Analysis of the Access to Services Domain in the Welsh Index of Multiple Deprivation by type of settlement, 2014

The calculations for the Welsh Index of Multiple Deprivation (WIMD) provide a useful starting point for assessing the areas of Wales that are most likely to have issues about how easy it is for people to travel to get access to a range of services.

This statistical article analyses the results from the 2014 edition of the Index. It combines the results from the Index with a classification of the settlements in which people live to try and shed light on the "urban-rural" issues.

The article is intended to give a systematic overview of the data that are available and offer some tentative conclusions. It is not intended to be a definitive piece of work. One objective of this piece of work is to generate feedback from users about where the analysis matches well with local experience and where it does not.

As well as the results presented in this article a supporting spreadsheet has been produced that contains the analysis in more detail.

Highlights

Around 20 per cent of the Welsh population live in settlements of less than 2,000 people (Table 1). This is split roughly evenly between the less sparse and sparsest contexts which we can loosely see as accessible and remote areas.

Considering the access to service deprivation rankings, and the travel times to individual services, confirms that access issues are mainly, *but not exclusively*, related to the settlements of fewer than 2,000 (Table 3 and Table 6).

The travel time estimates show, as expected, that travel times are significantly longer for travel by public transport compared to travel by car (Table 4). The longest average travel time by car for any of the services in the Index was found to be just less than 50 minutes for a round trip (Table 4). By contrast, for travel without a car in just over half the LSOA in the settlements of under 2,000 people in the sparsest context have travel times of over 40 minutes for all the services assessed (Table 6).

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With the differences in travel time with and without a car it is useful to know about the share of households in an area that do not have a car. For Wales as a whole this is 23 per cent and varies from 30 per cent in settlements of at least 100,000 to around 10 per cent for the settlements of under 2,000 (Table 7).

Comparing the ranks for access deprivation with those for overall concentrations of deprivation shows that areas that have the highest access deprivation tend to have relatively low concentrations of overall deprivation (Table 8).

The access to services calculations for the Welsh Index of Multiple Deprivation show areas that have the potential for access to services issues. The Index cannot at present say how many people in the highlighted areas actually experience access issues and what impact it has on them.

The analysis shows that access to services is likely to be an issue in a small but significant number of areas of Wales.

Contents

- Defining Built Up Areas
- Introducing the Access to Service domain
- Analysing rankings in the Access domain by settlement class
- Analysing travel times for services by settlement class
- Example of travel times to the nearest secondary school
- Analysis of travel times above and below thresholds
- Analysis of access to a car
- Analysis of the relationship between access to services and general deprivation
- Considering issues in measuring access to services
- Wider issues
- Concluding thoughts
- Links and further information

Defining Built Up Areas

Defining the size of settlements that people live in is one approach to categorising rural or urban areas. Using settlement size allows a range of categories, rather than imposing a simplistic urban-rural split. Conceptually we can look at the difference between big cities, large or small towns, and smaller villages, hamlets and so on.

While this concept is easy and obvious, actually making the calculations – and setting the thresholds between the size groups – can be done in a multitude of reasonable ways. The particular approach used here is based on the Built Up Areas published by ONS for use with the Census of Population 2011. It uses the best fit of the Built Up Areas to the Lower Super Output Areas (LSOA) from Welsh Government.

Following on from previous work the following size groups are used (giving approximately equal populations in each)

- Largest - at least 100,000 people
- Large - 25,000 to 99,999 people
- Medium - 10,000 to 24,999 people

- Small - 2,000 to 9,999 people
- Smallest – less than 2,000 people

As well as simple settlement size it can be useful to try and show if the areas are "accessible" or "remote". As a proxy for this, we can use the settlement context from the National Statistics rural-urban classification. Each LSOA is either in the Less Sparse or Sparsest context. Note that the "large" and "largest" categories are entirely in the less sparse context. The "medium" and "small" categories are mainly in the less sparse context with a minority in the sparsest. The medium category has four towns in the sparsest context – Holyhead, Newtown, Aberystwyth and Carmarthen. The smallest category is split about equally between the two contexts. For simplicity in this paper the classification will only apply the settlement context to the smallest category of settlements.

- Largest – at least 100,000 people in less sparse context only
- Large – 25,000 to 99,999 people in less sparse context only
- Medium – 10,000 to 24,999 people in either context
- Small – 2,000 to 9,999 people in either context
- Smallest (L) – under 2,000 people in less sparse context only
- Smallest (S) - under 2,000 people in sparsest context only

The full classification can be seen in the supporting spreadsheet. The short classification is shown in Map 1 with Table 1 summarising the distribution of people and land.

Table 1

Summary settlement classification for Wales

Settlement class	LSOA	People ('000)	Land (sq km)	Share of Wales total		
				LSOA	People	Land
Largest	402	645	316	21%	21%	2%
Large	385	606	538	20%	20%	3%
Medium	362	584	795	19%	19%	4%
Small	404	648	1,920	21%	21%	9%
Smallest (L)	187	307	5,339	10%	10%	26%
Smallest (S)	169	273	11,873	9%	9%	57%
Total	**1,909**	**3,063**	**20,780**	**100%**	**100%**	**100%**

Source: LSOA best fit to Built Up Areas and National Statistics rural classification

The way that the overall size bands have approximately equal populations is a key feature of the Welsh population. The total number of people living in settlements of under 2,000 people is about the same as the total number of people living in Cardiff, Swansea and Newport. By contrast the share of the land is highly skewed. The smallest settlements and the areas around them account for a little over 80 per cent of the land but just under 20 per cent of the people.

