Coleridge

Trees, canopy cover and land use

Prepared by Dr Tobias Jackson for Matthew Magrath, Cambridge City Council

Tree summary	Coleridge	Ward ranking	City
Canopy cover (%)	17.32	11	17.58
Canopy cover change since 2008 (%)	2.95	1	0.52
Mean canopy height (m)	9.42	14	12.32
Change in canopy height since 2008 (m)	0.87	9	0.87
Number of trees	21241	7	335,868
Tree density (trees per ha)	110	7	83
Small (< 6 m) tree density	85	6	58
Medium (6-12 m) tree density	19	10	18
Large (12-18 m) tree density	5	12	5
Massive (> 18 m) tree density	0	12	2
Small tree canopy cover (% total cover)	29	1	30
Medium tree canopy cover (% total cover)	40	6	19
Large tree canopy cover (% total cover)	26	10	33
Massive tree canopy cover (% total cover)	4	13	18

Table 1 – Summary of the trees in 2018, compared to other wards and the city. Ward rankings are ordered from 1=highest to 14 = lowest. For example, a ranking of 14 for canopy cover would be the ward with the lowest canopy cover. Note that the total canopy cover (first row) is given as a percentage of the total ward area, while the canopy cover per tree size class is given as a percentage of the total canopy cover in this ward.

Land area summary	Coleridge	Ward ranking	City
Total area (km2)	1.9	9	40.7
Tree Preservation Orders area (%)	0.7	12	2.3
Land use - gardens (%)	35.9	4	23.1
Land use - manmade (%)	36.8	8	31.9
Land use - natural (%)	27.7	9	45.3
Conservation area (%)	0.1	11	23.7
Protected Open Space (%)	21.9	5	18.2
Land ownership - CCC (%)	27.7	4	16.1
Land ownership - highways (%)	12.2	5	9.5
Road shade (%)	30.6	12	33.8
Proportion of roads bordered by gardens	66.1	2	48
Index of multiple deprivation 2019 (mean)	13.8	7	13.2

Table 2 – Summary of the land use patterns in 2018, compared to other wards and the city. All statistics are valid for 2018 except index of multiple deprivation (2019).

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1. Output area summary

1.1. Canopy cover

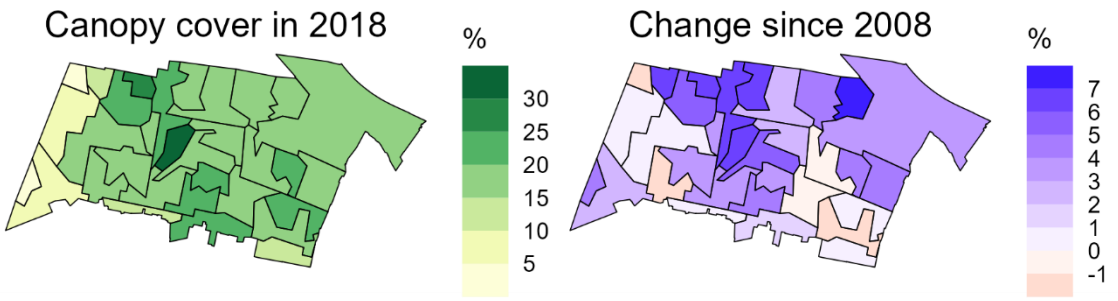

Figure 1 – Map of canopy cover (%) in 2018 and the change since 2008 at the OA scale.

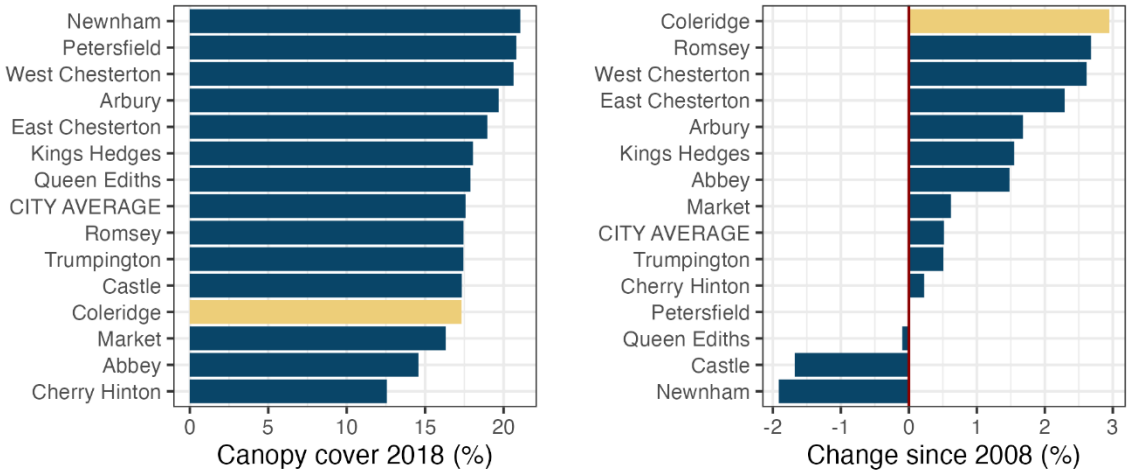

Figure 2 – Bar charts showing canopy cover (%) at the ward level.

1.2. Canopy height

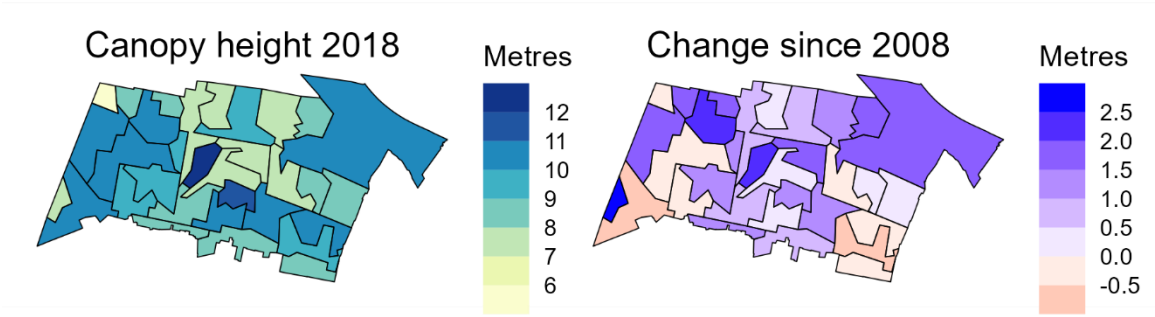

Figure 3 – Map mean canopy height (m) in 2018 and the change since 2008 at the OA scale.

