

Lichfield Local Development Framework

Appraisal of Spatial Options

19/11/08

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Document History

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|-------------|---------------------|------------|---|----------|------------|----------|
| JOB NUMBER: | | | DOCUMENT REF: Stage One Final Report 191108.doc | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| V2 | Final | | | | KK | 19/11/08 |
| V1 | Draft | LT | KK | KK | KK | 10/10/08 |
| Revision | Purpose Description | Originated | Checked | Reviewed | Authorised | Date |

Contents

| Section | Page |
|------------------------|-------------|
| 1. Introduction | 3 |
| 2. Approach | 4 |
| 3. Findings | 7 |

Appendices

Appendix A – Journey Time Accessibility Maps

Appendix B - Composite Accessibility Maps

Appendix C - Site Assessment Frameworks

1. Introduction

- 1.1 Lichfield District Council (LDC) is engaged in the staged preparation of the Core Strategy of the Local Development Framework which will guide development in the District in the period to 2026. Staffordshire County Council (SCC) is working alongside the District Council to provide transport advice.
- 1.2 LDC's Core Strategy Issues and Options Paper seeks feedback on four spatial options
- Option 1 - Town Focussed Development (growth be directed to Lichfield and Burntwood, with additional growth in the district at Rugeley and Tamworth to meet Cannock Chase District and Tamworth Borough Councils' requirements);
 - Option 2 – Town and Key Rural Village Focussed (allow development in Lichfield and Burntwood and other sustainable settlements (Alrewas, Armitage with Handsacre, Fazeley, Little Aston, Shenstone and Whittington);
 - Option 3 – Dispersed Development (to rural settlements with a more limited range of facilities); and
 - Option 4 – New Settlement.
- 1.3 Atkins, assisted by SCC, has been appointed to undertake a two stage study to determine the most sustainable locations for development in transport terms for Lichfield District. This work will help identify the Preferred Option for the Core Strategy. Stage one of the study will identify the most suitable spatial locations for strategic growth within the District. Stage two will involve a more detailed consideration of the potential development sites that could deliver the preferred Spatial Option most sustainable.
- 1.4 Government guidance suggests that new development should be focussed in locations where residents can make use of existing services and facilities to maximise travel choice and minimise additional travel by private car. Accession analysis undertaken by SCC has been analysed by Atkins to help identify the most sustainable locations across the district, and rank settlements within the district in terms of their relative sustainability.
- 1.5 This report details the findings of Stage one of the study describing the analysis of the Accession work. It makes clear recommendations concerning the most appropriate locations for new development on transport grounds, thereby informing the selection of a preferred spatial option for Lichfield District.
- 1.6 Stage two of the study will be completed in due course. However, Staffordshire County Council has previously been consulted by Lichfield District Council in early 2008 with regard to the potential traffic impacts of 10 sites in Lichfield District. The response, which included consideration of recent accidents, existing traffic flow on the local network, demographic composition of the local area and accessibility by walking, cycling and bus, provides an initial assessment for the potential locations of growth within the preferred spatial option. Copies of these pro-formas have been included in Appendix C for reference.

2. Approach

- 2.1 Accession accessibility planning software was developed by MVA consultancy for the Department for Transport to enable Local Authorities to measure and monitor local accessibility as part of the Accessibility Strategy in their Local Transport Plans. Accession calculates journey times based upon public transport timetable data, road network information and a range of user-defined parameters. The calculations can be applied to a range of destination types including doctor's surgeries, schools and town centres.
- 2.2 Accessibility in Lichfield District was calculated for the following destinations:
- Employment;
 - Secondary Schools;
 - GP Surgeries;
 - Supermarkets;
 - Primary Schools;
 - Further Education Colleges;
 - Hospitals; and
- 2.3 It should be noted that the provision of these services and facilities may change over time. It is likely that developers will provide additional transport infrastructure, public transport services and/or local facilities. Destination datasets are accurate for May 2008.
- 2.4 Accessibility was calculated using public transport for the majority of destinations; this included the use of bus and/ or rail services. The timetables used were dated 21st May 2008 and October 2007 for bus and rail respectively. When calculating accessibility for public transport, the software takes into account walk time to the stop/ station, wait time for the service, in vehicle travelling time and walk time to the destination. It also allows for interchange between services and modes such as bus and rail.
- 2.5 For primary and secondary school accessibility calculations; it is more appropriate to calculate accessibility on foot as some children use contracted services which are not included in the bus timetable. This calculation uses the road network and applies an average walk speed of 4.8kph.
- 2.6 For all calculations, a threshold of 60 minutes was set within which the entire journey must be completed including any interchanges. The software computes a journey time for every ten minute interval within the defined time period to the nearest destination point and the shortest journey times are returned. Therefore, the accessibility contour maps represent the best journey time that can be achieved within the defined time period.
- 2.7 For some destination types, such as employment, it is not appropriate to calculate accessibility to the nearest destination point; as the nearest point of employment may not be suitable i.e. lack of job choice. For employment and further education college destinations a Hansen score was calculated. This combines the number of destinations that can be accessed within a 60 minutes journey time with the disbenefits of travel in terms of journey time. The higher the score, the greater the level of access and choice.
- 2.8 In all the following Accession calculations were made:
- Public Transport Access to Employment (bus and rail) - Wednesday 07:30 to 09:30 hours – Hansen scores;
 - Walking Times to Secondary Schools (10 minute travel time isochrones);
 - Walking Times to Primary Schools (10 minute travel time isochrones);
 - Public Transport Access to Further Education Colleges (bus and rail) Wednesday 0700 to 0900 hours – Hansen scores;
 - Public Transport Access to Retail Supermarkets (bus and rail) Saturday 1000-1300 hours (10 minute travel time isochrones);

- Public Transport Access to Retail Supermarkets (bus and rail) Wednesday 1000-1300 hours (10 minute travel time isochrones);
- Public Transport Access to GP Surgeries (bus and rail) Wednesday 0800-1000 hours (10 minute travel time isochrones);
- Walking Times to GP Surgeries (10 minute travel time isochrones); and
- Public Transport Access to Hospitals (bus and rail) Wednesday 0800-1000 hours (10 minute travel time isochrones).

- 2.9 Contour maps showing the results of these calculations are included in Appendix A. The plots highlight relative levels of existing accessibility by mode across Lichfield District to individual destinations. This approach has its limitations in terms of assessing a new settlement if it is located in a rural area as existing services and facilities are likely to be very low. The scale of development for a new settlement would be sufficient to provide transport infrastructure and local facilities for the new residents.
- 2.10 It is useful to be able to combine this information into an overall accessibility score for an area. In 2006 the Department for Transport (DfT) published '*Technical Guidance on Accessibility Planning in Local Transport Plans*'. This included details of the methodology used by DfT to calculate the National Core Accessibility Indicators. Part of this is the calculation of an overall measure of accessibility at ward level. This methodology has been applied to accessibility calculations in Lichfield District using local data sources.
- 2.11 The composite score includes calculations of accessibility to the destinations listed above using the same time periods. In the case of the supermarket calculation, the combined accessibility score utilised the results for a Saturday as it is assumed to be one of the main supermarket shopping days. Access to GP surgeries is represented by the public transport calculation as this mode is important in the rural parts of the District. For the composite accessibility score, population weighted Hansen scores were calculated for each destination set. Population weighted Hansen scores combine the number of destinations that can be accessed within a 60 minutes journey time with the disbenefits of travel in terms of journey time and the total number of people affected by the modelled level of accessibility. For example, does an area with poor access to a particular service affect a large number of people?
- 2.12 The weighting enables the results to be summed across the origin points within a ward to create a ward Hansen score. Employment Hansen scores are also weighted by the total number of jobs at each destination point.
- 2.13 The ward Hansen scores are then ranked in descending order and divided into quartiles. Wards located in each of the quartiles are allocated the following scores:
- Top quartile - 4 (good accessibility);
 - 2nd quartile - 3;
 - 3rd quartile - 2; and
 - Bottom quartile - 1 (poor accessibility).
- 2.14 The DfT methodology uses deciles, but for the Lichfield study quartiles are more appropriate for the number of wards involved.
- 2.15 The process of obtaining ward scores and allocating quartile scores is completed for each destination set. To obtain a composite accessibility score, the different destinations must be combined. The dataset includes three education measures and two health related measures. To ensure that education and health were not over represented in the composite score, combined education and health scores were produced by summing the relevant quartile scores and ranking

the result. To produce the final composite score, the quartile scores of the four destination types; employment, supermarket, education and health, were summed and ranked.

- 2.16 This produces an unweighted composite accessibility score for all wards in Lichfield District. The composite accessibility score has also been calculated by applying trip purpose weightings to the four destination types. The weightings have been derived from Staffordshire County Council's Local Household Travel Survey 2005 using data for the whole County. Data has been extracted to include only home to destination trips to be consistent with Accession. The resulting weightings relate to the total number of recorded journeys for the whole sample by destination type and have been applied at the point where the four ward quartile scores are summed.
- 2.17 The weightings are as follows:
- Employment: 0.50;
 - Supermarket: 0.34;
 - Education: 0.08; and
 - Health: 0.08.
- 2.18 The composite accessibility ward scores provide a useful evidence base from which to consider the proposed spatial options for Lichfield District. The ward geography outlines the two main settlements of Lichfield and Burntwood providing a basic comparison between settlements and rural areas in terms of accessibility. It should be viewed with caution when considering individual sites as the scores are an average for the entire ward. Parts of the ward may score higher or lower than the average score.
- 2.19 The journey time contour and Hansen calculation maps provide more detailed information. They enable existing modelled accessibility levels to specific destination types to be viewed. This information could provide a base for considering the sustainability in accessibility terms of developments sites in Lichfield District.

3. Findings

Journey Time Accessibility Maps

- 3.1 The following section presents key findings from the journey time accessibility plots provided in Appendix A.

Access to Employment

- 3.2 Figure 1 shows that Lichfield City has the best access to employment as the majority of the urban area has a score within the top quintile. Only the outskirts of the City receive a lower access to employment score. The results are a combination of the number of jobs available within the City and the public transport links to other centres such as Birmingham, Burton-upon-Trent, Tamworth and Burntwood. Burntwood has the next highest score with the majority of the urban area receiving a score in the top two quintiles. Parts of Armitage, Shenstone, Little Aston and Tamworth also have good access to employment. These locations all have public transport access to Birmingham City Centre. Smaller settlements and rural parts of the district have lower levels of access to employment which reflects the limited choice of destinations by public transport.

Access to Education

- 3.3 Three calculations were made to measure access to education; walking access to primary schools, walking access to secondary schools and a public transport access to further education colleges Hansen score.
- 3.4 Figure 2 shows the results of the further education accessibility mapping. Lichfield City has the highest scores in terms of opportunities to access Further Education Colleges. The smaller rural villages including Stonnall, Harlaston, and Hamstall have the lowest score for public transport access, with the exception of the areas around Shenstone rail station, which provides access to colleges in Lichfield and Sutton Coldfield. This reflects the limited choice of Further Education Colleges that can be accessed using public transport. This is important as not all Further Education Colleges offer the same courses. It should be noted that this calculation does not take account of A-levels offered by sixth form colleges attached to secondary schools.
- 3.5 Access to primary schools, shown in Figure 3, is very good across the District with only those villages without a primary school, such as Weeford, Hammerwich and Hamstall Ridware, scoring poorly. Secondary schools are only located in the larger settlements. In Lichfield District some children travel outside the District to Rugeley, Burton-upon-Trent and Tamworth to attend secondary school. Only residents Lichfield City and Burntwood are within sensible walking distances of secondary schools. These are the locations that could provide the most sustainable development in terms of access to secondary schools as buses or contract services are less likely to be required.

