not all can be reconciled with available Australian data. Other organisations, such as the World Health Organisation (WHO) do present city-scale data for individual NCPF indicators (e.g. air quality), but have a narrower coverage of topics than the NCPF (WHO 2020).

The Australian City Deals model is similar to City Deals in the United Kingdom (UK), however the UK Government does not publish performance metrics like the NCPF. The Centre for Cities, an independent think-tank in the UK, publishes data for the UK's 63 largest cities (Centre for Cities 2020). The smallest of these, Worthing, at 110 000 is equivalent in size to Ballarat. While most of the indicators are similar to NCPF indicators, each would need to be assessed for definitional differences.

From this, it is clear that conducting international benchmarking of Australian cities will be a complex and time consuming exercise. Some international data sets for individual indicators may be able to be used if definition differences can be resolved. However, it is likely that for most indicators the data will need to be sourced separately for each indicator. As such, benchmarking the full NCPF set of indicators won't be possible and a priority list would need to be identified.

There is also the question of whether the results of an international benchmarking exercise would be best presented within the NCPF dashboard itself, or done as a separate research project which draws on NCPF data. If international benchmarking is deemed a high priority, BITRE's assessment is that it would be best done as a separate research project. The alternative of embedding international benchmarking within the dashboard would require a significant redesign of the existing dashboard, and could detract from the dashboard's main purpose by reporting on international cities that will only be of interest to a subset of users.

Proposed approach

An international benchmarking project will be considered for inclusion in the department's 2021-22 work plan as a separate research project, but whether it proceeds will be subject to other priorities of the department.

Questions for consultation—Potential extensions of the NCPF

Should the NCPF dashboard be extended to present time-series data for Australian cities?

• What are the benefits of such a change? What issues would arise? Should the dashboard be redesigned to make time-series data the principal focus (rather than comparing cities at a point in time)?

Which of the following possible extensions of the NCPF is the highest priority to you?

- Extending coverage to include smaller cities
- Presenting data for city subregions
- Including time-series data
- International benchmarking of Australian cities.

Next steps

Next steps

Review process

The general process for conducting the review is illustrated in Figure 5. BITRE has formed a view regarding its proposed approach to the key issues based on a review of relevant documents, data and through consultation with the Cities Division and Western Sydney City Deal Implementation section. The consultation paper outlines the key issues under consideration in the 3-year review and serves as the basis for consultation with stakeholders. The consultation paper is accompanied by a survey which seeks feedback on the questions raised in the paper. Input to the consultation process is encouraged to occur through the survey, however general submissions will be accepted if sent to the email address NationalCitiesPerformanceFramework@infrastructure.gov.au.

The consultation process will be open until 12 February 2021. A workshop will be held with invited stakeholders in March.

Figure 5 Overview of review process



The consultation process provides a unique opportunity to review the existing indicators, consider new ones and canvas views on what makes a city liveable, which will inform the new indicators proposed for the Liveability and Sustainability themes. It will also help us understand which of the range of possible extensions to the NCPF are considered most valuable by users, which is an important consideration in the context of limited available resources. This process will enable us to understand what the issues and priorities are in order to improve the NCPF.

Following analysis of the consultation submissions, survey results and the workshop, the department will consider priorities and prepare a final report, which makes recommendations about what changes should be made to the NCPF and specifies timeframes for implementation. The final paper will be published on the BITRE website in the second quarter of 2021 (at <u>https://www.bitre.gov.au/national-cities-performance-framework</u>). This timeframe will enable implementation of some of the recommendations to occur in the mid-2021 NCPF update, while other changes will be implemented in subsequent NCPF updates.

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Abbreviations and acronyms

Abbreviations and acronyms

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
ANU	Australian National University
ASGS	Australian Statistical Geography Standard
BITRE	Bureau of Infrastructure and Transport Research Economics (formerly known as Bureau of Infrastructure, Transport and Regional Economics)
Cat.	Catalogue
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAWE	Department of Agriculture, Water and the Environment
DISER	Department of Industry, Science, Energy and Resources
DITRDC	Department of Infrastructure, Transport, Regional Development and Communications
DTA	Digital Transformation Agency
GCCSA	Greater Capital City Statistical Area
HVI	Heat vulnerability indices
LGA	Local Government Area
NBN	National Broadband Network
NCPF	National Cities Performance Framework
NEAR	National Energy Analytics Research
NSW	New South Wales
OECD	Organisation for Economic Co-operation and Development
PHIDU	Public Health Information Development Unit
PM2.5	Particulate matter, less than 2.5 micrometres diameter
QLD	Queensland
RMIT	Royal Melbourne Institute of Technology
SA2	Statistical Area Level 2
SA3	Statistical Area Level 3
SA4	Statistical Area Level 4
SIH	Survey of Income and Housing
SUA	Significant Urban Area
TRA	Tourism Research Australia
UK	United Kingdom
VIC	Victoria
WA	Western Australia
WHO	World Health Organisation
WSCD	Western Sydney City Deal
WZ	Working Zone