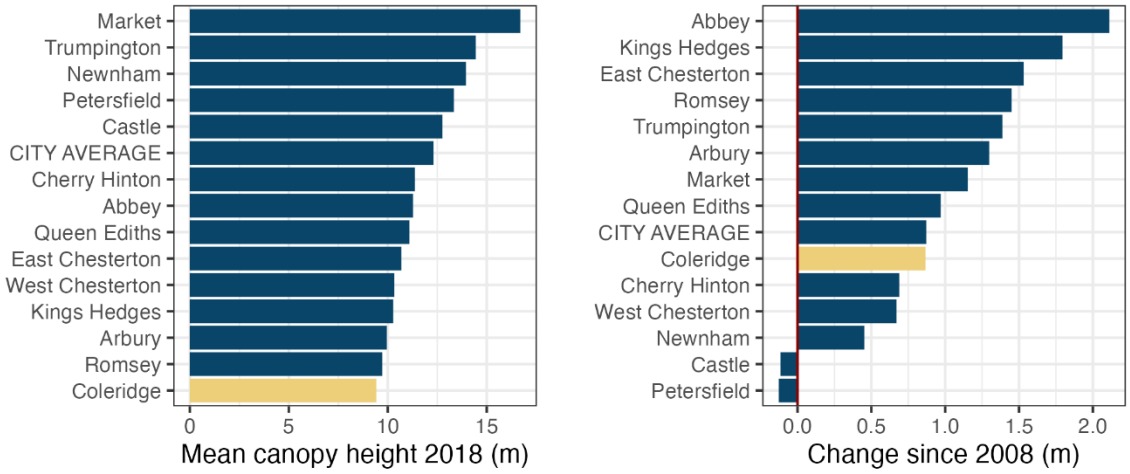

Figure 4 – Bar charts showing mean canopy height (m) at the ward level.

1.3. Tree density in 2018

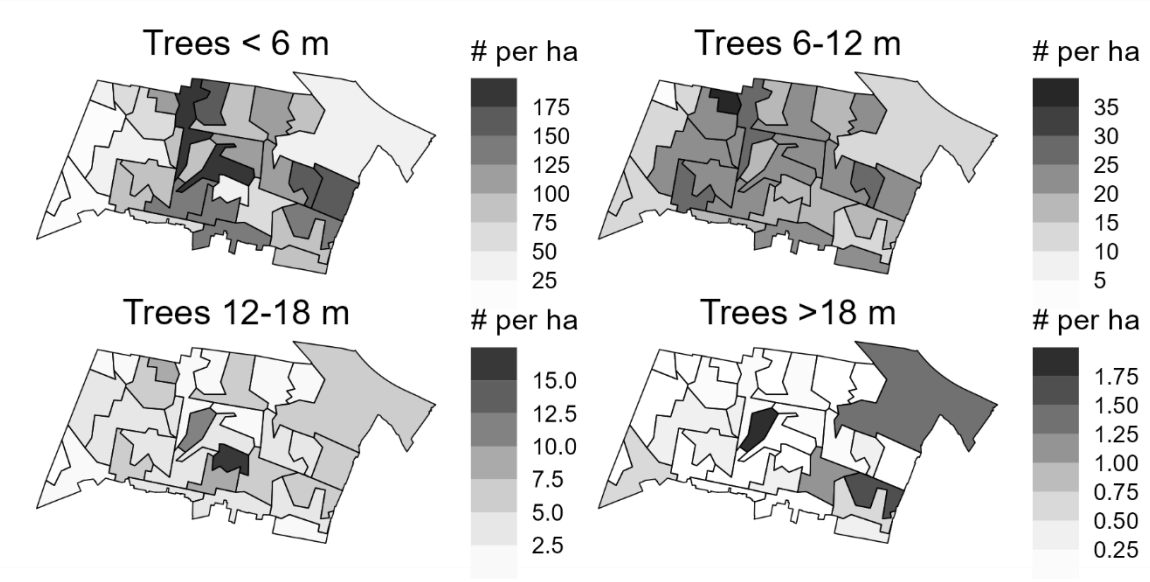

Figure 5 – Maps of tree density (number of trees per hectare) in 2018 at the OA level.

Note that we decided not to present tree density in 2008 or the change since 2008 because the estimates of the number of trees is inconsistent over time. Automatically distinguishing individual trees is challenging, especially for the small trees, so these estimates may be somewhat biased. However, the 2018 tree map is internally consistent, so the comparison of the relative number of trees across the city are robust.

