

POLICY DEVELOPMENT: NOT A STATEMENT OF GOVERNMENT POLICY

Subject: Fair Funding – Consideration of Population Concentration (Sparsity and Density) (NR TWG 18-16)

Report of: SIGOMA / Core Cities

Date: 21 Sept 2018

1. Introduction

- 1.1 This paper set out the views of Core Cities and SIGOMA authorities on population concentration and how this may affect unit costs, to be considered as part of the Fair Funding review.
- 1.2 The December 2017 Fair Funding Consultation paper proposed that the common cost drivers should include population and deprivation, this is widely accepted. The paper also proposes **rurality** as a common cost driver whilst also including references to more dispersed or concentrated populations in the proposed service specific formula.
- 1.3 Whilst the members we represent acknowledge that extreme variations in population concentrations may result in additional costs per (relevant) head in some services, they find it unproven by any objective standard that sparsity alone will result in increased unit costs and challenge its inclusion in either foundation or service specific formula without equal consideration of density.
- 1.4 Both density and additional population are included as top ups in the current formula and a significant amount of Environmental, Protective and Cultural Services (EPCS) needs (which the foundation formula will largely replace) are driven by these indicators. They are included in the formula because they are a proven measure of additional cost in those service areas, devised over time through practitioners at settlement working groups and previously consulted upon. Members of SIGOMA and core cities are concerned that the drive to increase rural funding by proposing rurality alone as a common cost driver appears to be a result of political pressure with very little supporting evidence.
- 1.5 Density is important as it acts as an indicator of the costs associated with urban congestion. The top up recognises that there are significant associated costs linked to activity around trading standards, additional enforcement activity, increased travel times, additional waste collection, population transience, costs linked with night-time visitors and an impact on air quality. Core Cities have set out examples below demonstrating where density leads to additional service costs per head.
- 1.6 It is noted the most recent objective research by LG Futures found that density outweighed sparsity as a positive cost driver in more than double the value of service costs in over a third more service heads.

2. Treatment of Sparsity and Density in 2013/14 Formula

- 2.1 The group has seen in earlier papers that both sparsity, density and additional populations are factors that have been used to weight individual service level

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allocations in 2013-14 formula. The inclusion of density and additional population in the current formula was for good reasons, and based upon statistical analyses.

- 2.2 At Appendix 1 we have reproduced the formula calculations affected by Sparsity as affecting four authorities, going from very high concentrations (Manchester) to very low concentrations (North Yorkshire and its Districts), along with our estimates of the £ value of sparsity, density and additional populations on the affected services.
- 2.3 Sparsity appears as the sole adjustment for variations in population concentrations in LA Central Education Function (CEF). CEF represented 31% of the whole of Children's Services RNF¹ or around £1.3 billion at 13-14 by our estimation. Of course the CEF function within formula was reduced by £1.039 billion as a rolled in adjustment before 13-14 formula was struck, much reducing this element.
- 2.4 Sparsity also appears as the sole adjustment for variations in population concentrations within social services for older people, though it was a relatively small factor even for sparse authorities such as North Yorkshire. SS for older people represented 60% of the Adult PSS allocation or around £7.5 billion by our estimate. Even using NY sparsity element (of 2%) this would give sparsity an overall value of £150 million, the real value possibly being closer to half that.
- 2.5 Sparsity appears as an adjustment within County and District Level Environmental, Protective and Cultural Services (EPCS) but, in this case, there are also adjustment for Density and Additional Populations.
- 2.6 EPCS in 2013-14 contains much of what would be allocated by the proposed common cost driver, as well as waste collection and disposal, totalling around £8.7 billion in 2013-14 of which we estimate around 50% would be covered by service specific formula². The service level formula allocation does not distinguish between waste and other services.
- 2.7 An extract from our Appendix 1, of the relative impact of weightings on our four selected authorities for EPCS appears thus:

¹<http://webarchive.nationalarchives.gov.uk/20140505104701/http://www.local.communities.gov.uk/finance/1314/settle.htm> 1314 RNF by sub block

² Using revenue outturn data for the services affected

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<u>EPCS Combined Tiers 2013-14</u>	Measure	North Yorkshire			
		Manchester	Barnsley	Durham	County & Districts
Combined Tier EPCS above baseline	£ million	44.775	7.201	16.440	15.484
Combined EPCS baseline	£ million	60.378	27.779	61.394	71.546
Total of EPCS Services in formula	£ million	105.154	34.980	77.834	87.030
Value of density element	£ million	21.57	4.20	8.59	7.76
	%	20.5%	12.0%	11.0%	8.9%
Value of additional population element	£ million	8.06	0.56	1.28	1.82
	%	7.7%	1.6%	1.6%	2.1%
Value of sparsity element	£ million	0.12	0.94	3.95	14.40
	%	0.1%	2.7%	5.1%	16.5%

G:\Sigma\Working and Steering Groups (External)\Working Groups\RatesRetention\New groups 2016\Needs sparsity formula.xlsx\County level EPCS

The authority level EPCS £ allocations are from SIGOMA analysis of formula, undertaken to evaluate the benefit of removing tier level aggregations, as submitted to the FF review.

- 2.8 Details behind the calculations are included in Appendix 1 where it can be seen that each of the elements above are independent of the other factors of Population, Area Cost Adjustment and Deprivation.
- 2.9 In the table above it can be seen in the extreme cases that density and additional population are as big an adjusting factor to Manchester as sparsity is to the North Yorkshire County and that the net impact of all three factors is greater for Manchester's density than it is for North Yorkshire's Sparsity.
- 2.10 This calls us to question what new evidence there is of a change in weightings, or what was incorrect about the 2013-14 formula that would cause the group to recommend that sparsity and sparsity alone would be included as common cost driver? This is examined in the following chapters.

