THE UNIVERSITY OF HONG KONG 香港大學
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Department of Urban Planning and Design
城市規劃及設計系

Centre of Urban Studies and Urban Planning
城市研究及城市規劃中心

HKURBANlab

Urban Design Research Briefing Note

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Contents

Executive summary

1. In Asia and China, @ sub city level and neighbourhood level, there is a lack of research* on the relationship between climate change preparedness, liveability, wellbeing, sustainable transport, and Built Environment (BE) dimensions such as high, and very high density, in particular around TOD service areas

2. Recent meta-review of worldwide research* in placemaking-urban design shows a disproportionate level of US and EU studies and a lack of knowledge in Asia and China – APAC.

3. Recent meta-reviews of worldwide research* shows that there are knowledge deficiencies about TOD communities design and TOD service areas design in general and in Asia in particular - APAC

4. New towns (NT), new districts (ND), new extensions (NE) in China are now maturing. There is a lack of understanding of their performance. In the light of the national policy agenda moving from quantity to quality, NT, ND, NE performance should be better understood.

5. Recent meta-review of worldwide research* on the benefits of urban density shows a disproportionate level of US and EU studies and a lack of knowledge in Asia and China – APAC.

*in English

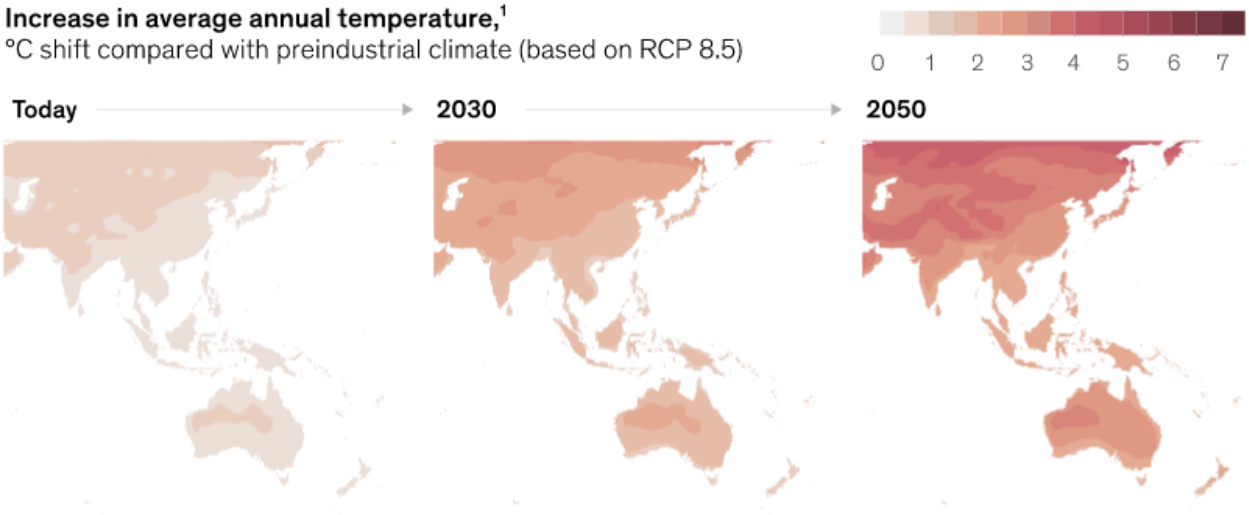
Recommendations

1. To create research prize strands distinguishing research from practice and from academia
2. HKIUD research prize(s) should incentivise APAC urban design research
3. Research prize should be thematically branded for example:
    a. Liveable TOD communities
    b. Liveable new town
    c. Liveable high density

MEGA THREAT: CLIMATE CHANGE

Average temperatures are projected to increase in many parts of Asia.

Increase in average annual temperature,[1]
°C shift compared with preindustrial climate (based on RCP 8.5)

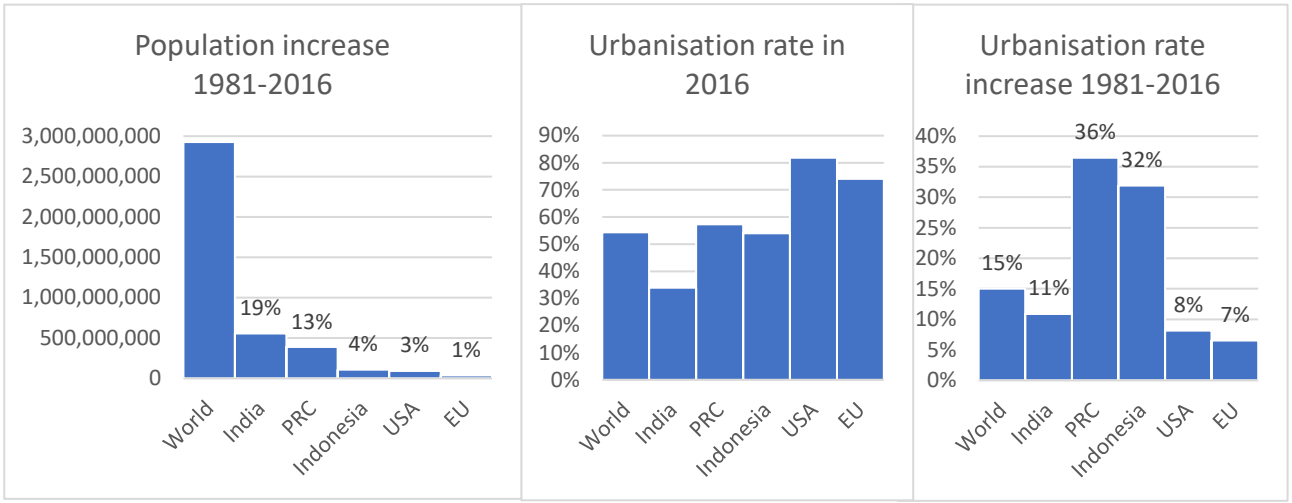


Note: See Technical appendix, *Climate risk and response: Physical hazards and socioeconomic impacts*, McKinsey Global Institute, January 2020, for why we chose RCP 8.5. Projections based on RCP 8.5 CMIP 5 multimodel ensemble. Heat-data bias corrected. Following standard practice, we typically define current and future (2030, 2050) states as average climatic behavior over multidecade periods. Climate state today is defined as average conditions between 1998 and 2017, in 2030 as average between 2021 and 2040, and in 2050 as average between 2041 and 2060.
[1]Taken from KNMI Climate Explorer, 2019, using mean of full CMIP5 ensemble of models. Preindustrial levels defined as period between 1880–1910.
Source: KNMI Climate Explorer, 2019; Woodwell Climate Research Center; McKinsey/United Nations (disputed boundaries); McKinsey Global Institute analysis

McKinsey & Company

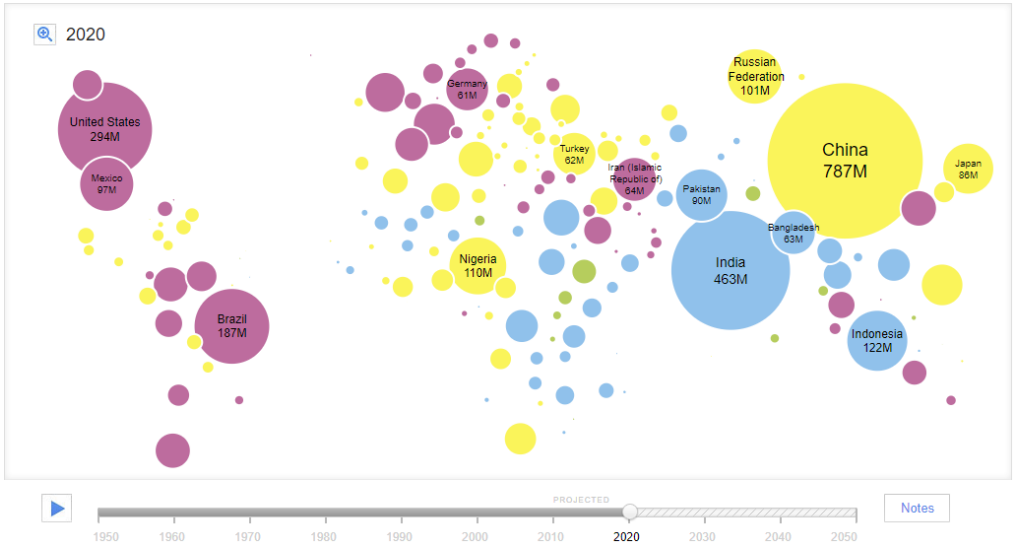
Sources:
https://www.mckinsey.com/business-functions/sustainability/our-insights/climate-risk-and-response-in-asia#
https://www.carbonbrief.org/explainer-the-high-emissions-rcp8-5-global-warming-scenario