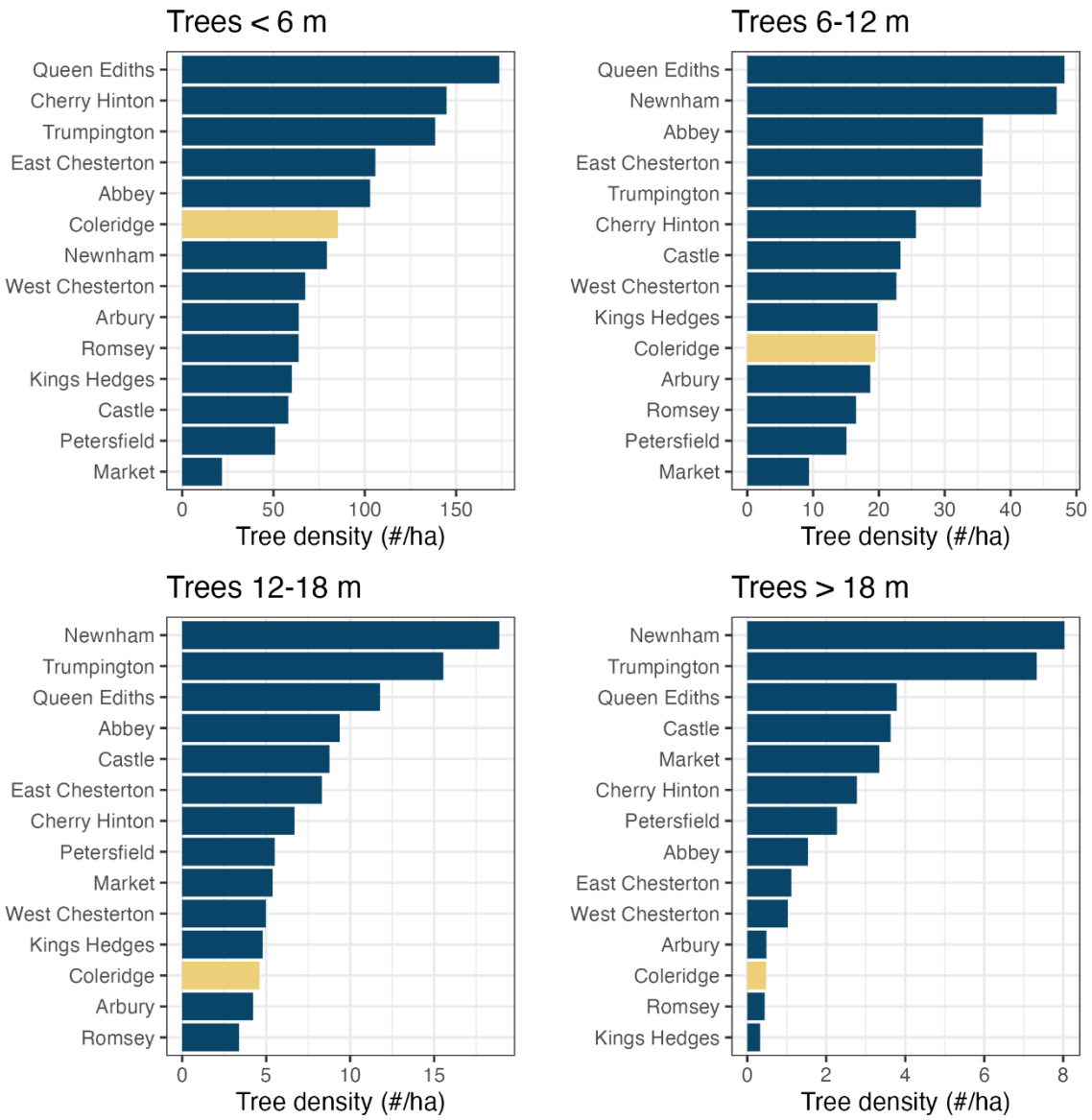

Figure 6 – Bar charts showing tree density by height class at the ward level.

1.4. Canopy cover by height class

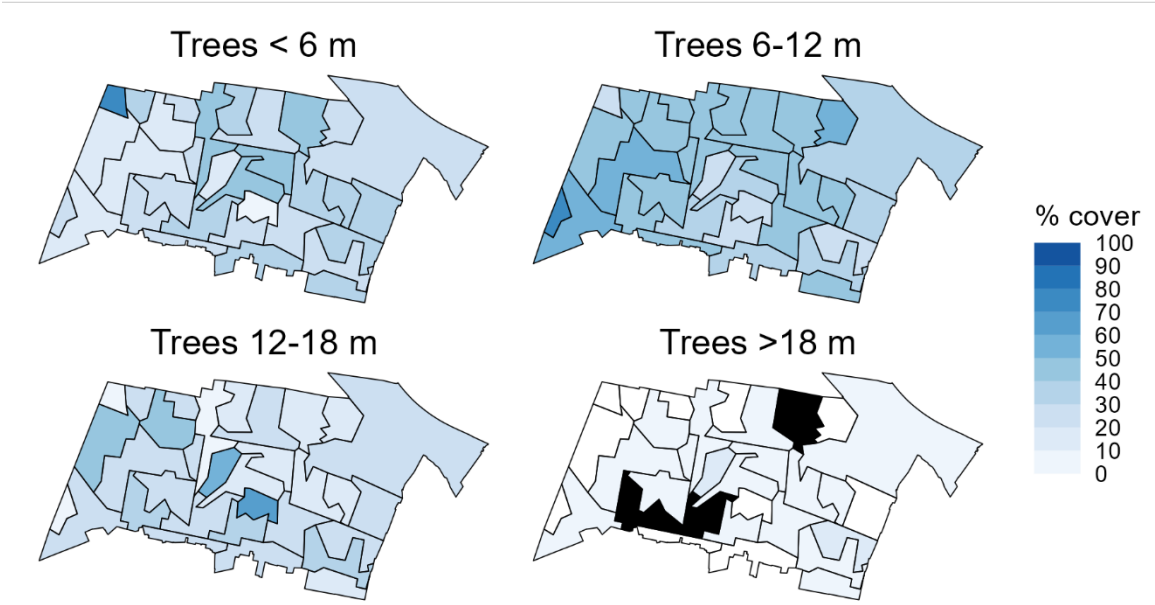

Figure 7 – Maps of canopy cover in 2018, subdivided by height class, at the OA level

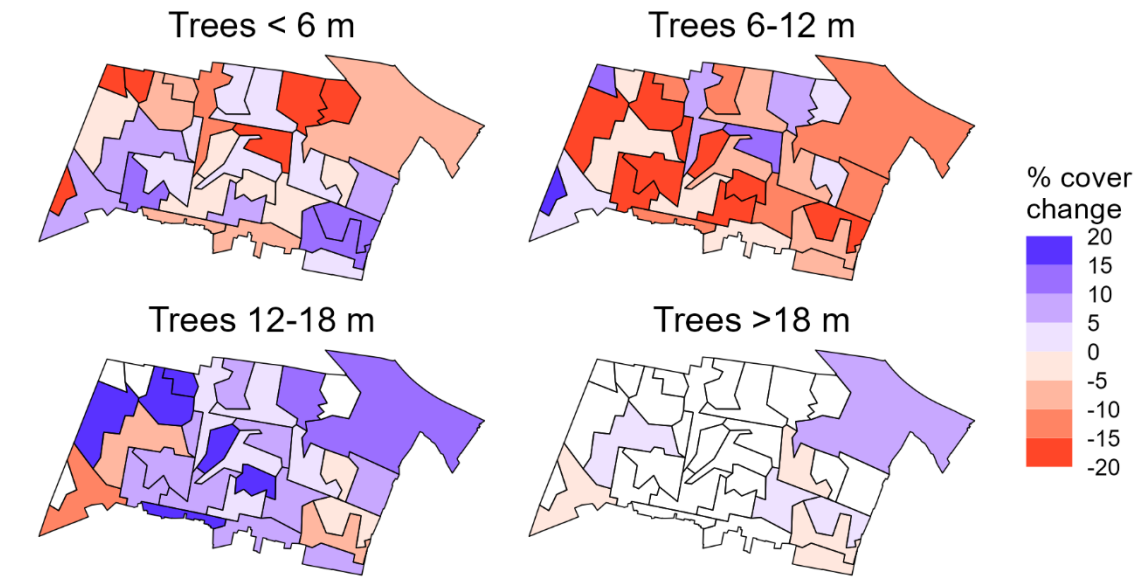

Figure 8 – Maps of change in canopy cover from 2008 to 2018, subdivided by height class, at the OA level.

