





# Data on Peer-Reviewed Papers about Green Infrastructure, Urban Nature, and City Liveability

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Abstract: This data descriptor summarizes the process applied and data gathered from the contents of 87 peer-reviewed papers/sources reporting on the contribution of public green infrastructure (PGI), in the form of public parks and urban nature spaces, in the context of city liveability and general human health and well-being. These papers were collected in a systematic literature review that informed the design of a questionnaire-based survey of PGI users in Perth, Western Australia. The survey explored visitor satisfaction with the amenities and facilities of the PGI space, and perceptions of the importance of such spaces for city liveability. Papers were sourced by searching over 15,000 databases, including all the major English language academic publishing houses, using the ProQuest Summon<sup>®</sup> service. Only English language peer-reviewed papers/editorial thought pieces/book chapters that were published since 2000 with the full text available online were considered for this review. The primary search, conducted in December 2016, identified 71 papers, and a supplementary search undertaken in June 2018 identified a further 16 papers that had become discoverable online after the completion of the initial search.

Dataset: The dataset has been submitted for publication as a supplement to this data descriptor.

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**Keywords:** biophilic design; city liveability; green infrastructure; public amenity; public open space; renaturing cities; sustainable development; urban nature; urban planning; well-being

## 1. Summary

Against the backdrop of the global challenges created by the rapid growth and urbanization of humankind over the past 50 years, there has been growing interest in the ways that public green infrastructure (PGI) and urban nature (UN) can enhance the quality of life for urban residents and improve perceptions of city liveability [1–4]. A systematic literature review was completed in December 2016 (and supplemented in June 2018) to inform the design of a questionnaire-based survey that explored the satisfaction of visitors at a PGI space in Perth, Western Australia [5–7]. The review identified two commissioned academic editorial thought pieces, one edited book chapter, and 84 peer-reviewed papers, (hereafter all referred to as papers) that reported on the key attributes of the amenity and facilities of quality PGI and UN, the contribution that those sites made to the quality of life of PGI users, and how the presence of those sites impacts user perceptions of city liveability [5,8].

The dataset shared via this data descriptor and the research based on the systematic review reported by Parker and Simpson [8] are framed by the following definitions of the key concepts of

green infrastructure (GI), UN, and city liveability. The review and associated research were grounded in the definition of Norton et al. [9] (p. 128), that GI is a "network of planned and unplanned green spaces, spanning both the public and private realms, and managed as an integrated system to provide a range of benefits." The research informed by the review [5–8] was focused on a public open space (parkland) style of PGI space that incorporated UN. Urban nature is a GI element composed of remnant and restored examples of nature indigenous (native) to that locale [10]. Also known as indigenous biodiversity, UN should ideally support examples of the micro and macro flora and fauna that would have occupied the area before humans converted the land to an urban matrix. Emerging in the 1980s, the concept of city liveability evolved as city planners and theorists attempted to describe and quantify how social, political, economic, and environmental factors contributed to the quality of citizens' lives in urban settlements (e.g., [2,8,9,11,12]). Based on the research described in this data descriptor and the shared dataset, the review of Parker and Simpson [8] reports the significant contribution that quality PGI space, especially PGI that incorporates UN, can make to enhancing city liveability.

Publication of this data has the potential to benefit others who are researching, planning, and managing urban PGI and UN with the goals of contributing to better PGI, enhancing the protection and renaturing of UN, and creating healthier and more livable urban environments.

In addition to informing the previously mentioned survey [5] and a systematic quantitative literature review paper [8], the research associated with this data descriptor has also produced a research paper [6] and another *Data* paper [7].

#### 2. Data Description

The data extracted from the 87 peer-reviewed papers included in the systematic review were captured in Microsoft Excel and are provided as a workbook file (.xlsx) with this data descriptor. Identifying information for each paper (e.g., author(s), year of publication, paper title, journal title, issue/volume/page numbers) was recorded (Table 1).

Descriptors	Data Type	Description	
Paper ID	Numeric	Assigned by researchers 1 to 87 so that papers/sources could be discovered and added to review database	
Authors	Text	Names of authors as listed on front of paper/source	
First In-text Ref.	Text	Initial APA-formatted in-text reference for paper/source	
Subsequent In-text Ref.	Text	Subsequent APA-formatted in-text reference for paper/source	
APA Citation	Text	Full APA-formatted citation for use in bibliography/reference list	
Year	Date	Year of publication of paper/source	
Title	Text	Title of paper/source	
Journal/Source	Text	Name of journal or type of source	
Vol(Iss/Num)/Chap, pp.	Text	Numeric identifiers	
Type of Paper Categorical		<ul> <li>1 = Research paper/report</li> <li>2 = Review paper/report</li> <li>3 = Combination of review and research</li> <li>4 = Editorial/thought piece</li> </ul>	

**Table 1.** Metadata specification for paper/source descriptors.

The abstract for each paper included in the systemic literature review was also captured, and was used to inform the review article of Parker and Simpson [8], but they have been excluded from this data set for reasons of copyright.