A key category for access to services in Wales is the settlements of under 2,000 people in the sparsest context that accounts for just under 10 per cent of the Welsh population. These are small places that are also distant from larger population centres. These are the areas where we might expect issues for access to services simply by reasons of geography.
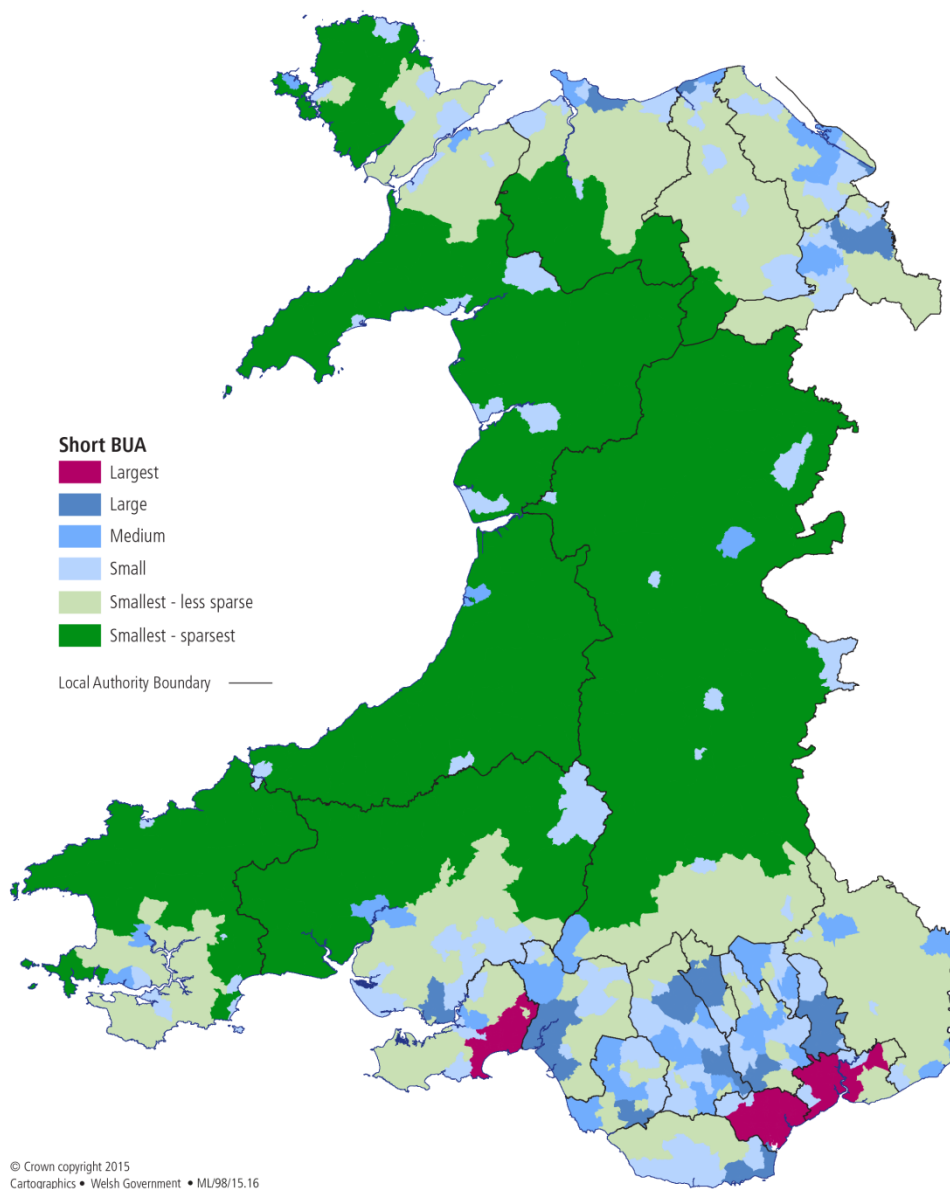
The traditional cut off for urban areas is settlements of at least 10,000 people. On this basis around 60 per cent of the Welsh population live in "urban" areas and 40 per cent in "rural" areas.

The settlement classes are indicative and should be a useful tool for analysis for this, and other, purposes. However, they are not definitive. The settlement size bands are essentially arbitrary. So is the choice to use the settlement context to identify the "remote areas". This seems to work

as a broadly descriptive tool for Wales. For more local analysis it may be appropriate to tweak some of the categories to reflect local circumstances. There will always be a trade off between getting the local detail right and having a consistent approach that allows comparison between areas.

Map 1

Settlement classes for LSOA in Wales

Short BUA

- Largest
- Large
- Medium
- Small
- Smallest - less sparse
- Smallest - sparsest

Local Authority Boundary —

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Introducing the Access to Services domain

Links to the full documentation for the Welsh Index of Multiple Deprivation, and ranking and indicator data, can be found in the section on references. This section gives a very brief introduction to the access to services domain in the 2014 Index.

The Index examines a set of essential services that people need to get access to. Nine services are included in the calculations.

- For each service we calculate the travel time for a return journey from each dwelling to the location of the nearest service. The travel times are calculated assuming car travel and also assuming travel by public transport.
- For travel by car the distance to the nearest service location can be accurately found from the road network. The issue is to convert distance to time. The calculations use car speed data taking into account actual delay on each road link, where sufficient data exist. Elsewhere, standard default speeds are used.
- For travel by public transport the bus and train timetables are used together with the locations of bus stops and train stations. There need to be assumptions of the time and day of the week of travel and matching this, where possible, with known opening times for the services. Assumptions are also made about the time needed for making connections where necessary.
- In each LSOA an average return travel time to each service is calculated with and without the use of cars. These average return travel times are published (see references).
- The average return travel times for each service in an LSOA are combined into an overall weighted score for the LSOA. The various services have statistically calculated common weights in all LSOA. The weight of travel with and without cars varies between LSOA depending on the share of households in the area that have no access to a car.
- These weighted scores are used to rank all the LSOA in order of access to services deprivation. These ranks are also published.
- The access ranks form part of the overall deprivation rankings. The access to services domain has a relatively low weight in the Index compared to domains like unemployment, low income, health and educational level.