Access to Healthcare

- 3.6 Figure 5 examines public transport access to GP surgeries. Lichfield City Centre, Burntwood, Fazeley, Alrewas, Shenstone, Armitage and along key bus corridors such as the 991 between Lichfield and Walsall, 765 between Lichfield and Tamworth and the 825 to Armitage, have good access. These bus routes all operate at least every 30 minutes. Other parts of the District have lower levels of access. Burntwood shows the highest level of access as the majority of the urban area is within a 10 minute journey time of a GP surgery. Lichfield City shows a lower level of access as there is less of a geographical spread of provision; the majority of the City is within a 20 minute journey time. Public transport access to GP surgeries is important in the rural areas of Lichfield where pedestrian facilities are not sufficient to enable people to walk safely between villages. Lichfield has less GP surgery locations but more GP's practise at each of the health centres.

- 3.7 Walking access (as shown in Figure 6) is naturally more concentrated around the individual GP surgeries, with areas around Lichfield City Centre, Armitage, Burntwood, Alrewas, Whittington, Fazeley, Shenstone and Stonnall having substantial areas with access to a surgery within a 20 minute walk.
- 3.8 Public transport access to hospitals is demonstrated by Figure 7, showing that residents in Lichfield and Fazeley have access to a local hospital within a 20 minute public transport journey as they are the only two settlements with a hospital. Some of the smaller villages such as Weeford have no access to a hospital by public transport. It should be noted that this calculation does not represent access to an Accident and Emergency Department as Samuel Johnson Community Hospital in Lichfield does not have this facility. The calculation does not include private hospitals.

Access to Supermarkets

- 3.9 Figures 8 and 9 show public transport accessibility assessments to supermarkets on a weekday (Wednesday) and Saturday. Timetabling of the bus services provides more rural areas with access to a supermarket on a Wednesday than a Saturday. The calculation considers a journey between 10am and 1pm which is likely to include some infrequent off-peak shopper bus services. Areas such as Lichfield, Burntwood, Little Aston and Fazeley have good access (20 minute) to the main supermarkets in the area.

Composite Accessibility Scores

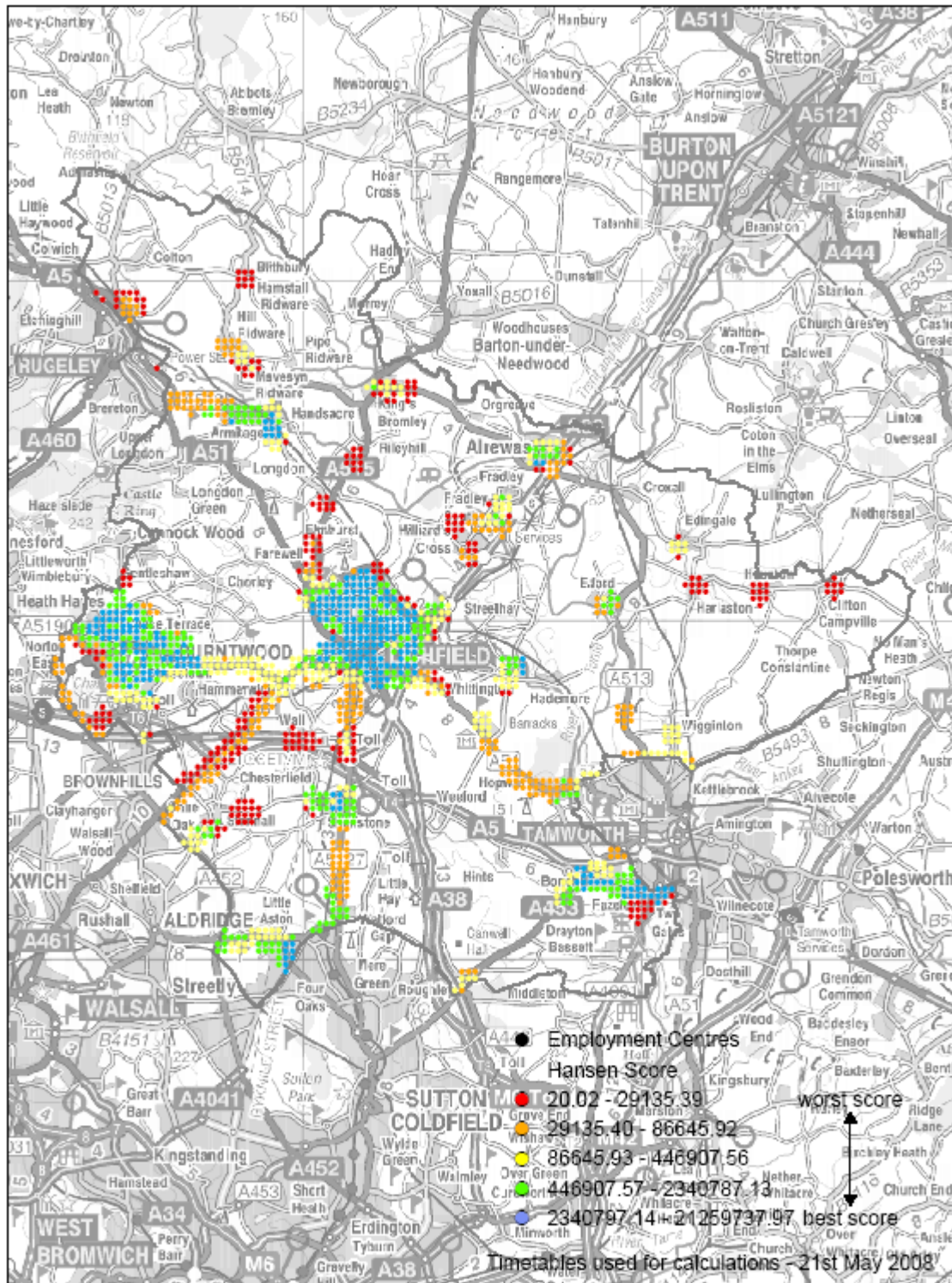
- 3.10 Appendix B includes the results of the ward composite accessibility scores, Figures 10 to 20. The weighted and unweighted overall composite accessibility score maps, Figures 10 and 11, highlight Lichfield, Burntwood and parts of Fazeley and Armitage as the most accessible overall. The remaining parts of the District which are predominantly rural form the bottom quartile. The unweighted score places Boley Park Ward in Lichfield and Chase Terrace Ward in Burntwood in the top quartile whereas they are second quartile when the weighting is applied. The difference is due to the quartile scores received for employment accessibility which has the highest weighting. In terms of access to employment, Boley Park and Chase Terrace both fall in the third quartile.
- 3.11 The scores for the wards in Lichfield mostly fall within the top quartile. Exceptions to this are Leomansley Ward which is within the second quartile for education, Curborough Ward which is in the second quartile for healthcare and Boley Park which falls into the third quartile for employment.
- 3.12 Burntwood receives lower quartile scores overall for access to employment and healthcare. In the overall composite accessibility scores Fazeley was classified as second quartile. For employment, the score is higher and Fazeley falls within the top quartile. However, in terms of access to supermarkets the score is lower and is within the third quartile. Armitage with Handsacre Ward falls within the third quartile overall but rises to the second quartile for access to supermarkets.
- 3.13 For each of the different destination types, there is a substantial difference in overall ward score between the third and bottom quartiles. This difference is larger than between any of the other quartiles. This reflects the significantly different level of services and facilities in the rural areas of the District compared to larger settlements.

4. Recommendations

- 4.1 Analysis of the various accessibility calculations has built up a robust picture of those areas within the District that are more sustainable, in terms of access to key services using existing transport infrastructure.
- 4.2 The ward level composite scores highlight Lichfield City as most consistently having high accessibility scores. Fazeley Ward receives a score that is within the second quartile. The majority of Burntwood has a third quartile level of accessibility with the exception of Chase Terrace which has greater access to essential services and facilities. Armitage with Handsacre Ward also falls within the third quartile. The journey time contour maps show that these areas experience relatively short journey times to services. In addition these locations commonly have a number of the key services in their locality enabling residents to easily access these services through walking or using public transport.
- 4.3 The rural areas of Lichfield consistently receive accessibility scores that fall within the bottom quartile.
- 4.4 These findings support Lichfield District Council's Spatial Options 1 Town Focussed Development and 2 Town and Key Rural Village Focussed. Sustainable development in terms of access to services and facilities would be challenging to deliver in the rural parts of the District as existing levels of public transport services are limited and few facilities are located there.
- 4.5 It is difficult to assess the potential sustainability of a new settlement using information for existing services and facilities. The scale of development for a new settlement would be sufficient to provide transport infrastructure and local facilities for the new residents.

Appendix A – Journey Time Accessibility Maps

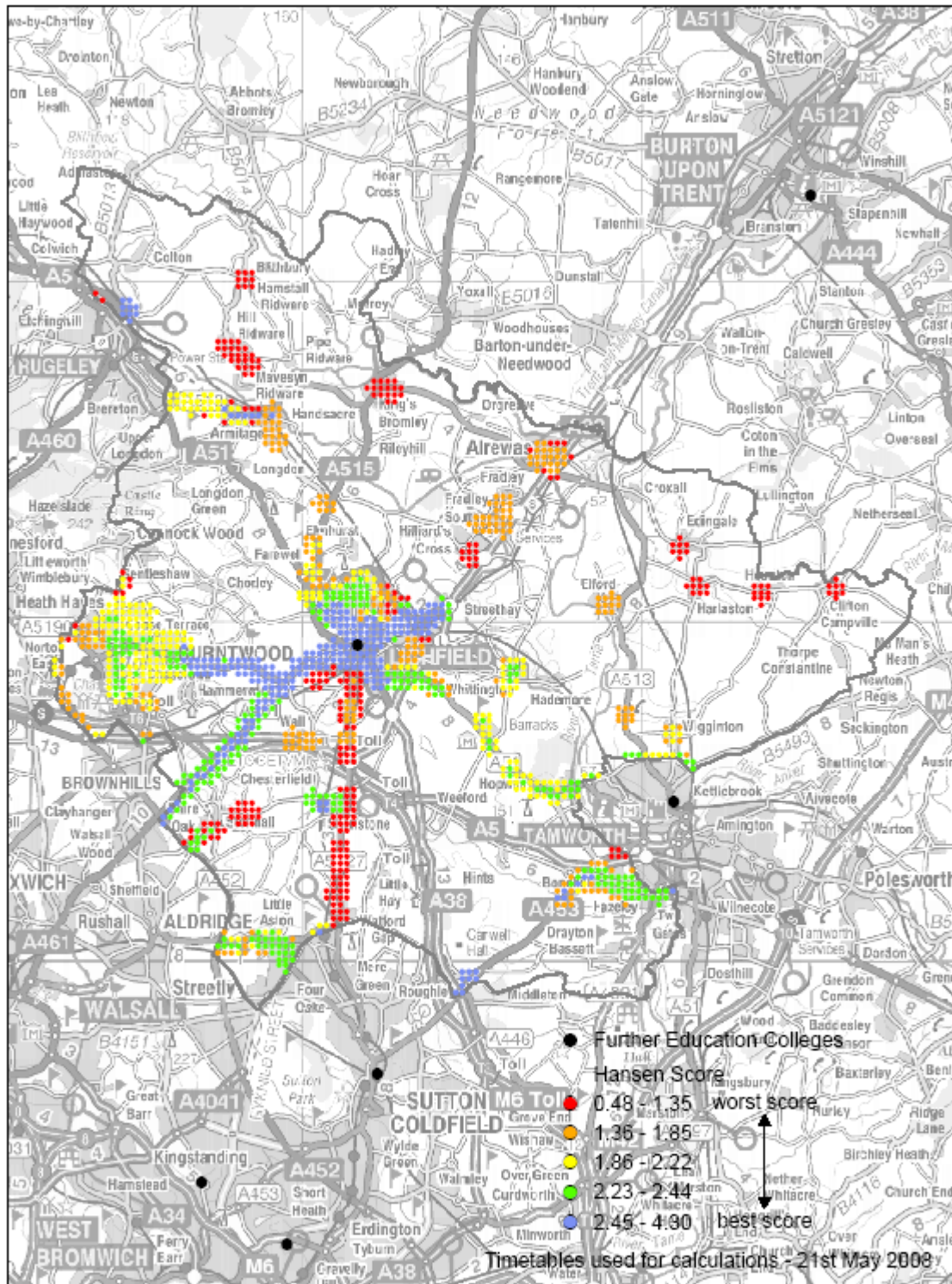
Figure 1: Public Transport Access to Employment (Bus and Rail)
 Wednesday 07:30 to 09:30 hours