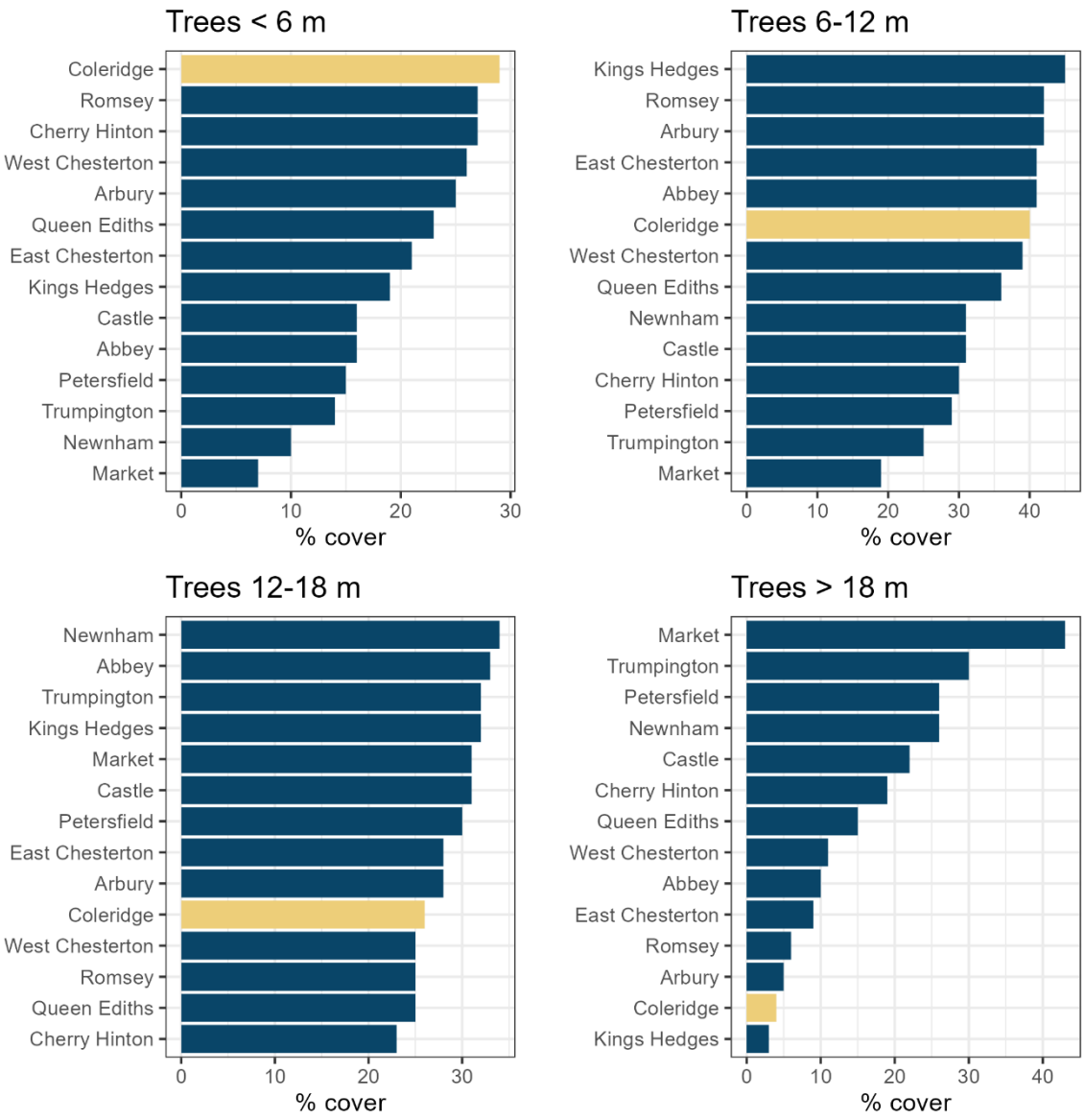

Figure 9 – Bar charts showing the canopy cover, subdivided by height class, at the ward level