The Welsh Index of Multiple Deprivation allow for analysis at three different levels. The overview from the rankings of the combined index; the rankings from individual domains of deprivation; and the individual indicators used to construct the index.

Analysing rankings in the Access domain by settlement class

The 1,909 LSOA in Wales are ranked from the most deprived (rank 1) to the least deprived (rank 1,909). To show the distribution we split the LSOA into the ranking groups shown in Table 2.

Table 2

Access deprivation ranking groups

Description	Low rank	High rank
Highest 5%	1	96
5% to 10%	97	191
10% to 20%	192	382
20% to 50%	383	955
Lowest 50%	956	1,909

The "highest" group is intended to show the extremes of access deprivation. In many analysis of the Welsh Index of Multiple Deprivation we identify "hotspots" covering the most deprived 10 per cent or 20 per cent of LSOA, so these are also included.

For this particular domain in the Index it will be difficult to distinguish between the areas with the lowest rankings – the least deprived area. In these areas the travel times will tend to be low for all services either with cars or without. Small changes in the overall weighted scores can lead to large changes in the rankings. Thus the lowest category is very broad.

Table 3 summarises the share of LSOA in a settlement class across these ranking groups. Map 2 shows the ranking groups for all LSOA in Wales. For extra detail the supporting spreadsheet shows the full settlement class and also the distribution by local authority.
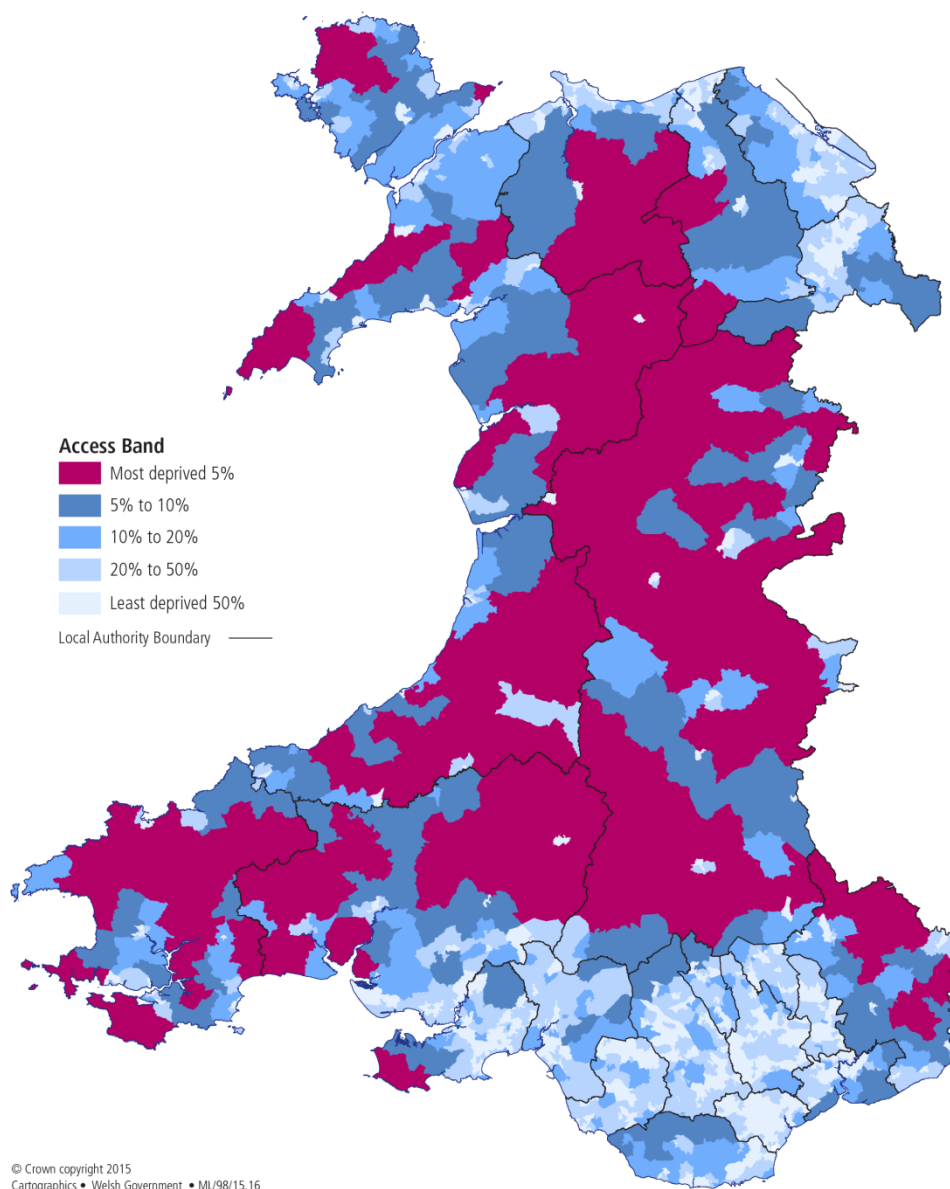
Table 3

LSOA by Access Deprivation ranks and settlement class

| | Deprivation rank in Access domain | | | | | |
	Highest 5%	5% to 10%	10% to 20%	20% to 50%	Lowest 50%	**Total**
Count						
Largest	0	1	14	74	313	**402**
Large	0	0	19	130	236	**385**
Medium	0	0	17	144	201	**362**
Small	1	1	41	167	194	**404**
Smallest (L)	20	50	67	48	2	**187**
Smallest (S)	75	43	33	10	8	**169**
Total	**96**	**95**	**191**	**573**	**954**	**1,909**
Share						
Largest	none	0.2%	3.5%	18.4%	77.9%	**100.0%**
Large	none	none	4.9%	33.8%	61.3%	**100.0%**
Medium	none	none	4.7%	39.8%	55.5%	**100.0%**
Small	0.2%	0.2%	10.1%	41.3%	48.0%	**100.0%**
Smallest (L)	10.7%	26.7%	35.8%	25.7%	1.1%	**100.0%**
Smallest (S)	44.4%	25.4%	19.5%	5.9%	4.7%	**100.0%**
Total	**5.0%**	**5.0%**	**10.0%**	**30.0%**	**50.0%**	**100.0%**