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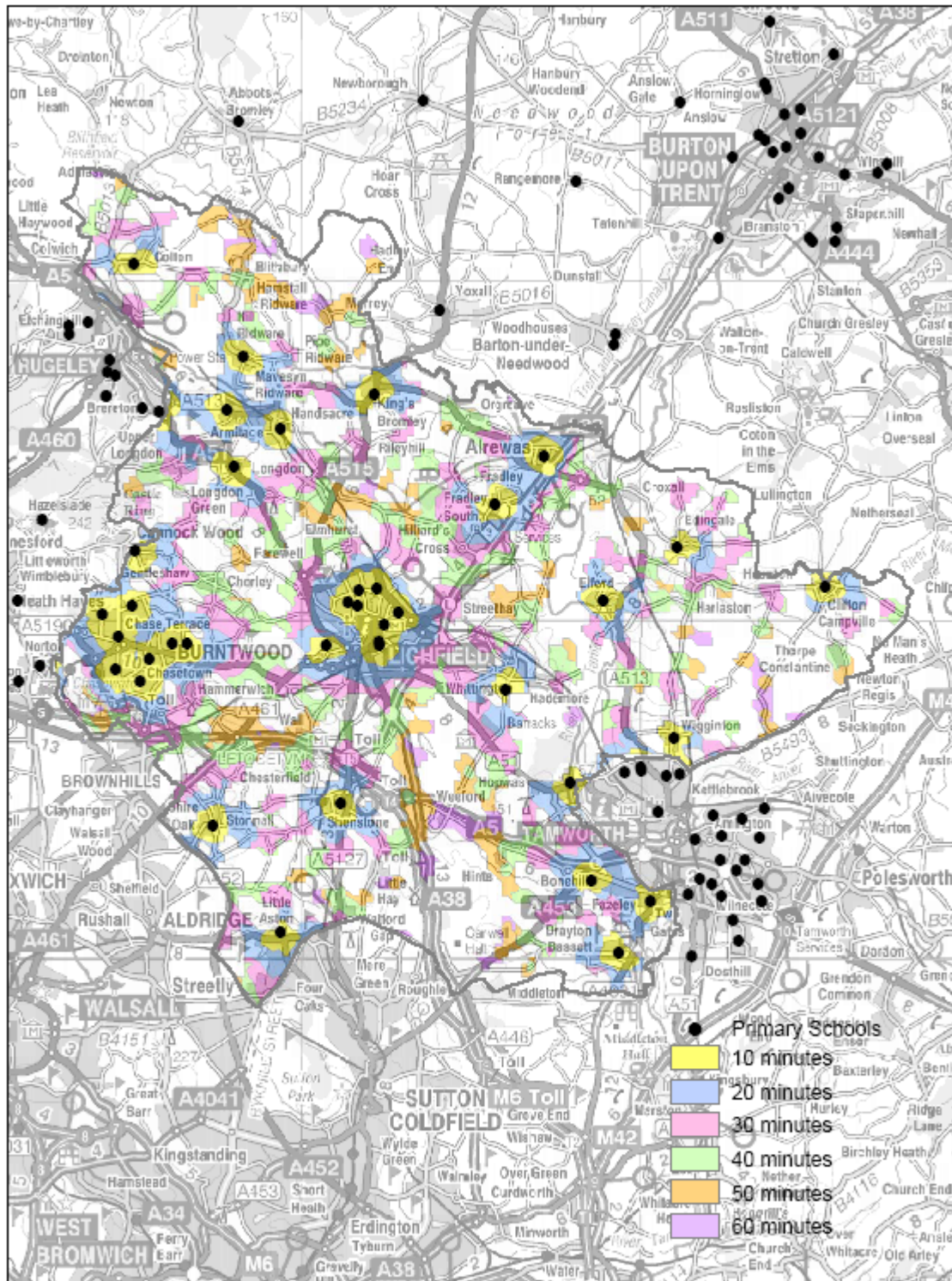
Figure 2: Public Transport Access to Further Education Colleges
(Bus and Rail) Wednesday 07:00 to 09:00 hours



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Figure 3: Walking Times to Primary Schools

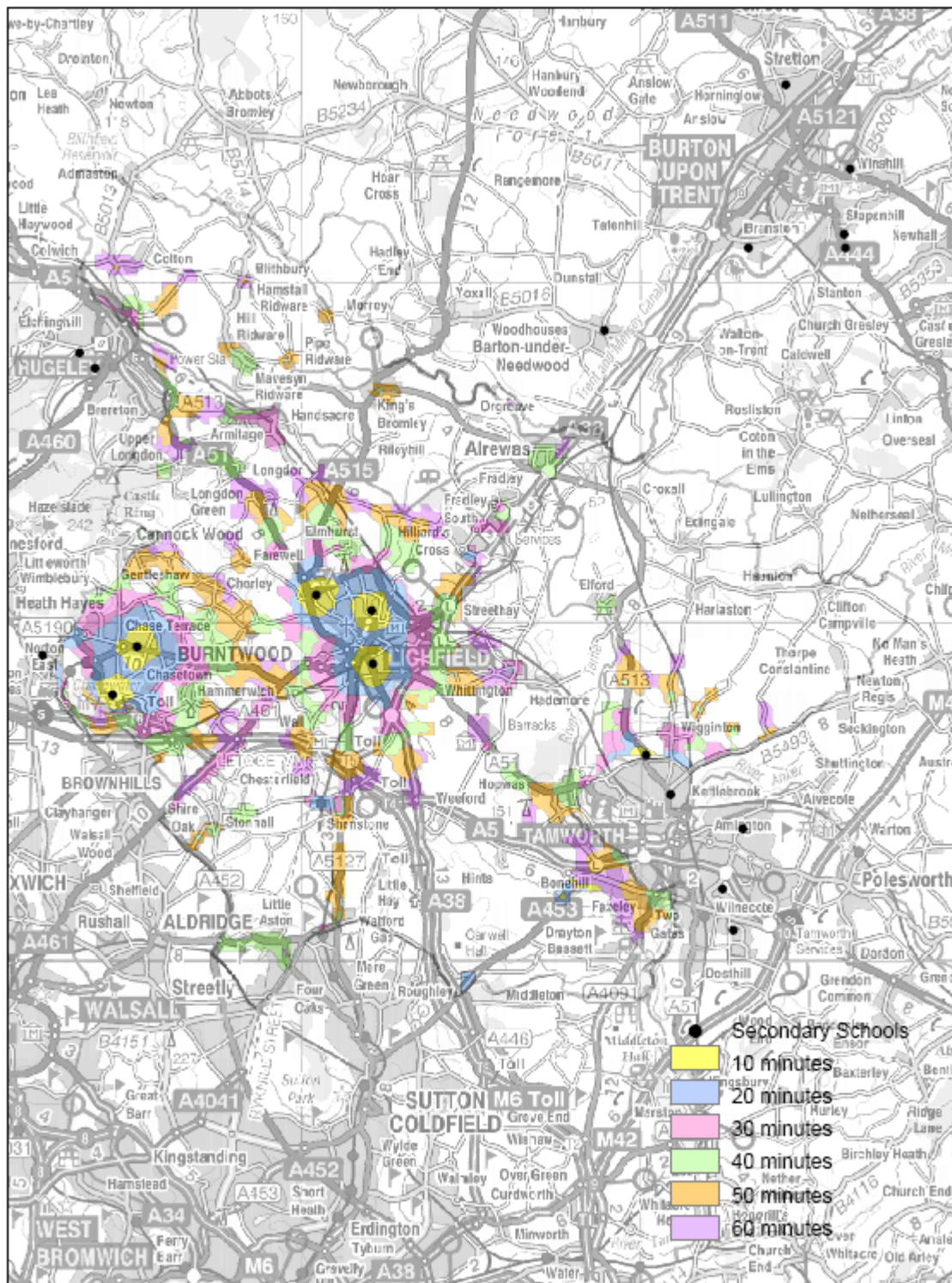


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Figure 4: Walking Times to Secondary Schools

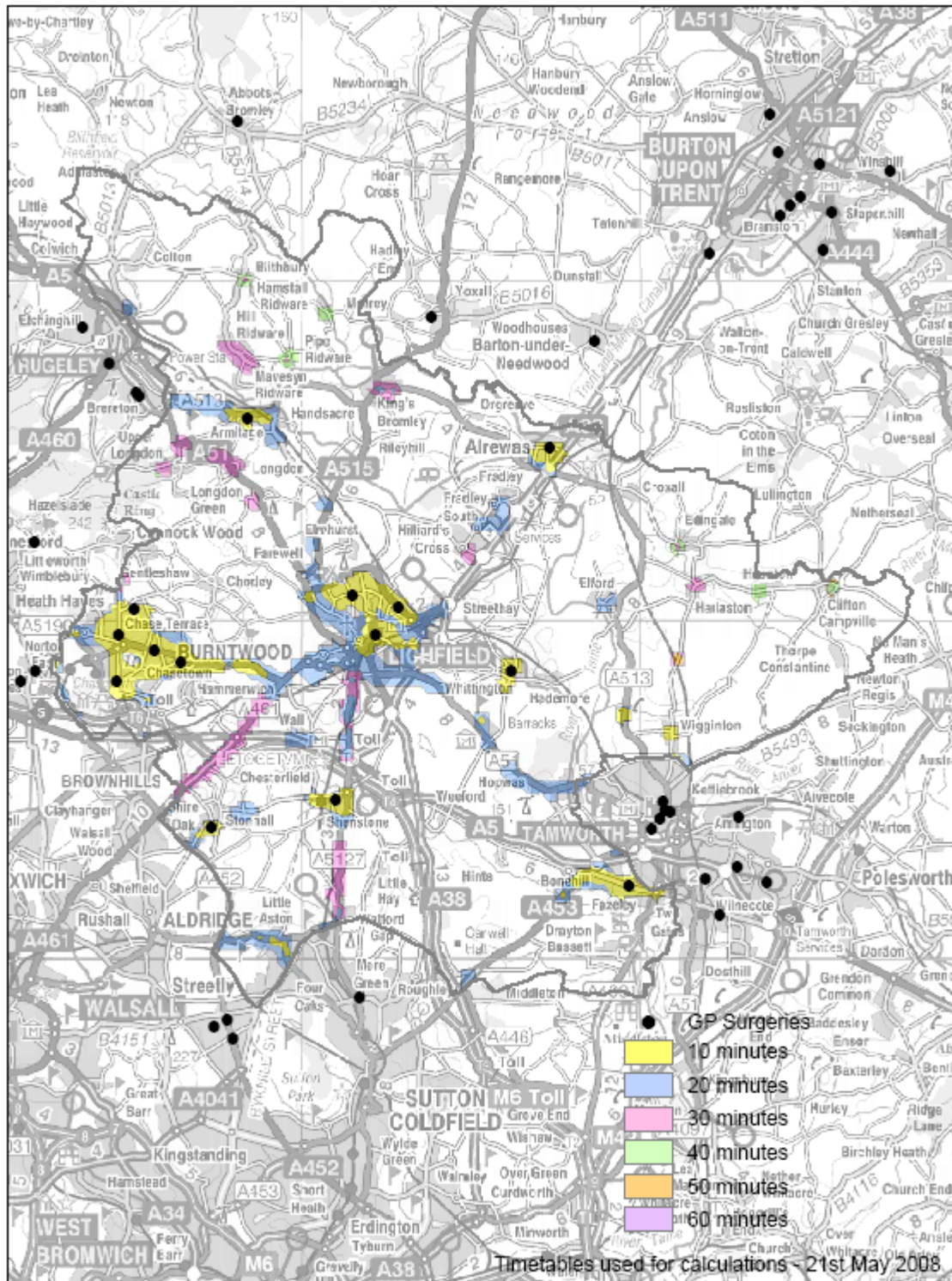


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Figure 5: Public Transport Access to GP Surgeries (Bus and Rail)
(Wednesday 08:00 to 10:00 hours)