MEGA TREND: ASIA & SOUTH ASIA - POPULATION & URBANISATION, 1980-2016 /2020-50

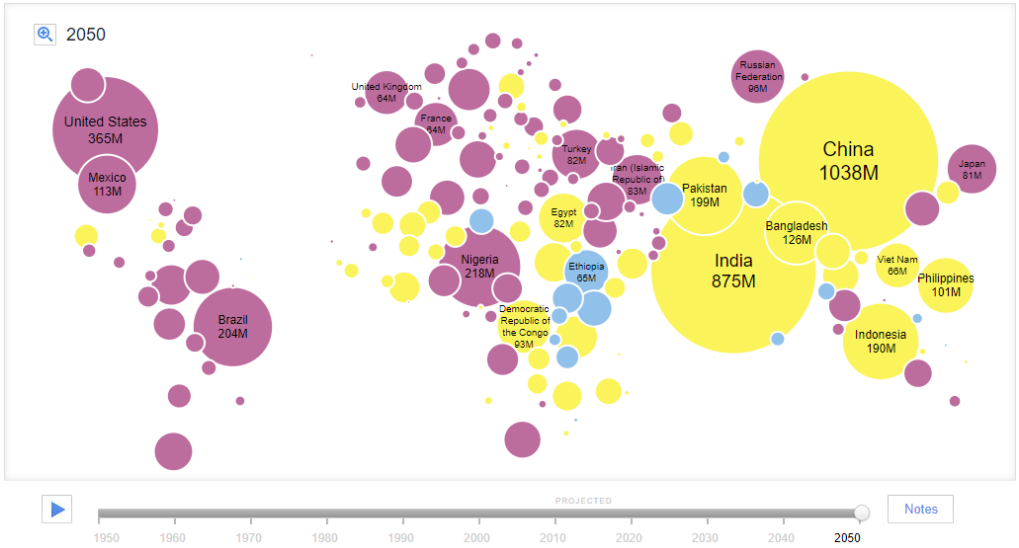


Sources: World Bank, https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?end=2019&locations=US-IN-ID-1W-CN-EU&start=1960&view=chart Unicef https://www.unicef.org/sowc2012/urbanmap/

Urbanisation 2020

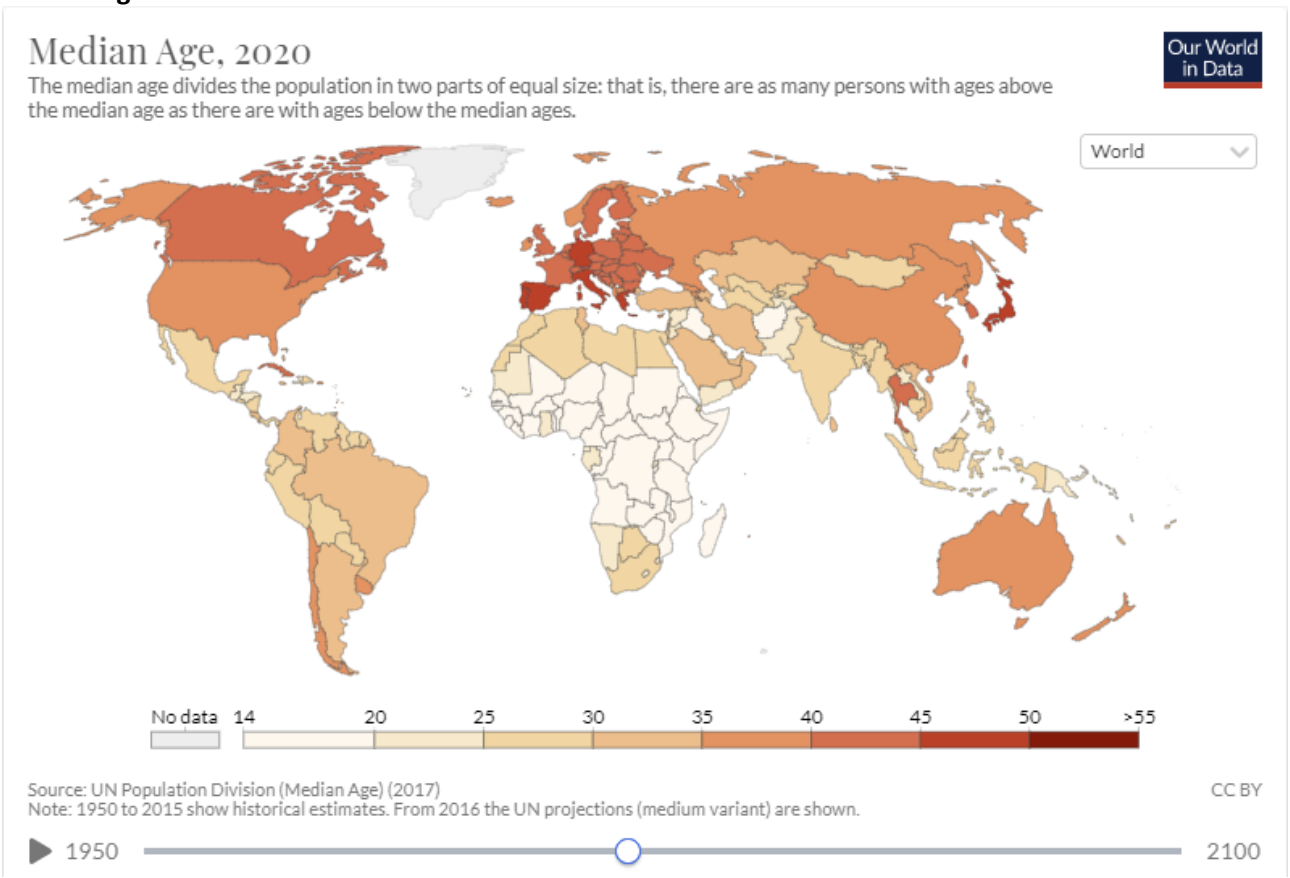


Urbanisation 2050

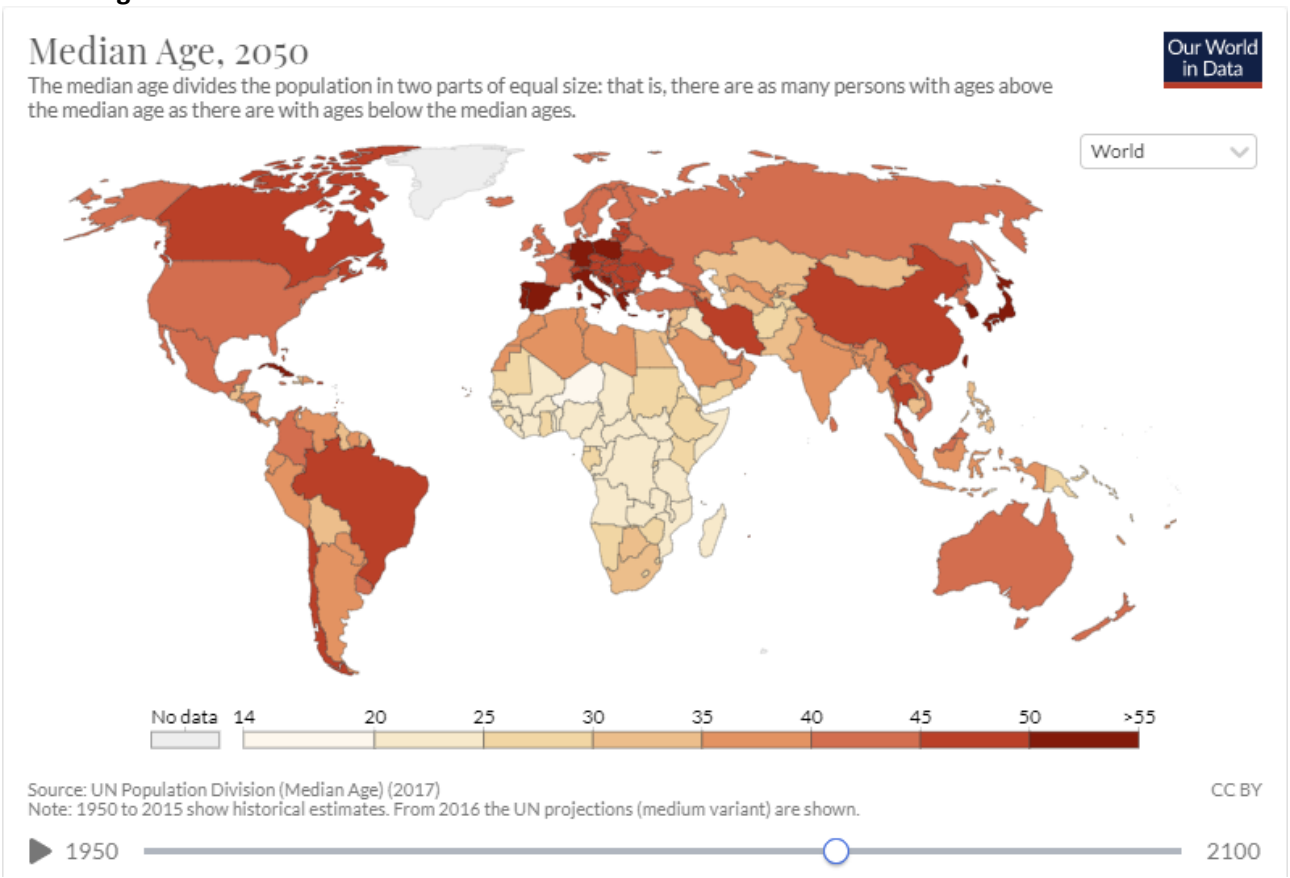


MEGA TREND: AGING POPULATION 2020-50
Source: https://ourworldindata.org/grapher/median-age

