Braintree Local Plan Review

Sustainable Accessibility & Baseline Appraisal

Technical Report Appendices

January 2026

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Appendices

Appendix A – RAG Assessment Criteria

Table A.1 – Assessment criteria used in the sustainable accessibility assessment

Indicator	Data Source	RAG Measure	Green	Amber	Red
Accessibility to urban centres	Three Podaris runs using cycling, walking and PT Data to determine journey times to urban centres	Settlement area within a reasonable walk, cycle or PT journey time to existing urban centres	Settlement area within a 15 minute walk or cycle journey to an urban centre	Settlement area within a 30 minute public transport journey to an urban centre	Settlement area greater than a 30 minute public transport journey to an existing urban centre
Accessibility to employment locations	Three Podaris runs using cycling, walking and PT Data to determine journey times to employment locations	Settlement area within a reasonable walk, cycle or PT journey time to existing employment locations	Settlement area within a 15 minute walk or cycle journey to an employment location	Settlement area within a 30 minute public transport journey to an employment location	Settlement area greater than a 30 minute public transport journey to an employment location
Accessibility to railway stations (walking and cycling)	Two Podaris runs using cycling and walking to determine journey times to railway stations	Settlement area within a reasonable walk or cycle journey time to railway stations	Settlement area within a 15 minute walk or cycle journey to a railway station with >1 service in each direction (07:00 – 09:00 weekdays)	Settlement area within a 15 minute walk or cycle journey to a railway station with any peak time railway service	Settlement area greater than a 15 minute walk or cycle journey to a railway station
Accessibility to railway stations (public transport)	One Podaris run using PT data to determine journey times to railway stations	Settlement area within a reasonable public transport journey time to railway stations	Settlement area within a 30 minute public transport journey to a railway station with >1 service in each direction (07:00 – 09:00 weekdays)	Settlement area within a 30 minute public transport journey to a railway station with any peak time railway service	Settlement area greater than a 30 minute public transport journey to a railway station

Indicator	Data Source	RAG Measure	Green	Amber	Red
Walking access to bus stops	One Podaris run using Podaris bus stop catchment walking output data to determine distances to bus stops	Settlement area within a reasonable walking distance to nearest bus stop with >1 bus per hour	Settlement area within 400m of a bus stop	Settlement area within 800m of a bus stop	Settlement area over 800m from a bus stop
Mapping bus services and frequency	Essex County Council	Settlement area within 500m of a high frequency bus service (86+ a week)	High frequency bus service within the settlement area or settlement area within 500m* of a high frequency bus service	Medium frequency bus service within the settlement area or settlement area within 500m of a medium frequency bus service	Low / limited frequency bus service within the settlement area or settlement area within 500m of a low / limited frequency bus service
UFBB internet connectivity	Ofcom broadband data (2024)	Settlement area able to access UFBB	Settlement area contains at least 75% of premises that are able to receive UFBB	Settlement area contains at least 50% of premises that are able to receive UFBB	Settlement area contains less than 50% of premises that are able to receive UFBB
Accessibility to healthcare	Google Maps Podaris	Settlement area within a reasonable distance to a healthcare facility (GP, drop-in, hospital)	Healthcare facility within the settlement area or settlement area within 1km* of a healthcare facility	Settlement area within 1 - 4km of a healthcare facility	Settlement area further than 4km from a healthcare facility
Accessibility to nursery	Google Maps Podaris	Settlement area within a reasonable distance to a nursery	Nursery within the settlement area *or* settlement area within 400m* of a nursery	Settlement area within 400m - 1km of a nursery	Settlement area further than 1km from a nursery

Indicator	Data Source	RAG Measure	Green	Amber	Red
Accessibility to primary schools	Google Maps Podaris	Settlement area within a reasonable distance to a primary school	Primary school within the settlement area *or* settlement area within 400m* of a primary school	Settlement area within 400m - 1km of a primary school	Settlement area further than 1km from a primary school
Accessibility to secondary schools	Google Maps Podaris	Settlement area within a reasonable distance to a secondary school	Secondary school within the settlement area *or* settlement area within 400m* of a secondary school	Settlement area within 400m - 1.5km of a secondary school	Settlement area further than 1.5km from a secondary school

*Distance measured from the settlement area's centroid (centre point).

Appendix B – Podaris Parameters

Table B.1 – A list of urban centres, employment locations and railway stations used in the Podaris analysis

Urban Centres	Employment Locations	Railway Stations
Comprising cities and towns in Braintree District with access to key public facilities including banks, post offices and supermarkets. *Also comprising urban centres lying outside of Braintree District that would generate cross-boundary movements to / from settlement areas located near to the administrative border.*	*Comprising moderate-to-large sized industrial sites, business parks and service areas located within Braintree District.* *Also comprising employment locations lying outside of Braintree District that would generate cross-boundary movements to / from settlement areas located near to the administrative border.*	*Comprising all mainline and branch line railway stations located within Braintree District.* *Also comprising railway stations lying outside of Braintree District that would generate cross-boundary movements to / from settlement areas located near to the administrative border.*
Braintree Chelmsford Colchester Halstead Haverhill Sudbury Witham	Axial Way BlueBridge Industrial Estate Braintree Freeport Colchester Business Park Dukes Park Industrial Estate Earls Colne Business Park Horizon 120 Phase 1 Lakes Industrial Park Lynderswood Business Park Moonhall Business Park Old London Road Skyline 120 Business Park Springfield/Hedgerows Business Springwood Industrial Park Stansted Cargos Centre Stansted Northside Sturmer Industrial Estate Waterhouse Business Centre Widford Industrial Estate Witham Industrial Estate	Beaulieu Park Railway Station Braintree Freeport Railway Station Braintree Railway Station Bures Railway Station Chappel and Wakes Colne Railway Station Chelmsford Railway Station Colchester Railway Station Colchester Town Station Cressing Railway Station Hatfield Peverel Railway Station Kelvedon Railway Station Marks Tey Railway Station Sudbury Railway Station White Notley Railway Station Witham Railway Station

Table B.2 – Podaris Methodologies.

Metric	Methodology	Data Source
Walking connectivity to Urban Centres / Railway Stations / Employment Locations	Calculated through Podaris, using the isochrone analysis which provided travel times using the 2021 population census data households of Braintree District. Podaris uses the Bus Open Data Service for its bus Open Roads and the RDG Public Transport network links. Any trips beyond 15 minutes were not measured in the calculation.	OS Open Roads Data produced by Ordnance Survey. Downloaded from DataCutter. Public Transport Dataset imported from Podaris Internal database using Open Roads and Public Transport network links Google Maps research for Sudbury Branch Line location
Cycling connectivity to Urban Centres / Railway Stations / Employment Locations	Calculated through Podaris, using the isochrone analysis which provided travel times using the 2021 population census data households of Braintree. Podaris uses the Bus Open Data Service for its bus Open Roads and the RDG Public Transport network links. Any trips beyond 15 minutes were not measured in the calculation.	
Public transport connectivity to Urban Centres / Railway Stations / Employment Locations	Calculated through Podaris, using the isochrone analysis which provided travel times using the 2021 population census data households of Braintree. Podaris uses the Bus Open Data Service for its bus Open Roads and the Railways Delivery Groud (RDG) Public Transport network links. Any trips beyond 60 minutes were returned as inaccessible.	
Accessibility to bus stops	Calculated through Podaris, using the Braintree Bus Network extracted from Podaris, calculating the distance from Households, using the Braintree 2021 population Census data. It provided a walking distance to the nearest bus stop with a frequency of service greater than 1 per hour. Any trips further than 800m were not recorded in the calculation.	

Table B.3 – Podaris settings for the 'Origin-Destination' calculations (walking, cycling and PT access to urban centres / railway stations / employment locations).

Podaris Parameter	Walking	Cycling	Public Transport
Type/destination	From origin to destination	From origin to destination	From origin to destination
Network	N/A	N/A	Braintree Public Transport Network
Duration Contours	5m, 10m, 15m (minutes)	5m, 10m, 15m (minutes)	15m, 30m, 45m, 60m (minutes)
Dataset	Braintree Census Data Output Areas 2021	Braintree Census Data Output Areas 2021	Braintree Census Data Output Areas 2021
Transit Options			
Day	N/A	N/A	Tuesday
Time Period	N/A	N/A	7am – 9am
Max Access Distance	N/A	N/A	400m
Wait Times	N/A	N/A	Timetable
Transfer limit	1	1	1

* Decreased from the default to meet our criterion for walking distances outlined in Appendix A.

Table B.4 - Podaris settings for the 'Local Accessibility' calculations (walking access to bus stops).

Podaris Parameter	Walking
Step Type	Distance
Distance Contours	200m, 400m, 600m, 800m
Road Network (Crow Flies/ Street)	Street
Station Parametres	
Day	Tuesday
Min. frequency (vph)	1 vph
Start Time	07:00
End Time	09:00

*Frequency changed from the default to 1 per hour to capture all regular services in the district.

Appendix C – Map and Table Outputs of the Sustainable Accessibility Analysis

C.1 – Podaris Mapped Outputs. (Created using Podaris software, displayed in QGIS)

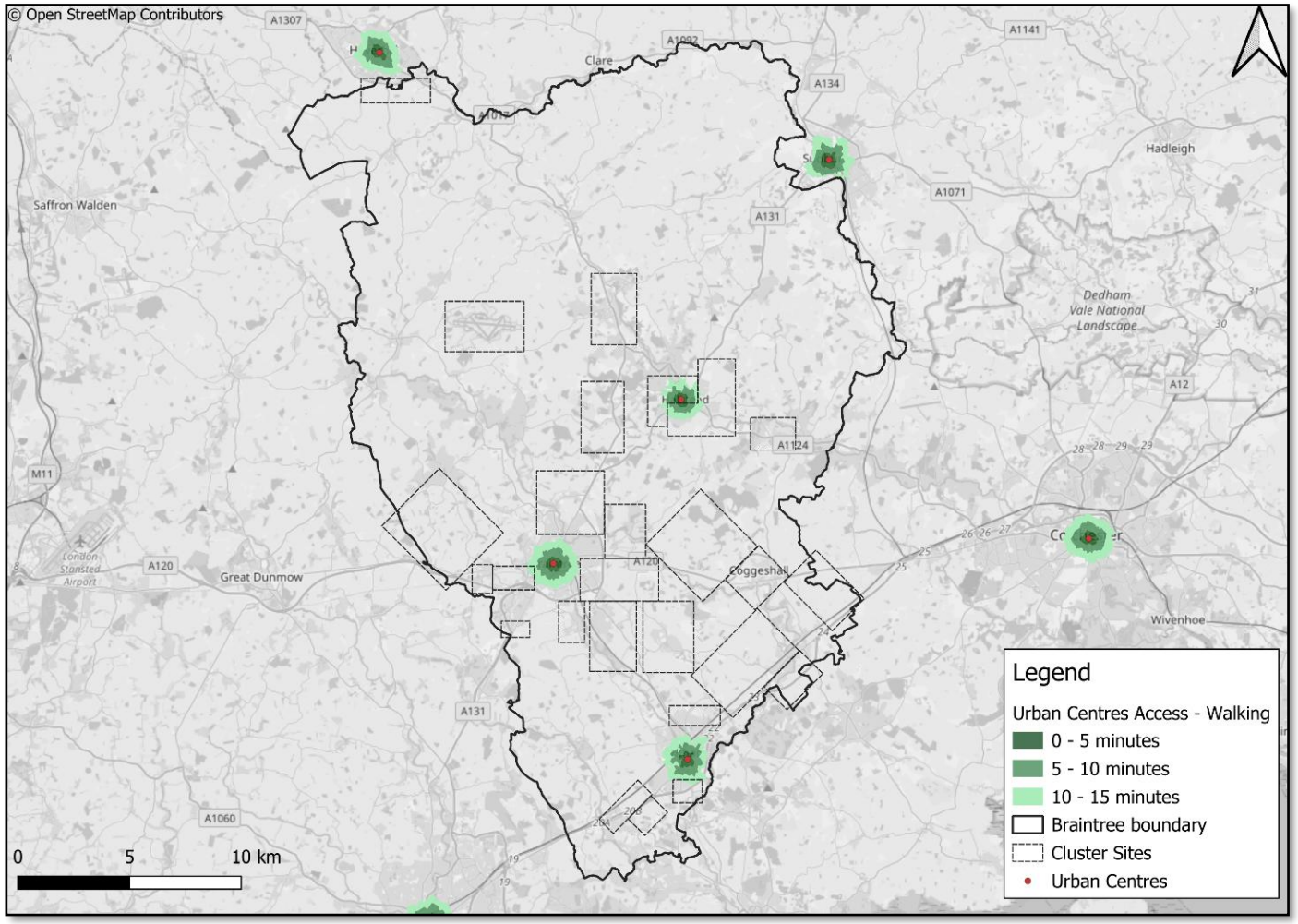

Figure C.1.1. Podaris mapped output illustrating accessibility to urban centres – walking

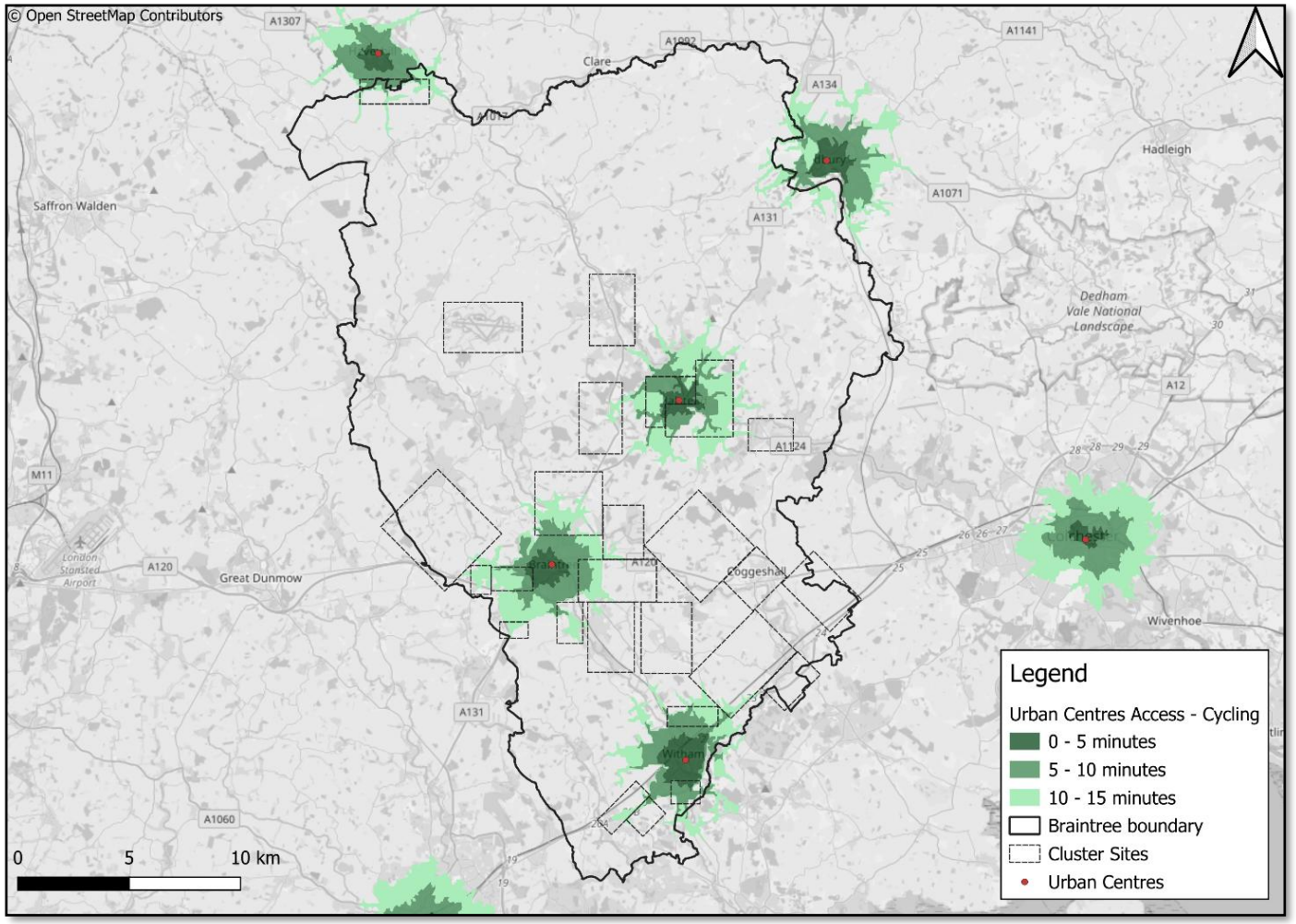

Figure C.1.2. Podaris mapped output illustrating accessibility to urban centres – cycling