Source: WIMD 2014 and LSOA best fit to Contiguous Built Up Areas

Map 2

Access to services deprivation for LSOA in Wales

Access Band

- Most deprived 5%
- 5% to 10%
- 10% to 20%
- 20% to 50%
- Least deprived 50%

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Key messages from Table 3 and map 2.

- The ranks from the access to services domain of the Welsh Index of Multiple Deprivation confirm that access issues occur mainly in the smallest settlements and particularly for those in the sparsest context. However, it also shows that there are issues across all the settlement size bands to some extent.
- As expected the smallest settlements dominate the highest access deprivation categories. There are only 3 LSOA in the most deprived 10 per cent in Wales outside the smallest settlements. The two LSOA around Llandovery and Seven Sisters (in Neath Port Talbot authority) are on the boundary of the size groups with populations of around 2,100. The third LSOA also looks like a special case. It is W01001912 which is part of Newport but includes the areas running along the coast between Newport and Cardiff. The population of this LSOA is split almost exactly half and half between the large settlement and areas that have no named Built Up Area.
- Also as expected the smallest settlements in the sparsest context have a higher share of LSOA in the most deprived 10 per cent than those in the less sparse context.
- There is more variety of settlements in the range from 10 per cent to 20 per cent most deprived. The smallest settlements still make up just over half the LSOA in this range but all settlement categories have at least 14 LSOA in this range. There seem to be two main types of LSOA in the larger settlements that fall into this category. Firstly LSOA on the fringe of a larger settlement, where the dwellings outside the main settlement increase the average travel times. Secondly areas where there is a relatively high share of households with no car. This will increase the weight of the longer travel times without cars and so increase the overall access deprivation score in the area.
- The share of LSOA in the least access deprived 50 per cent of Wales increases with settlement size. The smallest settlements are rare in this category with 10 LSOA out of the total of 954.
- As with all maps, Map 2 needs to be interpreted with care. Since the smallest settlements and the areas around them account for 80 per cent of the land but only 20 per cent of the people the map needs to be read in conjunction with Tables 1 and 3. It is however, useful to show the broad geographic spread of the access deprivation bands.

Analysing travel times for services by settlement class

As usual with the Welsh Index of Multiple Deprivation the rankings are a useful starting point. The simplification of just using ranks can give some initial insight, hopefully, as here. However, to examine the subject in more depth we need to use the individual indicators that were used in the construction of the Index.

For the Access to Services domain the indicators are the average return travel times for dwellings within an LSOA to a set of individual services. They are calculated assuming travel by public transport ("without cars") and for travel by car ("with cars"). For an individual dwelling the return travel times are truncated at 180 minutes. In the current data this is only necessary for travel without a car.

The set of services used is as follows:

- Secondary school
- Leisure centre
- Public library
- GP surgery
- Pharmacy
- Primary school
- Food shop

- Post office
- Petrol station (only used for travel with a car)

The reasons behind the selection of services are given in the WIMD 2014 documentation (see links).

The travel times thus give an indication of the level of access and should give useful comparisons between areas of Wales. They are not definitive and over interpretation of small differences should be avoided. It is the gross differences between areas that are really of interest.

Table 4 shows the number of LSOA in various travel time bands for each of the services in the Access to Services Domain. The services are broadly sorted by the overall travel times – with petrol stations placed last because it is only calculated for travel with cars.

Table 4

LSOA by average travel time in an LSOA to the services in WIMD

Time (mins)	Sec school	Leisure centre	Public library	GP surgery	Phar macy	Prim school	Food shop	Post office	Petrol station
Without cars									
0 - 10	59	103	131	348	433	560	885	478	na
10 - 20	539	586	643	804	807	952	656	947	na
20 - 30	452	398	496	335	288	178	123	249	na
30 - 40	265	246	233	139	87	64	47	53	na
40 - 50	159	136	103	51	52	32	35	40	na
50 - 60	99	97	52	44	41	31	28	31	na
60 - 90	145	126	87	68	66	57	73	62	na
90 - 120	101	76	85	64	64	22	38	31	na
120 - 150	64	89	53	38	44	10	17	13	na
150 - 180	26	52	26	18	27	3	7	5	na
Total	**1,909**	**1,909**	**1,909**	**1,909**	**1,909**	**1,909**	**1,909**	**1,909**	na
With cars									
0 - 10	1,346	1,385	1,509	1,699	1,744	1,883	1,850	1,878	1,781
10 - 20	440	428	335	175	137	26	59	30	118
20 - 30	106	86	60	33	26	0	0	1	9
30 - 40	16	7	5	2	2	0	0	0	1
40 - 50	1	3	0	0	0	0	0	0	0
50 - 180	0	0	0	0	0	0	0	0	0
Total	**1,909**	**1,909**	**1,909**	**1,909**	**1,909**	**1,909**	**1,909**	**1,909**	**1,909**

Source: Welsh Index of Multiple Deprivation, 2014, Access to Services domain

Key messages from Table 4

- Table 4 shows the large difference between travel with and without a car.
- Travel times without a car have a long tail with all services having some LSOA with a time over 2 hours. However, for all the services at least half the LSOA have a travel time of under 30 minutes.
- Travel with a car has a much more compact distribution and average travel times are shorter. The share of LSOA with a drive time of under 10 minutes ranges from just over 70 per cent (secondary schools and leisure centres) to just under 100 percent (primary schools, food shops and post offices). No LSOA has a drive time of over 50 minutes for any service.
- The travel times show the potential for access issues. In areas with long travel times anyone needing to use the service will have to make the journey. However, those not

using the service (not at all or simply not now) are not inconvenienced. This makes it difficult to assess the impact of longer or shorter travel times.