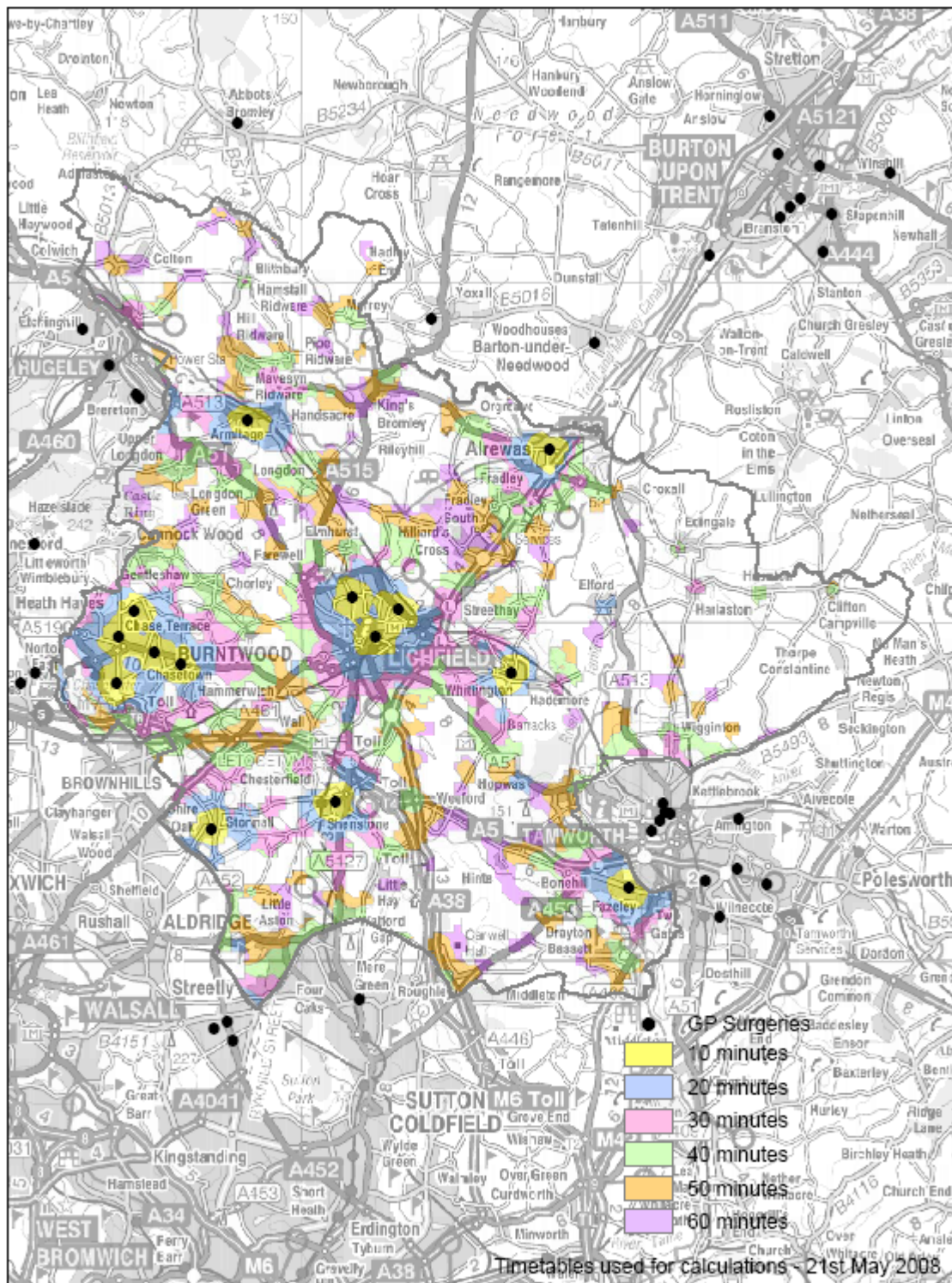


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Figure 6: Walking Times to GP Surgeries

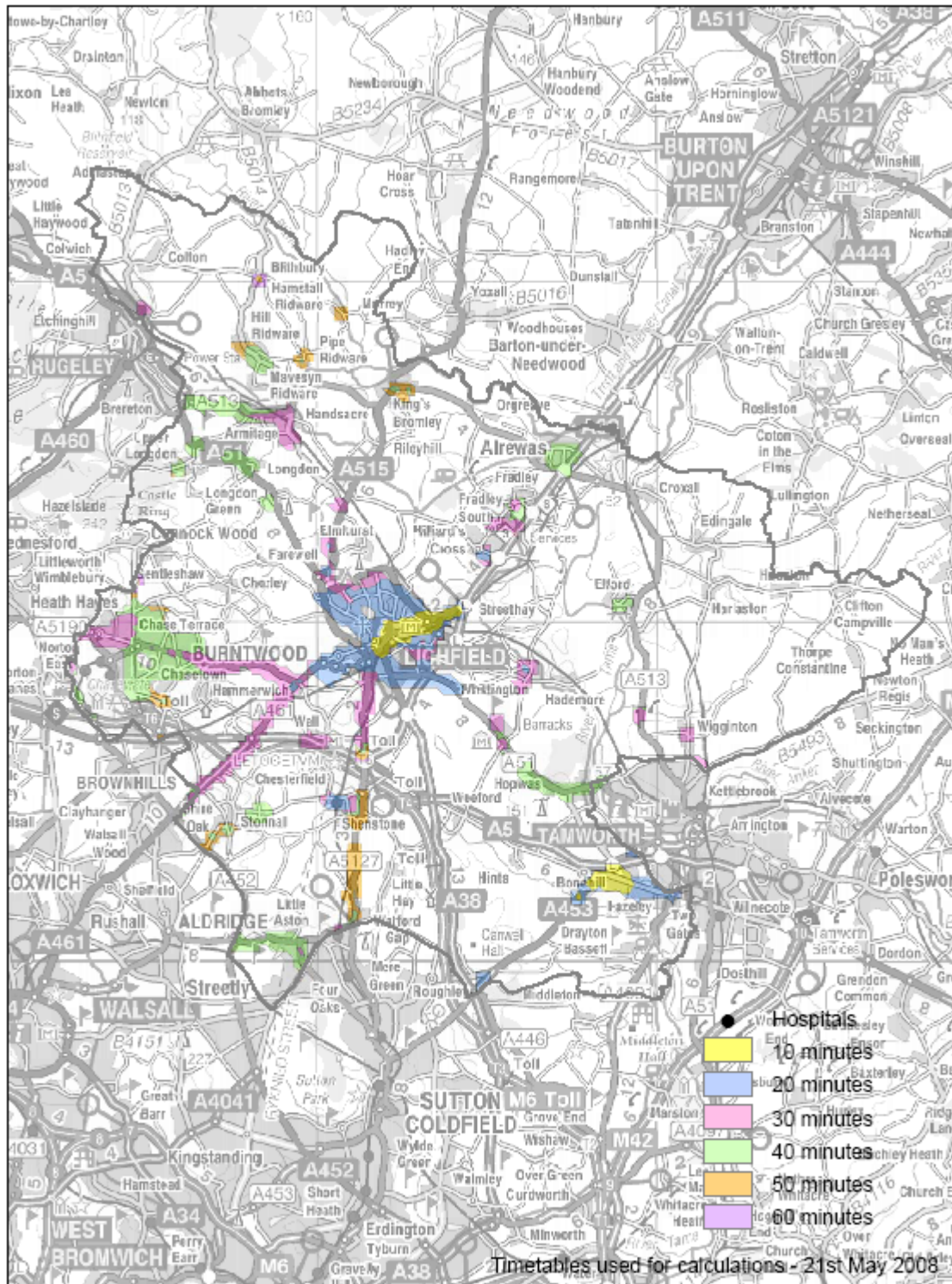


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Figure 7: Public Transport Access to Hospitals (Bus and Rail)
 Wednesday 08:00 to 10:00 hours

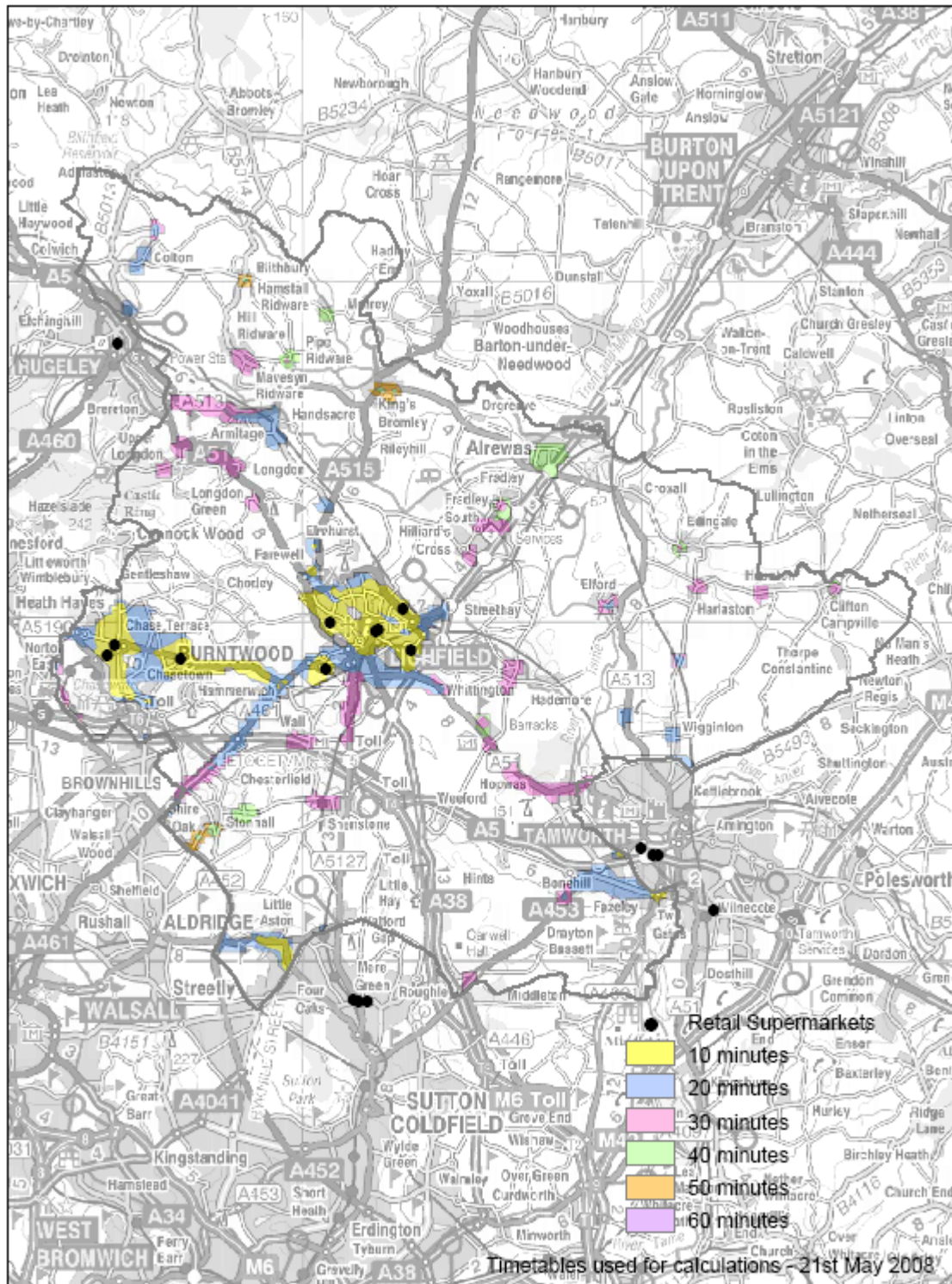


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Figure 8: Public Transport Access to Retail Supermarkets (Bus and Rail) Wednesday 10:00 to 13:00 hours