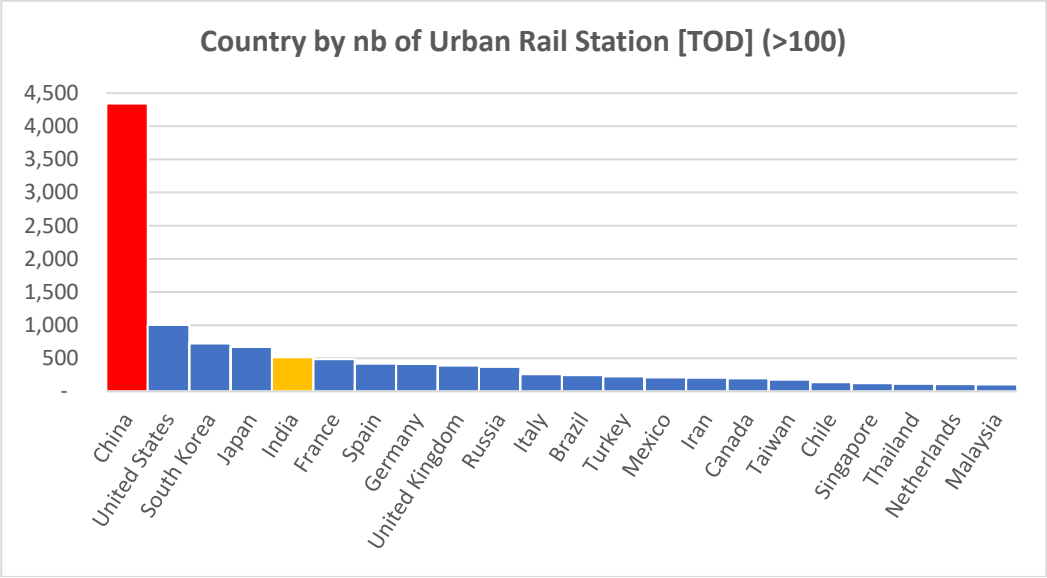
Median age 2020

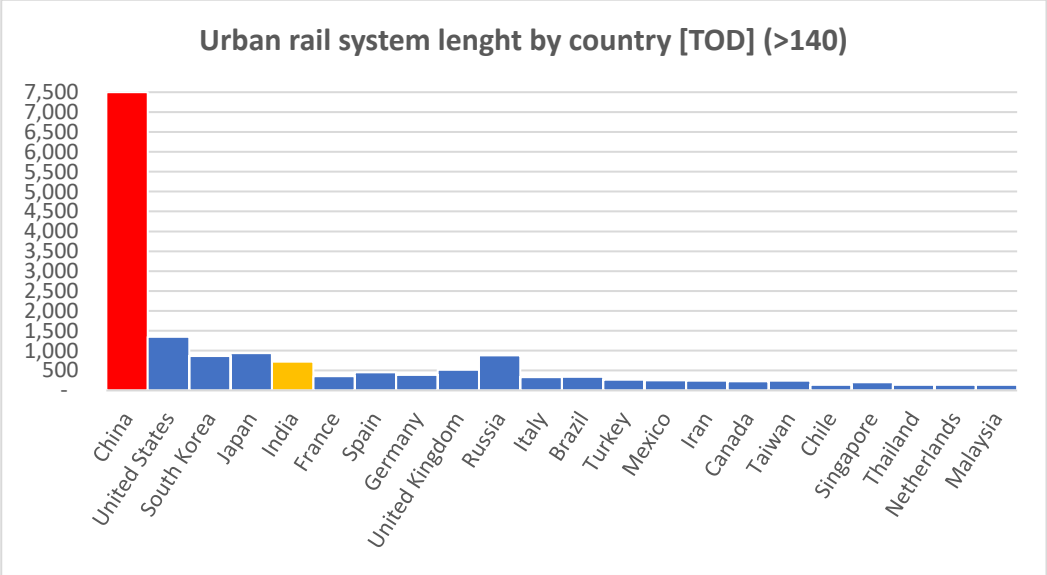


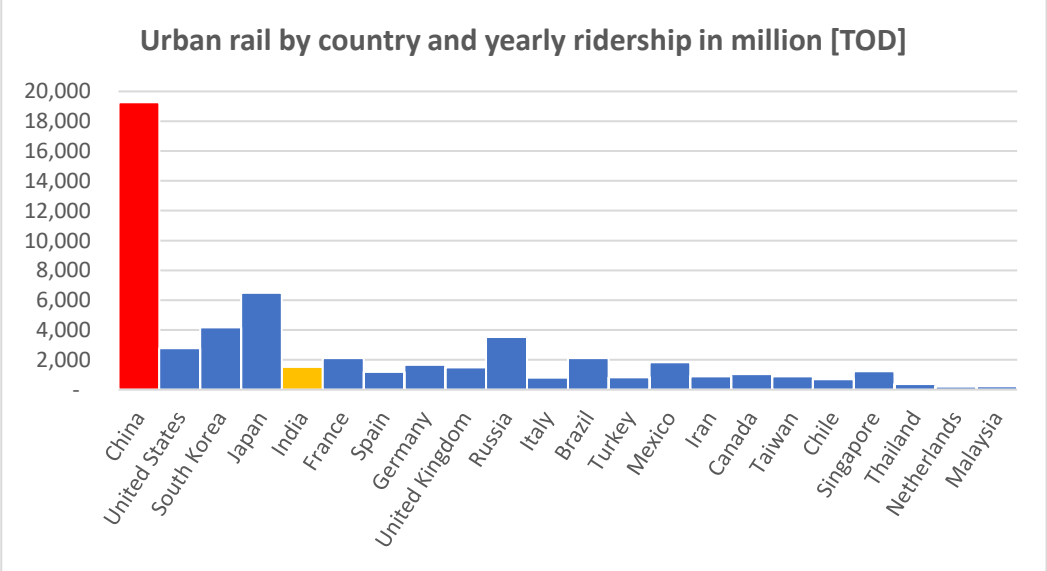
Median age 2050



TREND – TOD - 2020
Source: adapted from Wikipedia https://en.wikipedia.org/wiki/List_of_metro_systems#A







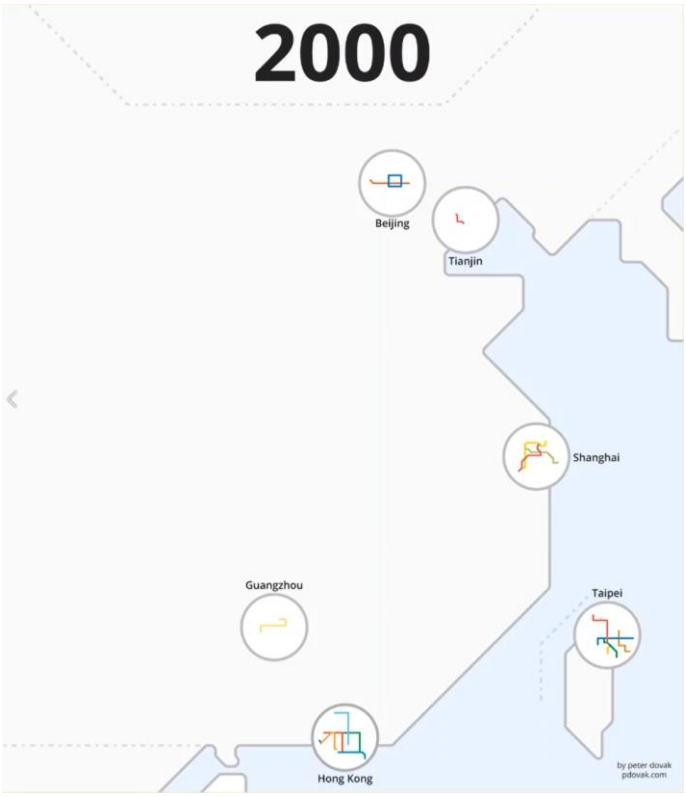
CHINA: URBAN RAIL 2000-20

TOD Transit Oriented Development
TAD Transit Adjacent Development
TED Transit Environment Development
TID Transit Inducing Development
DIT Development Inducing Transit

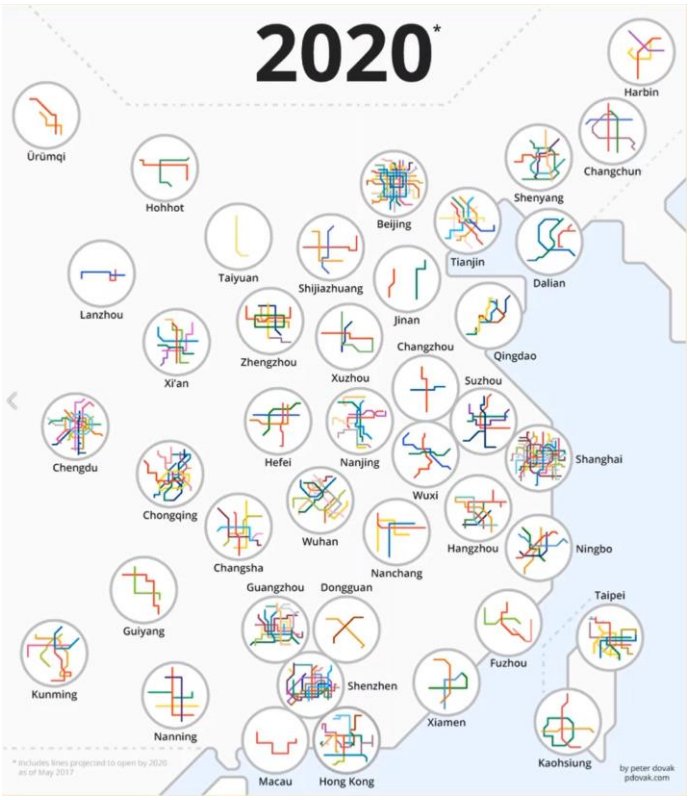
National Policy move:

- From quantity to urban quality
- To experiential and knowledge economy
- To smoothing socio-economic and spatial inequity

Source (map): Peter Dovak, https://theoutline.com/post/4651/china-taiwan-mass-rapid-urban-transit-map-gif

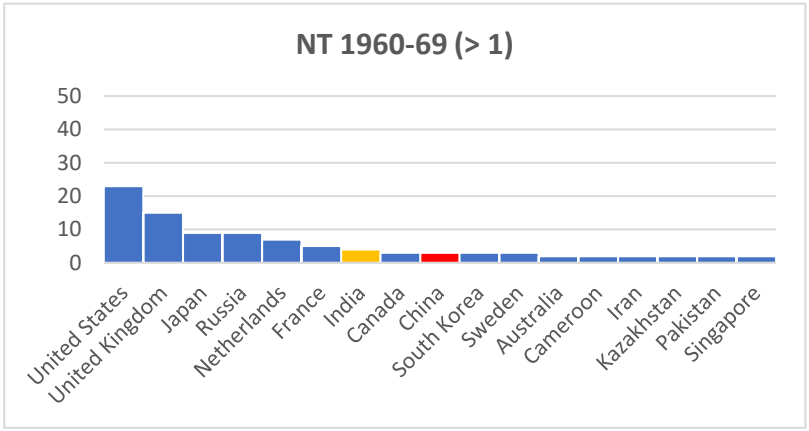


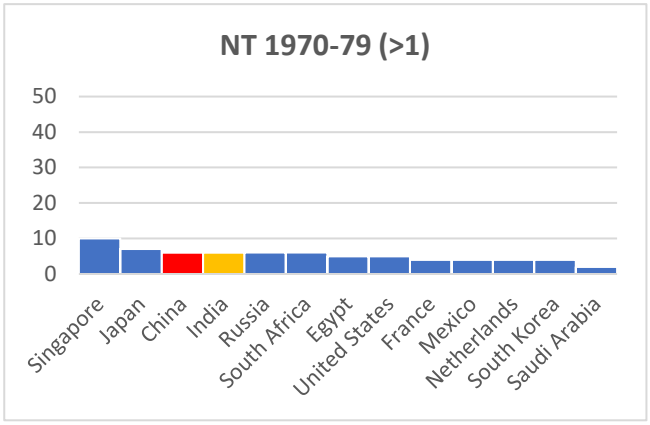
China urban rail 2020

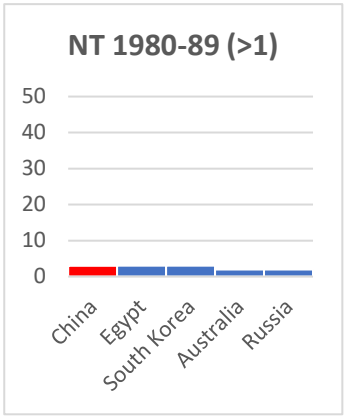


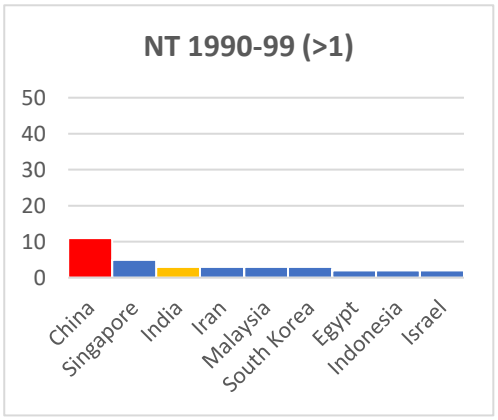
TREND: NEW TOWN 1960-2017

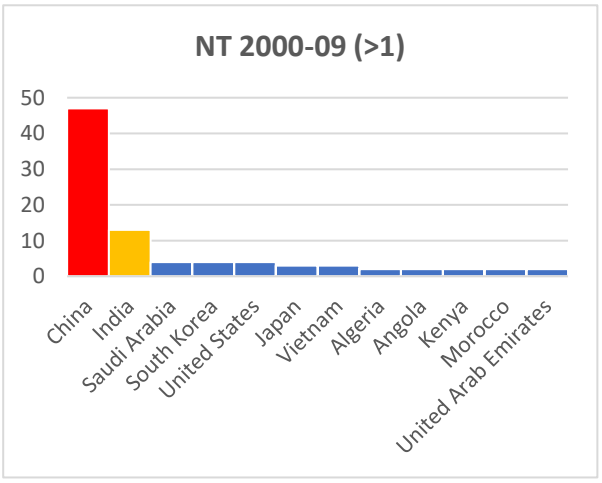
(**Source**: Peiser, R. and Forsyth, A. eds., 2021. *New Towns for the Twenty-First Century: A Guide to Planned Communities Worldwide*. University of Pennsylvania Press.)

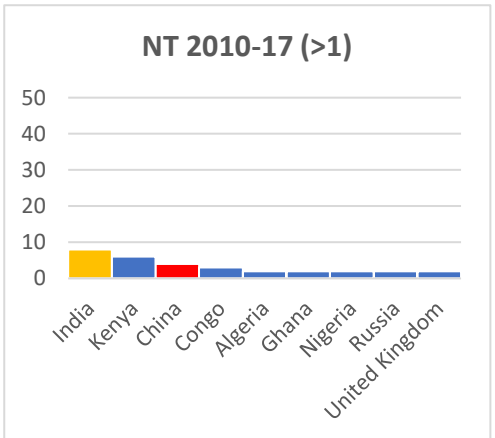










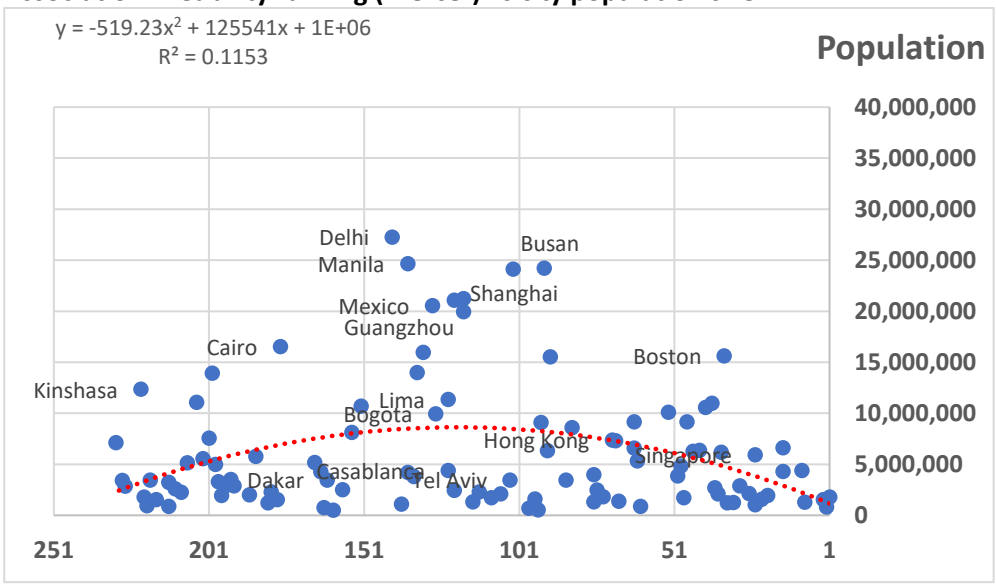


TREND: HIGH DENSITY & HIGH LIVEABILITY?

Based on the Mercer's Liveability index
"There is no precedent of high density and high liveability cities"
Hong Kong 2030+ p.23, 2016
Singapore, Centre for liveable cities

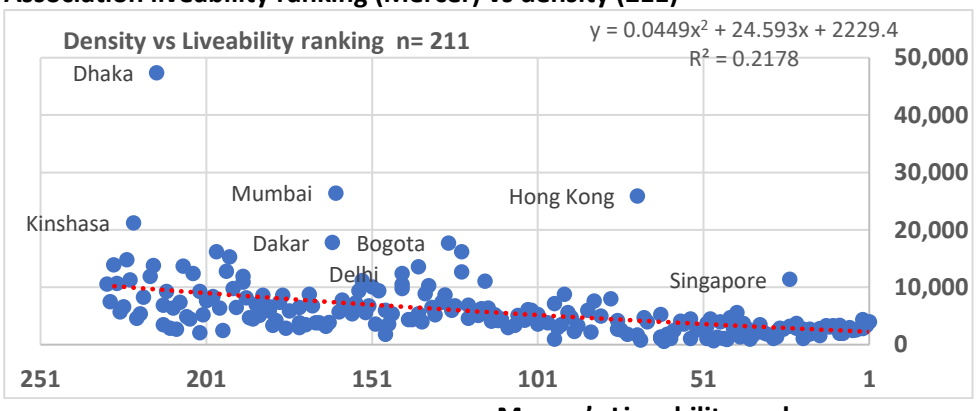
Sources: Mercer's Liveability Index 2019 – 231 urban areas
Demographia 2019 World urban areas 15th edition – 211 urban areas matched
UN World Happiness report 2020 - 106 urban areas matched

Association liveability ranking (Mercer) vs city population size



- Urban areas (> 10,000,000) that have very large population, do not have high liveability, exception Boston?
- Smaller city (<5,000,000) can have any rank of liveability.