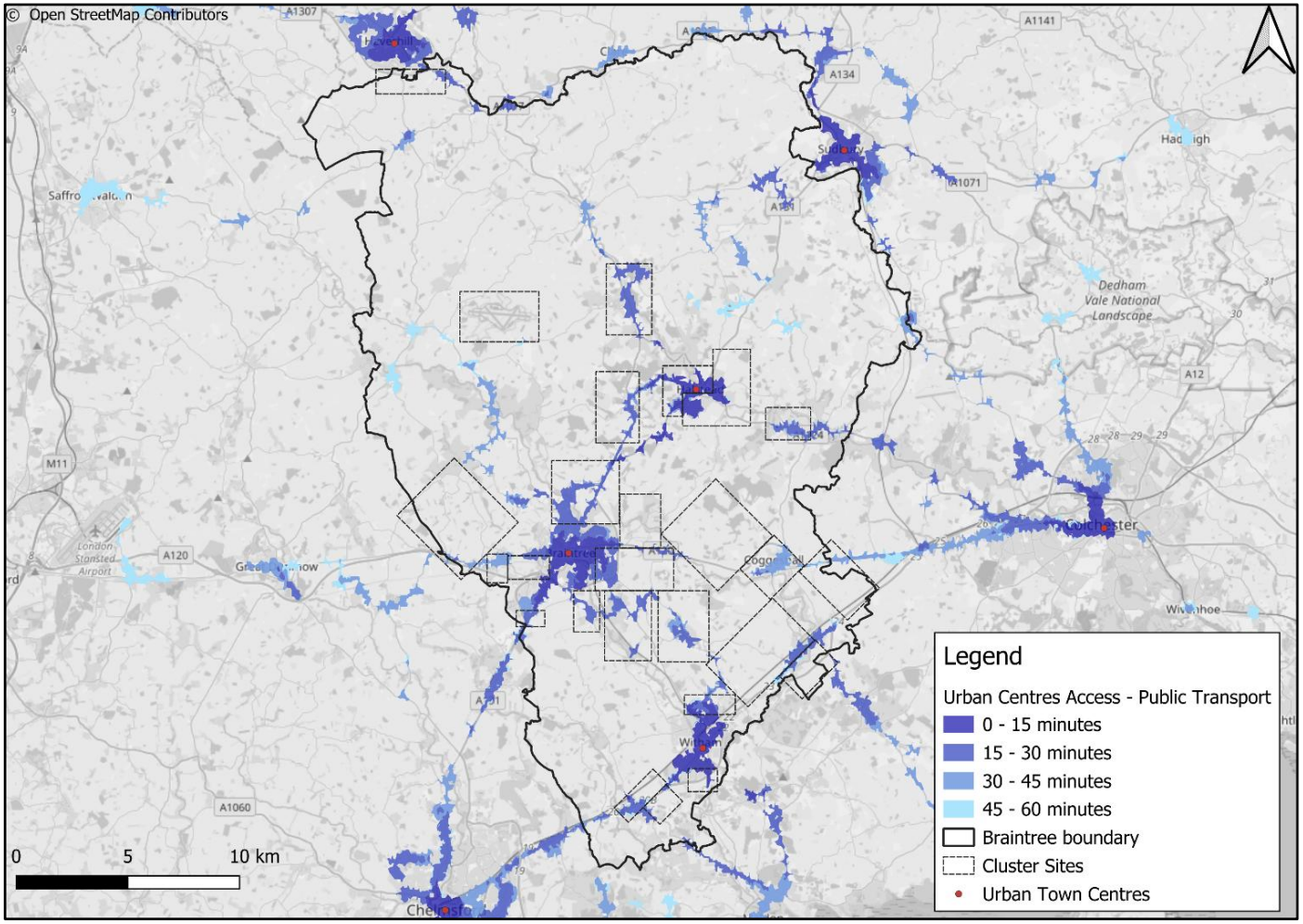

Figure C.1.3. Podaris mapped output illustrating accessibility to urban centres – public transport

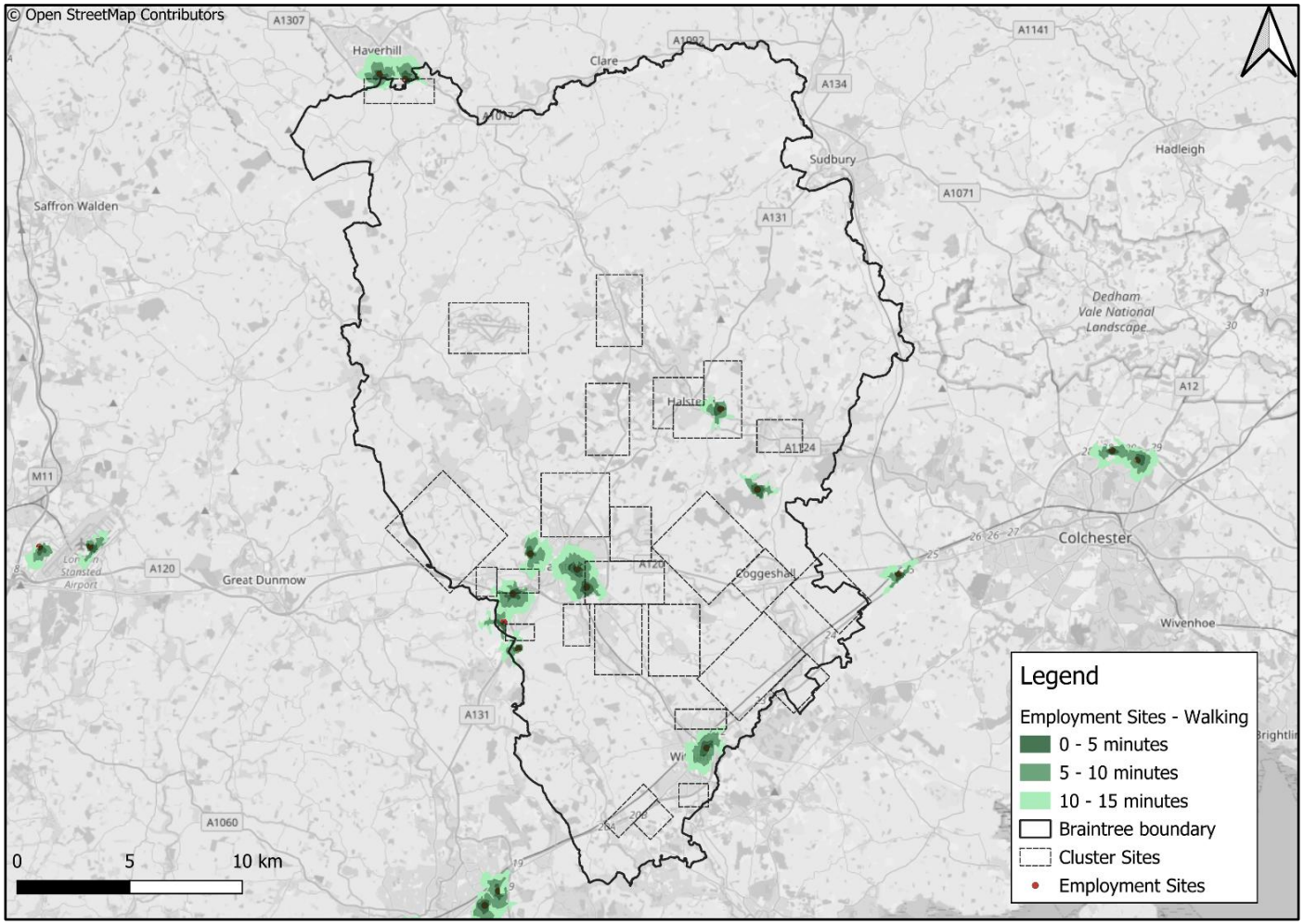

Figure C.1.4. A Podaris map showing accessibility to employment locations – walking

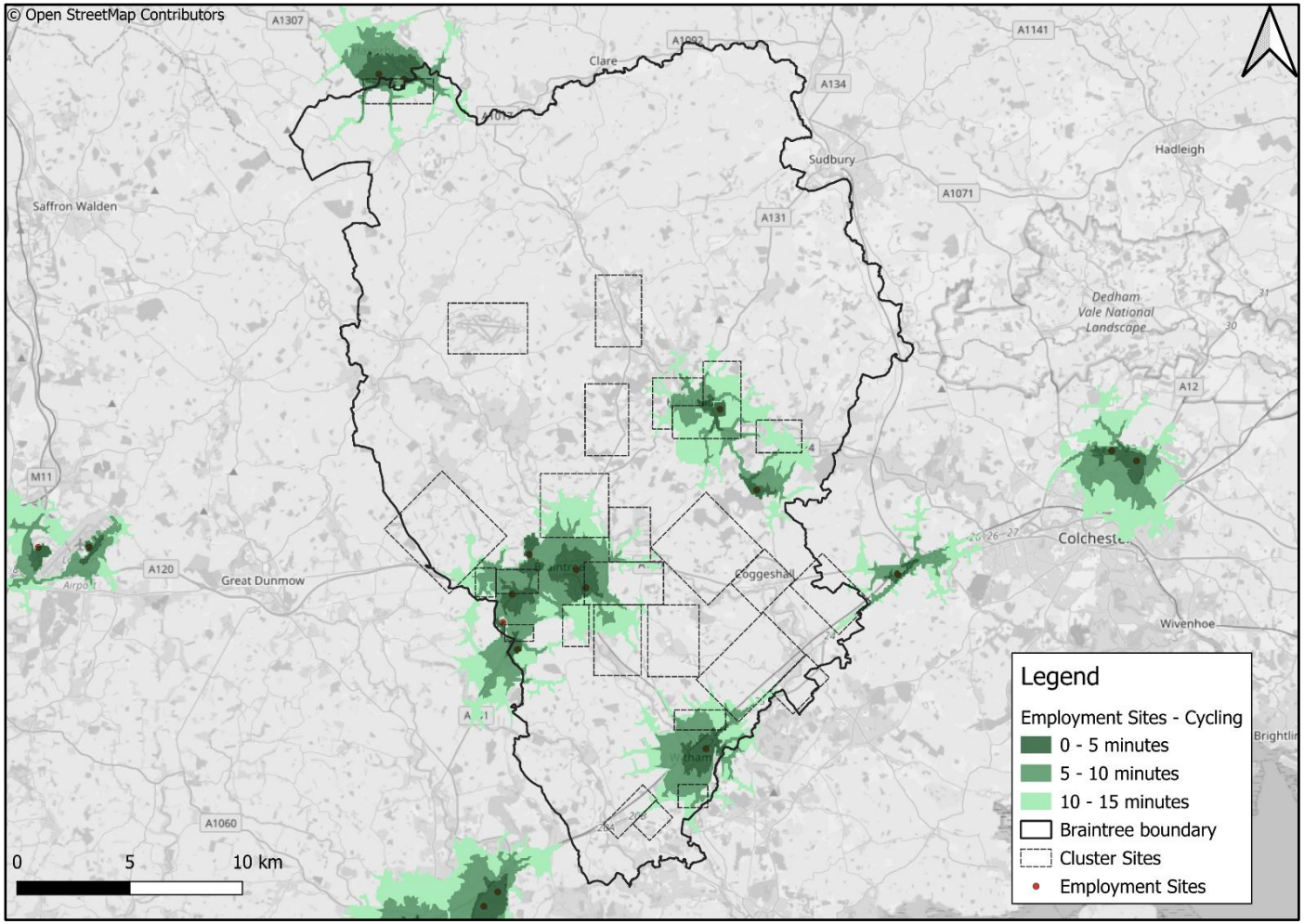

Figure C.1.5 Podaris mapped output illustrating accessibility to employment locations – cycling