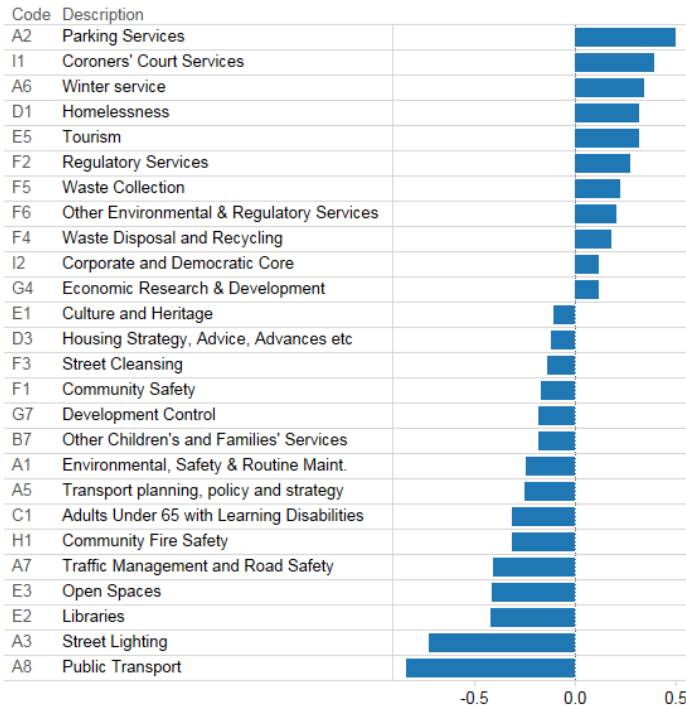
3. Findings of LG Futures 2014 report

- 3.1 The most recent objective report addressing the issue of rurality was the 2014 report by LG Futures for DCLG/DEFRA based on research with 27 Councils to identify whether and to what extent rural authorities face additional costs in delivering services compared to urban authorities.
- 3.2 The report, by its own admission, has limitations and as long as this remains an area of contention it would be better for us all to see another, objective report that follows through some of the conclusions of the 2014 report.
- 3.3 The report summary of the results is as follows:
- Of the 51 expenditure groups considered, **sparsity** was found to be positively and significantly related to unit costs in **11 cases**. These services accounted for £7.0bn (or **15.0%**) of local authorities' total expenditure in 2012/13.
 - Sparsity was significantly and negatively associated with unit costs in **15 cases**. These expenditure groups accounted for £14.6bn (or **31.1%**) of total expenditure in 2012/13. (We take this to be the equivalent of a positive **density** association)
 - In the remaining 25 cases, sparsity was not found to have a statistically

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significant effect on unit costs. These groups accounted for £25.3bn (or 53.9%) of total expenditure.

- 3.4 A table of the service heads found to be significantly affected by sparsity, extracted from the report, is as follows:



- 3.5 The report points to a more varied relationship between population concentrations and a common cost driver than simply sparsity and as the report states:

“..... for example, sparsity may be a significant variable explaining the variation in local authorities' waste collection costs, but this significance may be lost when explaining the variation in overall EPCS costs.”

- 3.6 We are therefore drawn again to ask what within this report supports the inclusion of sparsity as the only factor exerting a positive effect on cost drivers when clearly it's opposite, density and population change, has at least an equal positive effect on some service costs.

4. **SIGOMA Analysis of Sparsity and Density**

- 4.1 SIGOMA have carried out their own analysis of spend per head and population density (using ONS mid 2013 population density at LLSOA and Revenue expenditure RO 2016-17) for service heads.

- 4.2 Whilst we would welcome more robust statistical analysis, there is prima facie no evidence of a conclusive link between sparsity and cost per head, even within sparsely populated areas.

- 4.3 The SIGOMA analysis of a foundation formula considered outturn data for 2016-17 for the aggregate of:

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- Housing services (GFRA only)
- Cultural and related services
- Environmental and regulatory services
- Planning and development services and
- Central services
adjusted to remove waste collection and disposal

- 4.4 This was correlated against population, deprivation and concentrations of populations, overall and for the different authority types.
- 4.5 As might be expected, the most obvious and strongest correlation was of overall cost to population for all authorities outside London³, with most authority types having 0.6 - 0.7 correlation.⁴
- 4.6 There was also a strong positive correlation between cost per head and deprivation overall (0.34) though this varied between authority types from as low as 0.02 to as high as 0.31
- 4.7 Population concentrations showed an overall positive correlation between Density and spend per head, i.e. cost per head increasing with density, of 0.52. The following table summarises the SIGOMA analysis:

Correlation factors where 1.0 = perfect correlation and 0 = no correlation

Type/ Comparison	Total R ²	London Authorities	Metropolitan Districts	Shire Counties	Shire Districts	Unitary Authorities
Population and total cost	0.45	0.09	0.75	0.71	0.61	0.72
IMD and cost per head	0.34	0.23	0.31	0.02	0.08	0.28
Density and cost per head	0.52	0.59	0.09	0.01	0.15	0.14

- 4.8 Whilst this analysis is not offered as proof conclusive that Density should be used as a cost driver adjustment it does, to us, suggest that stronger proof is needed of the proposal that sparsity alone should be a positive cost driver.

5. Authority led evidence on Sparsity and Density

- 5.1 The Rural Services Network paper submitted to the 29 Sept 2017 Technical Working Group concludes that '*population sparsity remains the best way of distributing funding for rural areas*'. It highlighted four causes of additional costs in rural areas as follows:

- Additional service demand and pressures e.g. services to meet needs of dispersed populations such as transport and additional volume in some services relating to an aging population. We observe that the first point is based upon assertion, rather than evidence and the second

³ SIGOMA noted in our FF submission the perplexing lack of correlation ($r^2=0.09$) between population and total spend within London authorities.

⁴ Where 1.0 is perfect straight line correlation.

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point r.e. volume of older people would be recognised in the population common cost driver therefore not require a sparsity adjustment.