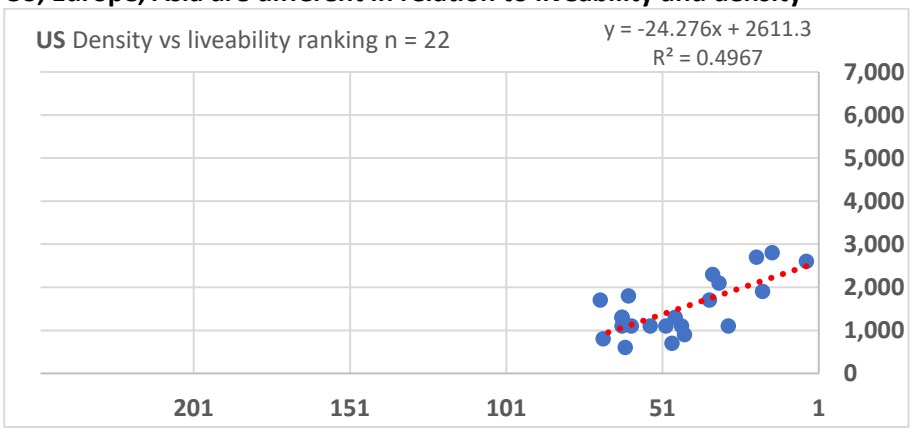
Association liveability ranking (Mercer) vs density (211)



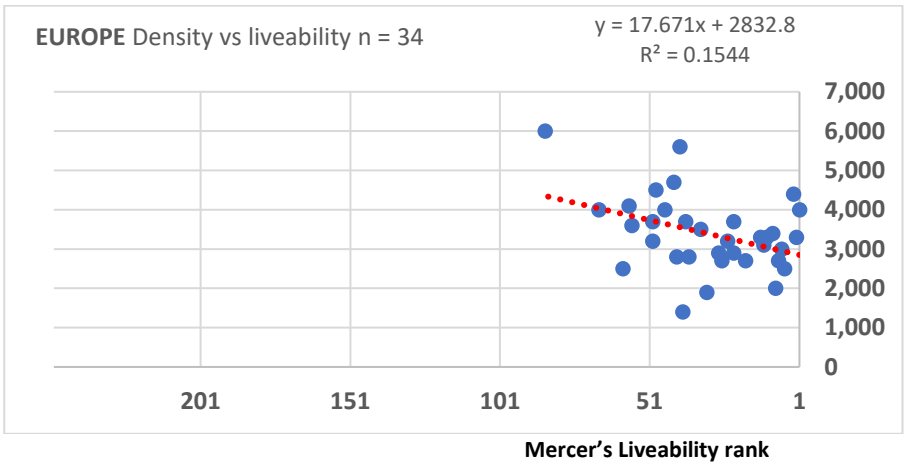
- Downward association, lower density associated with high level liveability
- Are high density city doomed? Exception Singapore.
- Density "explains" between 22% and 38% of the liveability variance

Association liveability ranking (Mercer) vs density: USA & Canada (22), Western Europe (34)

US, Europe, Asia are different in relation to liveability and density

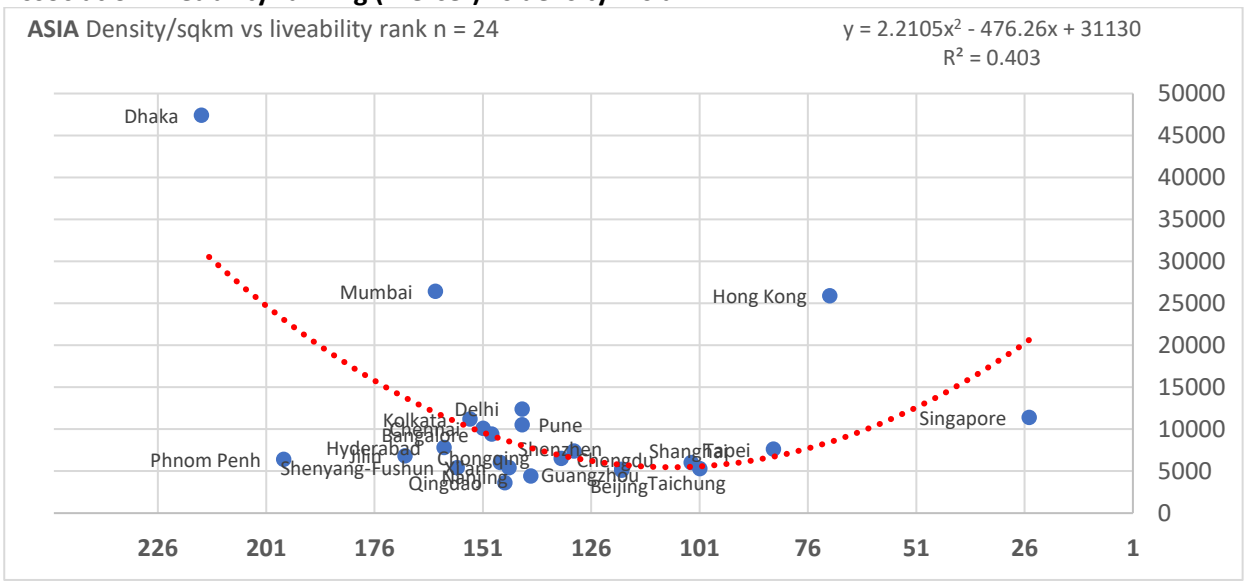


- Upward association between density and liveability, the higher the density the higher the liveability rank – the density upper range is about 3,000/km2
- Density "explains" 50% of the liveability variance



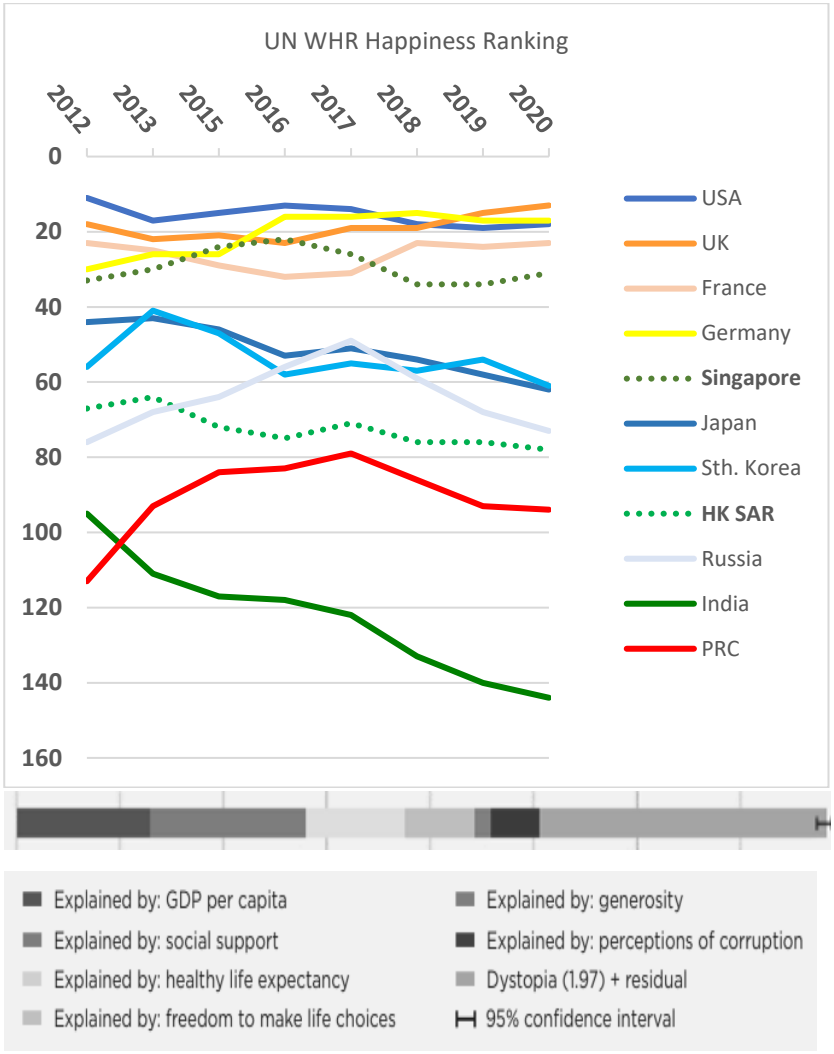
- Downward association between density and liveability, the higher the density the lower the liveability rank – the density lower range is about 3,000/km2
- Density "explains" 15% of the liveability variance