Appendix A: Census derived indicators to be retained

Dwelling type breakdown

This indicator shows the share of dwellings that are detached houses, semi-detached, apartments or other dwellings. The mix of dwelling types is important for diverse populations, and liveability can be enhanced by ensuring that new housing has good access to jobs and services. The ABS *Housing Occupancy and Costs* (ABS 2019a) contains data on dwelling type by separate house, semi-detached, flats or apartments and is conducted every two years (sourced from the *Survey of Income and Housing*). This dataset is available by GCCSA and state or territory, but not for the other geographies in the NCPF, and so is not a viable option to replace the census indicator.

Average persons per dwelling

This indicator shows the average number of people per occupied dwelling. The ABS *Household Income and Wealth* publication (sourced from the *Survey of Income and Housing*) collects information about income, wealth and housing from private residents in Australia (ABS 2019b). This dataset is updated every two years and is available by GCCSA, but not for the other geographies in the NCPF, and so is not a viable option to replace the census indicator.

Housing tenure

This indicator shows the share of occupied private residential dwellings that are owned outright by the occupier, owned with a mortgage, are rented, or have other tenure types. The ABS *Housing Occupancy and Costs* (ABS 2019a) contains data on housing tenure by GCCSA. Again this data is not readily available for other NCPF geographies and so is not a viable option to replace the census indicator.

Languages other than English spoken at home

This indicator shows the proportion of residents who speak a language other than English at home. Unfortunately at this point there is no other source for this data.

Homeless per 100K people

This indicator shows the number of homeless people per 100,000 people. Data collection for homelessness is a challenge. On Census night in 2016, approximately 116,000 people were enumerated as being homeless. The AIHW Specialist Homeless Services Collection counted around 280,000 clients using homeless services for 2015 to 2016 (AIHW 2019). Essentially these datasets are not the same. The ABS use the specialist homelessness services data from Census night to aid the estimation of homeless people.

The national peak body for homelessness in Australia, Homelessness Australia rely on both datasets (the Census and the AIHW Specialist Homeless Services data collection) for their statistics.

The AIHW specialist homelessness services data is readily available for the NCPF geographies and will be updated for 2019-20 in December 2020 (AIHW 2019). However, it is proposed to continue using the Census data for the NCPF dashboard.

Housing

Housing

Liveability and Sustainability

Housing

Housing

Share of households in lowest income guintile

This indicator shows the share of households in the bottom 20 per cent of the national household income distribution from the Census. This indicator is the only indicator illustrating inequality in the NCPF; however this measure only shows the representation of households, not the extent of the difference in incomes. The usual approach to measuring income inequality is either using a GINI index or through an income ratio of the top 20 per cent and the bottom 20 per cent. The GINI index is not transparent to many and presents issues in calculation and interpretation for small areas. The ratio on the other hand is easily interpreted. The Australian National University's (ANU) Centre for Social Research and Methods models this data and can produce annually updated estimates of the lowest income quintile estimate for the NCPF geographies for a fee. BITRE has not received feedback that a more frequent version of this indicator is a priority for users. In the context of limited available resources, BITRE is currently prioritising data purchases in other areas (i.e. access to services, sustainability, planning, and tourism).

Proportion of households under mortgage stress

This indicator shows the proportion of households for which mortgage payments makes up 30 per cent or more of household income. No other nationally consistent source is available.

Proportion of households under rent stress

This indicator shows the proportion of households for which rent makes up 30 per cent or more of household income. No other nationally consistent source is available.

Proportion of journeys to work by public transport

This indicator shows the proportion of journeys to work that are taken by public transport. No other nationally consistent source is available.

Proportion of journeys to work by active transport Infrastructure and Investment

This indicator shows the proportion of journeys to work that are taken by active transport (walking or cycling). No other nationally consistent source is available.