Geographical data and liveability rankings associated with the scope and locations of papers included in the systemic literature review are specified in Table 2. Population densities were calculated using data from the United Nations Demographic Yearbook 2016 [13]. The reported climate categories are based on the global Koppen climate categories described by the Met Office of the United Kingdom [14]. The Economist Intelligence Unit (EIU) and Mercer, a global human resources

consulting firm, produce annual listings that rank cities on the quality of their urban life based on their Global Liveability Ranking (www.eiu.com/topic/liveability) and Quality of Living City Rankings (https://mobilityexchange.mercer.com/Insights/quality-of-living-rankings). Where available and applicable, the EIU liveability rankings and Mercer quality-of-life rankings for 2015 and 2018 are also reported in the dataset.

The included papers were then analyzed with respect to the focus criteria of the review as detailed in the Methods section. Additional criteria recorded included items such as the reporting of social, environmental, economic, ecological, human health, and lifestyle contributions of urban PGI and UN to citizen life and city liveability (Table 3). The research methods utilized in each paper were also noted, as well as the proposal of a new tool/technique, if present. Recommendations for further research and any other recommendations were also recorded for each paper analyzed. In the dataset associated with this data descriptor, these data are grouped under four clusters: Measurement tools and methods, Focus areas covered in paper, Contributors to city liveability, and Recommendations of paper.

Descriptors	Data Type	Description	
Focus of Paper/Report	Categorical	<ol> <li>1 = Australia</li> <li>2 = International (countries other than Australia)</li> <li>3 = Global (broadly focused, but specific countries not named)</li> </ol>	
Country	Text	Country/countries named in paper/report or global	
Region	Text	Regional focus of paper/report or global	
City	Text	City/cities named in paper/report NA = Not applicable for global/review papers NS = Not specified	
Type of Space(s)	Categorical	<ol> <li>1 = Specific/individual space</li> <li>2 = Few local spaces in single city</li> <li>3 = Broadly focused single city</li> <li>4 = Few local spaces in multiple cities, single/multiple countries</li> <li>5 = Broadly focused multiple cities, single country</li> <li>6 = Broadly focused multiple cities, multiple countries</li> </ol>	
Name of Space(s)	Text	Name/description of spaces from paper/report or not specified	
Population Density	Text	Number of people per square km NA= Not applicable ND = No data NS = Not specified	
Climate	Categorical	E = Equatorial A = Arid M = Mediterranean T = Temperate S = Snow P = Polar NA = Not applicable NS = Not specified	
2015 EIU	Text	1 to 140 = EIU City Liveability ranking for 2015 NA = Not applicable NR = Not ranked by EIU as one of the 140 most liveable cities NS = Not specified which cities were included in study	
2015 Mercer	Text	1 to 231 = Mercer Quality of Living ranking for 2017 NA = Not applicable NR = Not rated as one of Mercer's 231 most liveable cities NS = Not specified which cities were included in study	
2018 EIU	Text	1 to 140 = EIU City Liveability ranking for 2015 NA = Not applicable NR = Not ranked by EIU as one of the 140 most liveable cities NS = Not specified which cities were included in study	
2018 Mercer	Text	1 to 231 = Mercer Quality of Living ranking for 2017 NA = Not applicable NR = Not rated as one of Mercer's 231 most liveable cities NS = Not specified which cities were included in study	

Table 2. Metadata specifications for geographic data. EIU, Economist Intelligence Unit.