Example of travel times to the nearest secondary school

In Chart 1 and Table 5 we examine access to a secondary school as an example service. This particular service is chosen as one where there are some extreme travel times. In the supporting spreadsheet similar charts and tables can be produced for each of the services in WIMD. There is also a summary table with the percentile distribution for each service by settlement class.

Note that the travel times are for the nearest secondary school and do not include any dedicated school bus services that the local authority provides. It is thus a general measure of travel time to the nearest school and not necessarily the time a pupil would take to get there.

The travel time shows the average time for a return trip to the nearest secondary school for dwellings within an LSOA. The target school can change for different parts of a single LSOA. There will be dwellings with travel times above or below the LSOA average figure.

Chart1 and Table 5 look at the "percentile" distribution of travel times (in minutes) to the nearest secondary school. The percentage values in Table 5 show the share of LSOA in a settlement class that have a travel time less than the value shown. The table also shows the minimum and maximum values (the zero and 100 per cent figures). The distributions are calculated for each of the settlement categories and for Wales as a whole. Chart 1 shows the full distribution for each of the settlement categories and for Wales as a whole.

Key messages from Table 5 and Chart 1

- The extra travel time needed when not using a car is again striking. Less than 1 per cent of LSOA have an average journey of over 30 minutes by car to the nearest secondary school. Without a car this increases to just under half.
- In each of the settlement classes except Small the maximum travel time with a car is less than the median time without a car (note that this is not true for Wales as a whole).
- The difference between the smallest settlements and the other size categories is also again striking.
- There seems to be little difference in the distribution of the travel times for the medium, large and largest settlement classes. Generally the average travel times increase relatively slowly, but there are a small number of LSOA with average travel times that are much longer than most of the LSOA in the class.
- The small settlements follow a similar pattern, but with higher average travel times.
- For the smallest settlements the pattern is reversed. There are a small number of LSOA with low average travel times and for the rest the average times increase steadily.
- For the medium, large and largest settlements there are a small number of LSOA where the average travel time without a car is over an hour. These LSOA can be artefacts of the LSOA and settlement best fit methodologies where they are on the fringe of the settlement and include people living in the more dispersed hinterland of the settlement.
- This service was selected as one with longer travel times. Note however, that when travelling with a car around 70 per cent of the LSOA have travel times of under 10 minutes – and that this represents the return journey. For travel without a car just over half the LSOA have a travel time of under 30 minutes.

Table 5

Distribution of LSOA average travel time to a Secondary School by settlement class

	Largest	Large	Medium	Small	Smallest (L)	Smallest (S)	Total
Travel without cars							
Min	5	5	7	8	13	11	5
10%	11	12	13	14	37	57	13
50%	21	22	23	31	69	109	27
90%	42	38	42	68	120	155	90
95%	51	46	45	79	141	167	118
99%	69	54	55	108	156	180	156
Max	91	62	63	131	170	180	180
Travel with cars							
Min	2	1	2	2	3	2	1
10%	3	3	3	3	7	9	3
50%	6	6	6	8	13	18	7
90%	11	10	10	16	22	29	17
95%	12	11	11	21	25	31	22
99%	15	13	13	27	30	34	29
Max	19	17	17	38	41	36	41

Source: WIMD 2014 and LSOA best fit to Contiguous Built Up Areas

Values in the table show the return travel times in minutes

To help explain Table 5 it is useful to look at one settlement category as an example. We will use the small settlement category and consider the average travel times without a car for the 404 LSOA in this category (Table 1). The shortest travel time amongst the 404 LSOA is 8 minutes for the round trip to the nearest secondary school. Half the LSOA in the small category have an average travel time of less than 31 minutes and 90 per cent have a travel time of under 68 minutes.

Chart 1

Distribution of LSOA average travel time to a Secondary Schools by settlement class