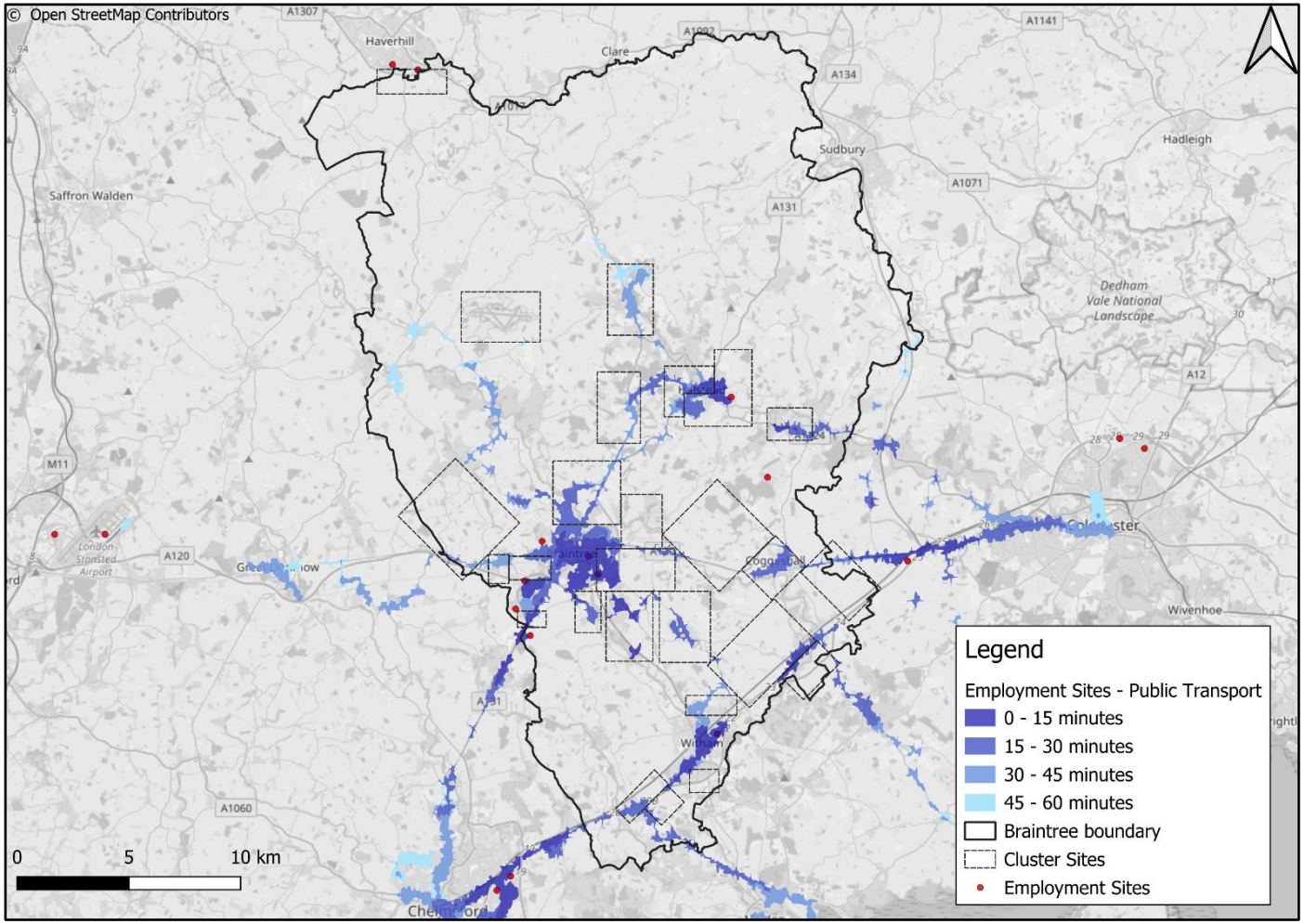

Figure C.1.6. Podaris mapped output illustrating accessibility to employment locations – public transport

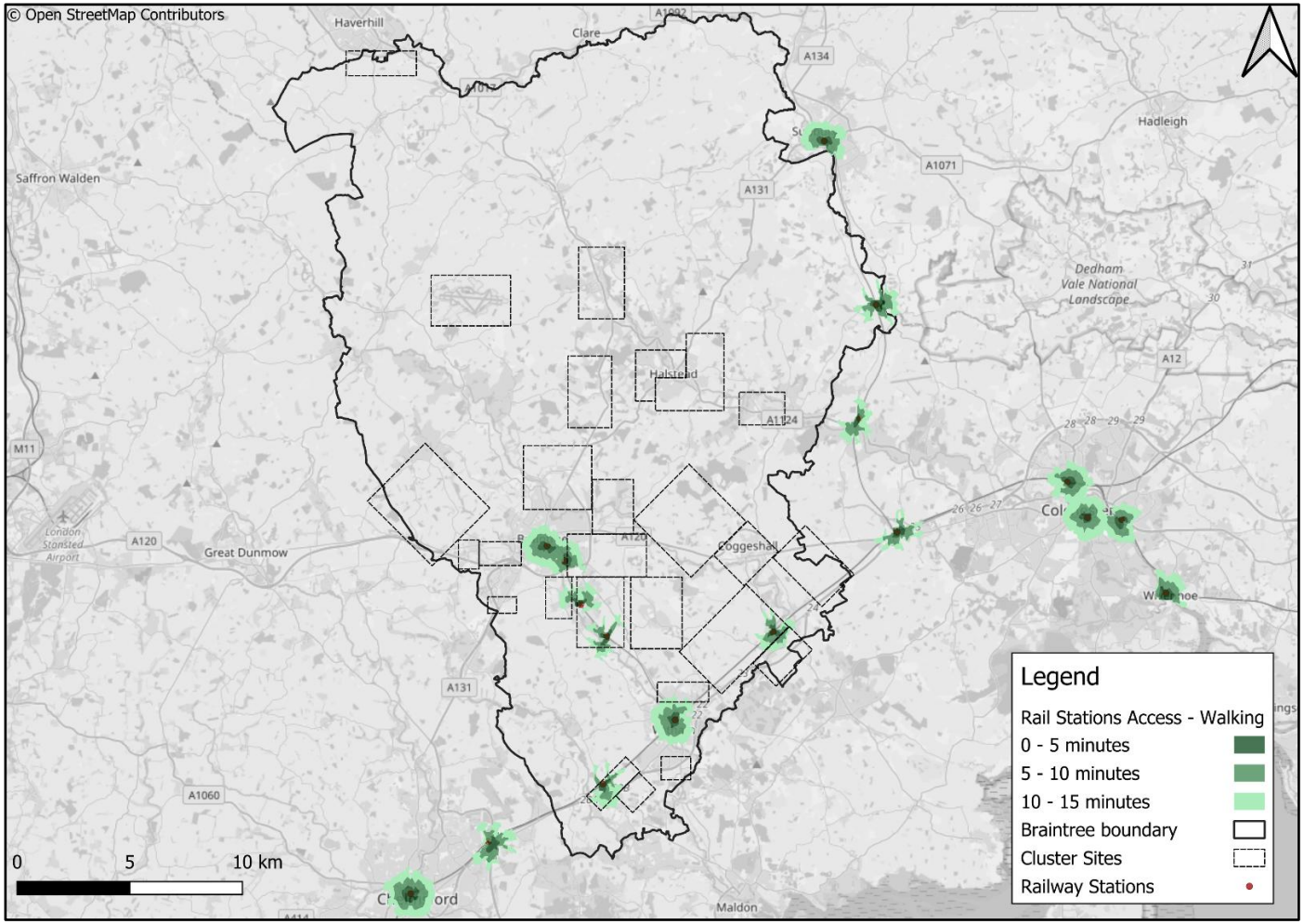

Figure C.1.7. Podaris mapped output illustrating accessibility to railway stations – walking

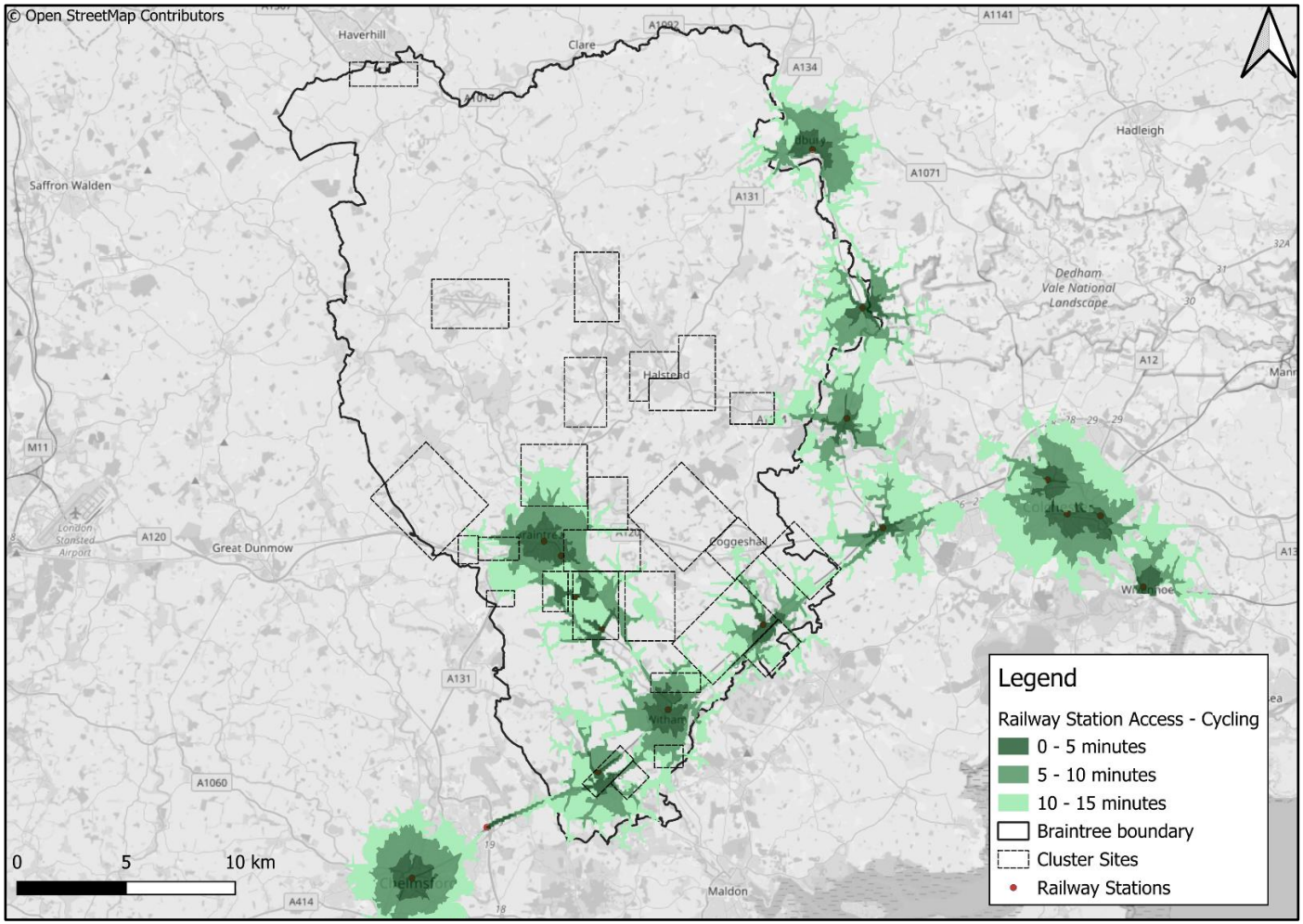

Figure C.1.8. Podaris mapped output illustrating accessibility to railway stations – cycling

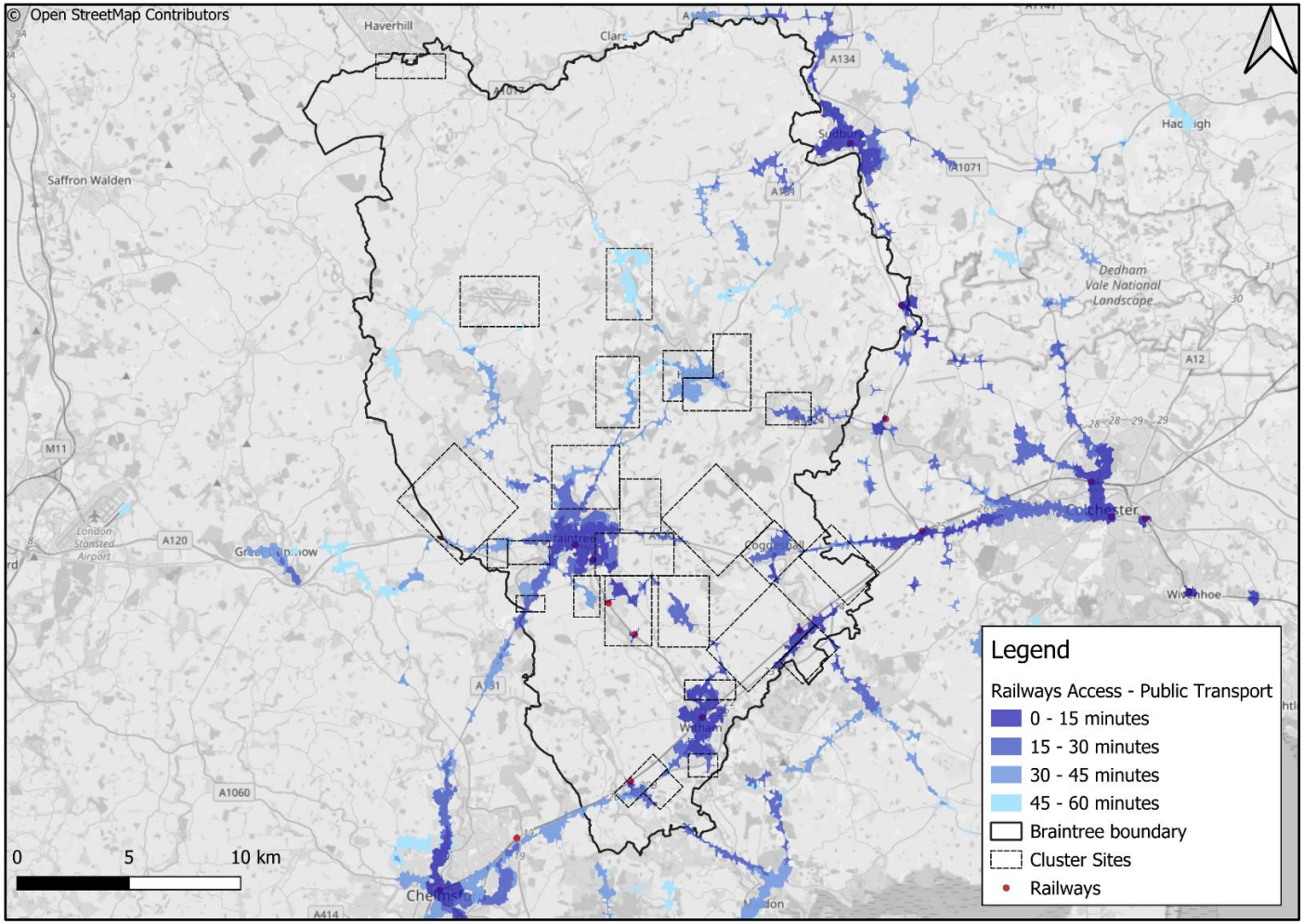

Figure C.1.9. Podaris mapped output illustrating accessibility to railway stations – public transport