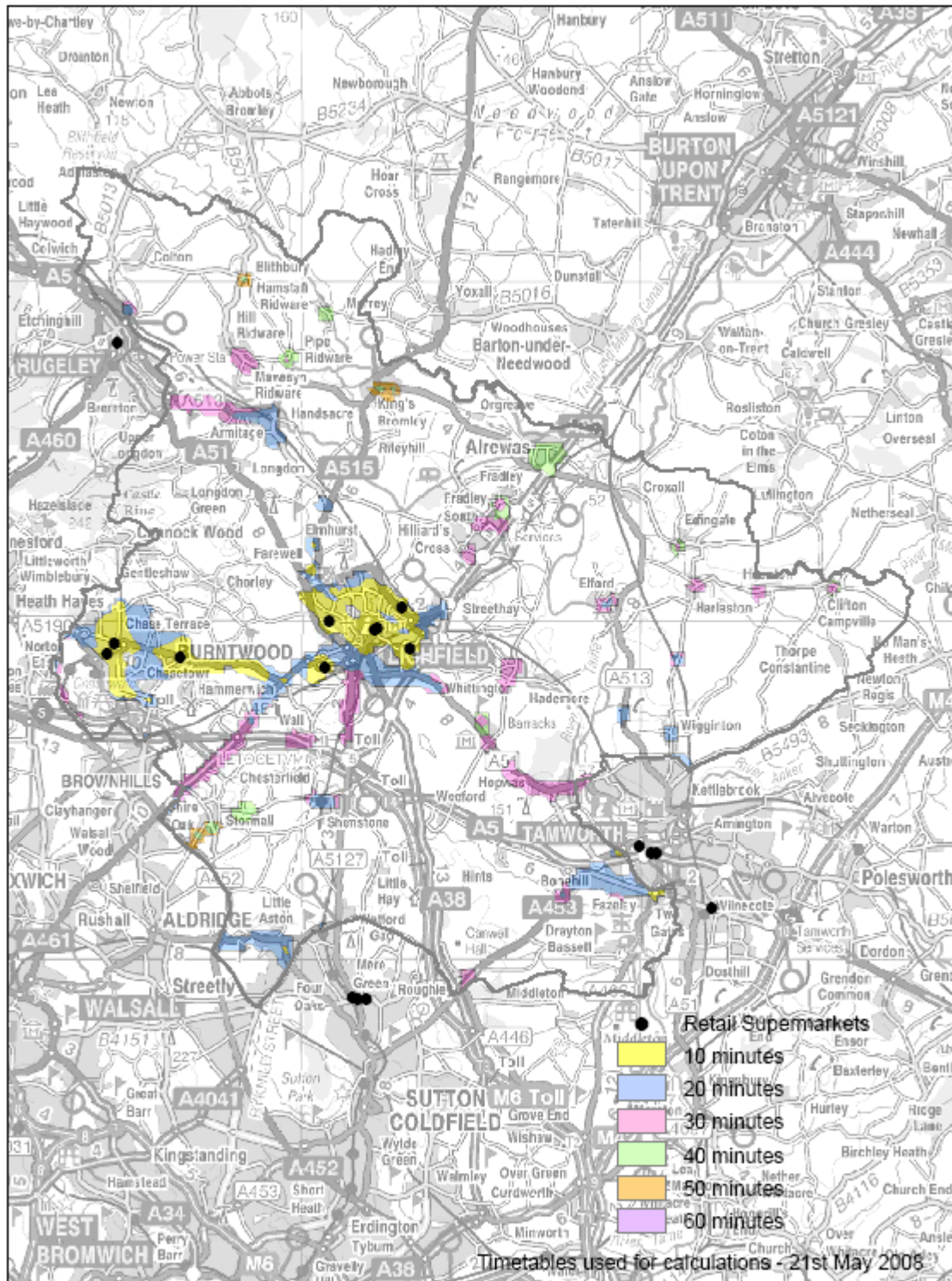


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Figure 9: Public Transport Access to Retail Supermarkets
(Bus and Rail) Saturday 10:00 to 13:00 hours



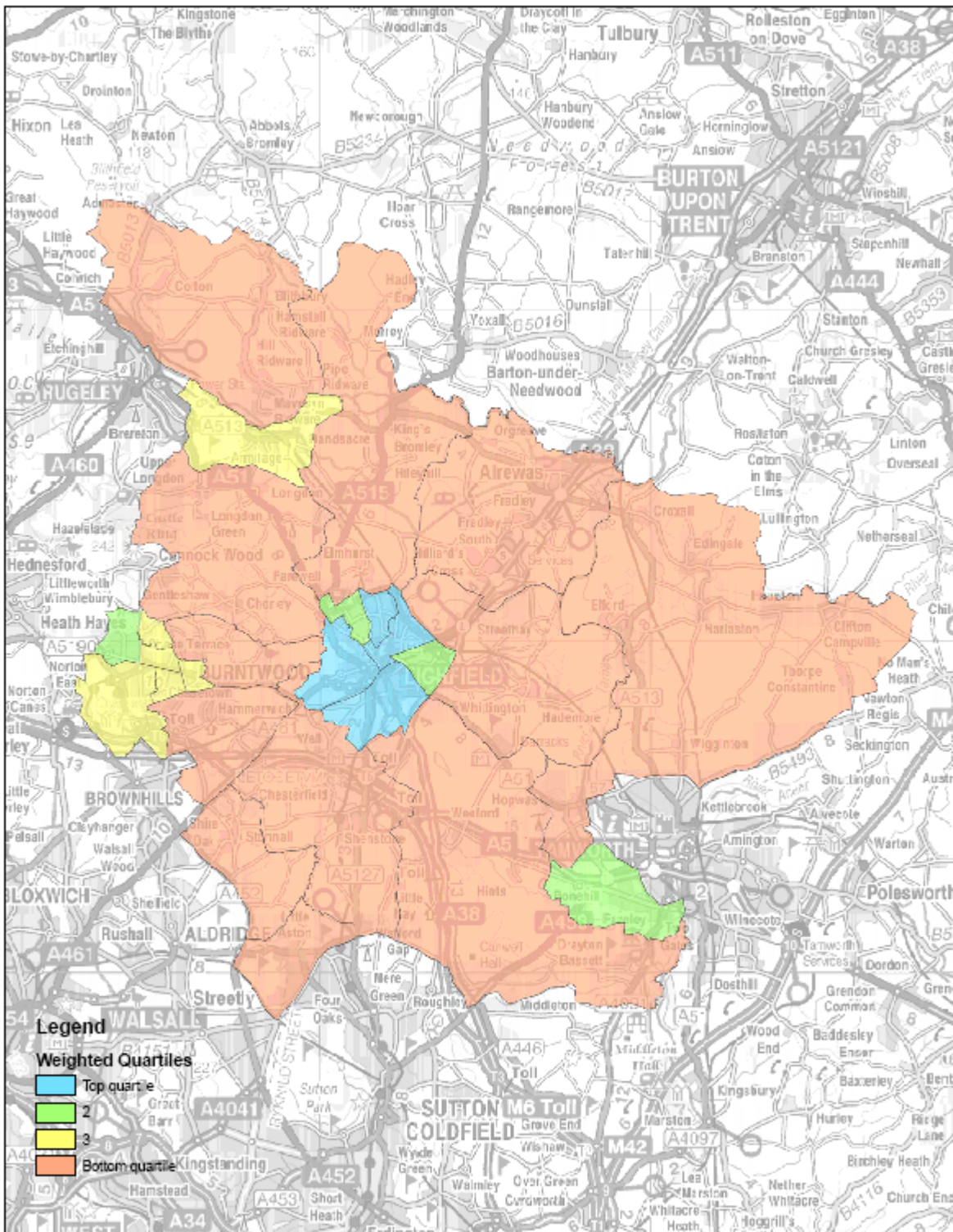
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Appendix B – Composite Accessibility Maps

Figure10: Weighted Overall Composite Accessibility Score

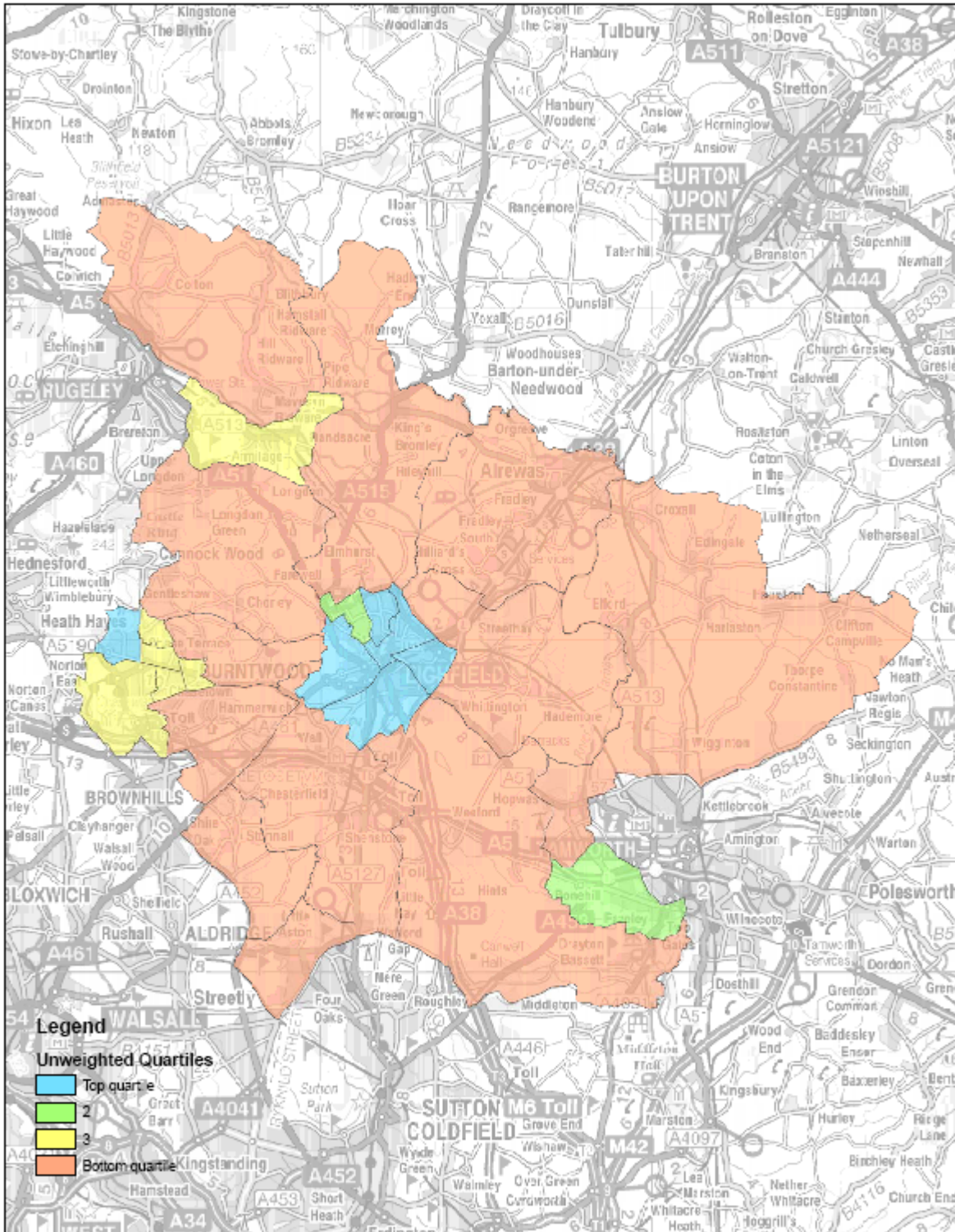


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Figure 11: Unweighted Overall Composite Accessibility Score