Association liveability ranking (Mercer) vs density: Asia

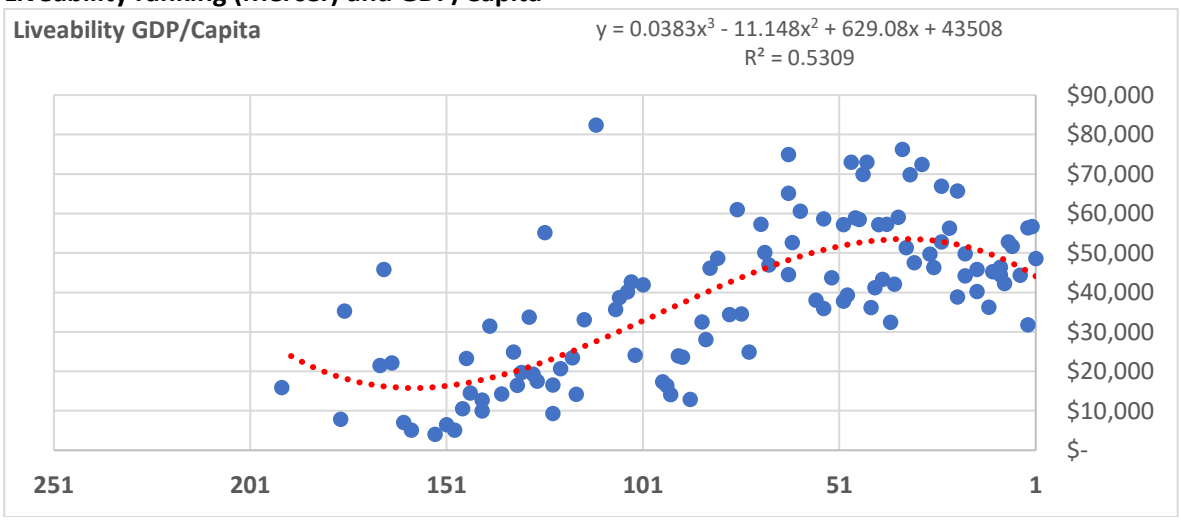


Mercer's Liveability rank

World Happiness Report (UN 2012-2020) GDP & Liveability

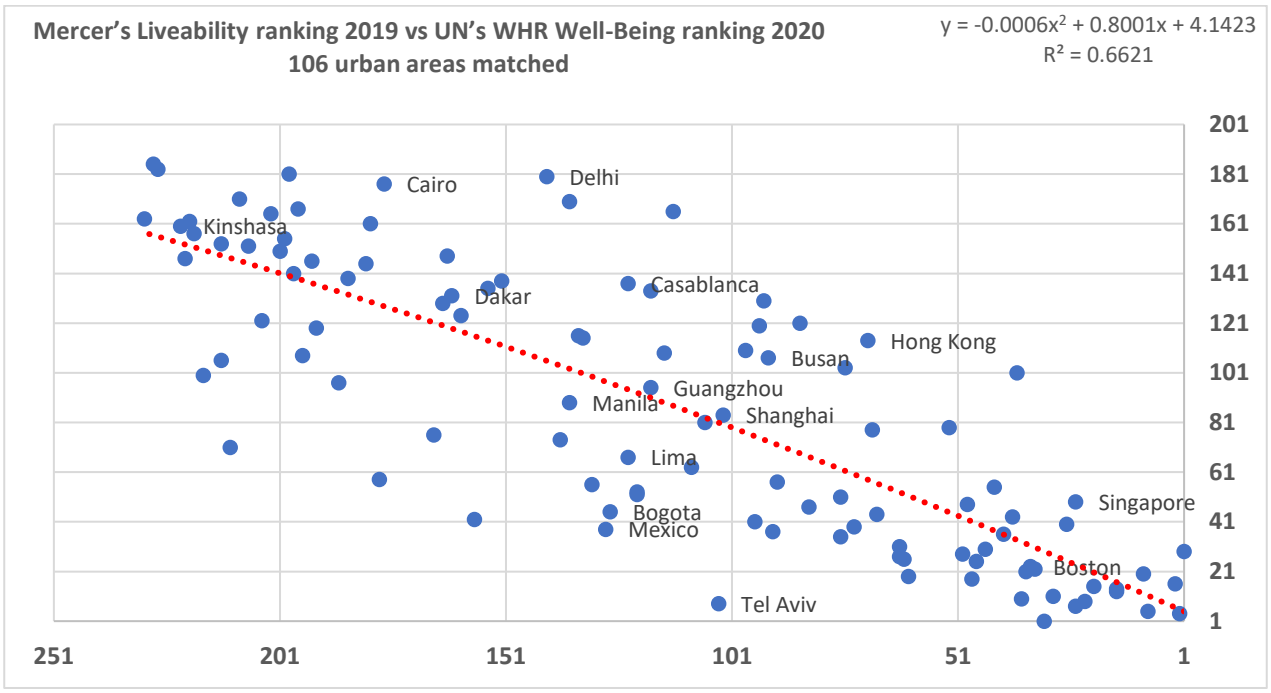


Liveability ranking (Mercer) and GDP/Capita

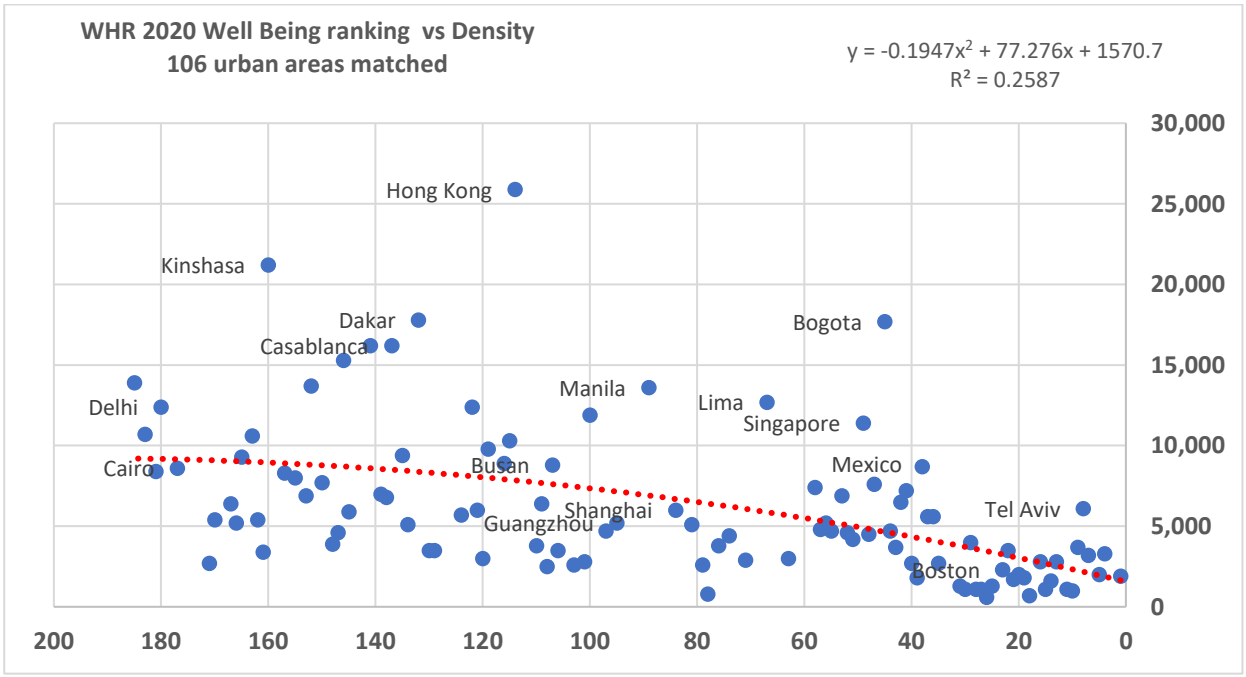


- Liveability increases with the City's GDP/capita, yet **highest liveability cities do not have highest GDP per capita**