Travel without a car

Travel with a car
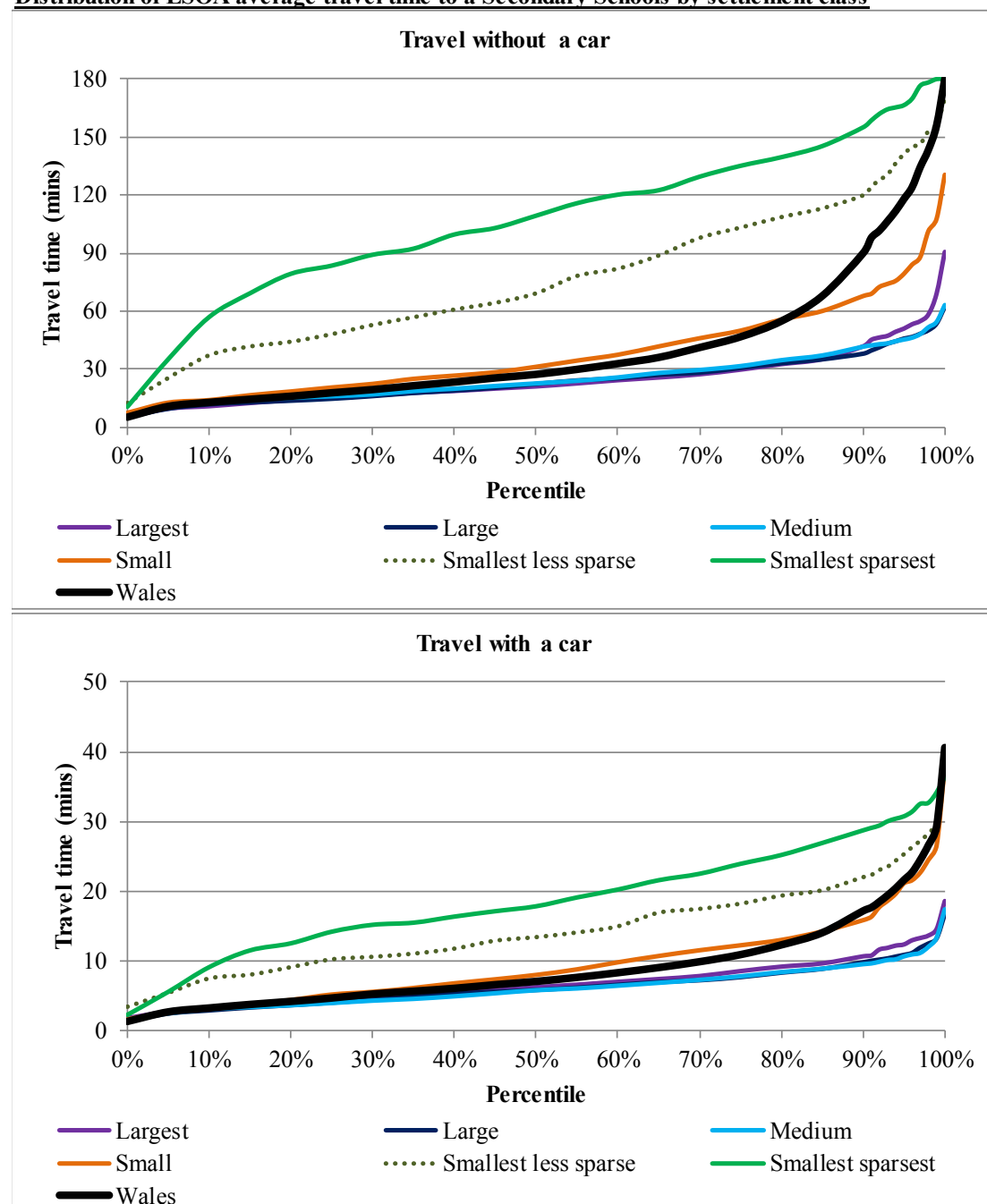
Source: WIMD 2014 and LSOA best fit to Contiguous Built Up Areas

Analysis of travel times above and below thresholds

The Welsh Index of Multiple Deprivation calculates travel times for a range of services. It is useful to consider the number of services in an LSOA that have travel times above a high threshold or below a low one. This allows us to see when all services are near or far or various combinations in between.

There is no definitive way to assess the combinations. For the Index the services are combined as a weighted sum to provide an overall score to be used in the rankings. The way that the services and travel modes are weighted is set out in the documentation for the Index (see links).

As a simple way to introduce the balance between services, this paper will use some simple thresholds as an indication of broadly long and short journeys. The LSOA are then categorised according whether the travel times are all below the lower threshold; all below the higher threshold; or how many services are above the higher threshold.

Note that in the table the counts are exclusive. The total in each case adds up to the total number of LSOA in the settlement category, as seen in Table 1.

For travel without a car we take as thresholds 40 minutes and 20 minutes. For travel with a car 20 minutes and 10 minutes. Table 6 summarises the numbers of LSOA split according to the thresholds and by the settlement class. The supporting spreadsheet has extended versions of this table.

Table 6
LSOA by settlement class and the number of services below travel time thresholds

Services compared to travel thresholds	Settlement class						Total
	Largest	Large	Medium	Small	Smallest (L)	Smallest (S)	
Travel with no car							
All under 20 mins	91	41	52	36	0	2	**222**
All under 40 mins(*)	245	258	226	157	8	7	**901**
One over 40 mins	46	59	58	108	15	5	**291**
2 or 3 over 40 mins	18	23	19	92	41	15	**208**
4 to 7 over 40 mins	1	4	7	9	84	53	**158**
All 8 over 40 mins	1	0	0	2	39	87	**129**
Total	**402**	**385**	**362**	**404**	**187**	**169**	**1,909**
Travel with a car							
All under 10 mins	315	281	288	185	15	10	**1,094**
All under 20 mins(*)	87	104	74	188	128	77	**658**
One over 20 mins	0	0	0	26	26	17	**69**
2 or 3 over 20 mins	0	0	0	5	13	34	**52**
4 to 7 over 20 mins	0	0	0	0	5	31	**36**
8 or 9 over 20 mins	0	0	0	0	0	0	**0**
Total	**402**	**385**	**362**	**404**	**187**	**169**	**1,909**

Source: WIMD 2014 and LSOA best fit to Contiguous Built Up Areas

For travel without cars there are 8 services in total and 9 for travel with cars

The categories are exclusive with each LSOA counting in only one category so the categories

marked (*) exclude exclude the LSOA already counted under the previous category

For travel without a car

- At the Wales level, just over 40 per cent of LSOA have an average travel time of over 40 minutes for at least one service. Just under 7 per cent of LSOA in Wales have average travel times of over 40 minutes for all eight services.
- Also at the Wales level just under 12 per cent of LSOA have average travel times of under 20 minutes for all eight services
- For the smallest settlements in the sparsest context just over half the LSOA have average travel times of over 40 minutes for all eight of the services considered. In this class over 80 per cent of the LSOA have average travel times of over 40 minutes for at least 4 services.
- For the smallest settlements in the less sparse context just over 20 percent of LSOA have average travel times of over 40 minutes for all eight services and just over 65 per cent have average travel times over 40 minutes for at least 4 services.