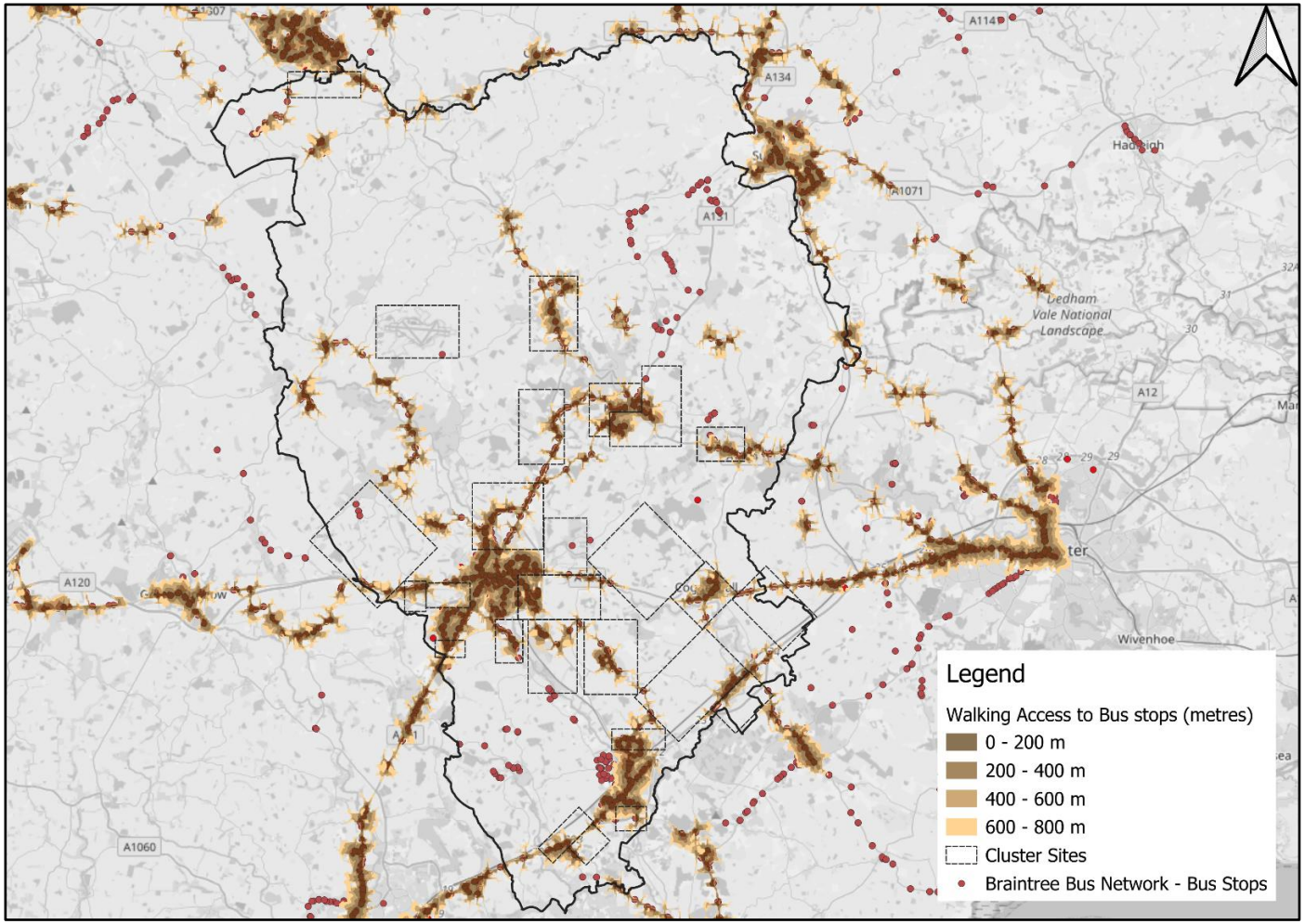

Figure C.1.10. Podaris mapped output illustrating walking distances to local bus stops

C.2 – Bus Frequency Mapped Outputs. (Created using bus frequency information provided by ECC's IPTU. Displayed using QGIS)

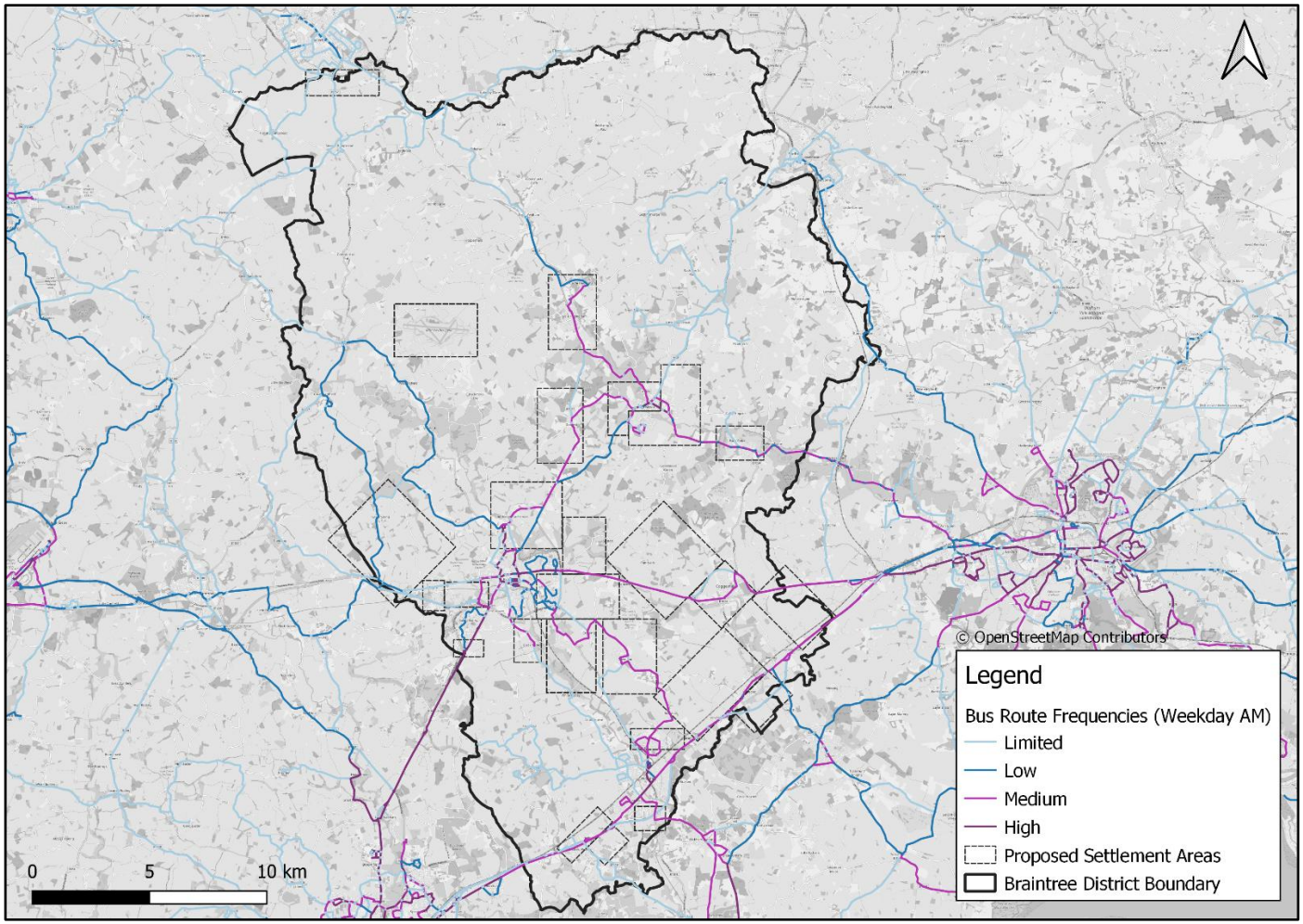

Figure C.2.1. Access to weekday bus services – AM (07:00 – 11:00)

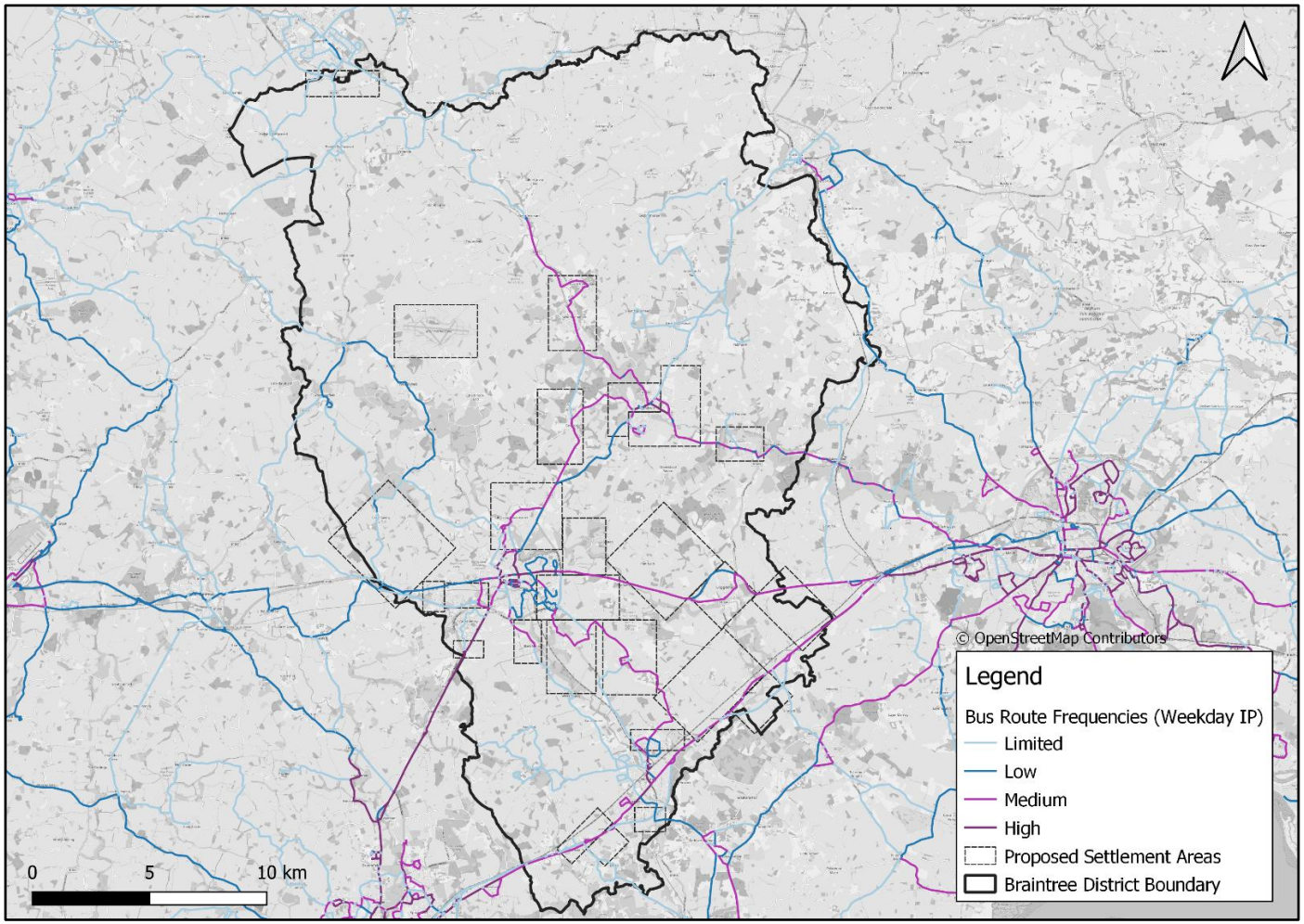

Figure C.2.2. Access to weekday bus services – Inter peak (11:00 – 16:00)

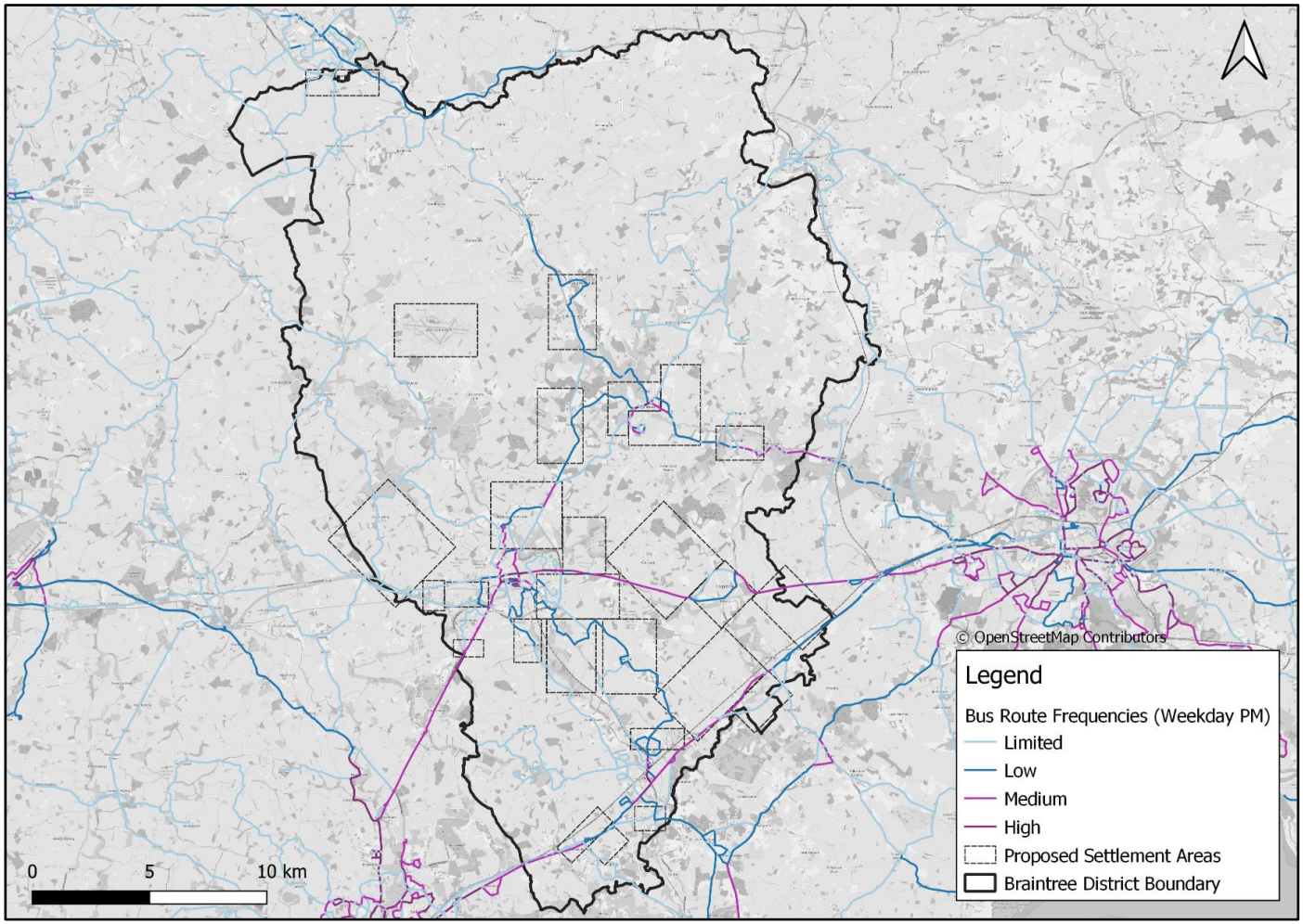

Figure C.2.3. Access to weekday bus services – PM (16:00 – 20:00)