- ii. Unmet need
 - iii. Rural deprivation linked to lack of access to services and low/seasonal pay. We would expect the later to be reflected in the deprivation cost driver and therefore not require a separate sparsity adjustment.
 - iv. Higher Unit Costs – This is not consistent with the 2014 LG Futures findings.
- 5.2 **Density** acts as an indicator of the costs associated with urban congestion. Population density is one of the factors, which is currently taken into account in the Environmental, Protective and Cultural Services (EPCS) block. In the present system of revenue grant distribution to local authorities, density is calculated by reference to the number of residents per hectare at Census of Population Enumeration District Level. Non-residents are not taken into account in the current density measure.
- 5.3 We recognise there are many positives which come with being the centre of a city region, access to good infrastructure and public transport, shops, cultural offer and being close to large, safe open spaces make them an attractive place to live and work. However there are adverse consequences with assets and services being used more intensively bringing significant associated costs. Cities are a draw for the homeless, people on low incomes, those with high needs, students, transient populations and night time visitors. This brings additional activity around combating crime, trading standards, enforcement activity, more intensive waste and street cleaning requirements and which all impact on the relative cost of council services. Making high density city's work best for those who live in them is all about balances and, of course, resources.
- 5.4 Core Cities have set out examples below demonstrating where density leads to additional service costs per head:
- 5.5 **Traffic Congestion**- Whilst we note that sparsity leads to longer travel distances to provide services, congestion also has a significant impact on travel time. Local authorities with high density will incur a higher amount of traffic congestion. Although individuals within rural districts may have to travel further, they can in some rural areas travel double the distance in the same amount of time. Appendix 2 shows the average mph on A roads for Core Cities and County Council Network Councils (CCN) per DfT statistics⁵. This shows the average mph in 2017 differed materially from 18.3mph in Core Cities to 30.8mph in Counties.
- 5.6 **Air Quality / Pollution** - Local Authorities have responsibilities around addressing air pollution, the Government's latest Air Quality Plan noted that councils were "best placed to take the lead".

⁵ Source - Road Congestion Statistics Table CGN0501b Published 28 February 2018 by DfT <https://www.gov.uk/government/statistical-data-sets/average-speed-and-delay-on-local-a-roads-cgn05#table-cgn0501>

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- 5.7 As well the costs of tackling air pollution the consequences of poor air quality and corresponding impact on need are substantial. In 2014 Public Health England published a report 'Estimating local mortality burdens associated with particulate air pollution'⁶ which found that the levels of particulate air pollution have a considerable impact on public health. As well as the effects on mortality air pollution also effects morbidity meaning that air pollution related illness is an additional burden on the population. The estimate of the fraction of mortality attributable to long term exposure to particulate air pollution range from less than 4% in some rural areas to over 8% in some of the London boroughs.
- 5.8 Analysis by the World Health Organisation reported in May 2018⁷ that five of the Core Cities (Sheffield, Nottingham, Manchester, Liverpool and Leeds) have fine-particle air pollution levels above 10 micrograms per cubic metre.
- 5.9 One of the greatest contributor to this is traffic congestion. The Public Health England report notes that there will be some areas with higher concentrations of air pollution then others, notably near busy roads. A high amount of traffic within a city originates for outside its boundaries, principally from commuters cars and haulage vehicles.
- 5.10 Fine-particle air particles are produced by vehicle exhausts and burning materials such as wood, oil and coal. They are particularly bad for us, penetrating deep into the lungs and cardiovascular system, causing diseases including stroke, heart disease, lung cancer and respiratory infections, all of which put a further strain on social care services.
- 5.11 **Health and wellbeing** - Counties expect to see a larger rise in their over 65 population, a group widely accepted to be a key driver of cost. It is a fact, people live longer lives in rural areas however longer lives don't automatically translate to more costs. Office of National Statistics (ONS) statistics on Healthy life expectancy and disability free life expectancy are combined with density info in the tables at Appendix 3. Life statistics are taken for the <1 year old category, i.e. expectancy at birth.
- 5.12 People in dense areas can expect to spend more of their life (proportionally and in absolute terms) unhealthy and / or with some form of disability, supported by figures 1, 2 and 3 in Appendix 3. Not only does density link to shorter healthy lives with potentially longer reliance on social care due to living longer with illness or disability, it can also be linked to less ability to pay for that care. Figures 4 and 5 illustrate this point.

⁶ PHE - Estimating local mortality burdens associated with particulate air pollution
<https://www.gov.uk/government/publications/estimating-local-mortality-burdens-associated-with-particulate-air-pollution>

⁷WHO Global Ambient Air Quality Database (update 2018)
<http://www.who.int/airpollution/data/cities/en/>

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- 5.13 Additionally, the cultural and economic advantages in urban areas are not distributed equally, and urbanization may adversely affect cohesion and crime. Living in highly populated areas can also increase anonymity and alienation for some.
- 5.14 **Waste Collection-** With regard to the refuse collection service higher population density results in higher weights of waste being collected per property. The greater the tonnage of waste collected, the more time is required to dispose of this waste and this will therefore impact on the costs of collection and disposal.
- 5.15 Densely populated areas have a large proportion of high and medium rise accommodation and multiple occupancy homes, which precludes widespread use of the most efficient waste collection processes i.e. wheelie bins. Access to these properties by vehicle can also be more difficult and time consuming as many of the properties were not designed for residential or food/drink industry use. In addition Neighbourhood teams spend a lot of time responding to complaints about bin stores in apartments (contamination / overfilling etc.)
- 5.16 Property type is also linked to recycling performance. Where properties have space to store their own individual bins to separate rubbish and recycling higher rates of recycling are achieved - in Manchester the 4 bin households recycle around 50%. These properties account for 70% of properties. Where properties have less space - apartment's or dense terraced housing they often share communal containers - in Manchester these properties recycle around 10% and account for the remaining 30% of properties.
- 5.17 **Homelessness/rough sleeping-** Homelessness in cities is partly driven by the number of people who migrate to the area and the associated density as the lack of urban land relative to its demand causes prices to be bid up reducing the affordability of housing. Across the Core Cities the homeless count has risen dramatically in recent years.
- 5.18 Cities are also a magnet for rough sleepers and beggars from across the country which results in additional costs. In Manchester for example this has necessitated an additional Anti-Social Behaviour resource working out of normal hours to address the increase in workload associated with the behaviours caused by this group particularly around drinking, drug taking, aggressive and offensive behaviour etc. and additional compliance staff working extended hours to address the drug/alcohol detritus and waste associated with the rough sleepers/beggars.
- 5.19 The link between homelessness and density is clearly shown in Appendix 4 with the 10 densest authorities having an average number accepted as being homeless and in priority need of 4.3 per 1,000 households compared to 1.3 for the 10 sparsest authorities.
- 5.20 **Costs linked to levels of crime-** Community Safety and Anti-Social Behaviour services costs per head are higher in more densely populated areas which are subject to higher crime rates. Cities are a draw to children,

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young people and adults vulnerable to exploitation (a recent day of action in Manchester found six vulnerable children / young people in the city centre of which 3 were from outside the city). Offenders target city centres to carry out offences such as drug dealing, robbery, vehicle crime and anti-social behaviour. Whilst this impacts on local police resources it also affects the local authority who are asked to carry out target hardening (strengthening of the security of buildings/installations to reduce the risk of theft), liaise with car park providers and support with civil action such as Criminal Behaviour Orders.