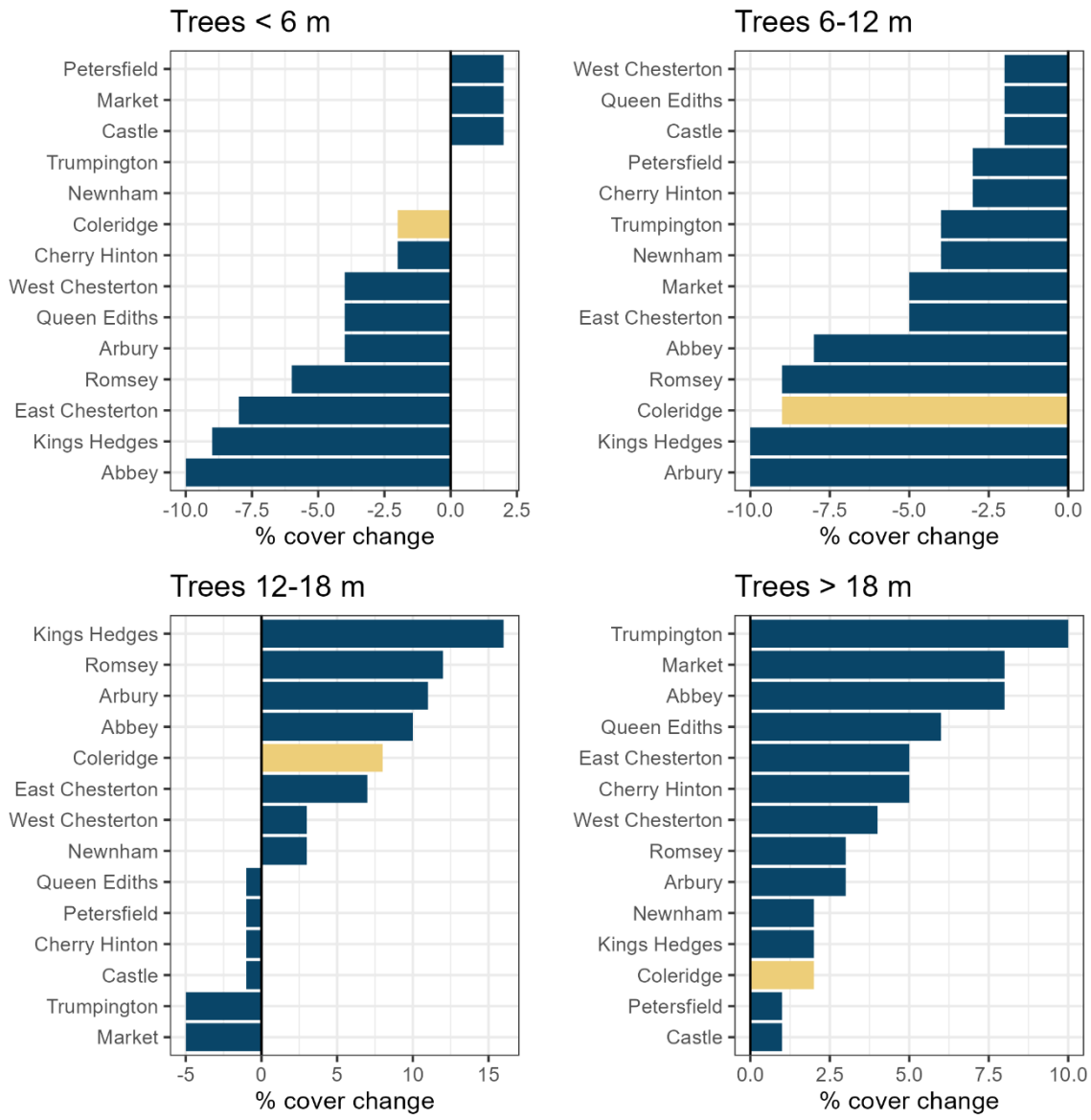

Figure 10 – Bar charts showing the change in canopy cover, subdivided by height class, at the ward level.

2. Land use types

2.1. Area covered by each land use type.

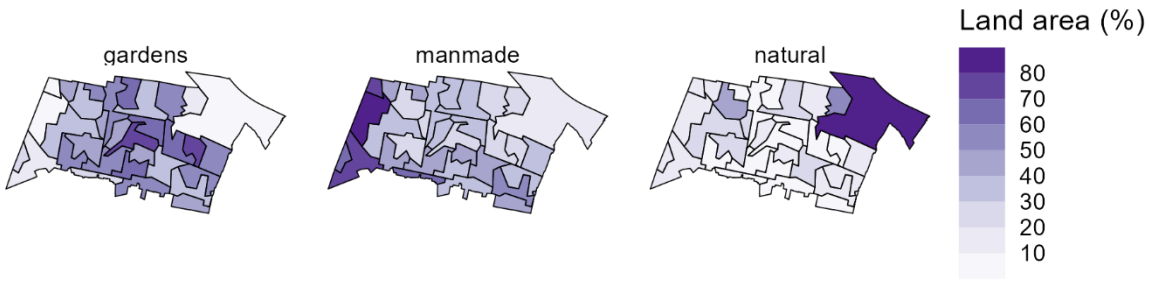

Figure 11 – Maps of land area (%) covered by each land use type in 2018 at the OA level.

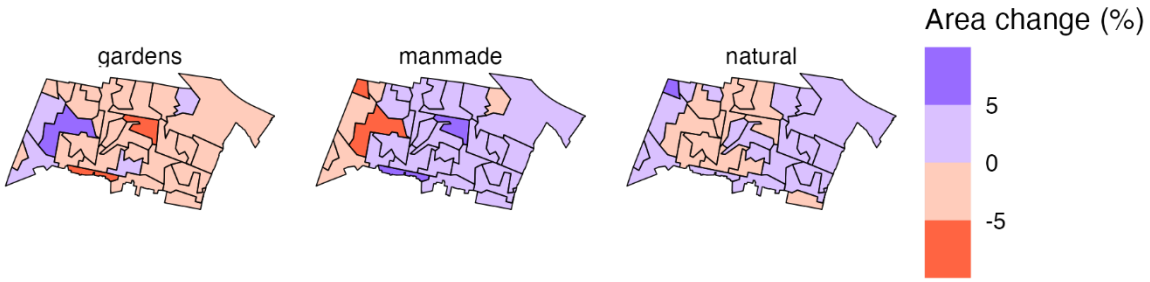

Figure 12 – Maps of the 2008-18 change in land area (%) covered by each land use type.

2.2. Canopy cover in each land use type

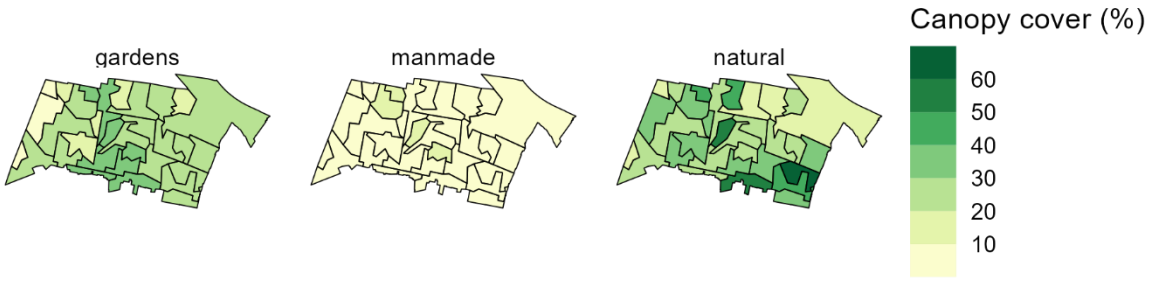

Figure 13 – Maps of the proportion of canopy cover (%) in each land use type in 2018 at the OA level

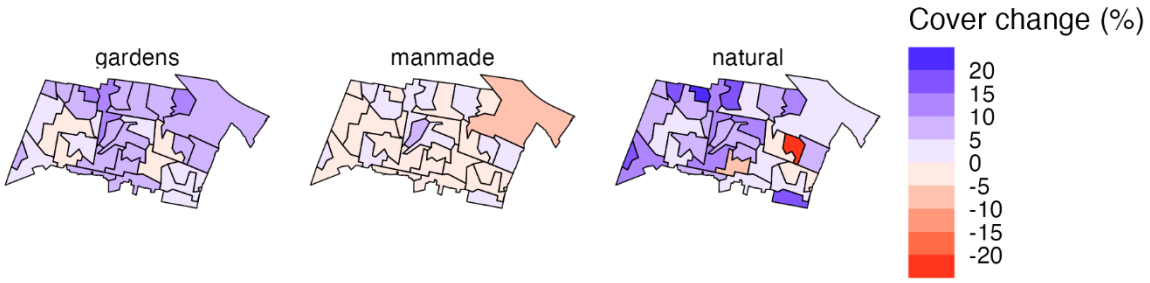

Figure 14 – Maps of the 2008-18 change in the canopy cover (%) in each land use type.