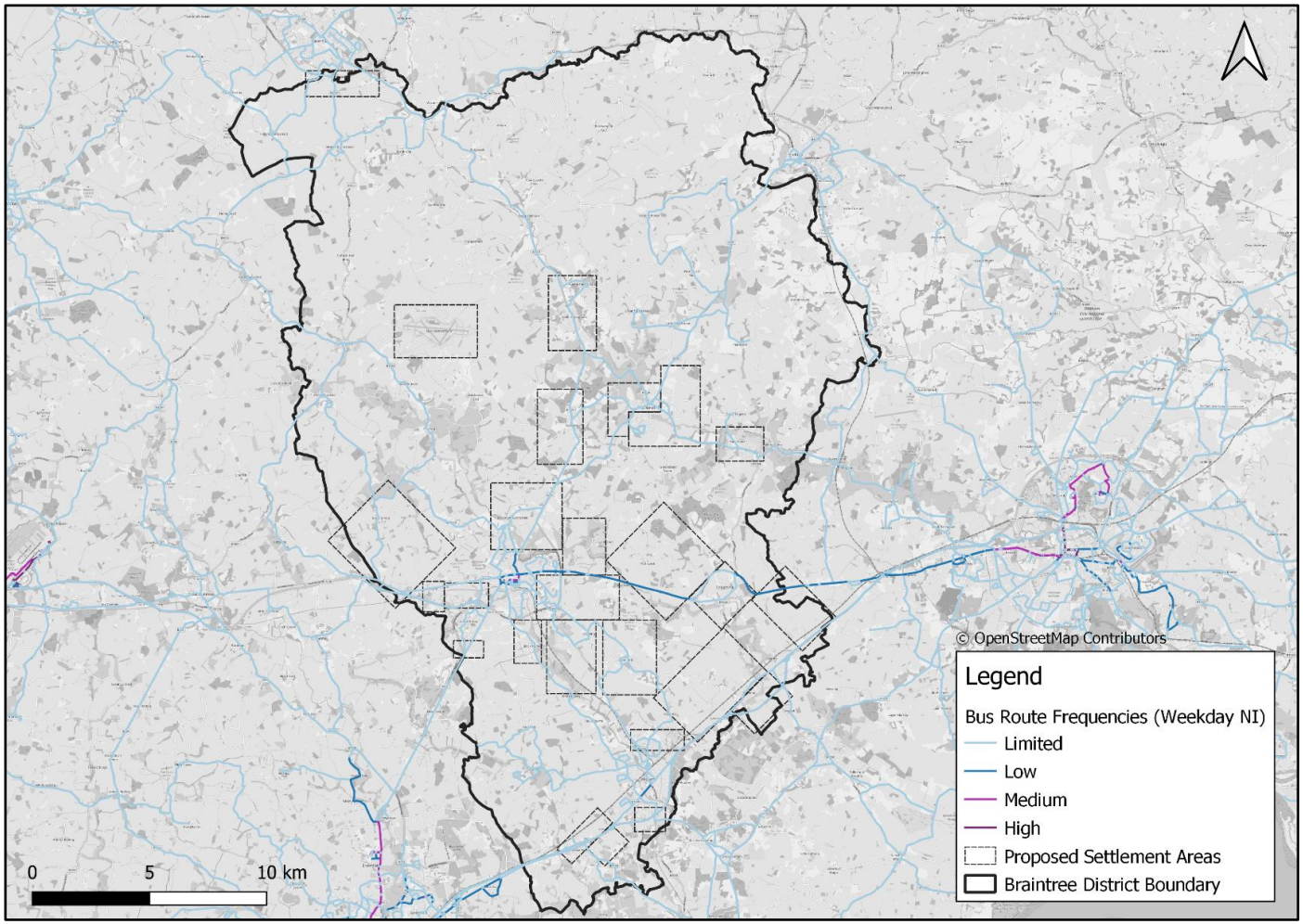

Figure C.2.4. Access to weekday bus services – Night (20:00 – 07:00)

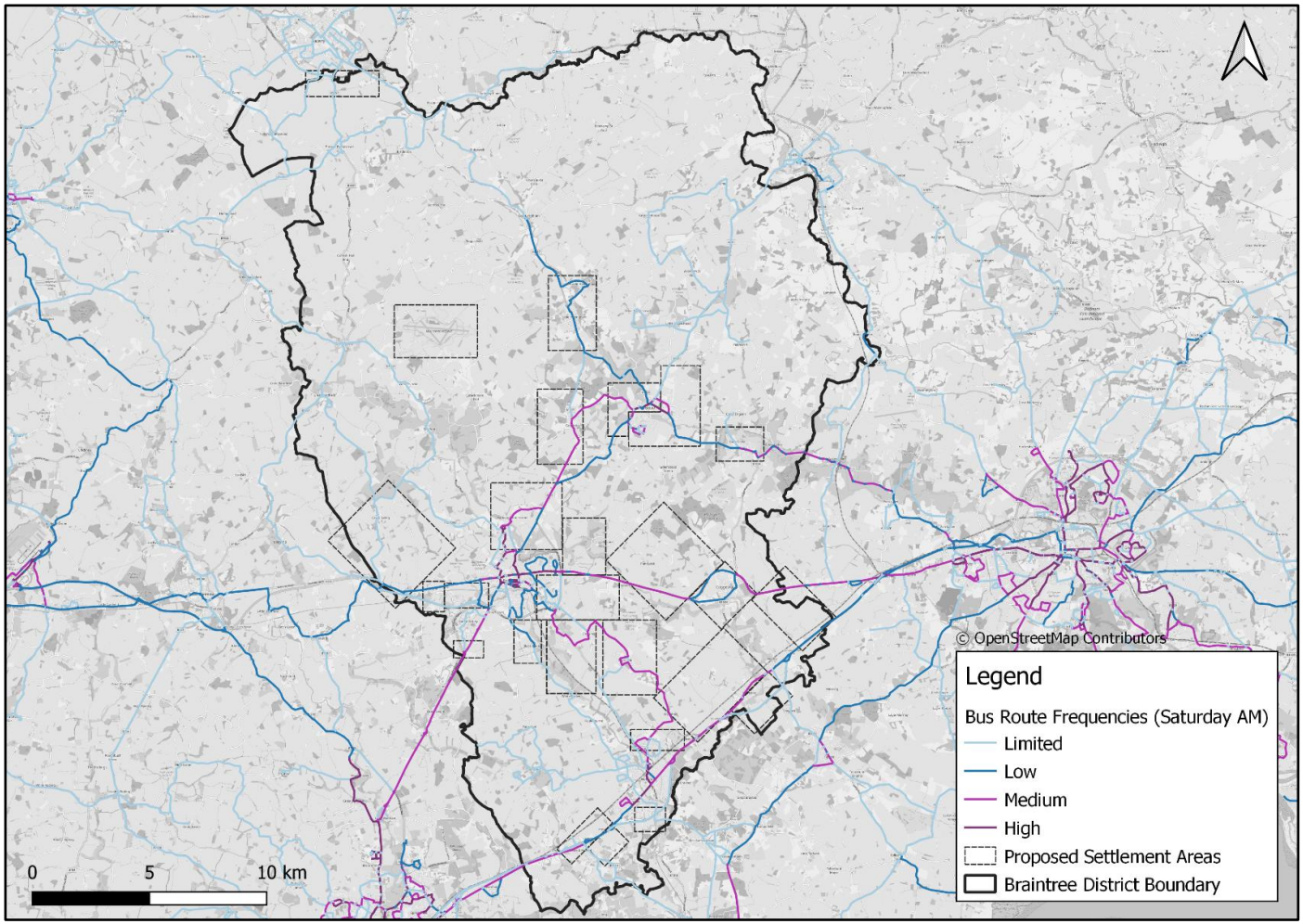

Figure C.2.5. Access to Saturday bus services – AM (07:00 – 11:00)

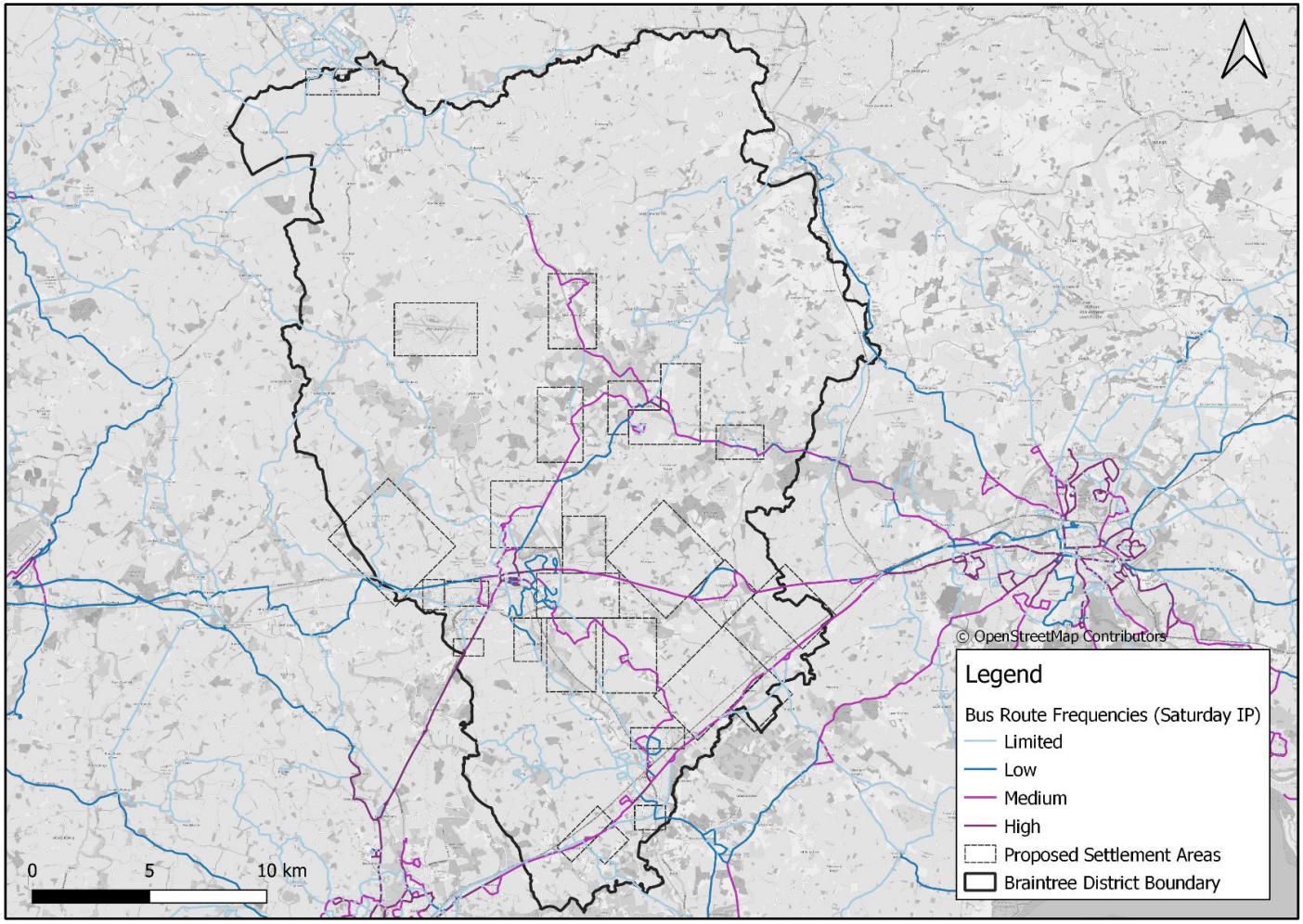

Figure C.2.6. Access to Saturday bus services – Inter peak (11:00 – 16:00)

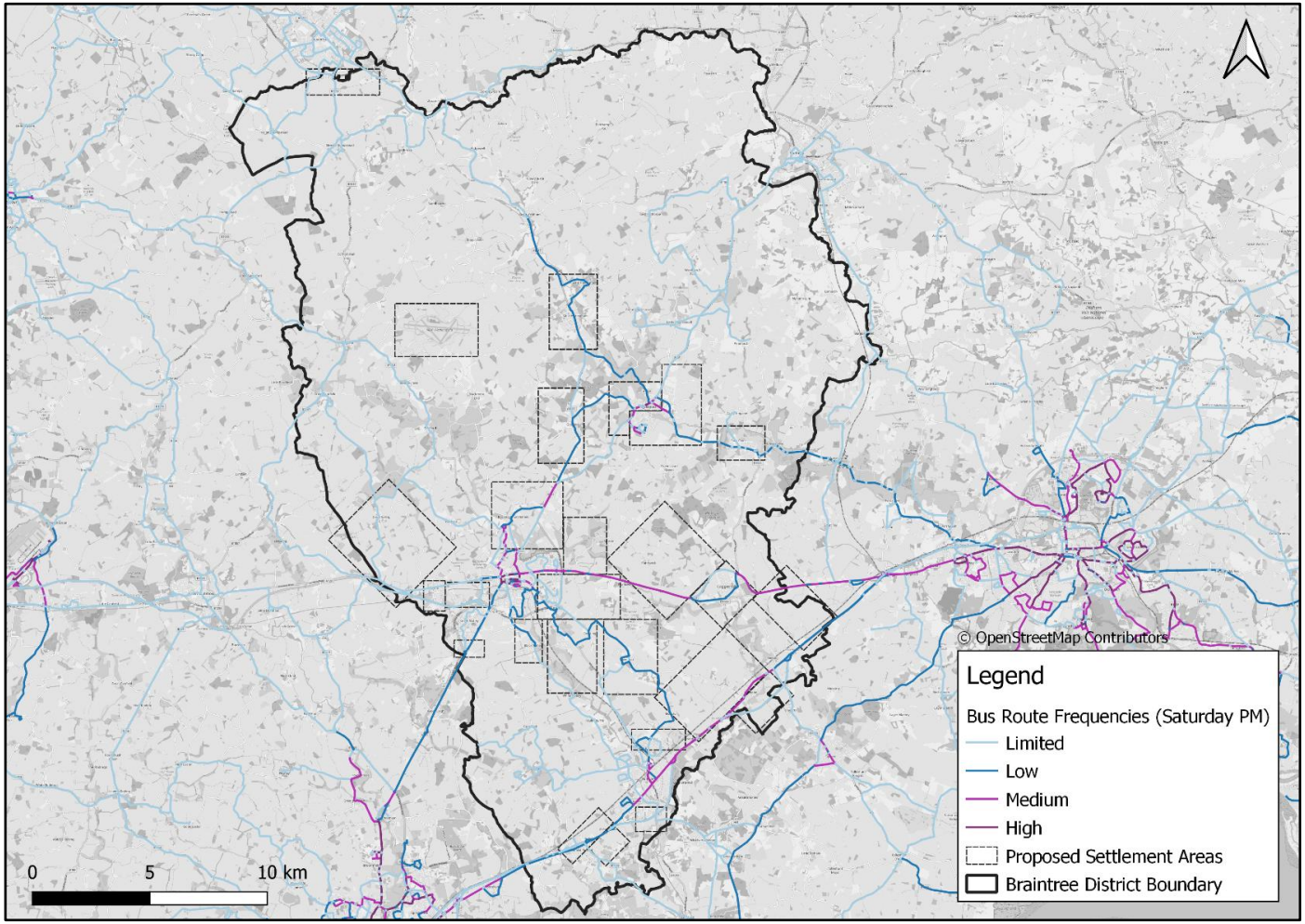

Figure C.2.7. Access to Saturday bus services – PM (16:00 – 20:00)