- 5.21 **Welfare reform** – the density of claimants within cities means that the changes to the welfare system are likely to have additional cumulative costs for urban authorities which will not be incurred by rural authorities, particularly during the transition period.
- 5.22 Liverpool carried out a cumulative impact assessment (Welfare Reform Cumulative Impact Analysis 2016⁸) which built on the work of Sheffield Hallam University in 2016 (The Uneven Impact of Welfare Reform: Beatty and Fothergill 2016⁹). The Universities analysis illustrated the heightened impact of welfare reform on cities like Liverpool with high density and deprivation levels. It found that Liverpool had the fifth highest financial loss in the country by 2016 estimated to be £157M loss per annum, and twentieth highest loss per working age adult estimated to be £480 loss per annum.
- 5.23 **Migration and ethnicity** – Cities are also home to large, highly diverse populations, including migrant communities, which can require additional support to settle well in the city, alongside attendant programmes to promote social cohesion and intercultural communication and transient populations which put more pressure on our waste and enforcement services.
- 5.24 **Development and building control** - The high density of buildings, complex mix of activities and thriving economy result in the planning service having an extremely large workload compared to the average authority and compared to the size of its resident population. Also high rent levels in dense areas mean that much of the Private Rental Sector is in multiple occupation bringing additional costs of inspection, regulation, enforcement etc.

6. Additional Population Top up

- 6.1 The current funding formula also includes a top-up to compensate for the additional costs incurred by authorities receiving large numbers of in-commuters and/ or visitors, sometimes referred to as “daytime population”. Those authorities with the highest top-ups are typically those in the very centre of conurbations, i.e. the Core Cities. The top up recognises we are

⁸ Liverpool City Council - Welfare Reform Cumulative Impact Analysis 2016
<http://www.liverpool.anglican.org/userfiles/files/News/2017/Liverpool%20Welfare%20Reform%20Cumulative%20Impact%20Analysis%20Interim%20Report%20Final%20VersionWeb.pdf>

⁹ Sheffield Hallam University in 2016 (The Uneven Impact of Welfare Reform: Beatty and Fothergill 2016 https://www4.shu.ac.uk/research/cresr/sites/shu.ac.uk/files/welfare-reform-2016_1.pdf)

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supporting a bigger population base than that which is recognised in the ONS projections due to visitors / commuters.

- 6.2 For example in Manchester the 2011 Census showed that of the 288,175 people working in the City in 2011, 108,658 (38%) were Manchester residents and 179,517 (62%) lived outside of Manchester. 2017 library membership figures show that 23% of our members were non-Manchester residents in 17/18. Greater Manchester attracts 118.5m visits per year and Manchester local authority is the second most visited for day visits in England, behind only City of London (Great Britain Day Visits Survey 2016; VisitEngland). The 2016/17 visitor report found that the majority of visitors to the Art Galleries and Manchester museums are from outside of Manchester. The 3 establishments received visitors totalling 1.34m and non-Manchester residents made up 84% of Manchester Art Gallery visits, 71% of Manchester Museum visits and 56% of Whitworth Art gallery visits.
- 6.3 Core Cities have a critical role in the wider economic area as hubs of business, concentrations of amenities and assets, leisure and retail destinations and travel hubs. The resulting high levels of additional population received on a daily basis increases the use and cost of universal services.
- 6.4 Refuse collection and disposal is an example of a mandatory service which is heavily used by all groups of non-residents; commuters, overnight visitors and tourists as visitors create a substantial amount of waste, some of which is dropped on the streets requiring intensive street cleaning. Open spaces and parks are another example of services which are enjoyed by residents and non-residents alike, which is not reflected in a population based need assessment. Costs in these areas are also increased by visitors to major events such as stadium/arena concerts and city centre events.
- 6.5 The night time economy has grown significantly in Manchester and attracts people from all across the region and national and international visitors. This creates an enforcement need in terms of licensing premises and ensuring they comply with licence conditions, noise nuisance enforcement etc.
- 6.6 There is a statutory obligation for each local authority to fund the Coroners Service and provide the financial and human resources identified by the Coroner to enable the discharge of their office. The NHS have moved several centres of excellence into Manchester, meaning our hospitals receive tertiary referrals from a wide geographical area. The death rate among these seriously ill patients is of course high which means we are seeing many more inquests involving complex medical issues. Over the last five years, the annual death reporting figure has risen from 2888 to 3693, an increase of 27%. In 2013 we concluded 152 complex cases; in 2016 we concluded 427 cases, a rise of 173%.
- 6.7 Each of the above issues are replicated in other cities and on a smaller scale in town centres around the country.

7. **Conclusion**

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- 7.1 We acknowledge that extreme variations in population concentrations may result in additional costs per (relevant) head in some services, it is unproven by any objective standard that sparsity alone will result in increased unit costs and we challenge its inclusion in either foundation or service specific formula without equal consideration of density.
- 7.2 Taking account of the government's own principles for the Fair Funding review, particularly around transparency and robustness (objective analysis) it is unreasonable to allow for the impact of rurality on spending requirement whilst ignoring the very significant impact of density. The focus should be on ensuring the formula recognises the impact of extreme concentrations of populations equally and fairly.
- 7.3 We would welcome further independent research which follows through on the conclusions of the 2014 LG Futures report and look forward to further discussions on this topic.