- For the large, medium and small settlements around 10 per cent of the LSOA have average travel times below 20 minutes for all eight services. This increases to 20 per cent for the largest settlements.
- For the largest, large and medium settlements at least 75 per cent of the LSOA have average travel times under 40 minutes for all services. For the small settlements this falls to just under 50 per cent.

For travel with a car:

- For Wales as a whole just over 55 per cent of LSOA have average travel times of under 10 minutes for all nine services. Just over 8 per cent of LSOA have at least one service with a travel time of over 20 minutes. No LSOA in Wales has all nine services with average travel times of over 20 minutes.
- For the smallest settlements in the sparsest context just over 50 per cent of the LSOA have all services within an average travel time of 20 minutes, although only around 6 per cent have all services within an average travel time of 10 minutes. Nearly 40 per cent of LSOA have average drive times of over 20 minutes for more than one service.
- For the smallest settlements in the less sparse context just over 75 per cent of LSOA have an average drive time of under 20 minutes for all services, with around 8 per cent of LSOA have all services within an average travel time of 10 minutes. Nearly 10 per cent of LSOA have average drive times of over 20 minutes for more than one service.
- For the small settlements just over 45 per cent of LSOA have the average travel time for all services under 10 minutes. Just under 8 per cent of LSOA have at least one service with a drive time of over 20 minutes.
- For the medium, large and largest settlements over 70 per cent of LSOA have all services within an average drive time of 10 minutes. In these settlements the maximum average drive time for a service is under 20 minutes.

Note also that the longest average travel time by car for any service in any LSOA is just under 50 minutes (Table 4).

The analyses in this Article use the average return travel time within an LSOA. Individual households in an LSOA will have longer or shorter travel times depending on their location. Since travel times are calculated for every household further analysis is possible to find all the households with travel times over a given threshold. Clearly this is a very large piece of analysis and has not been attempted.

The overall impression from Table 6 is that, for travel by car, in most areas the average travel times are not too long for most, if not all, services. However, there are a relatively small, but not trivial, number of areas where there are longer average travel times – over 20 minutes in the example shown. .

That conclusion is less clear for traveling without a car. Here the share of longer average travel times is higher and there is more of a question about whether 40 minutes is, or is not, an "acceptable" time.

Analysis of access to a car

Throughout this article the difference between travel with and without a car has been clear. Using the Census of Population 2011 we can look at whether households have access to a car and how many cars they have. For every occupied household the Census asks how many cars the household has access to. This will include cars that a household does not own but can use for private transport. The definition of cars includes vans used for private transport.

In this article only a brief introduction is given. A more in depth analysis is being prepared.

Table 7 gives a summary of the share of households having none, one or more cars and also the average number of cars per household. The table splits Wales into the settlements classes and also by the access to service deprivation rankings (Table 2). The supporting spreadsheet has the numbers of households and cars used to calculate Table 7. It also gives an extended breakdown of the average number of cars per household by settlement class and by access to services deprivation ranking.

Table 7

Summary of access to a car by settlement class

Settlement class	Share households by number of cars			Households ('000)	Avg cars per household
	None	One	2 or more		
By settlement class					
Largest	30%	43%	28%	271	1.06
Large	26%	44%	30%	259	1.13
Medium	25%	44%	32%	248	1.16
Small	22%	44%	34%	279	1.24
Smallest (L)	13%	39%	48%	128	1.56
Smallest (S)	11%	42%	47%	118	1.56
Total	**23%**	**43%**	**34%**	**1,303**	**1.23**
By access to services deprivation ranking					
Highest 5%	9%	39%	53%	67	1.69
5% to 10%	10%	39%	51%	67	1.64
10% to 20%	20%	42%	38%	130	1.32
20% to 50%	24%	43%	33%	394	1.20
Lowest 50%	26%	44%	30%	645	1.13
Total	**23%**	**43%**	**34%**	**1,303**	**1.23**

Source: WIMD 2014; LSOA best fit to Contiguous Built Up Areas;
and Census of Population 2011

Key highlights from Table 7

- In the smallest settlements of under 2,000 people and in LSOA ranked in the most deprived 10 per cent of Wales the share of households without a car is still around 10 per cent.
- The share of households that have no access to a car increases with settlement size and decreases with increasing access deprivation ranking.
- The share of households that have a single car is quite stable at around 40 per cent across settlement size and access deprivation ranking.
- The average number of cars per household decreases with settlement size and increases with access deprivation ranking.

Given the large difference in travel times between travel times with and without a car the share of households without a car is an important indicator. However, it is incomplete. When thinking about the impact on access to services, we also need to consider households where some people in the household do not have access to a car. Perhaps the household has only one car and this is used during the day by one member of the household to get to work leaving the others with no car.

The table suggests that whether households have cars, and how many, is not a simple matter. The need for transport can be seen as important from these results. However, levels of income must also play a role. Historically there has been quite a good correlation between areas with

high shares of households with no car and generally deprived areas. However, in an area like Wales with a varied settlement pattern it may be simplistic to assume that this makes car ownership a good deprivation measure.

Analysis of the relationship between access to services and general deprivation

This section considers the comparison between the rankings for the access to services domain and the overall deprivation ranking from Welsh Index of Multiple Deprivation. The analysis could be repeated for any of the individual deprivation domains.

For these comparisons we will break the 1,909 LSOA in Wales into 5 almost equal groups using the overall deprivation rankings. The group with the lowest rankings has one fewer LSOA than the others.