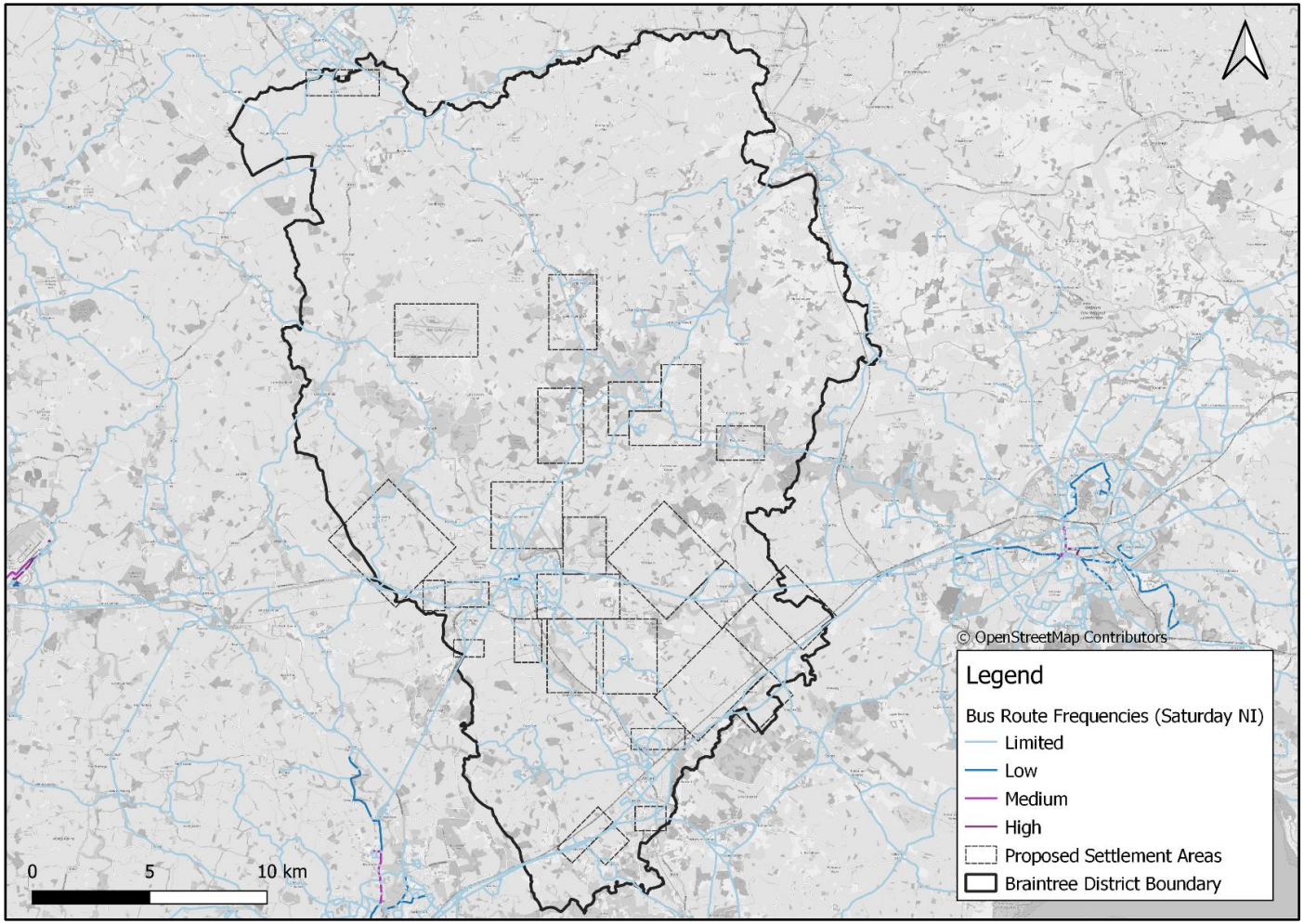

Figure C.2.8. Access to Saturday bus services – Night (20:00 – 07:00)

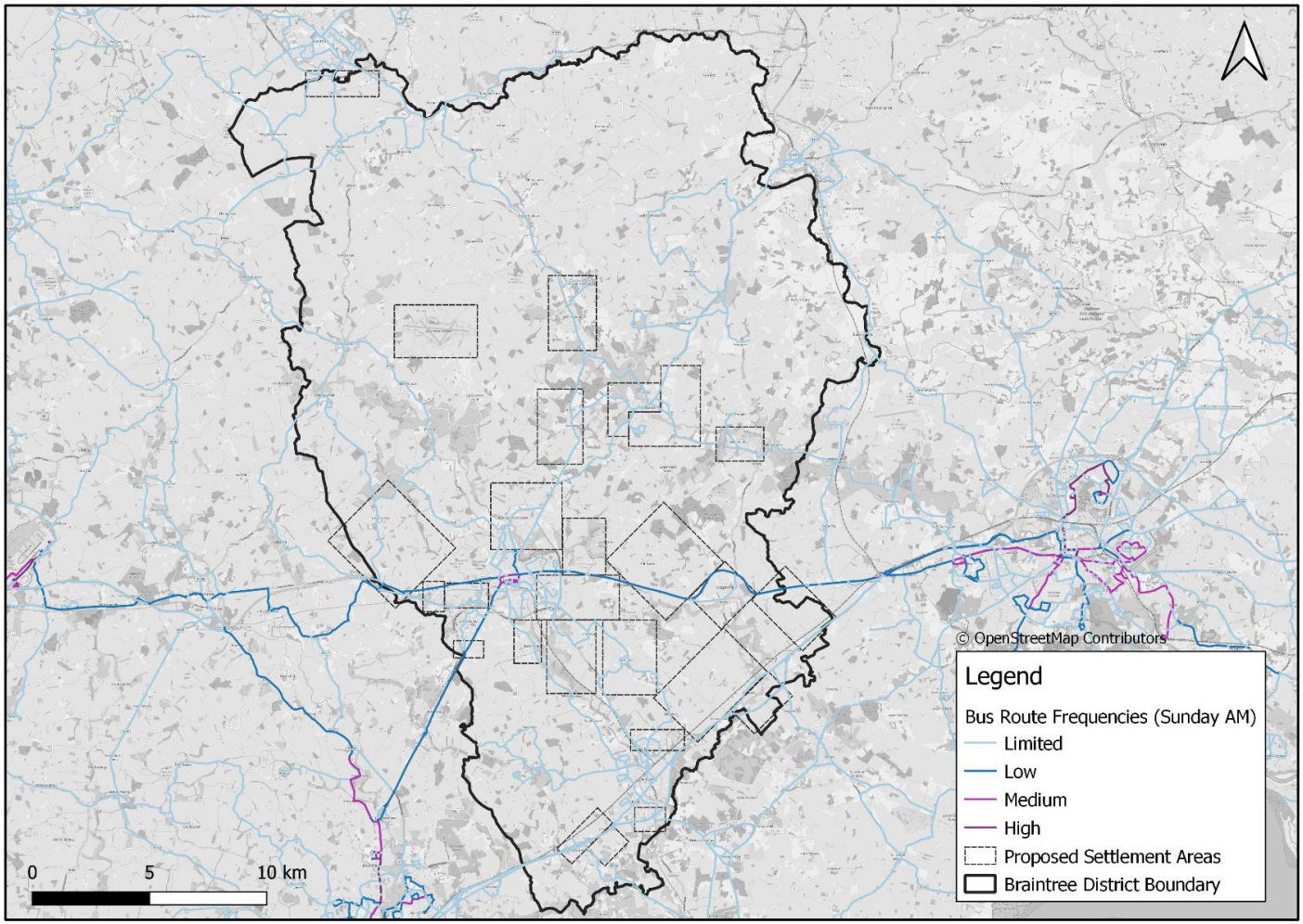

Figure C.2.9. Access to Sunday bus services – AM (07:00 – 11:00)

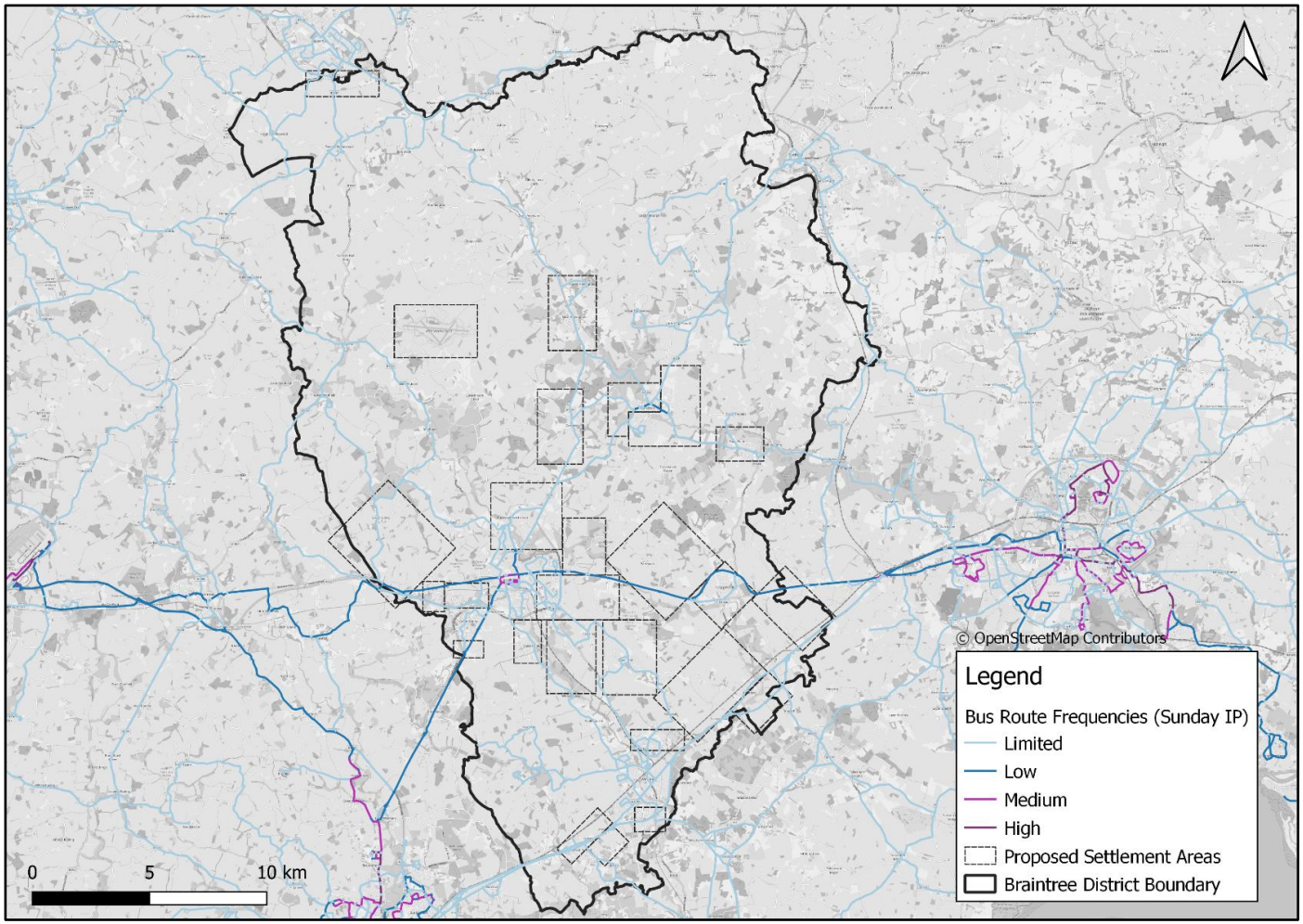

Figure C.2.10. Access to Sunday bus services – Inter peak (11:00 – 16:00)

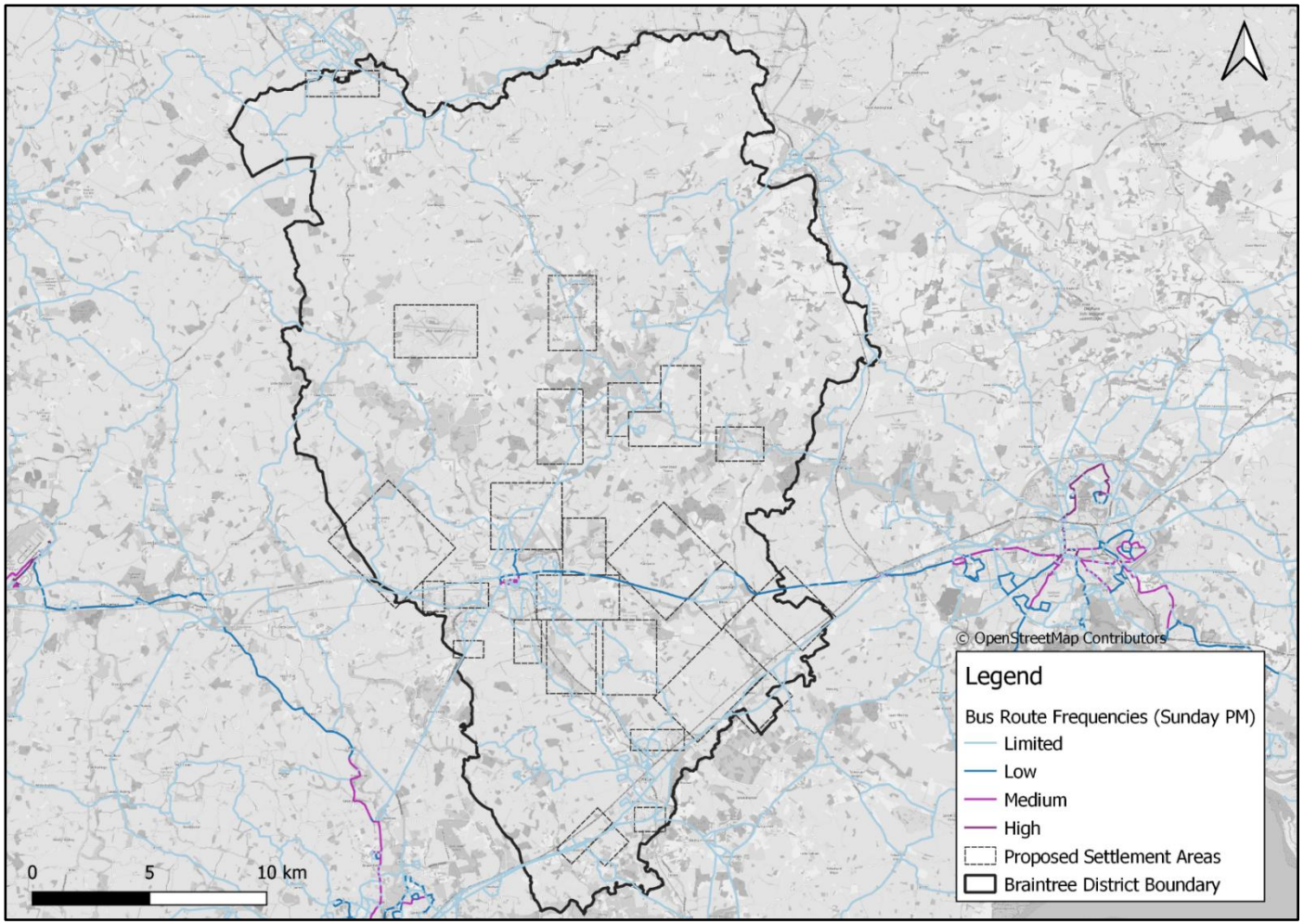

Figure C.2.11. Access to Sunday bus services – PM (16:00 – 20:00)