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APPENDIX 1

SPARSITY AND DENSITY WITHIN 2013 FORMA - ILLUSTRATION

EPCS Combined Tiers 2013-14		North Yorkshire			
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	%	7.7%	1.6%	1.6%	2.1%
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County Level EPCS		Authority:			
	Measure	Manchester	Barnsley	Durham	North Yorkshire
FORMULA EXTRACT					
(a) Projected Population In 2013 Multiplied By The Result Of: COUNTY SERVICES EPCS BASIC AMOUNT; plus COUNTY SERVICES EPCS DENSITY TOP-UP; plus COUNTY SERVICES EPCS SPARSITY TOP-UP;	Base population	510,993	235,097	519,588	605,503
	Factor	6.6566	6.6566	6.6566	6.6566
	Factor	1.3489	0.6248	0.5758	0.4477
	Factor	0.0047	0.0890	0.1692	0.5279
	Weighted pop	4,093,160.2	1,732,761.1	3,845,785.8	4,621,341.5
(b) COUNTY SERVICES EPCS ADDITIONAL POPULATION TOP-UP; plus COUNTY SERVICES EPCS DEPRIVATION TOP-UP	Factor	802,529.0	73,513.9	167,205.7	236,819.8
	Factor	2,253,947.7	810,321.0	1,700,880.4	1,098,589.5
	Factor b total	3,056,476.7	883,834.9	1,868,086.1	1,335,409.3
(c) The result of (a) and (b) is added together and the result is then multiplied by Area Cost Adjustment For EPCS	Weighted pop	7,149,636.9	2,616,596.0	5,713,871.9	5,956,750.8
	Factor	1.01690	1.00000	1.00000	1.00000
	Weighted pop	7,270,465.8	2,616,596.0	5,713,871.9	5,956,750.8
(d) For London boroughs and the Common Council of the City of London, the result of (c) is then multiplied by	Factor	0.99998	0.99998	0.99998	0.99998
(e) The result of (c or d) is then multiplied by the scaling factor given in for these services	Weighted pop	7,270,315.1	2,616,541.8	5,713,753.5	5,956,627.4
(f) Needs County Level EPCS Sub Block	Weighted pop/10m	0.0007270	0.0002617	0.0005714	0.0005957
Density, Sparsity & Additional Population Weightings					
Sum of all COUNTY EPCS Components	Wtd Pop/10m	0.0007270	0.0002617	0.0005714	0.0005957
Value of density within Sum	Wtd Pop/10m	0.0000701	0.0000147	0.0000299	0.0000271
Value of additional population within Sum	Wtd Pop/10m	0.0000816	0.0000074	0.0000167	0.0000237
Value of sparsity within Sum	Wtd Pop/10m	0.0000002	0.0000021	0.0000088	0.0000320
£m values of Density, Additional populations and Sparsity					
County EPCS RNF total above baseline	£ million	17.889	2.995	6.122	2.088
County EPCS baseline	£ million	24.093	11.085	24.498	28.549
Total of County EPCS Services in formula	£ million	41.982	14.079	30.620	30.637
Value of Density element	£ million	4.05	0.79	1.60	1.39
	%	9.6%	5.6%	5.2%	4.6%
Value of Additional population element	£ million	4.71	0.40	0.90	1.22
	%	11.2%	2.8%	2.9%	4.0%
Value of Sparsity element	£ million	0.01	0.11	0.47	1.64
	%	0.0%	0.8%	1.5%	5.4%

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District Level EPCS					
	Measure	Manchester	Barnsley	Durham	N Yorks Districts
FORMULA EXTRACT					
(a) Projected Population In 2013 Multiplied By The Result Of: DISTRICT SERVICES EPCS BASIC AMOUNT; plus DISTRICT SERVICES EPCS DENSITY TOP-UP; plus DISTRICT SERVICES EPCS SPARSITY TOP-UP ;	Base population	510,993	235,097	519,588	605,503
	Factor	8.8433	8.8433	8.8433	
	Factor	5.8421	2.7063	2.4939	
	Factor	0.0347	0.6527	1.2413	
	Weighted pop	7,521,853.6	2,868,709.1	6,535,630.0	8,879,187.6
(b) District Services Epcs Additional Population Top-Up; Plus DISTRICT SERVICES EPCS DEPRIVATION TOP-UP	Factor	570,854.6	31,439.4	71,508.2	
	Factor	2,667,324.5	998,399.0	2,151,067.1	
(c) The result of (a) and (b) are added together and the result is then multiplied by: Area Cost Adjustment for EPCS	Factor b total	3,238,179.1	1,029,838.3	2,222,575.3	1,518,007.9
	Factor	1.0169	1.0000	1.0000	1.0000
	Weighted pop	10,941,877.2	3,898,547.5	8,758,205.2	10,397,195.5
(d) (c) is then multiplied by the scaling factor for these services Scaling Factor	Factor	0.999995	0.999995	0.999995	0.999995
	Weighted pop	10,941,819.7	3,898,527.0	8,758,159.2	10,397,140.9
(e) Needs District Level EPCS Sub Block	Weighted pop/10m	0.00109418	0.00038985	0.00087582	0.00103971

Density, Sparsity & Additional Population Weightings					
Sum of all DISTRICT epcs Components	Wtd Pop/10m	0.0010942	0.0003899	0.0008758	0.0010397
Value of density within Sum	Wtd Pop/10m	0.0003036	0.0000636	0.0001296	0.0001174
Value of additional population within Sum	Wtd Pop/10m	0.0000580	0.0000031	0.0000072	0.0000111
Value of sparsity within Sum	Wtd Pop/10m	0.0000018	0.0000153	0.0000645	0.0002351

£m values of Density, Additional populations and Sparsity					
District EPCS RNF total above baseline	£ million	26.886	4.207	10.318	13.396
District EPCS baseline	£ million	36.286	16.694	36.896	42.997
Total of District EPCS Services in formula	£ million	63.172	20.901	47.214	56.392
Value of density element	£ million	17.53	3.41	6.99	6.37
	%	27.7%	16.3%	14.8%	11.3%
Value of additional population element	£ million	3.35	0.17	0.39	0.60
	%	5.3%	0.8%	0.8%	1.1%
Value of sparsity element	£ million	0.10	0.82	3.48	12.75
	%	0.2%	3.9%	7.4%	22.6%