2.3. Ward level land use and canopy cover changes

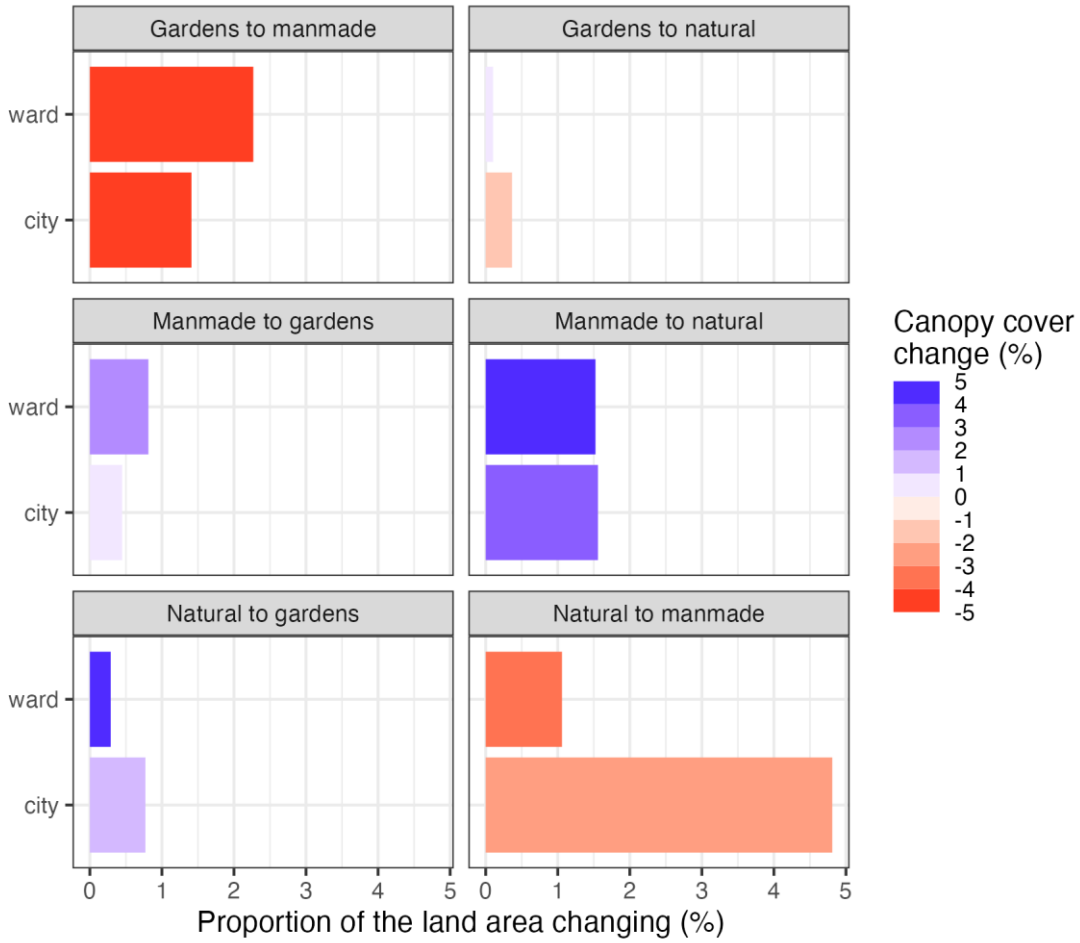

Figure 15 – Bar charts showing the proportion of the land area (%) undergoing each type of land use change at the ward level and the city level. The colours show the change in canopy cover (%) on this same land.

3. Protected trees

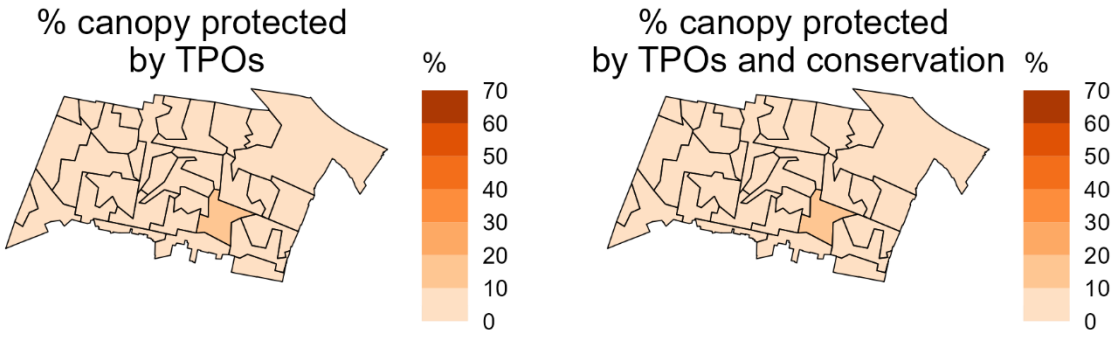

Figure 16 – Maps showing the percentage of the canopy protected.

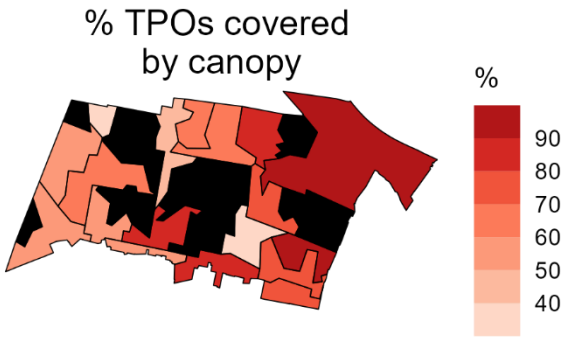

Figure 17 -Map showing the percentage of TPO area covered by tree canopy. OAs coloured black had no TPOs to assess.