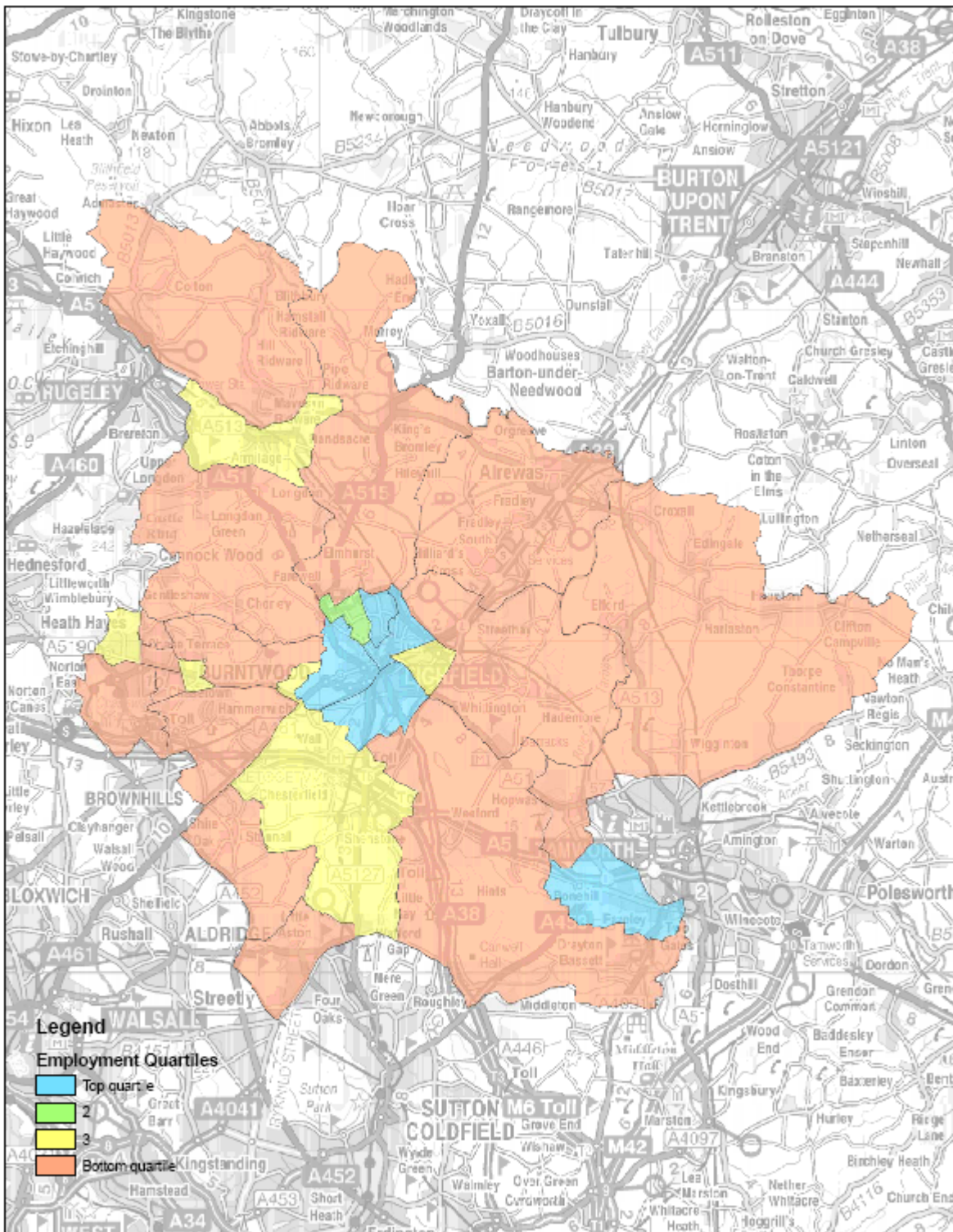


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Figure 12: Public Transport Access to Employment (Bus and Rail)
Wednesday 07:30 to 09:30 hours

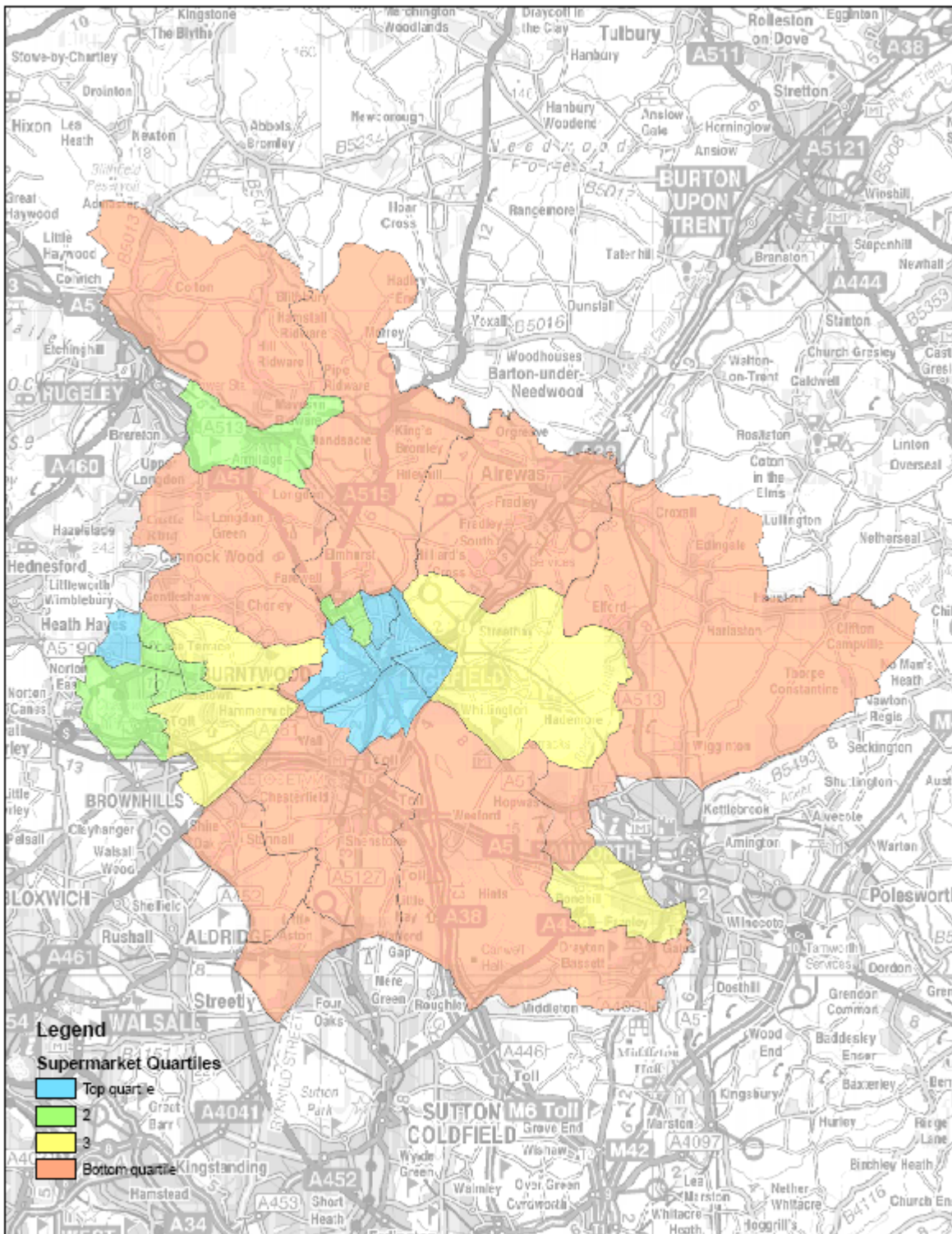


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Figure 13: Public Transport Access to Supermarkets (Bus and Rail)
Saturday 10:00 to 13:00 hours

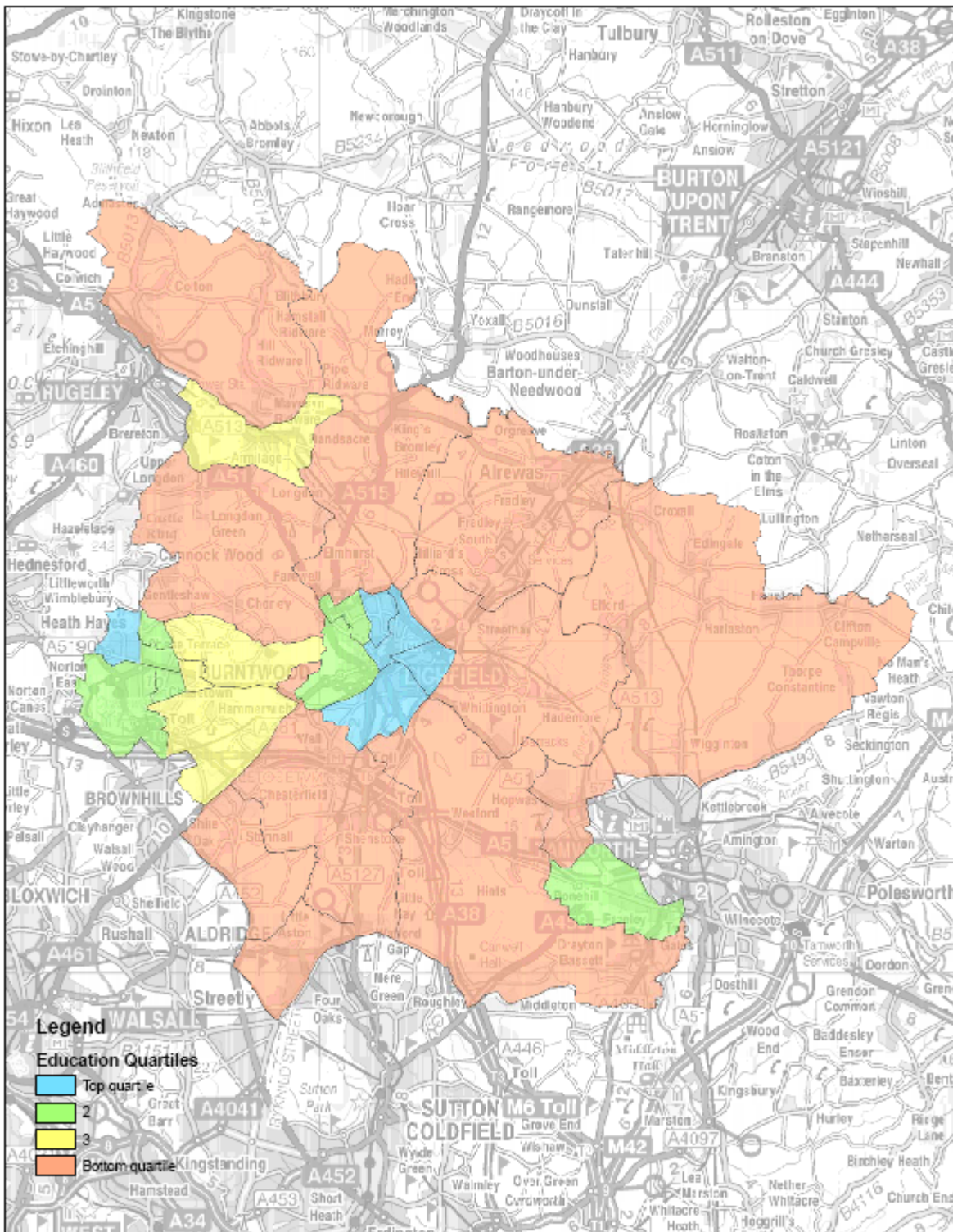


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Figure 14: Education Composite Accessibility Score