Local Authority Central Education Function					
	Measure	Manchester	Barnsley	Durham	North Yorkshire
FORMULA EXTRACT					
(a) PUPILS AGED 3 TO 18 (70985.0000) multiplied by the result of: PUPILS BASIC AMOUNT; plus PUPILS DEPRIVATION TOP-UP	Base population	69,019	32,104	70,985	85,260
	Factor	14.95150000	14.95150000	14.95150000	14.95150000
	Factor	5.70878928	2.94279480	2.70783648	-
	Weighted pop	1,425,952.5058	574,478.4403	1,253,548.0000	1,274,764.8900
(b) RESIDENT PUPILS AGED 3 TO 18 RESIDENT PUPILS BASIC AMOUNT; plus SPARSITY TOP-UP; plus RESIDENT PUPILS DEPRIVATION TOP-UP	Base population	75,403	34,830	74,685	86,303
	Factor	14.79340000	14.79340000	14.79340000	14.79340000
	Factor	-	1.90404396	7.72655520	23.61724092
	Factor	3.76780092	1.94224457	1.78717208	-
	Weighted pop	1,399,570.2333	649,220.3514	1,815,377.8007	3,314,953.5433
(c) The result of (a) plus (b) is multiplied by AREA COST ADJUSTMENT FOR EDUCATION		1.01580000	1.00000000	1.00000000	1.00000000
	Weighted pop	2,870,165.9984	1,223,698.7917	3,068,925.8007	4,589,718.4333
CEF FIXED COST AMOUNT	fixed value	52,157.5430	52,157.5430	52,157.5430	52,157.5430
(d) The result of (c) is then added to the CEF FIXED COST	Weighted pop	2,922,323.5414	1,275,856.3347	3,121,083.3437	4,641,875.9763
(e) The result of (d) is then multiplied by the scaling factor for the LA Central Education Functions sub block	Factor	1.00000004720780	1.00000004720780	1.00000004720780	1.00000004720780
	Weighted pop	2,922,323.6794	1,275,856.3949	3,121,083.4910	4,641,876.1955
(f) Needs Total LA Central Education Sub Block	Wtd Pop/10m	0.00029223237	0.00012758564	0.00031210835	0.00046418762

Sparsity Weighting					
Sum of all Childrens Services Components	Wtd Pop/10m	0.00133486075	0.00043447703	0.00091875754	0.00090149784
Value of sparsity within Sum	Wtd Pop/10m	-	0.00000663179	0.00005770578	0.00020382388

£m values Sparsity					
Childrens Services RNF total above baseline	£ million	46.994	8.706	16.259	6.786
Childrens services baseline	£ million	34.318	15.789	34.896	40.666
Total of Childrens Services in formula	£ million	81.313	24.495	51.155	47.452
Value of sparsity element	£ million	-	0.374	3.213	10.729
	%	0.0%	1.5%	6.3%	22.6%

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POLICY DEVELOPMENT: NOT A STATEMENT OF GOVERNMENT POLICY

Social Services for Older People					
	<u>Measure</u>	Manchester	Barnsley	Durham	North Yorkshire
FORMULA EXTRACT					
(a) Projected Household And Supported Residents Aged 65 Years And Over multiplied by the results of	Base population	47,820	41,448	97,110	128,402
OLDER PEOPLE PSS BASIC AMOUNT	Factor	72.6474	72.6474	72.6474	72.6474
OLDER PEOPLE PSS AGE TOP-UP	Factor	12.8475	4.1969	7.3659	9.6784814
OLDER PEOPLE PSS DEPRIVATION TOP-UP	Factor	127.4621	58.2533	64.3236	24.28908216
	Factor	212.9570	135.0976	144.3369	106.6150
	Weighted pop	10,183,603.6	5,599,524.0	14,016,558.4	13,689,574.6
Low Income Adjustment	Factor	1.0612	1.0213	1.0237	1.0071
(b) The Result Of (a) Is Multiplied By Low Income Adjustment Sparsity Adjustment	Weighted pop	10,806,840.1	5,718,793.9	14,348,750.9	13,786,770.5
	Factor	1.0001	1.0041	1.0116	1.0315
(c) The Result Of (B) Is Multiplied By Sparsity Adjustment For People Aged 65 And Over	Weighted pop	10,807,921	5,742,241	14,515,196	14,221,054
Area Cost Adjustment	Factor	1.0128	1.0000	1.0000	1.0000
(d) The Result Of (c) Is Multiplied By Area Cost Adjustment For	Weighted pop	10,946,262.2	5,742,240.9	14,515,196.4	14,221,053.8
(e) The result of (d) is then multiplied by the scaling factor of the Social Services for Older People sub block	Factor	1.000000324	1.000000324	1.000000324	1.000000324
	Weighted pop	10,946,265.7	5,742,242.8	14,515,201.1	14,221,058.4
(f) Needs Total Services for Older People Sub Block	Wtd Pop/10m	0.001094627	0.000574224	0.00145152	0.001422106
Sparsity Weighting					
Sum of all Adult Services Components	Wtd Pop/10m	0.00233987454	0.00108689000	0.00247707486	0.00212708784
Value of sparsity within Sum	Wtd Pop/10m	0.00000010945	0.00000234471	0.00001664456	0.00004342834
		0.00%	0.22%	0.67%	2.04%
Adults Services RNF total above baseline	£ million	88.045	41.253	96.560	57.924
Adults services baseline	£ million	56.183	25.848	57.128	66.574
Total of Adults Services in formula	£ million	144.228	67.101	153.687	124.498
Value of sparsity element	£ million	0.0067	0.1448	1.0327	2.5418
	%	0.0%	0.2%	0.7%	2.0%

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Appendix 2- Average MPH on A roads

Average speed on local 'A' roads2: by local authority in England: annual from 2015			
Core Cities	2015	2016	2017
Birmingham	18.7	18.6	18.3
Bristol	16.0	15.3	15.6
Leeds	23.9	23.6	23.6
Liverpool	17.9	17.5	16.7
Manchester	16.1	15.7	15.3
Newcastle	20.0	19.4	19.4
Nottingham	17.0	16.9	16.7
Sheffield	21.0	21.2	21.1
Core Cities Average	18.8	18.5	18.3