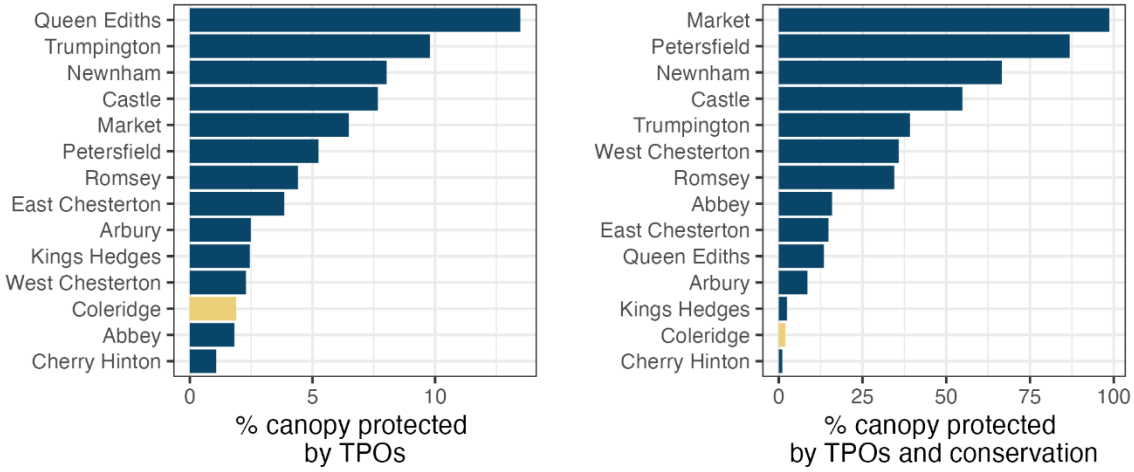

Figure 18 – Bar charts showing the percentage of the canopy protected at the ward level.

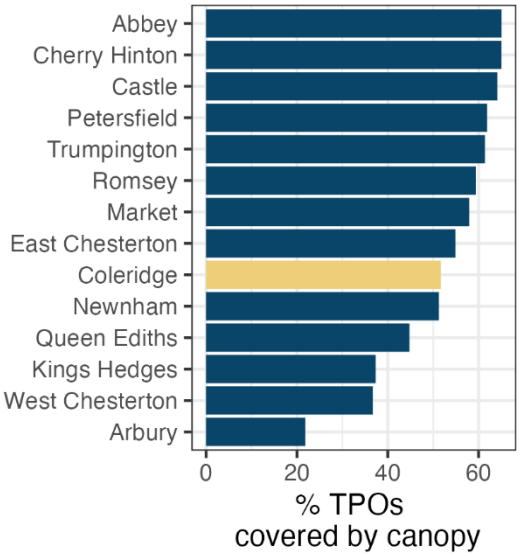

Figure 19 – Bar chart showing the percentage of TPOs covered by canopy at the ward level.

4. Protected Open Spaces

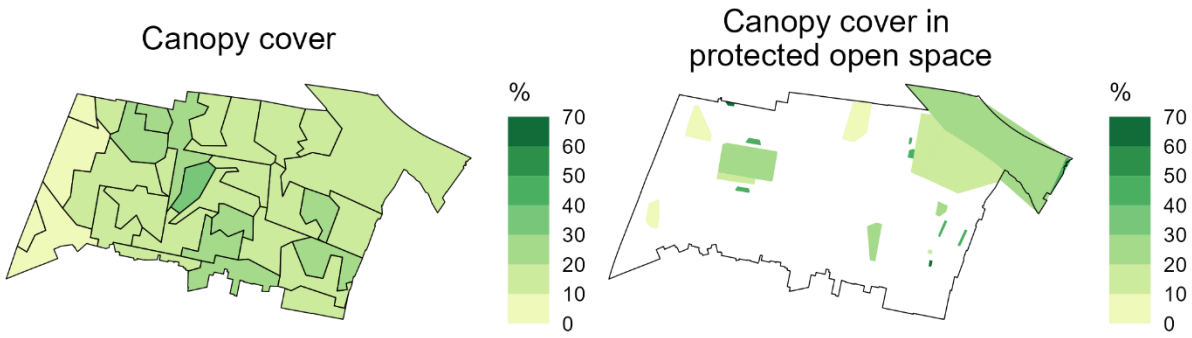

Figure 20 – Maps of canopy cover (%) at the OA level (left) and within protected open spaces (right).

5. Land ownership

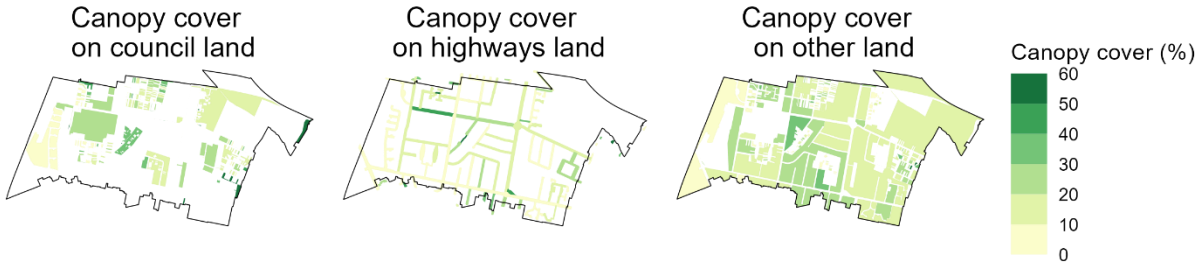

Figure 21 – Maps of canopy cover (%) on by land ownership type.

6. Shade and gardens

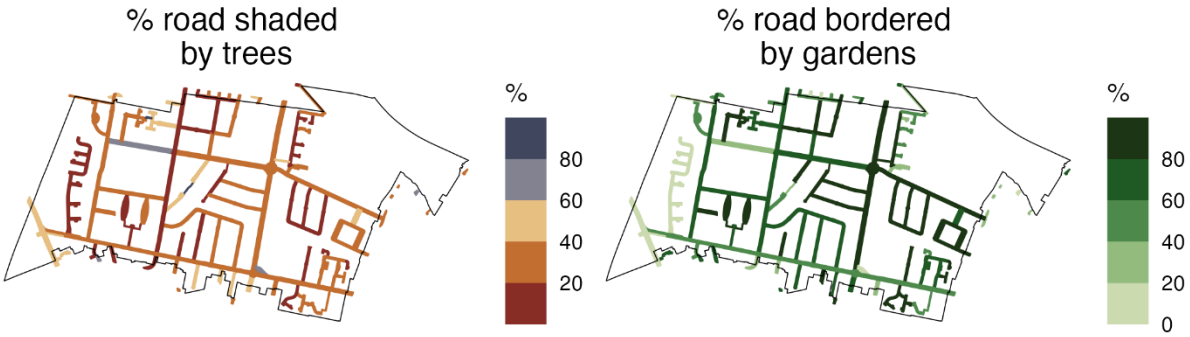

Figure 22 – Maps of road shade levels (left) and the proportion of the roads bordered by gardens (right).