Liveability ranking (Mercer) vs UN World Happiness report ranking 2020



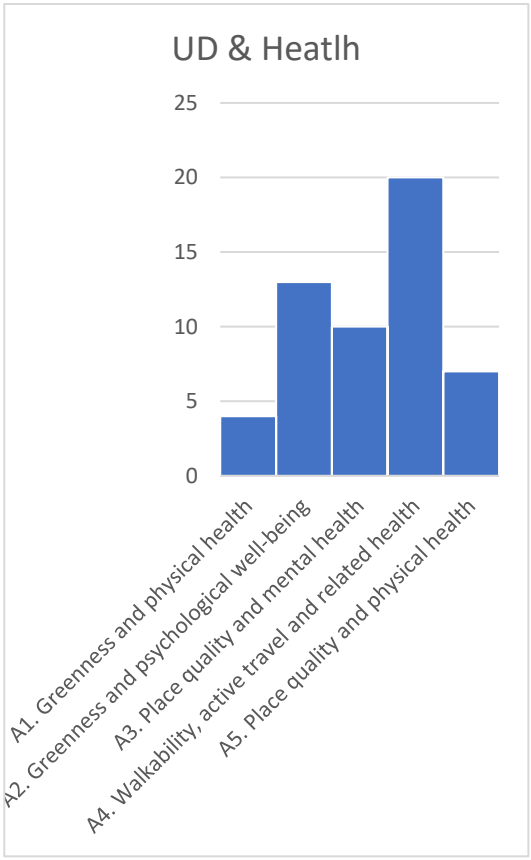
WHR 2020 Well Being ranking vs Density

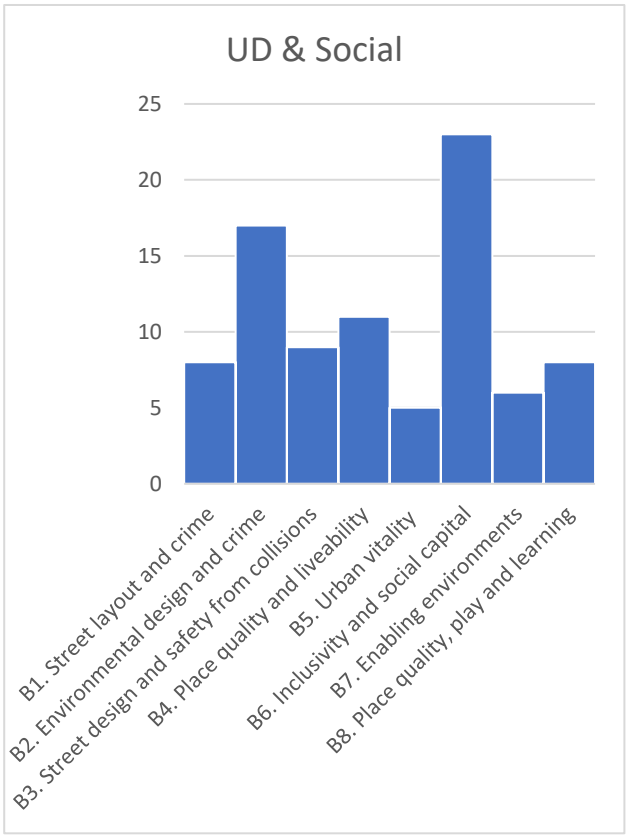


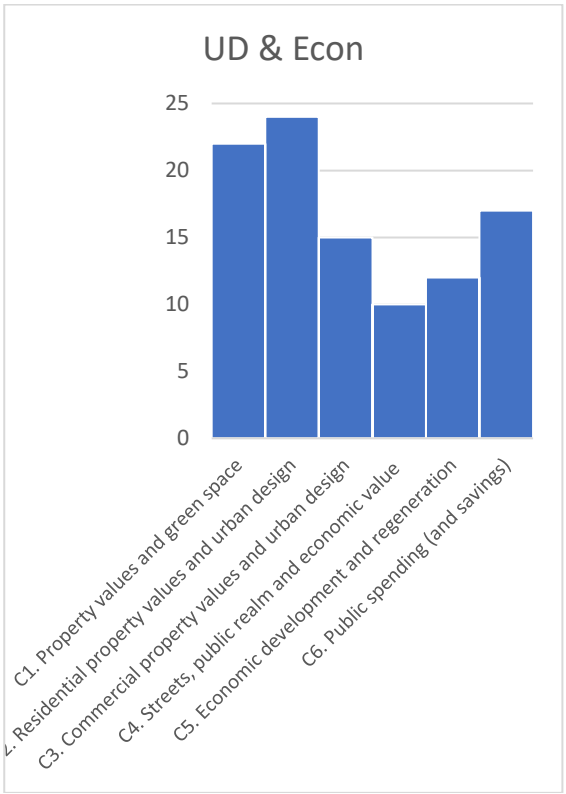
TRENDS: URBAN DESIGN RESEARCH

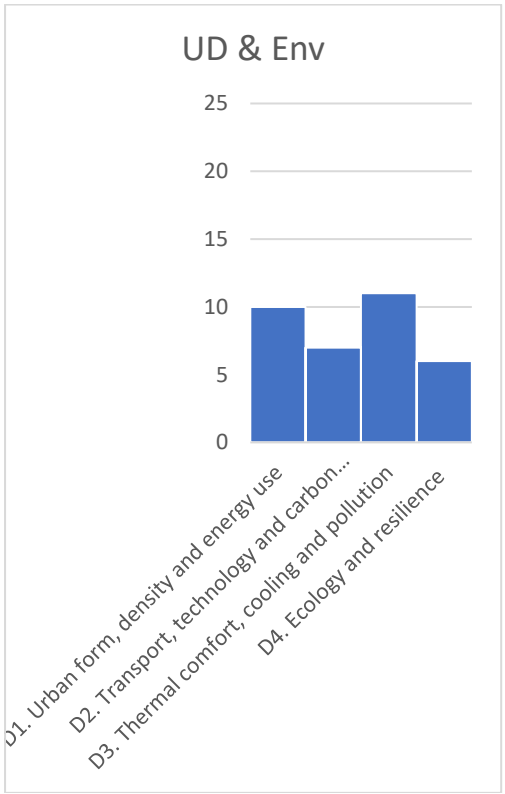
Source: Carmona, M., 2019. Place value: Place quality and its impact on health, social, economic and environmental outcomes. Journal of urban design, 24(1), pp.1-48. https://www.tandfonline.com/doi/pdf/10.1080/13574809.2018.1472523?needAccess=true

Urban design research articles (274) by theme

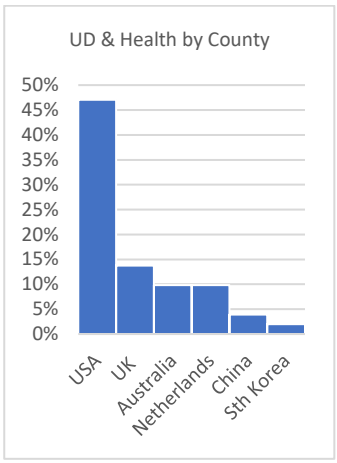


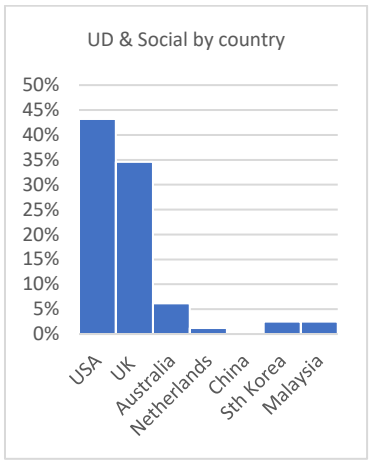


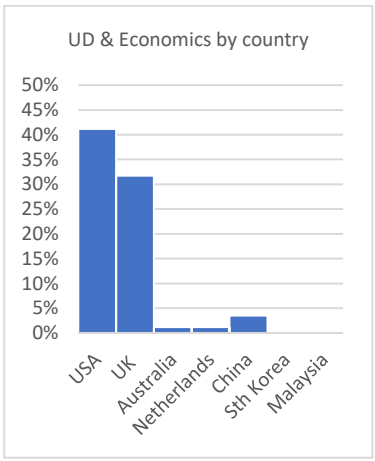


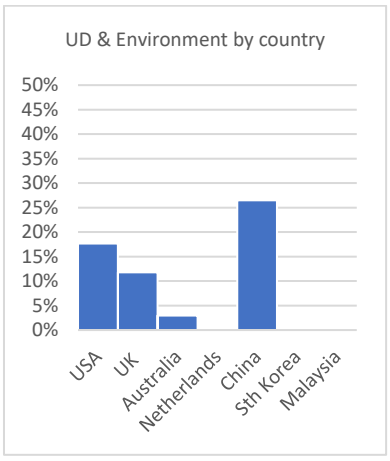


Urban design research articles (274) by theme and by country

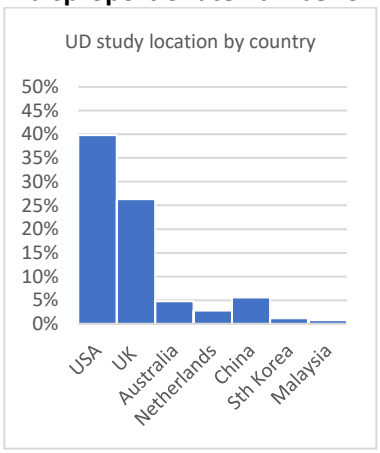








A disproportionate number of research are from the US and the UK (76%)

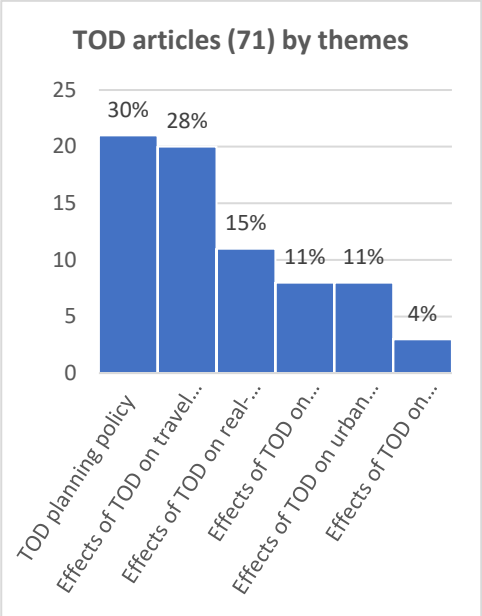


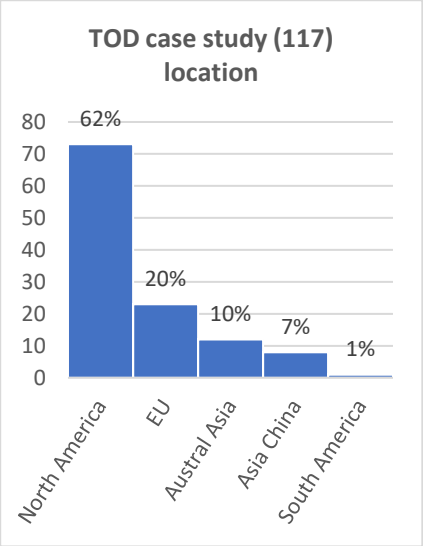
TRENDS: TOD RESEARCH

Source: Ibraeva, A., de Almeida Correia, G.H., Silva, C. and Antunes, A.P., 2020. Transit-oriented development: A review of research achievements and challenges. Transportation Research Part A: Policy and Practice, 132, pp.110-130. https://www.sciencedirect.com/science/article/pii/S0965856419304033