Average speed on local 'A' roads2: by local authority in England: annual from 2015			
CCN Councils	2015	2016	2017
Cumbria	31.9	31.5	31.7
Lancashire	25.7	25.5	25.5
Cheshire West & Chester Council	29.8	29.4	29.1
Cheshire East Council	29.8	29.1	28.3
Shropshire Council	36.1	35.6	35.0
Staffordshire	29.4	29.1	29.0
Warwickshire	31.0	30.5	30.2
Herefordshire	33.6	33.3	33.1
Worcestershire	32.2	31.9	31.8
Nottinghamshire	30.1	29.9	29.7
Derbyshire	30.6	30.3	30.2
Lincolnshire	36.7	36.5	36.2
Northamptonshire	31.5	31.1	30.9
Gloucestershire	30.1	29.5	29.5
Wiltshire	32.7	32.4	32.2
Somerset	30.8	30.4	23.0
Dorset	34.9	34.3	35.0
Devon	32.2	32.6	32.8
Cornwall	32.8	32.3	31.9
CCN Average	31.7	31.3	30.8

Source: Road Congestion Statistics Table CGN0501b Published 28 February 2018 by DFT

Link: <https://www.gov.uk/government/statistical-data-sets/average-speed-and-delay-on-local-a-roads-cgn05#table-cgn0501>

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Appendix 3- Unhealthy Lives

Fig 1.

Row Labels	Average of Life Expectancy (LE)	Average of Proportion in good health	Average of Proportion of life Disability free	Average of Health life (years)	Average of Life without disability (years)	Average of Unhealthy life (years)	Average of Life with disability (years)	Average of Population density People / hectare
ILB	82.07	75.98	75.28	62.34	61.76	19.73	20.31	106.38
MD	79.77	75.29	74.62	60.04	59.49	19.73	20.28	20.46
OLB	82.43	78.59	78.45	64.76	64.63	17.66	17.80	48.11
SCFIR	82.06	79.69	77.95	65.38	63.93	16.68	18.13	3.05
SCNFIR	82.02	79.91	77.49	65.53	63.53	16.49	18.49	2.83
UNIFIR	81.38	78.10	77.11	63.53	62.72	17.85	18.66	1.90
UNINFIR	80.84	77.68	76.57	62.81	61.89	18.04	18.95	17.42
Grand Total	81.12	77.48	76.46	62.86	62.01	18.26	19.11	26.44
Individual Local Authority data represents the male and Female average								
Sheffield	80.83	73.02	73.06	58.96	59.02	21.87	21.81	15.00
Manchester	77.47	70.37	72.87	54.49	56.40	22.98	21.07	43.50
Barnsley	80.04	74.00	75.33	59.21	60.28	20.83	19.75	7.00
Durham	79.67	74.18	74.74	59.08	59.51	20.59	20.16	2.30
North Yorkshire	82.41	81.12	77.92	66.82	64.18	15.59	18.23	0.70

Fig 2.

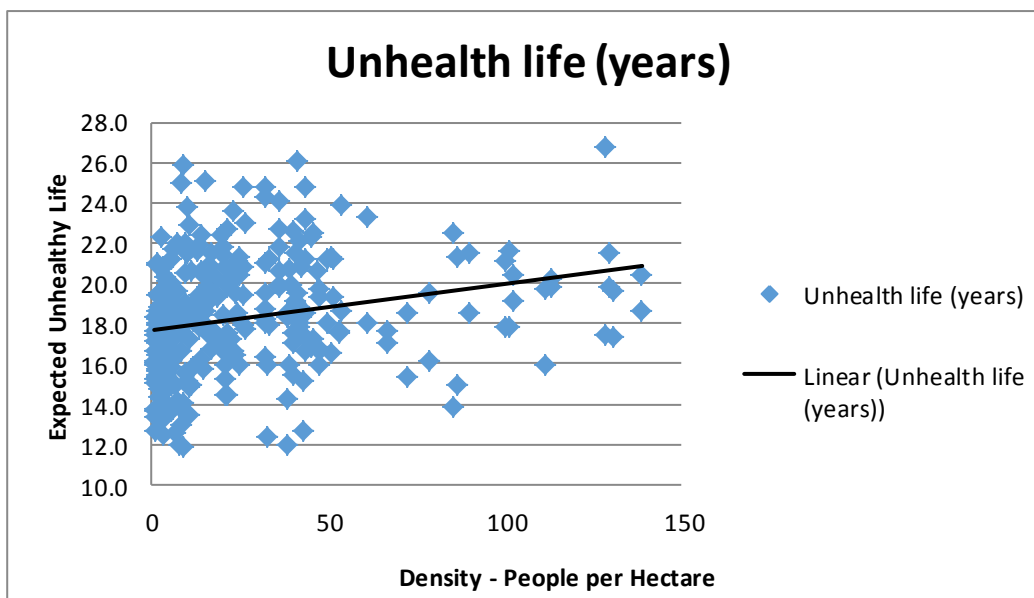


Fig 3.