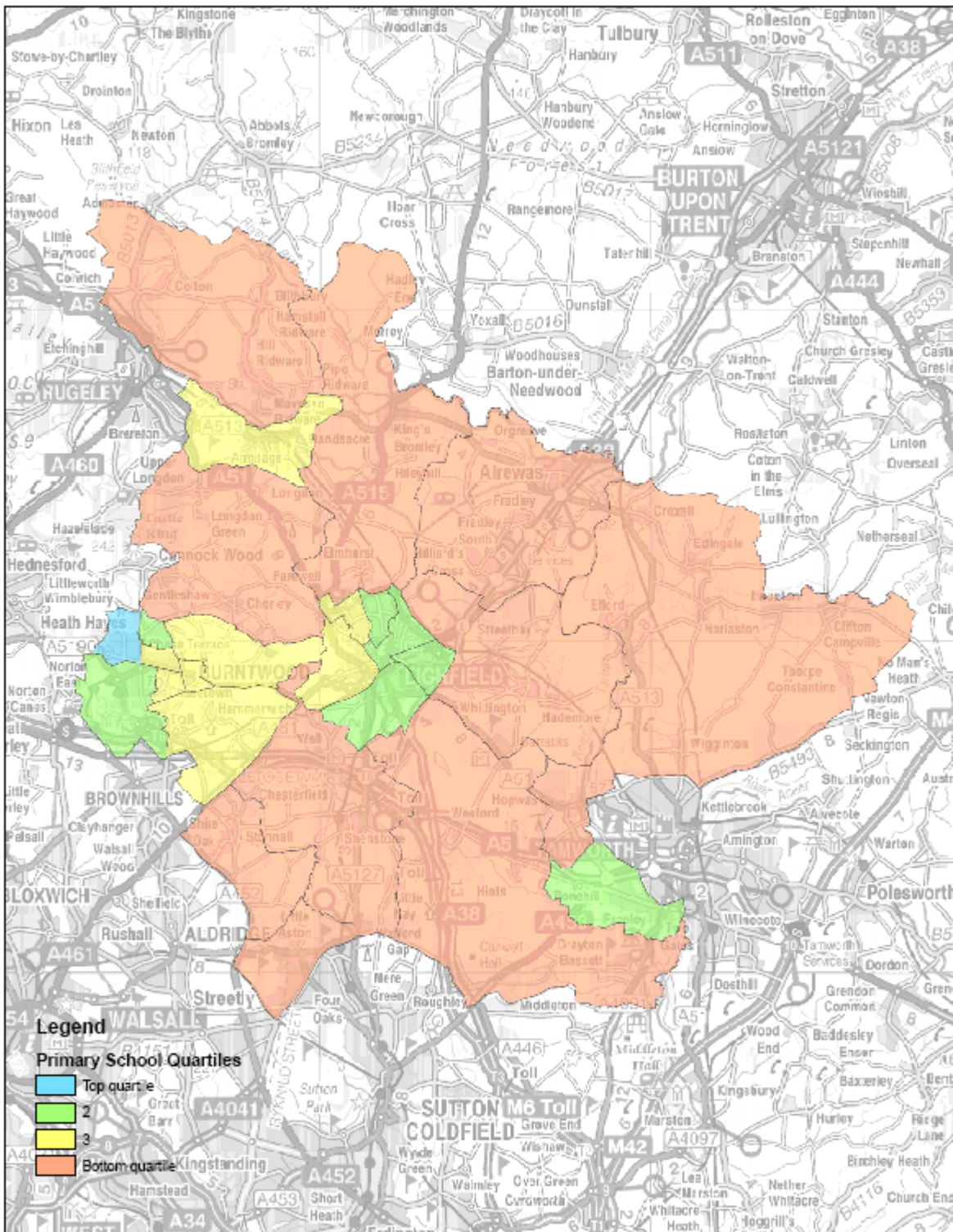


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Figure 15: Walking Access to Primary Schools

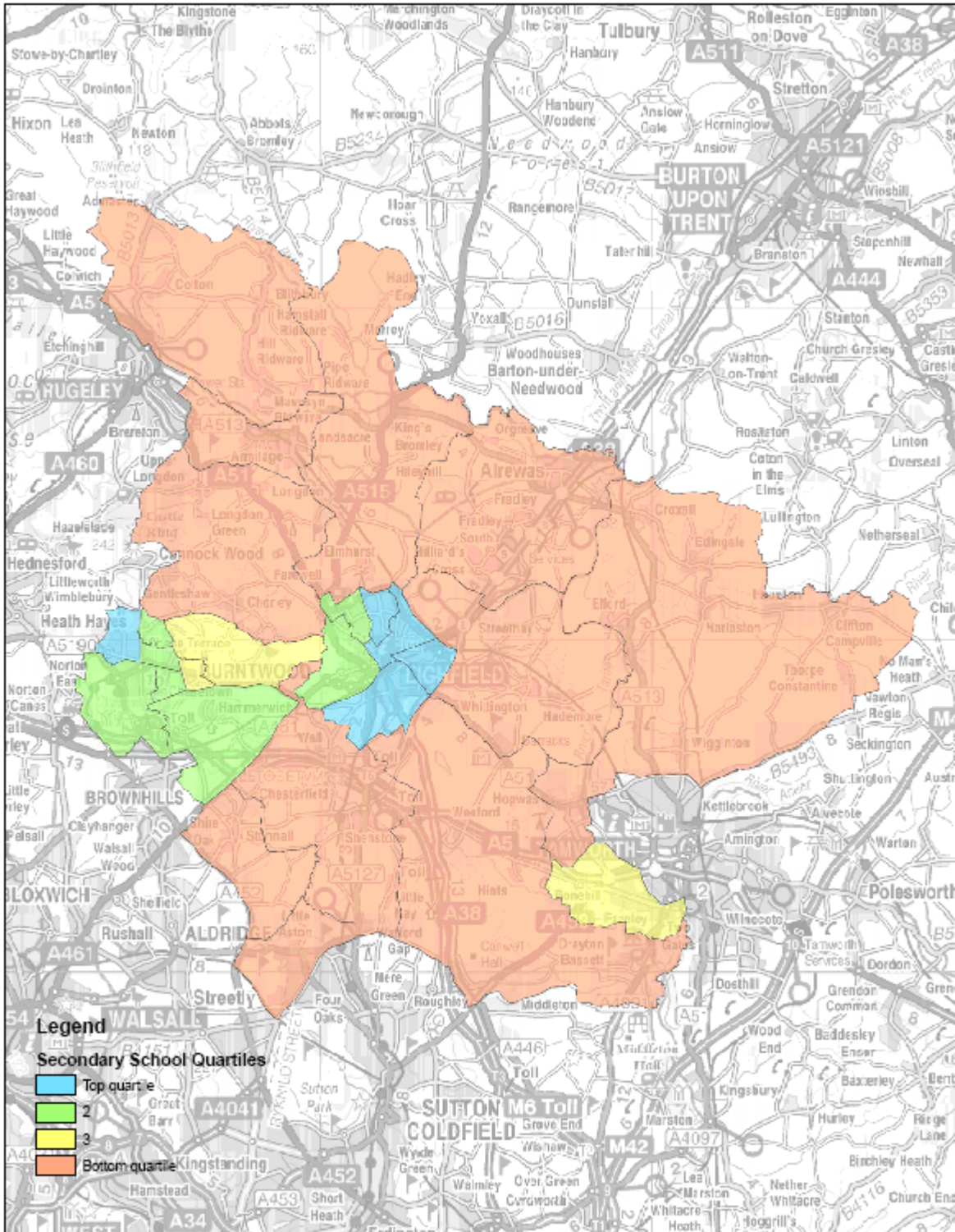


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Figure 16: Walking Access to Secondary Schools

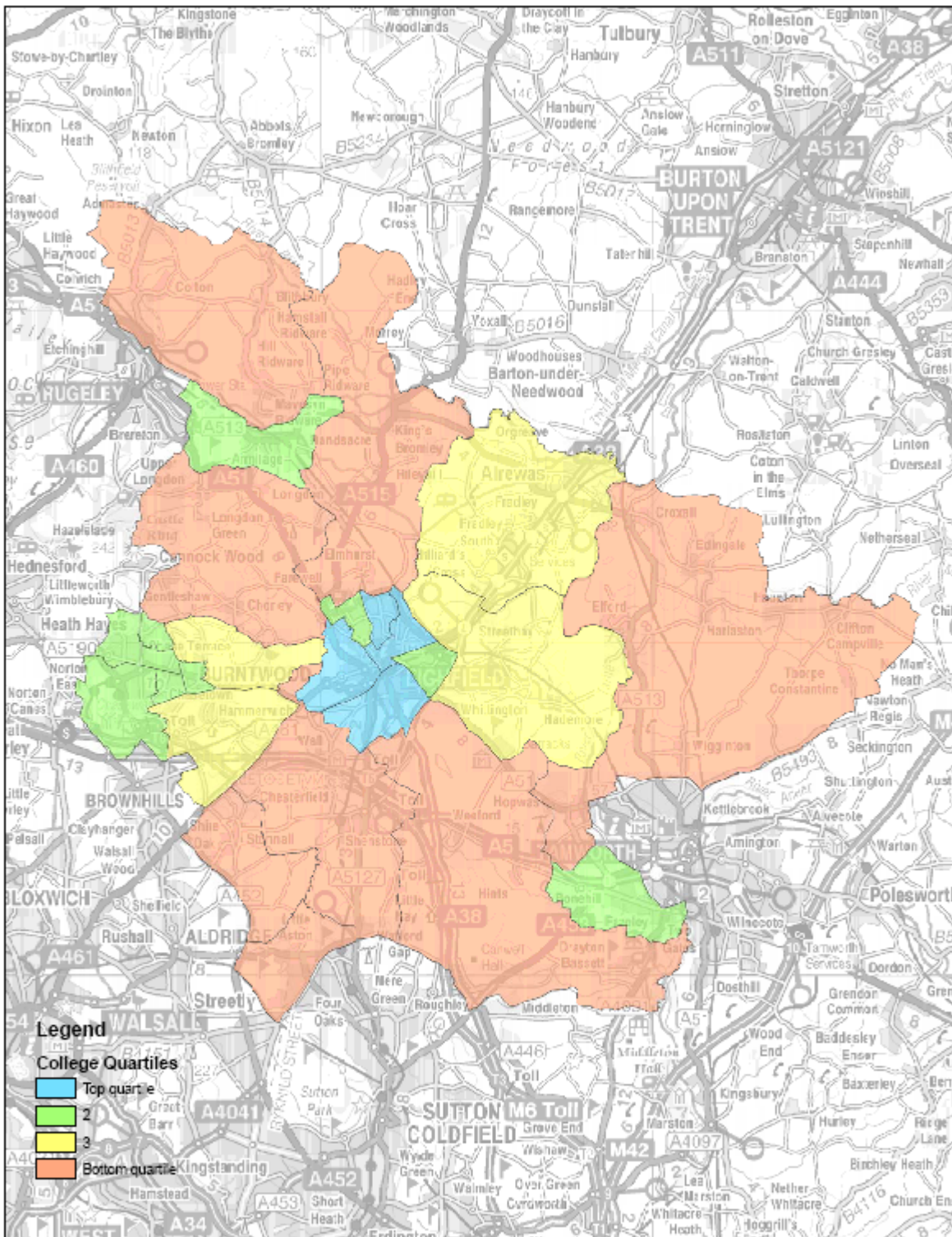


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Figure 17: Public Transport Access to Colleges (Bus and Rail)
Wednesday 07:00 to 09:00 hours