TOD worldwide, 71 articles, themes, and study location

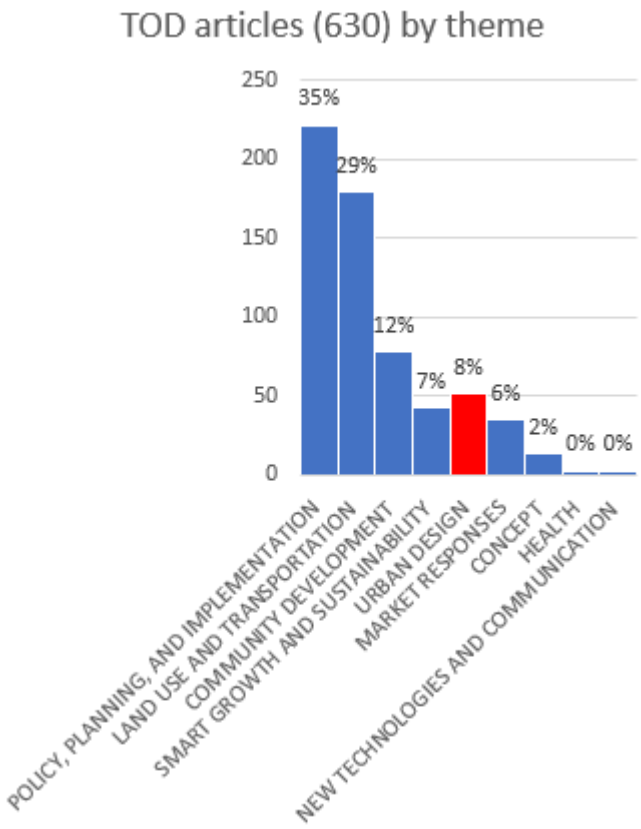
A disproportionate representation of the US & EU (82%)



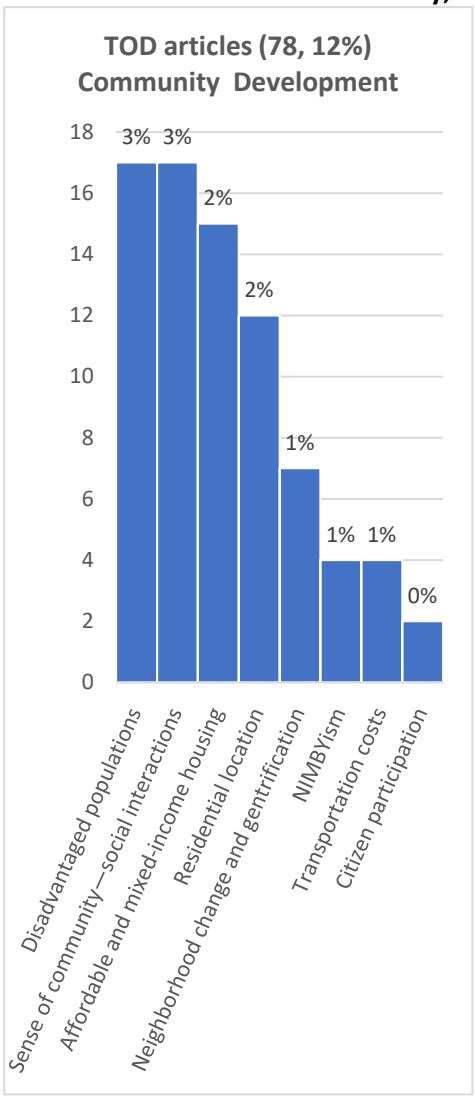


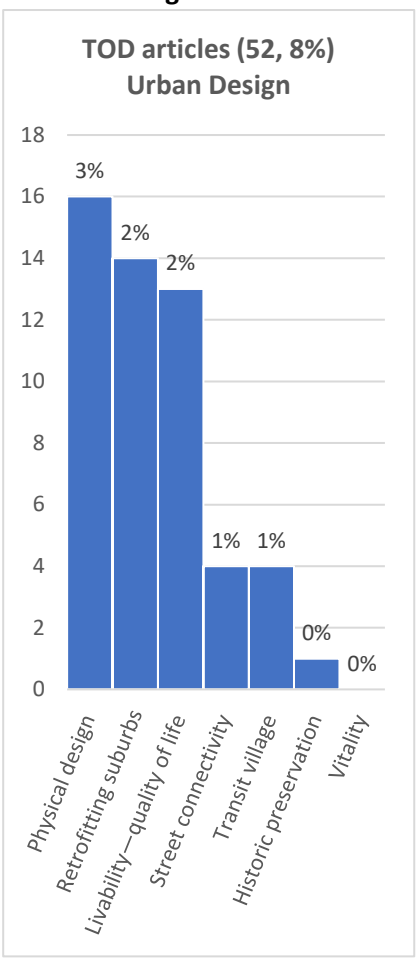
TOD articles (630) by theme

Source: Jamme, H.T., Rodriguez, J., Bahl, D. and Banerjee, T., 2019. A Twenty-Five-Year Biography of the TOD Concept: From Design to Policy, Planning, and Implementation. Journal of Planning Education and Research, 39(4), pp.409-428.



Lack of research on TOD community, TOD Urban Design

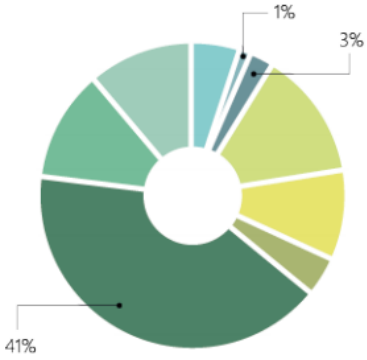




TRENDS: DENSITY RESEARCH

Source: Pont, M.B., Perg, P.G., Haupt, P.A. and Heyman, A., 2020, November. A systematic review of the scientifically demonstrated effects of densification. In *IOP Conference Series: Earth and Environmental Science* (Vol. 588, No. 5, p. 052031). IOP Publishing. https://iopscience.iop.org/article/10.1088/1755-1315/588/5/052031/pdf

What is the scientific evidence that density contributes to sustainable urban development and how do the results vary across various outcome categories?

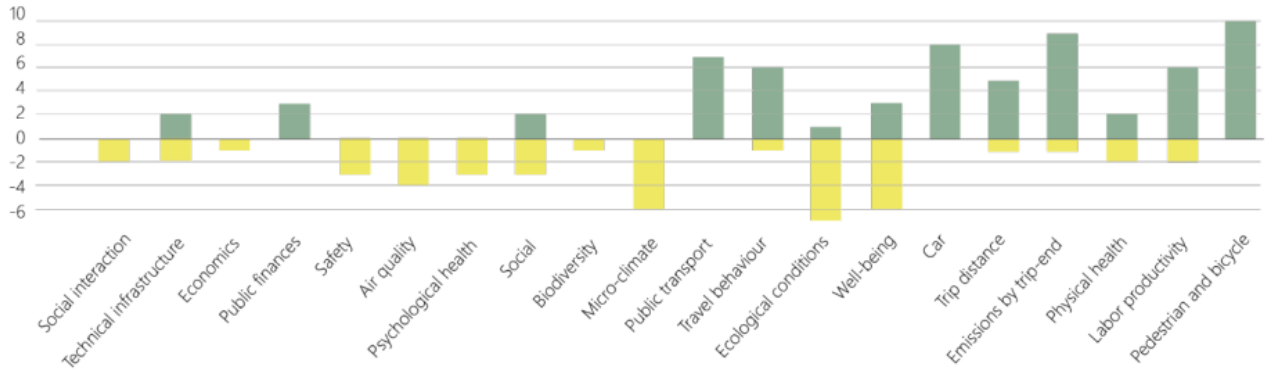


Category	Amount of articles	Percentage
Technical infrastructure	9	5%
Resource efficiency	1	1%
Service	5	3%
Economics	23	14%
Climate & ecology	16	9%
Urban environment	7	4%
Transport	70	41%
Social	20	12%
Human health	19	11%

Distribution of the studied outcome categories discussed in scientific papers

Study location
40% North America
29% Asia
23% Europe
8% Others
Positive
54% US 41% Europe 37% Asia
Transport
US 51% Asia 41% Europe 25%
Economics
US 13% Asia 8% Europe 25%
Health
US 10% Asia 7% Europe 13%
Ecology
US 10% Asia 10% Europe 8%
Social
US 10% Asia 7% Europe 16%

Distribution of the studied effects of density
From left to right: outcomes related to transport, economics, and social effects.



Top-20 of studied outcomes
Amount of positive effects on sustainable urban development are in green and negative ones in yellow.