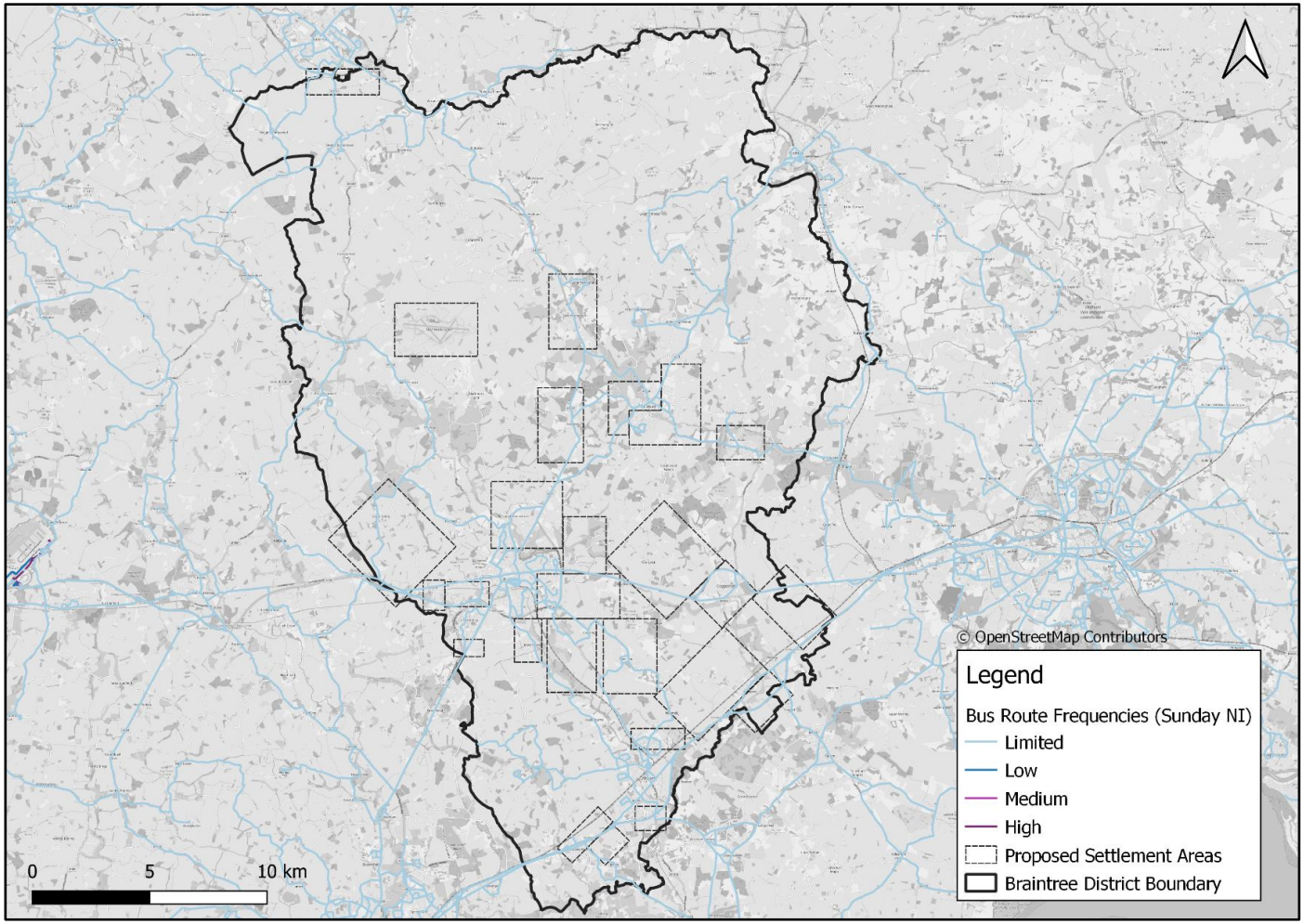

Figure C.2.12. Access to Sunday bus services – Night (20:00 - 07:00)

C.3 – Local coverage of broadband (Created using 2024 OFCOM data at OA level. Displayed using QGIS)

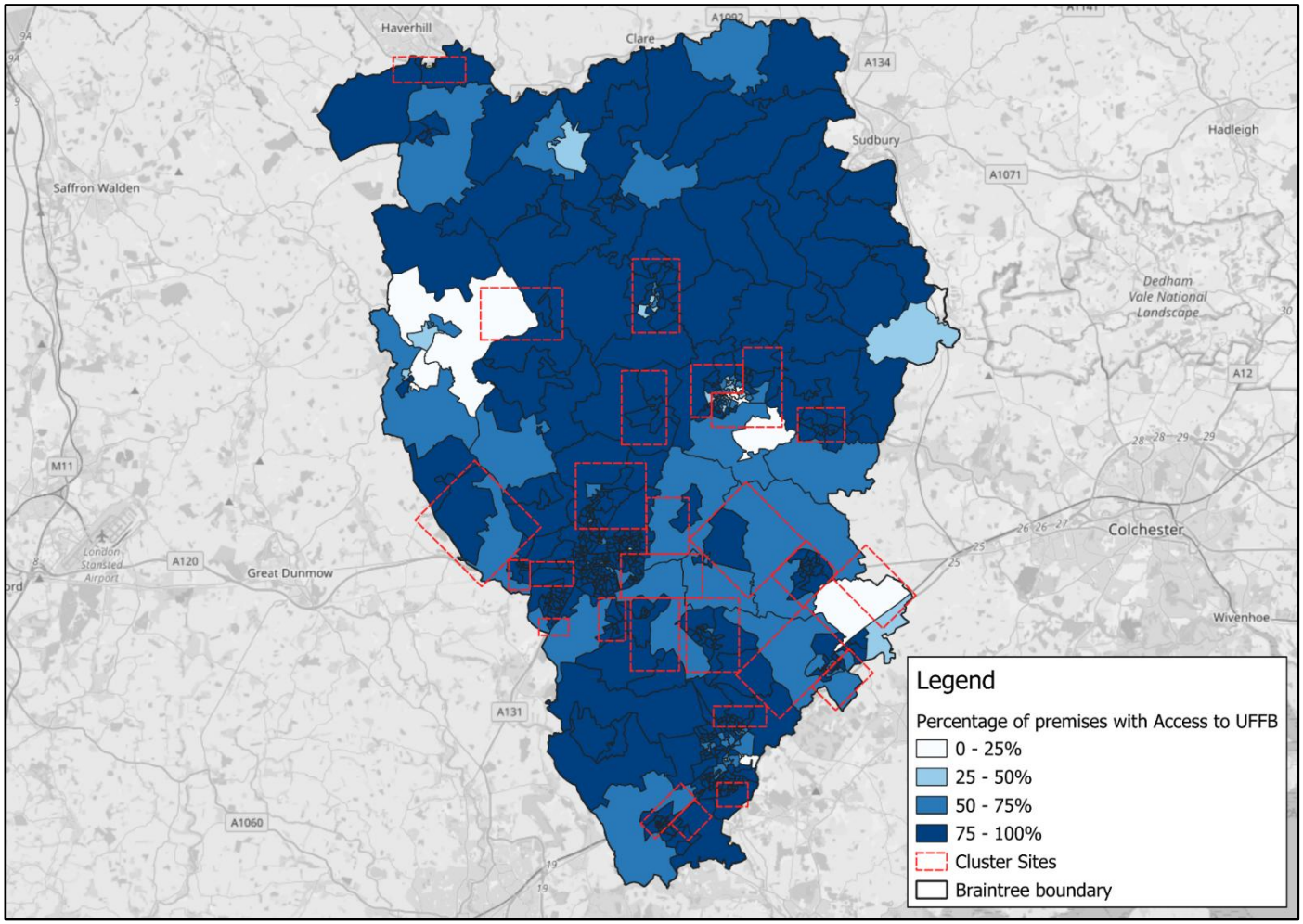

Figure C.3.1. Local coverage of broadband across Braintree District

Appendix D – Bus frequency criteria (provided by ECC's bus enhanced partnership team)

Bus Frequency Criteria		Methodology	Data Source
High frequency	≥8 two-way buses average per hour	Bus frequency data was provided for all routes in the area for Weekdays, Saturdays, and Sundays for the following periods: • AM – 07:00 – 11:00 • IP – 11:00 – 16:00 • PM – 16:00 – 20:00 • NI – 20:00 – 07:00 The data was then split into 4 categories using the criteria on the left and displayed onto maps.	Data was provided by ECC (Essex County Council) for the week commencing November 15th, 2021. Traveline was used when data was not available from ECC. It is noted that some routes will have been affected by Covid-19 at the time this data was sourced. However, many of these routes have not changed back due to passenger levels not returning to pre-pandemic levels. Therefore, this data still provides a fair representation of current bus frequencies.
Medium frequency	≥4 two-way buses average per hour		
Limited frequency	≥2 two-way buses average per hour		
Low frequency	<2 two-way average buses per hour		

Appendix E(i) – Results of the RAG assessment

Table E.1 – RAG assessment for each proposed settlement area (SA)

	SA 1a. Andrewsfield	SA 1a. Andrewsfield (potential)	SA 1b. Pattiswick Hall Farm	SA 1b. Pattiswick Hall Farm (potential)	SA 1c. Kings Dene	SA 1c. Kings Dene (potential)	SA2a - Halstead East	SA2b - Halstead West	SA3a - Wethersfield	SA3b - Sible Hedingham	SA3c - Gosfield	SA3d - Earls Colne	SA3e - Silver End	SA4a - Rayne	SA4b – South Great Notley	SA4c – Black Notley	SA4d - White Notley	SA4e - East Braintree	SA4f - Stisted	SA4g - Coggeshall	SA4h - Feering	SA4i - South Kelvedon	SA4j - North Witham	SA4k - South Witham	SA4l - North Hatfield Peverel	SA4m - South Hatfield Peverel	SA5a - Bocking	SA5b - Flitch Way	SA6a - South of Haverhill
Accessibility to Urban Centres	1	2	1	2	1	2	3	3	1	1	1	1	1	3	3	3	1	3	1	1	1	1	3	3	3	3	3	3	3
Accessibility to Employment locations	1	2	1	3	1	2	3	3	1	1	1	3	1	3	3	3	3	3	3	1	1	1	3	3	3	3	3	3	3
Accessibility to rail stations (walking and cycling)	1	1	1	1	3	3	1	1	1	1	1	1	1	1	3	3	3	3	3	1	1	3	3	3	3	3	2	3	1
Accessibility to rail stations (PT)	1	2	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	2	1	1
Walking access to bus stops	1	3	1	3	1	3	1	2	1	1	1	1	1	2	2	1	1	1	1	2	1	1	1	3	1	1	3	1	1
Weekday bus services and frequency	1	3	1	3	1	3	3	3	1	2	2	2	2	1	3	2	2	1	1	2	1	1	2	2	2	2	2	1	1
Saturday bus services and frequency	1	3	1	3	1	3	3	3	1	2	2	2	2	1	3	1	2	1	1	2	1	1	2	1	2	2	2	1	1
Sunday Bus Services and night	1	3	1	3	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	SA 1a. Andrewsfield	SA 1a. Andrewsfield (potential)	SA 1b. Pattiswick Hall Farm	SA 1b. Pattiswick Hall Farm (potential)	SA 1c. Kings Dene	SA 1c. Kings Dene (potential)	SA2a - Halstead East	SA2b - Halstead West	SA3a - Wethersfield	SA3b - Sible Hedingham	SA3c - Gosfield	SA3d - Earls Colne	SA3e - Silver End	SA4a - Rayne	SA4b – South Great Notley	SA4c – Black Notley	SA4d - White Notley	SA4e - East Braintree	SA4f - Stisted	SA4g - Coggeshall	SA4h - Feering	SA4i - South Kelvedon	SA4j - North Witham	SA4k - South Witham	SA4l - North Hatfield Peverel	SA4m - South Hatfield Peverel	SA5a - Bocking	SA5b - Flitch Way	SA6a - South of Haverhill
Broadband	3	3	2	3	2	3	2	3	1	3	3	3	3	3	2	3	3	2	2	2	1	2	3	3	2	3	3	3	3
Accessibility to Healthcare	1	3	2	3	2	3	2	3	2	3	2	3	3	2	3	2	2	2	2	3	2	3	2	2	3	2	2	2	2
Accessibility to Nurseries	1	3	1	3	1	3	2	2	1	1	1	2	2	2	2	3	1	1	1	3	1	2	2	1	2	2	3	2	1
Accessibility to Primary Schools	1	3	1	3	1	3	2	3	1	2	1	2	2	2	2	1	2	1	1	2	1	2	2	2	2	2	2	2	1
Accessibility to Secondary Schools	1	1	1	1	1	1	2	2	1	2	1	1	1	1	1	1	1	2	1	2	1	1	2	2	1	1	1	1	1
Site average RAG score	1.15	2.46	1.15	2.54	1.31	2.62	2.00	2.31	1.08	1.62	1.38	1.77	1.62	1.77	2.23	1.92	1.77	1.69	1.46	1.77	1.08	1.54	2.08	2.23	2.00	2.00	2.23	1.85	1.54
Location average RAG score (potential score)	1.2 (2.54)						2.16		1.49					1.81													2.04		1.54

Table E.2. Calculation of relative sustainable accessibility for each Spatial Approach

Location	Location Average	Approach A Dwellings (No. of Dwellings)	Approach A Score (Location Avg x No. of Dwellings)	Approach B Dwellings (No. of Dwellings)	Approach B Score (Location Avg x No. of Dwellings)	Approach C Dwellings (No. of Dwellings)	Approach C Score (Location Avg x No. of Dwellings)	Approach D Dwellings (No. of Dwellings)	Approach D Score (Location Avg x No. of Dwellings)	Approach E Dwellings (No. of Dwellings)	Approach E Score (Location Avg x No. of Dwellings)
Location 1	2.81	1,000	**2809.52**	2,500	**7023.81**	1,000	**2809.52**	1,000	**2809.52**	1,000	**2809.52**
Location 2	2.04	1,500	**3053.57**	1,500	**3053.57**	1,500	**3053.57**	500	**1017.86**	0	**0**
Location 3	2.14	500	**1071.43**	500	**1071.43**	500	**1071.43**	500	**1071.43**	0	**0**
Location 4	2.57	3,500	**9000.00**	3,500	**9000.00**	3,500	**9000.00**	4,500	**11571.43**	3,000	**7714.29**
Location 5	1.94	1,500	**2914.29**	0	**0**	1,000	**1942.86**	0	**0**	0	**0**
Location 6	1.68	0	**0.00**	0	**0**	500	**839.29**	0	**0**	0	**0**
Location 7	1.45	0	**0.00**	0	**0**	0	**0**	1,500	**2178.57**	0	**0**
Location 8	1.64	0	**0.00**	0	**0**	0	**0**	0	**0**	4,000	**6571.43**
Total Score	-	-	**18848.81**	-	**20148.81**	-	**18716.67**	-	**18648.81**	-	**17095.24**
Display Score (Total/10,000)	-	-	**1.88**	-	**2.01**	-	**1.87**	-	**1.86**	-	**1.71**
Ranking of Approaches (Highest to lowest score)			**2**		**1**		**3**		**4**		**5**

Appendix E(ii): Example Spatial Strategies

Table E.3 below shows five example 'spatial strategies' distinguishable by growth focussed across different settlement locations in Braintree District. These spatial strategies are typical of early-stage Local Plan Spatial Options that might be taken forward for high-level highway impact appraisal. However, for the purposes of this study, these example 'strategies' are labelled as such to separate them from the actual Spatial Options considered in the main report.