Street	Shade (%)	Surrounding gardens (%)
DERBY ROAD	5	68
CHALMERS ROAD	7	94
MARMORA ROAD	7	60
COWPER ROAD	8	80
FOOTPATH	11	88
BROOKFIELDS	11	72
SUEZ ROAD	12	87
BRITTEN PLACE	12	54
BANCROFT CLOSE	14	84

Table 3 – Streets with lowest levels of shade and high proportion of gardens.

Street	Shade (%)	Surrounding gardens (%)
TEYNHAM CLOSE	6	33
HARTINGTON GROVE	11	28
CLIFTON ROAD	14	8
CYPRUS ROAD	20	17
CARTER CYCLE BRIDGE	21	5
CARTER CYCLE BRIDGE	21	5
SUEZ ROAD	22	0
BLINCO GROVE	26	35
ST BEDES CRESCENT	29	21
WALPOLE ROAD	29	37

Table 4 - Streets with lowest levels of shade and low proportion of gardens

7. Index of multiple deprivation

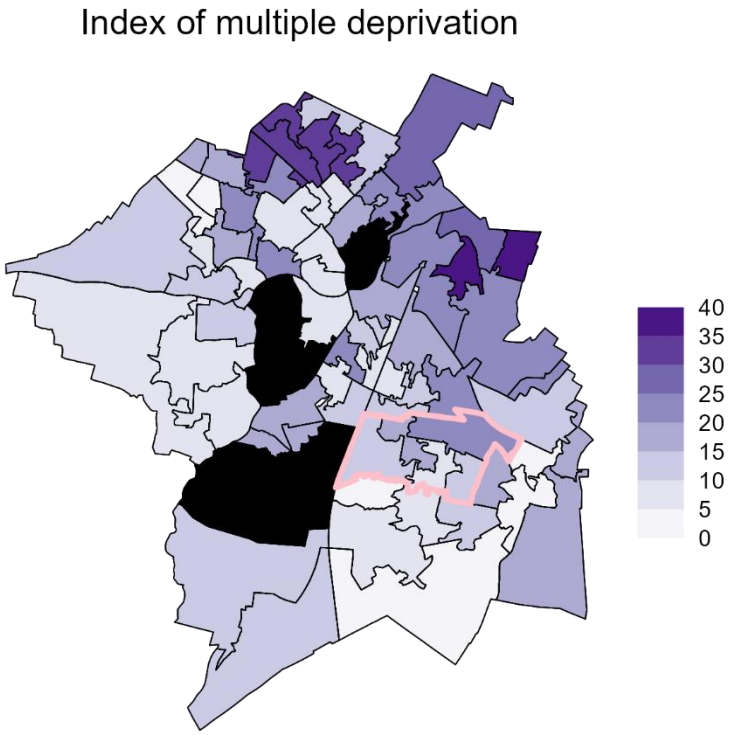

Figure 23 – Map showing the IMD for the whole city with the ward highlighted by a pink outline. LSOAs coloured black indicate no data available for IMD.

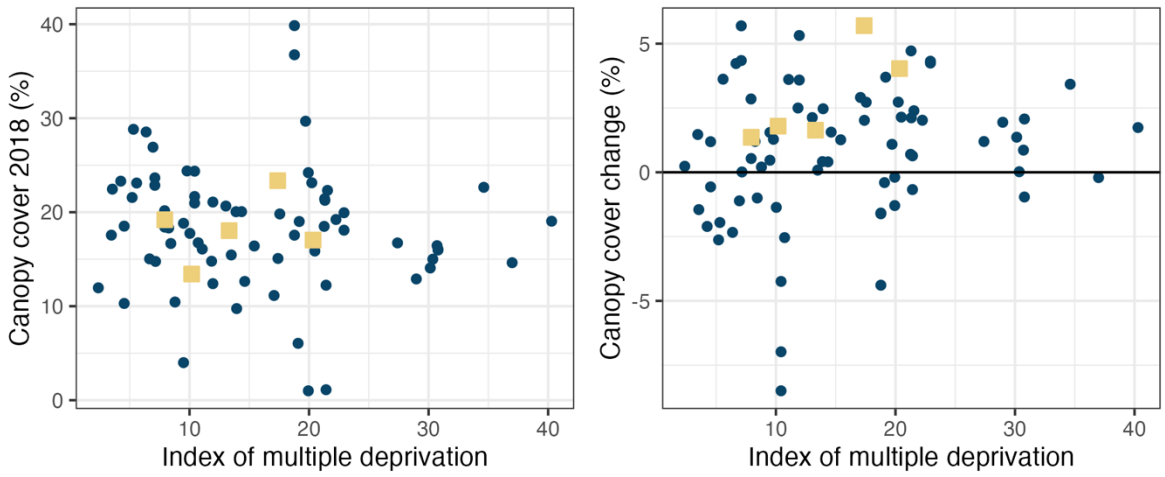

Figure 24 – Graph showing the canopy cover in 2018 (left) and the change since 2008 (right) against the index of multiple deprivation at the LSOA level. The LSOAs in this ward are plotted as yellow squares to highlight the relative position of this ward.

8. Methodology

All data used in this report were supplied by Cambridge City Council. All of the information on trees in Cambridge were derived from the Proximitree data set, collected by BlueSky in 2008 and 2018. Data from 2008 are not shown, but only used to calculate the change between 2008-18. Where no date is given the data are from 2018. The land use classes (natural, gardens and manmade) were derived from OS MasterMap 2008 and 2018.

There are two types of TPO in Cambridge, TPO points and TPO areas. In order to give a clear comparison of TPOs across the city, these two types were combined. The TPO points were assumed to cover a circular area with a radius of 5 m from the central point. These areas were then merged with the TPO areas.

The shade was calculated for a single time, 1st July 1600, which represents the start of rush hour in the middle of summer. Our previous work (Shadeways report) found that the time didn't greatly affect relative levels of shade across the city.

9. Definition of terms

Mean tree height – the mean height of all the trees in the area.

Canopy cover – the area covered by the crowns of all the trees as a percentage of the land area.

Mean canopy height – the mean height of the canopy cover. This is higher than the mean tree height because tall trees have larger crowns and therefore contribute more to canopy area.

Output area (OA) – the smallest mapping level used by government.

Lower super output area (LSOA) – a larger mapping level used by government.

Index of multiple deprivation (IMD) – a score for each LSOA which combines information on multiple social factors, higher IMD scores are considered more deprived areas.

Tree Protection Order (TPO) – an order given by the council to protected certain trees, or trees in certain areas.