Table 8

LSOA by deprivation ranking for Access to Services and overall deprivation

Overall	Access deprivation rank					
	Highest	5% to	10% to	20% to	Lowest	
deprivation rank	5%	10%	20%	50%	50%	**Total**
LSOA						
Most deprived 20%	0	1	49	150	182	**382**
Next 20%	9	8	33	117	215	**382**
Middle 20%	42	21	45	97	177	**382**
Next 20%	42	44	44	97	155	**382**
Least deprived 20%	3	21	20	112	225	**381**
Total	**96**	**95**	**191**	**573**	**954**	**1,909**
Share						
Most deprived 20%	0.0%	1.1%	25.7%	26.2%	19.1%	**20.0%**
Next 20%	9.4%	8.4%	17.3%	20.4%	22.5%	**20.0%**
Middle 20%	43.8%	22.1%	23.6%	16.9%	18.6%	**20.0%**
Next 20%	43.8%	46.3%	23.0%	16.9%	16.2%	**20.0%**
Least deprived 20%	3.1%	22.1%	10.5%	19.5%	23.6%	**20.0%**
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: Welsh Index of Multiple Deprivation

Highlights for Table 8

- For the 191 LSOA in the most deprived 10 per cent for access to services, less than 10 per cent are in the most deprived 40 per cent overall.
- For the other access ranking groups the shares in each of the overall deprivation groups are much closer to the expected value of 20 per cent.
- For the 382 most overall deprived LSOA there is 1 in the 10 per cent most access deprived category.

The table makes it clear that the most access deprived LSOA are usually in the lower overall deprivation categories. However, as always with the Index, we must be clear that this does not mean that there are no deprived people in the high access deprivation areas. Only that these areas do not have high concentrations of deprivation.

The negative correlation between access deprivation and overall deprivation should not, however, be overplayed. Given the large differences between travel times with and without cars it would be reasonable to expect that people without jobs, or with low income would be more likely to have no car and so be more affected by the access issues.

Considering issues in measuring access to services

The Welsh Index of Multiple Deprivation uses one particular way to measure access to services. The methodology was developed in a rigorous way considering the data available and its quality and involved consultation with a range of stakeholders. This is described in the documentation for the Index (see links). However, it is only one methodology amongst a wide range of feasible options. Key features of the methodology, and associated options or issues, are described briefly below.

- Summarising the household level data. The Index works from the individual household data to calculate the average travel time in an LSOA. This is a reasonable way to provide the deprivation ranking for an LSOA. However, we lose information about the variation of travel times *within* an LSOA. An alternative (or supplementary) technique would be to look at the share of households in an area with travel times in a number of time bands. This is more complicated and raises questions firstly about what the bands would be and secondly about how to combine the additional information into the rankings.
- Range of services used. A key factor in the choice of services in the Index was that the services had accurate locations and that the coverage was good. That is there were few missing points and few points that had ceased to exist.
- Weightings. Choices must be made on how to weight together the services, and travel with and without a car to produce a single measure to feed into rankings (see links for further details on weighting).
- Travel times by bus and train. The train and bus timetables are available. For the calculations there have to be a range of assumptions about when people want to travel and when the services might be open. This poses questions about the best way to treat places that, for example, only have a bus on a single day of the week.
- Travel times by car. The distance travelled by car can be measured accurately. The issue is how to convert this into a travel time. The data available for this are improving rapidly.

A key question for the development of access to service measures is the balance between adding extra complication (in terms of additional cost and reduced transparency) and the benefits of doing so (in terms of the credibility, reliability and scope of the analysis).

For users in general it is useful to remember that the Welsh Index of Multiple Deprivation provides a good starting point for considering access to services. It is not, and almost certainly cannot be, a definitive statement. Local analysis and local knowledge can add extra detail that is not feasible at the National level.

Even if the calculation of travel times can be improved this is still incomplete. The analysis so far demonstrates the *potential* for issues over access. Further research is needed to address the following key questions:

- What is a "reasonable" travel time – and how does it change for different services under different circumstances?
- How do people actually use the services?
- What is the role of access other than by a physical journey?
- How do people balance accessibility with other priorities for where they live?
- How do people in areas of poor accessibility cope with the issues? What is the impact on them in terms of extra time (and cost) of travelling and services foregone?

Concluding thoughts

The analysis in this paper shows that access to service issue may affect a small but significant minority of the people of Wales. Largely, but not exclusively, those living in settlements of

under 2,000 people. It identifies a small number of areas where there are general issues and a larger number where the issues are largely restricted to people who must travel by public transport.

The paper raises the questions about of how these access issues impact on the delivery of the full range of public services within Wales. This might be a matter of changing the way services are delivered or perhaps of improving transport links or, indeed, both. Whatever actions might be needed the analysis raises the question of about whether a "one size fits all" approach to service delivery is plausible with a settlement pattern such as we have in Wales.

The analysis has tried to work across the whole of Wales to paint a broad picture of trends. The price has been that there have to a number of simplifying assumptions made to make the calculations feasible. A valuable extension of this work would be to look at how the general results across Wales match with, or contradict, what local people know about their own areas. Feedback from local authorities and other local bodies on this would be valuable.

A key unknown in understanding how to approach access to services is that little seems to be known about what people do to manage the issues for themselves. What are the coping strategies, particularly for people in the most inaccessible areas and those without cars everywhere? How do people balance the advantages of living in an area with the inconvenience (and presumably extra costs) of extra travelling times?

Links and further information

Statistical reports on rural issues are collated on a rural sub-theme page on the Welsh Government website. As new reports are published these will also appear on this page.

Rural sub-theme page
LSOA best fit to Built Up Areas for Wales

The reports detailing the National Statistics rural-urban classification and the Built Up Areas can be found on the Office for National Statistics website.

Rural-urban classification

Built Up Areas

Links for the Welsh Index of Multiple Deprivation

Homepage

General data

The WIMD Interactive website
WIMD StatsWales homepage
StatsWales WIMD 2014 Ranks
StatsWales WIMD 2014 Indicator data

Access to Services domain

Ranks by LSOA
Indicator data (average travel times)
Summary report over local authority areas

Technical documents

Main report
Technical report
Development of the 2014 Index
Access to services development report

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