	wieasuremen	t Tools and Methods
Descriptors	Data Type	Description
Proposed New Tool	Categorical	1 = Yes 0 = No
GIS	Categorical	1 = Yes 0 = No
Qualitative	Categorical	1 = Yes 0 = No
Quantitative	Categorical	1 = Yes 0 = No
No. of Study Participants	Text	Numeric value = number of participants (research papers) Text = Alternate source of human data NA = Not applicable (review paper or no participants)
Other/Comments	Text	Text = Other types of measurement tools or methods used NA = Not applicable (review paper/no other tools/methods)
	Focus Areas	s Covered in Paper
Descriptors	Data Type	Description
Health/Well-Being	Categorical	1 = Yes 0 = No
Quality POS	Categorical	1 = Yes 0 = No
Environmental/Ecological	Categorical	1 = Yes 0 = No
Planning/Policy	Categorical	1 = Yes 0 = No
Liveability	Categorical	1 = Yes 0 = No
Economic	Categorical	1 = Yes 0 = No
Social	Categorical	1 = Yes 0 = No
Other/Comments	Text	Text = Other focus areas/insights provided in paper/report NA = Not applicable (other focus areas not covered)
	Contributors	s of City Liveability
Descriptors	Data Type	Description
Easy Access to GI/POS	Categorical	1 = Yes 0 = No
Walkability	Categorical	1 = Yes 0 = No
Tree Canopy Cover	Categorical	1 = Yes 0 = No
Green/POS Infrastructure	Categorical	1 = Yes 0 = No
Quality GI/POS	Categorical	1 = Yes 0 = No
Biodiversity/Ecological Opportunity	Categorical	1 = Yes 0 = No
Other	Text	Text = Other contributors/insights regarding city liveability NA = Not applicable (no other contributors to liveability)
	Recomme	ndations of paper
Descriptors	Data Type	Description
Claim Lack of Research	Categorical	1 = Yes 2 = No
Suggestion for Further Research	Categorical	1 = Yes 2 = No

**Table 3.** Metadata specifications for data of systemic literature review reported in Land [8]. GIS, geographic information system(s); POS, public open space.

#### 3. Methods

The data reported in this data descriptor were gathered as part of a systematic quantitative literature review based on the approach of Pickering and Byrne [15] and the Preferred Reporting Items for Systematic Reviews (PRISMA) guidelines [16]. The quantitative review and theoretical synthesis [8] focused on the role and contribution of urban PGI and UN in relation to the concept of city liveability. In December 2016, over 15,000 databases, including all the major English language academic publishing houses, were searched using the ProQuest Summon<sup>®</sup> [17] service accessed through the library of Murdoch University to identify papers related to PGI and UN. The keywords shown in Table 4 were used as search terms to identify potential papers that could be included in the literature review. Papers prior to 2000 were excluded based on the likelihood of diminished currency with respect to knowledge about best practice PGI management, the capture of pertinent knowledge from earlier papers being reported in the later literature, and a perception of decreased relevance among current PGI managers and users.

Primary Search Terms	Secondary Search Terms
"public green infrastructure" "public open space" "POS" "urban open space" "green space" "urban nature" "park" "wetland"	"liveability/livability" "city liveability/livability" "user satisfaction" "visitor satisfaction"

**Table 4.** Search terms used to identify papers included in the literature review. Potential papers were filtered using the primary and secondary search terms in the preliminary search.

The initial search identified 336 peer-reviewed papers, reports, editorial thought pieces, and edited book chapters published in English, with the full text available online, that were published between January 2000 and November 2016. An additional peer-reviewed paper [4] was included based on its relevance to the research location of the proposed visitor survey and its being newly available. As a secondary measure, four papers were selected from the 336 sources because those papers specifically reported on human perceptions regarding urban PGI and/or POS and city liveability. The reference lists of those four papers were individually analyzed, which resulted in an additional nine papers being located and deemed suitable for inclusion in the review. Of the 346 papers initially identified, 17 papers were found to be duplicates and were therefore excluded. The titles and abstracts of the remaining 346 papers were screened, and the papers that did not specifically relate to the contribution of urban PGI/POS/UN to city liveability in the context of the survey reported in Parker and Simpson [6,7] were excluded. This left 71 papers that were deemed suitable for inclusion in the PRISMA Expression provided in Figure 1.

As a final measure, a search using the method detailed above was performed in May 2018 to identify any newer, not previously discovered, peer-reviewed papers/sources in this area of research with a publication date prior to 1 January 2018 (Figure 1). This additional search identified 16 recently published papers reporting research relevant to this review [9,85–99]. This completed the research collection phase for the review. As previously mentioned, the data described in the previous section were extracted from each paper and recorded in a Microsoft Excel workbook to enable qualitative and quantitative analysis.

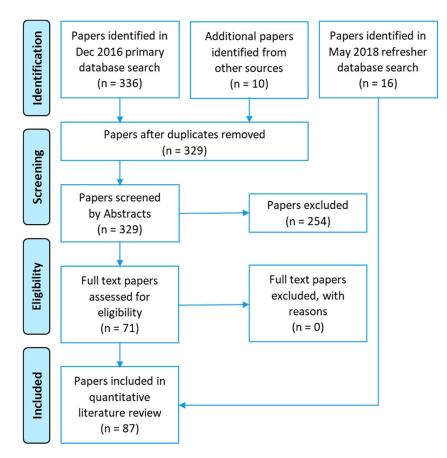


Figure 1. PRISMA Expression for systematic quantitative literature review.

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