Proportion of people that volunteer

This indicator shows the share of people aged 15 years and older who volunteered their time, services or skills to a club, organisation or association in the past twelve months. The only other source of this data is the ABS' General Social Survey (ABS 2020b). GSS 2020 is currently being conducted, the last survey was 2014. Given the GSS is not on a fixed schedule, as the Census is, it is recommended to not change the data source for this indicator.

Completed year 12

This indicator shows the share of the population that has completed year 12. The ABS Survey of Education and Work (ABS 2020c) provides education attainment levels by state and territory for the reference period 2020. Unfortunately, the survey results are not available by cities or local government areas. For a fee, the data would only be available by SA3 and SA4. Therefore, it is proposed to continue using the Census data.

Completed Certificate 3, 4 or Diploma

This indicator shows the share of the population with a Certificate 3, 4 or diploma. An alternate data source is not available at the NCPF geographies (see Completed year 12 description above).

Liveability and Sustainability

Appendix A: Census derived indicators to be retained

Jobs and Skills

Jobs and Skills

Housing

Housing

Infrastructure and Investment

Liveability and Sustainability

Completed bachelor degree or higher

This indicator shows the share of the population with a bachelor degree or higher qualification. An alternate data source is not available at the NCPF geographies (see *Completed year 12* description above).

Indigenous unemployment rate

Jobs and Skills

Jobs and Skills

This indicator shows the proportion of people identifying as Aboriginal or Torres Strait Islander who are seeking full-time or part-time work. Unfortunately there is no other data source for this indicator.

Appendix B: Indicator update schedule

No	Indicator name	Update frequency	Next update
1	Population	Annual	2021
2	Average annual population growth rate	Annual	2021
3	Proportion of population that is Indigenous	5 yearly	2023
4	Population density	Annual	2021
5	Dwelling type breakdown	5 yearly	2023
6	Average persons per dwelling	5 yearly	2023
7	Housing tenure	5 yearly	2023
8	Life expectancy at birth	Annual	2021
9	Share of households in lowest income quintile	5 yearly	2023
10	Languages other than English spoken at home	5 yearly	2023
11	Population breakdown by age	Annual	2021
12	Average house price	Annual	2021
13	Average unit price	Annual	2021
14	Industry sector share of employment	Annual	2021
15	Population with disability	5 yearly	2023
16	Median annual household income	5 yearly	2023
17	Local governments per city	Annual	2021
18	Dwelling price to household income ratio	Annual	2021
19	Average housing construction costs	Annual	2021
20	Public and community housing	5 yearly	2023
21	Homeless per 100K people	5 yearly	2023
22	Proportion of households under mortgage stress	5 yearly	2023
23	Proportion of households under rent stress	5 yearly	2023
24	Building approvals per 100K people	Annual	2021
25	Proportion of jobs accessible by car within 30 minutes	Annual	2021
26	Number of jobs accessible by car within 30 minutes	Annual	2021
27	Proportion of journeys to work by public transport	5 yearly	2023
28	Proportion of journeys to work by active transport	5 yearly	2023
29	Peak travel delay	Annual	2021
30	Dwellings with access to public transport	Annual	unknown
31	Workers in knowledge intensive services	Annual	2021
32	Households with broadband	5 yearly	n/a
33	Business entry	Annual	2021
34	Patent applications per 100K people	Annual	2021
35	Proportion of adults who are obese	Annual	2021
36	Adults that feel safe after dark in their local area	Ad-hoc	unknown
37	Dwellings with access to public open space	Annual	2021
38	Percentage of population able to get crisis support	Ad-hoc	unknown
39	Suicides per 100K people	Annual	2021
40	Air pollution particles smaller than PM2.5	Ad-hoc	unknown
41	Proportion of people that volunteer	5 yearly	2023
42	Greenhouse gas emissions	Annual	2021
43	Office building energy efficiency rating	Annual	2021
44	Road safety	Annual	2021

Appendix B: Indicator update schedule

No	Indicator name	Update frequency	Next update
45	Annual employment growth rate	Annual	2021
46	Unemployment rate	Annual	2021
47	Youth unemployment rate	Annual	2021
48	Participation rate	Annual	2021
49	Completed year 12	5 yearly	2023
50	Completed Certificate 3, 4 or Diploma	5 yearly	2023
51	Completed bachelor degree or higher	5 yearly	2023
52	Gross regional product	Unknown	unknown
53	Indigenous unemployment rate	5 yearly	2023