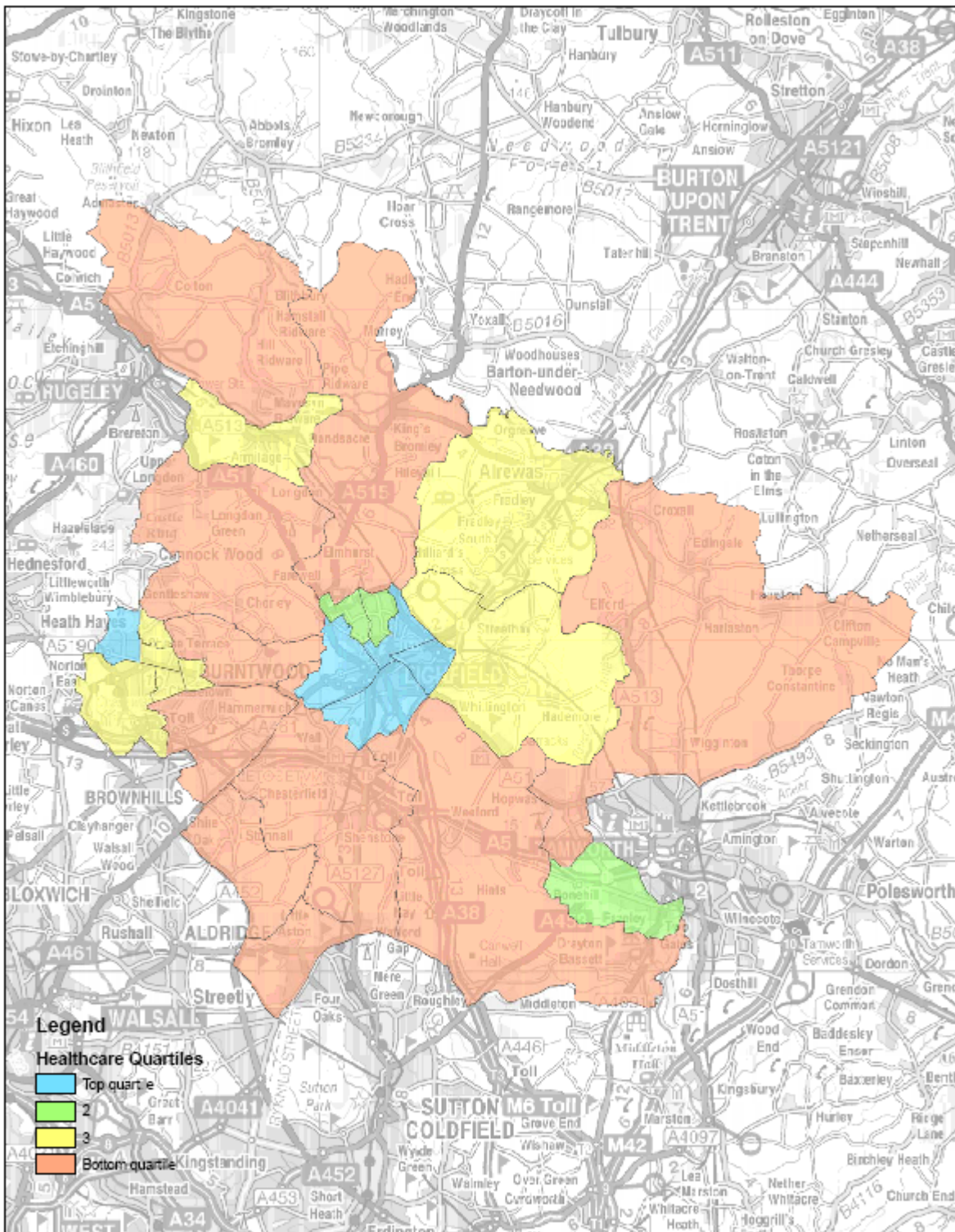


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Figure 18: Healthcare Composite Accessibility Score

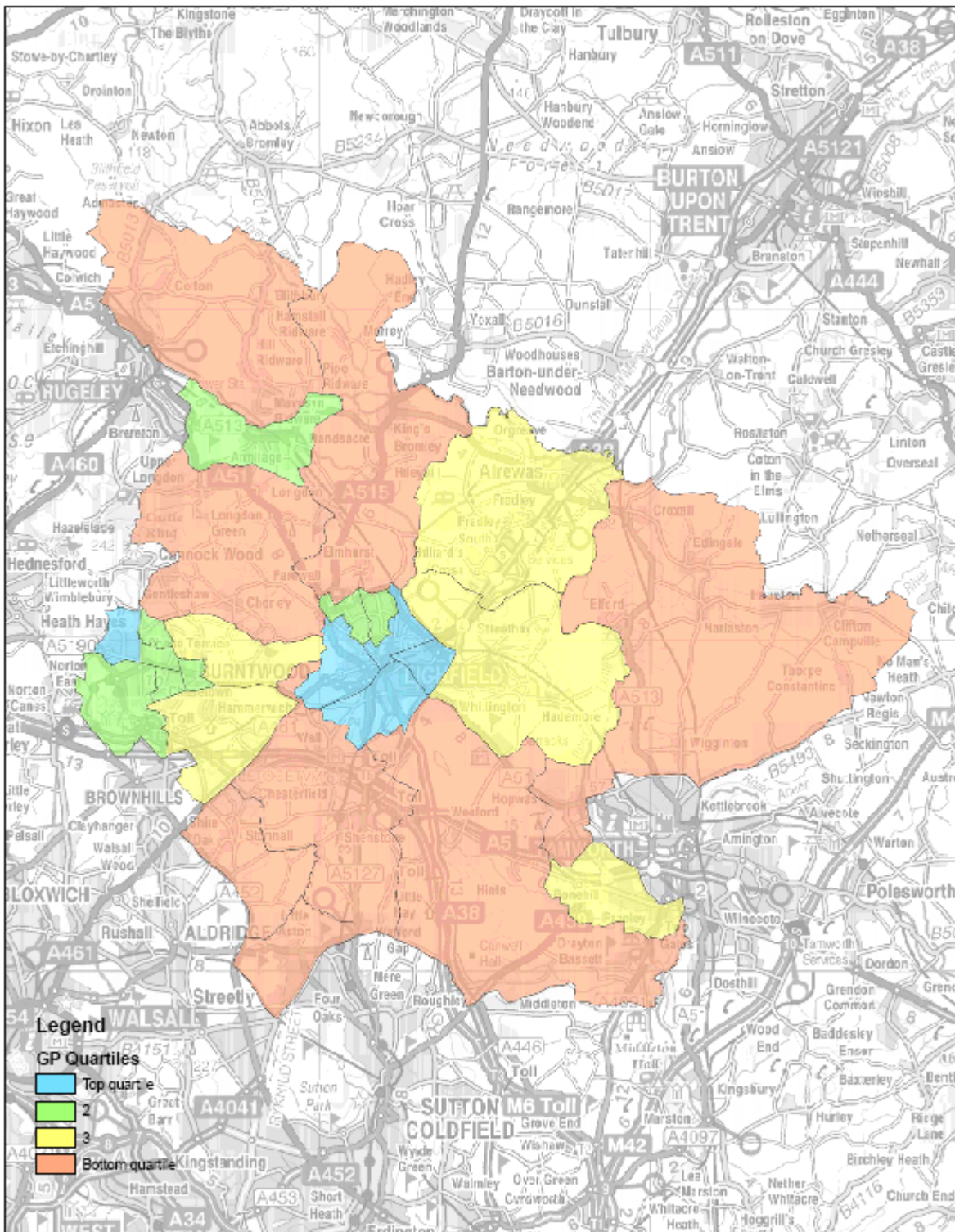


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Figure 19: Public Transport Access to GPs (Bus and Rail)
Wednesday 08:00 to 10:00 hours

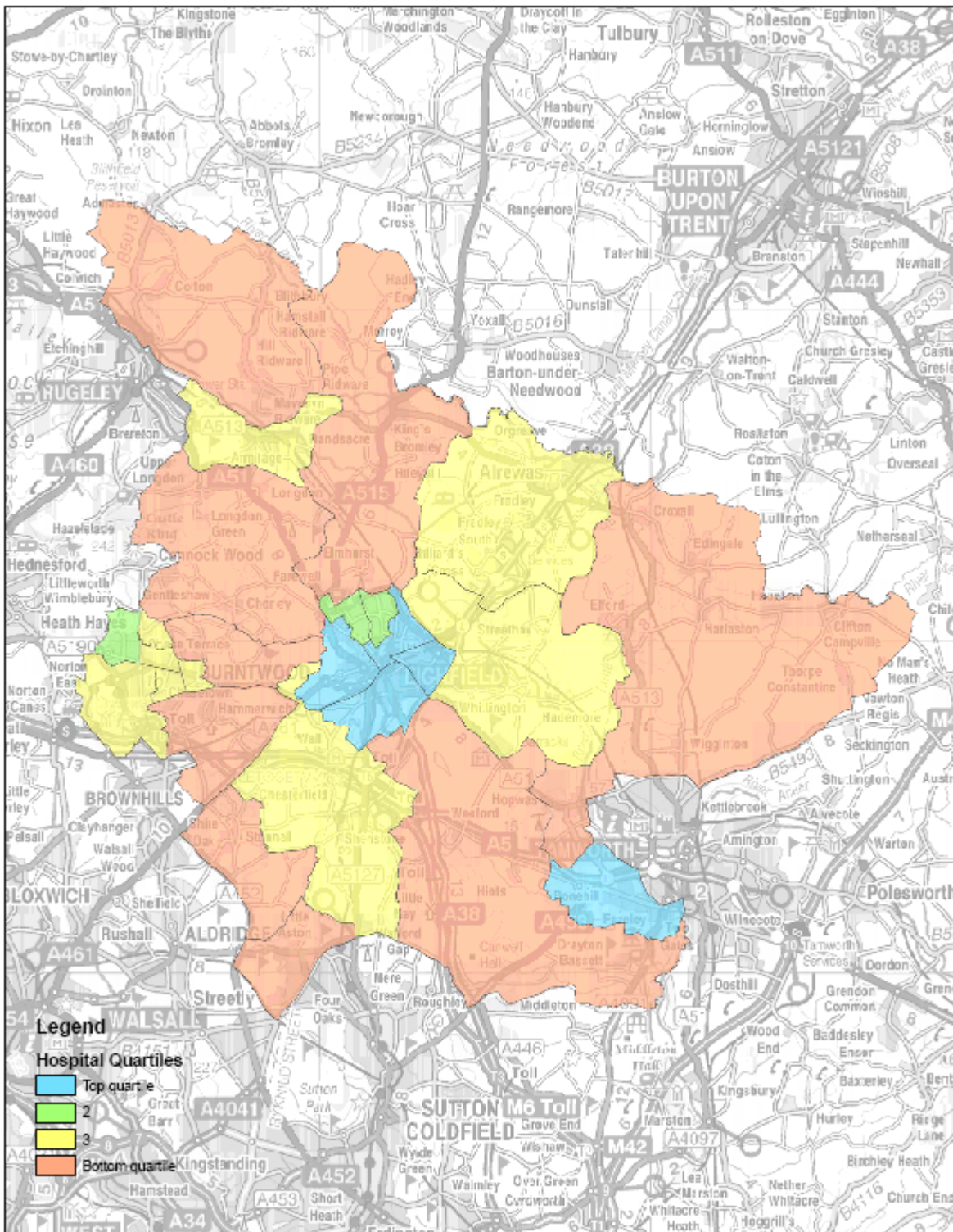


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Figure 20: Public Transport Access to Hospitals (Bus and Rail)
Wednesday 08:00 to 10:00 hours



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Appendix C – Site Assessment Frameworks