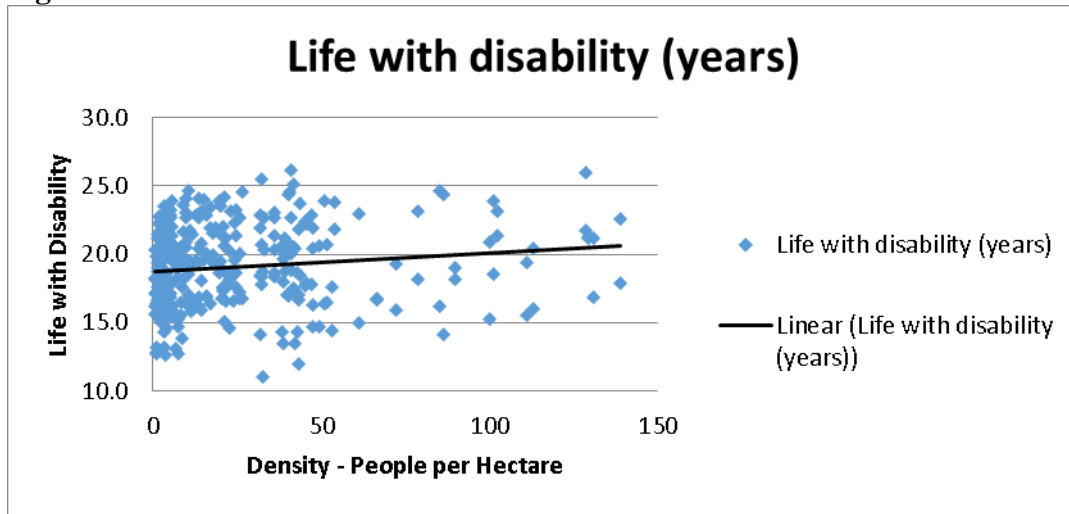


Fig 4

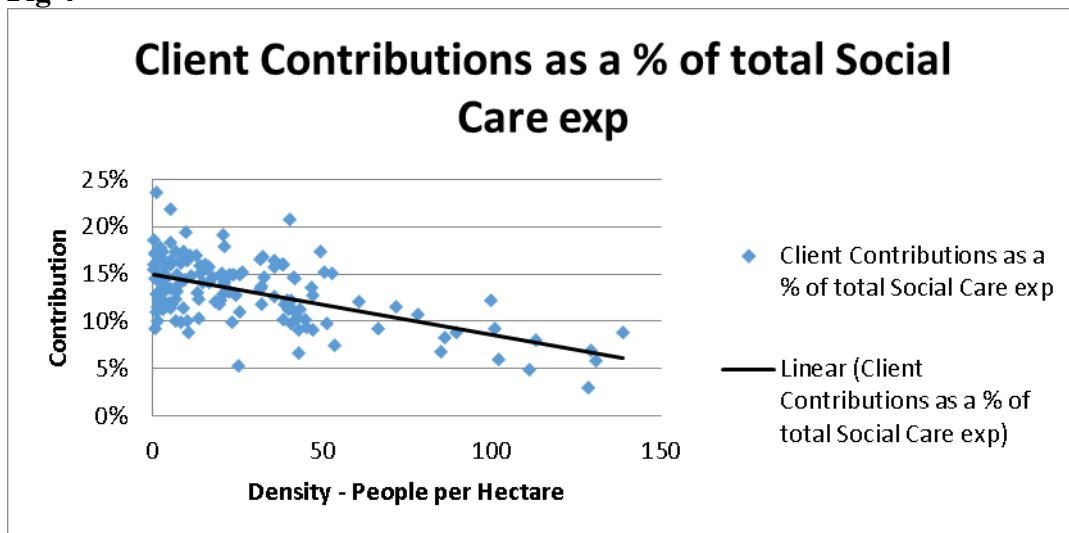
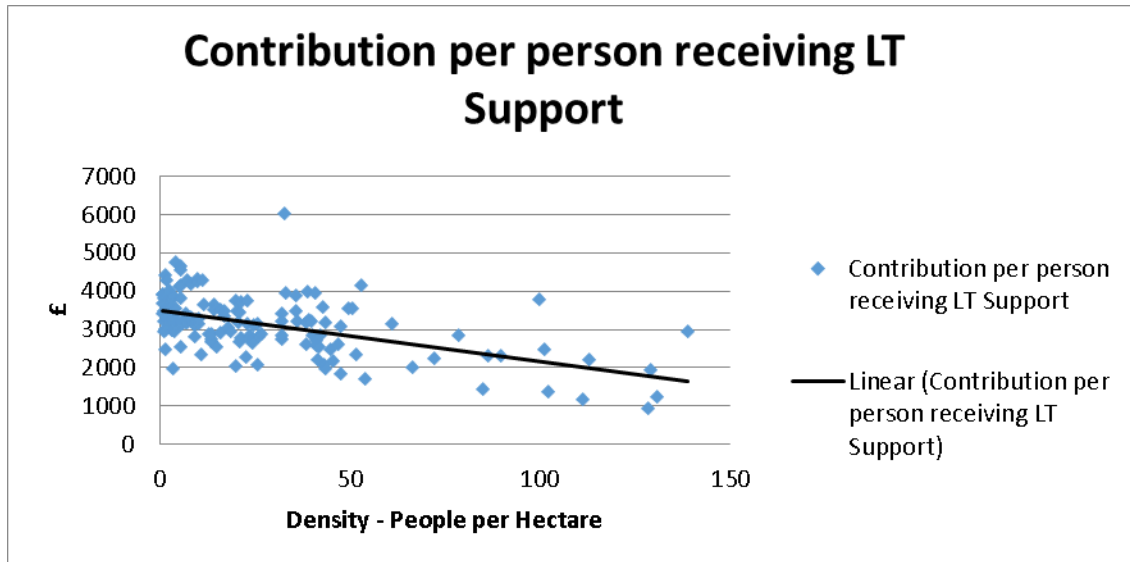


Fig 5

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Source: These were created using ONS population data and the NHS's Adult Social Care Activity and Finance Report, England 2016-17

Link: <https://digital.nhs.uk/data-and-information/publications/statistical/adult-social-care-activity-and-finance-report/adult-social-care-activity-and-finance-report-england-2016-17>

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Appendix 4 - Homelessness

Numbers accepted as being homeless and in priority need – 2017/18			
10 most Dense Populations (Highest number of persons per hectare)	Number per 1,000 households	10 most Sparse Populations (Lowest number of persons per hectare)	Number per 1,000 households
Islington	2.06	Northumberland	1.23
Kensington and Chelsea	8.93	Herefordshire	0.64
Hackney	8.04	Shropshire	2.39
Tower Hamlets	3.40	Wiltshire	1.20
Lambeth	3.21	Cornwall	1.48
Hammersmith and Fulham	2.99	North Lincolnshire	1.15
Westminster	3.73	West Berkshire	0.17
Camden	0.84	County Durham	0.56
Southwark	3.54	Cheshire East	00.6
Wandsworth	5.93	Bedford	3.19
Average	4.267	Average	1.261

Source: Table 784: local authorities' action under the homelessness provisions of the Housing Acts, financial years 2004-05 to 2017-18

Link: <https://www.gov.uk/government/statistical-data-sets/live-tables-on-homelessness>

Correlation between Homeless & in priority need and density

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