Table E.3. Potential spatial strategies and example development proportions

	Spatial Strategy A: Spatial Strategy	**Spatial Strategy B: Growth in Urban Areas**	**Spatial Strategy C: Growth in Rural Areas**	**Spatial Strategy D: Growth along Transport Corridors**	**Spatial Strategy E: New Settlement**
New Settlements (Andrewsfield, Pattiswick Hall Farms, Kings Dene)	50%	30%	30%	30%	70%
Halstead Expansion (Halstead East, Halstead West)	10%	30%	10%	10%	10%
Rural Village Expansion (Wethersfield, Sible Hedingham, Gosfield, Earls Colne, Silver End)	0%	0%	20%	0%	0%
Development on Strategic Network (Rayne, South Great Notley, Black Notley, White Notley, East Braintree, Stisted, Coggeshall, Feering, South Kelvedon, North Witham, South Witham, North Hatfield Peverel, South Hatfield Peverel)	20%	10%	10%	50%	10%
Braintree Town Expansion (Bocking and Flitch Way)	20%	30%	10%	10%	10%
South of Haverhill	0%	0%	20%	0%	0%

The percentages shown are based on a subjective allocation of development across various settlement locations – albeit influenced by an awareness of the more sustainably accessible settlement locations in the district.

It should be noted that these example spatial strategies have been derived solely from the sustainable accessibility analysis presented, and it is understood that the three spatial options taken forward for further assessment in the sustainable accessibility assessment, will have been appraised on other site-sustainability considerations such as environmental, landscape, heritage etc. to determine suitable sites for inclusion.

Appendix F – 2023 Journey Time Graphs

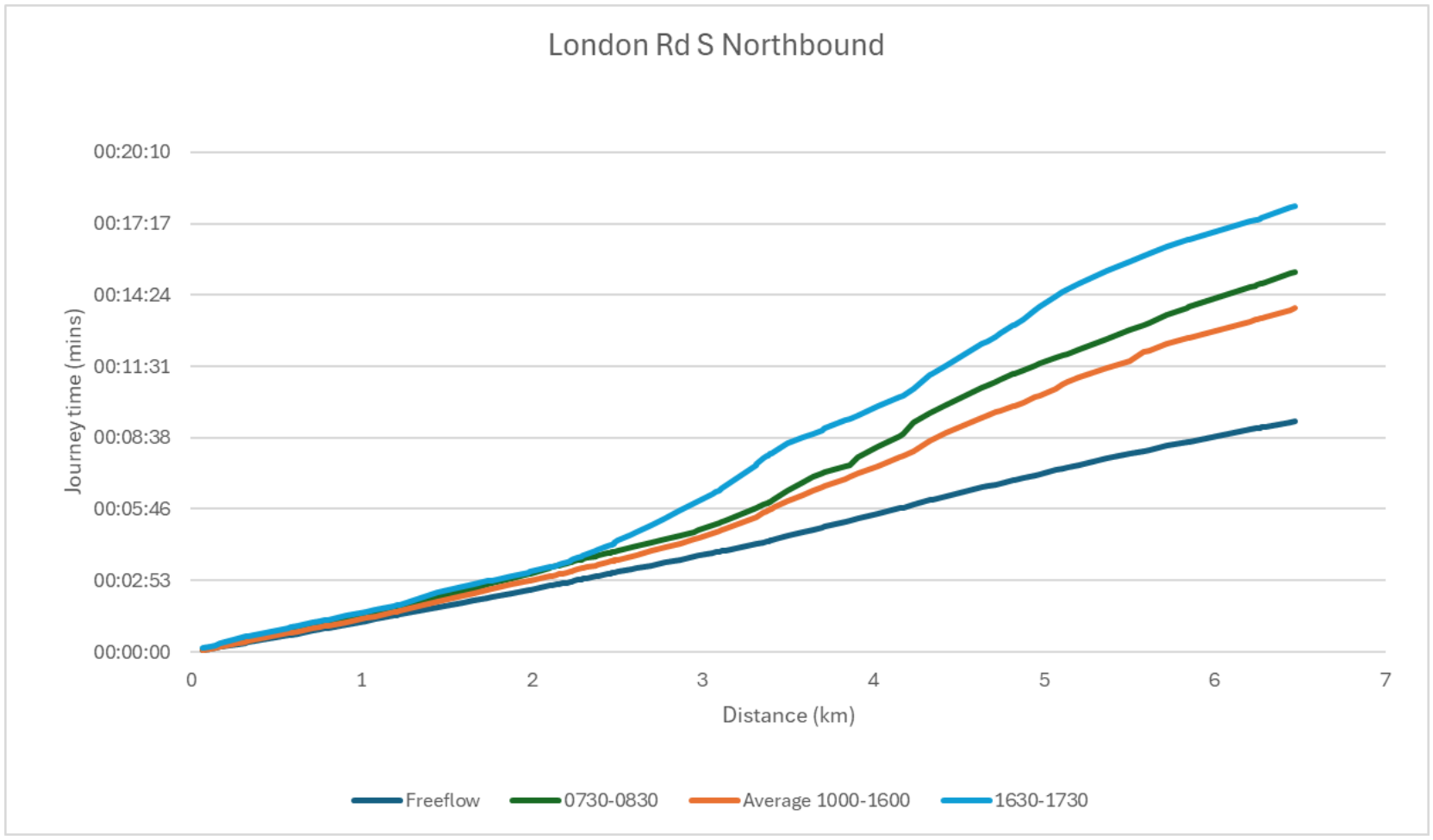

Figure F.1 – London Road northbound from A131 Great Notley bypass to A120 Marks Farm Roundabout

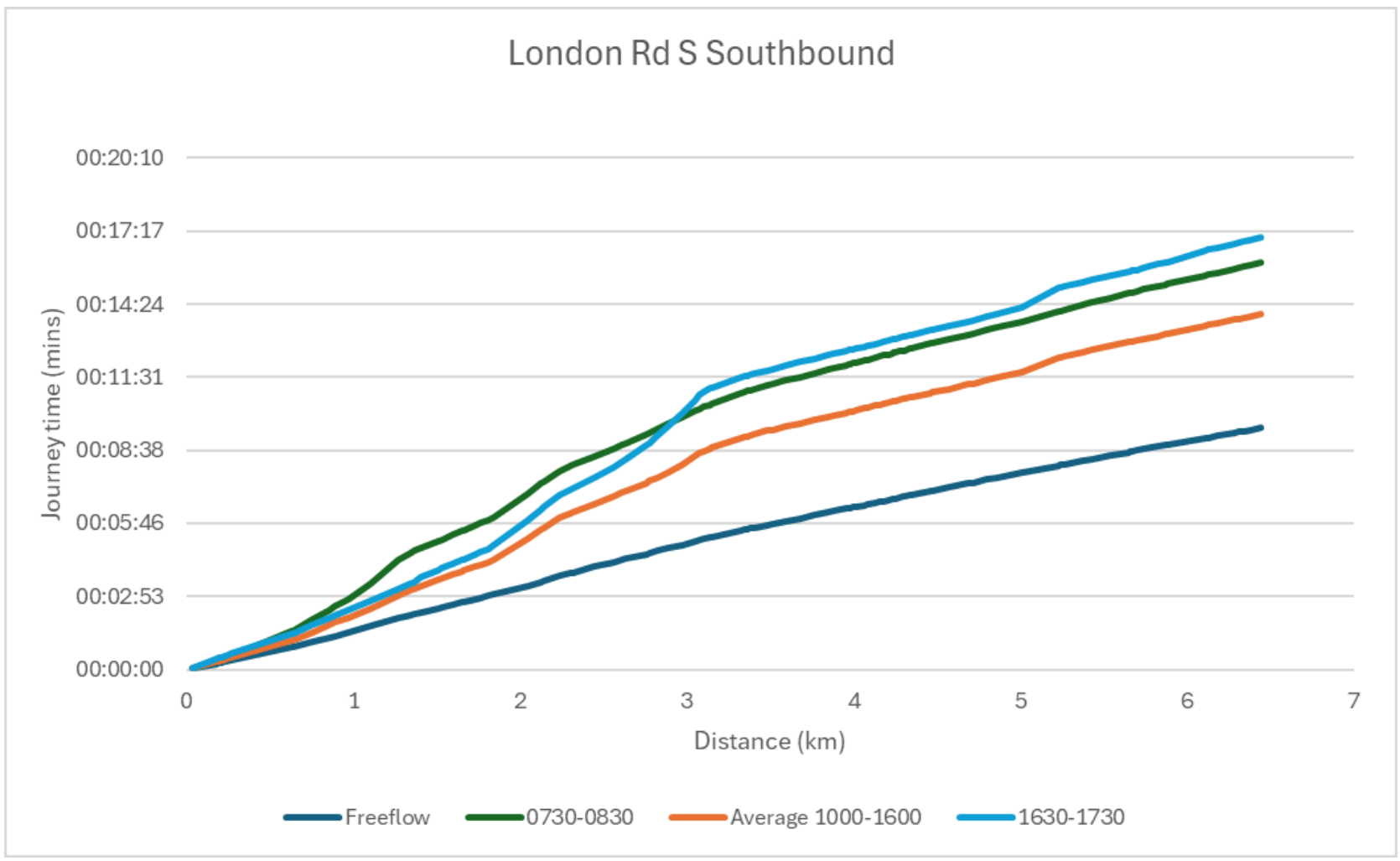

Figure F.2 – London Road southbound from A120 Marks Farm Roundabout to junction with A131 Great Notley bypass

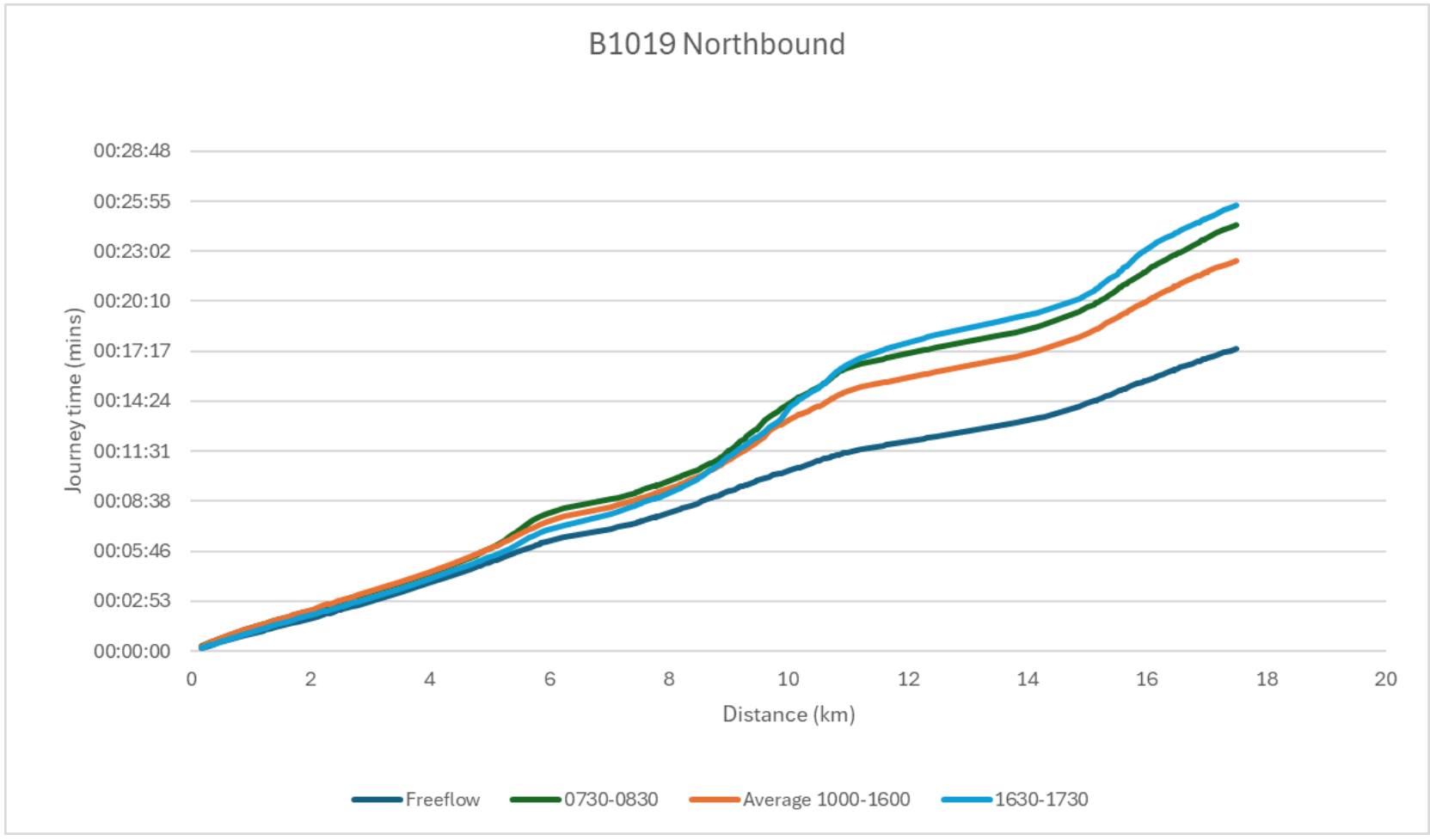

Figure F.3 – B019 northbound from junction with B1018 nr Heybridge to A12 Junction 24 at Feering

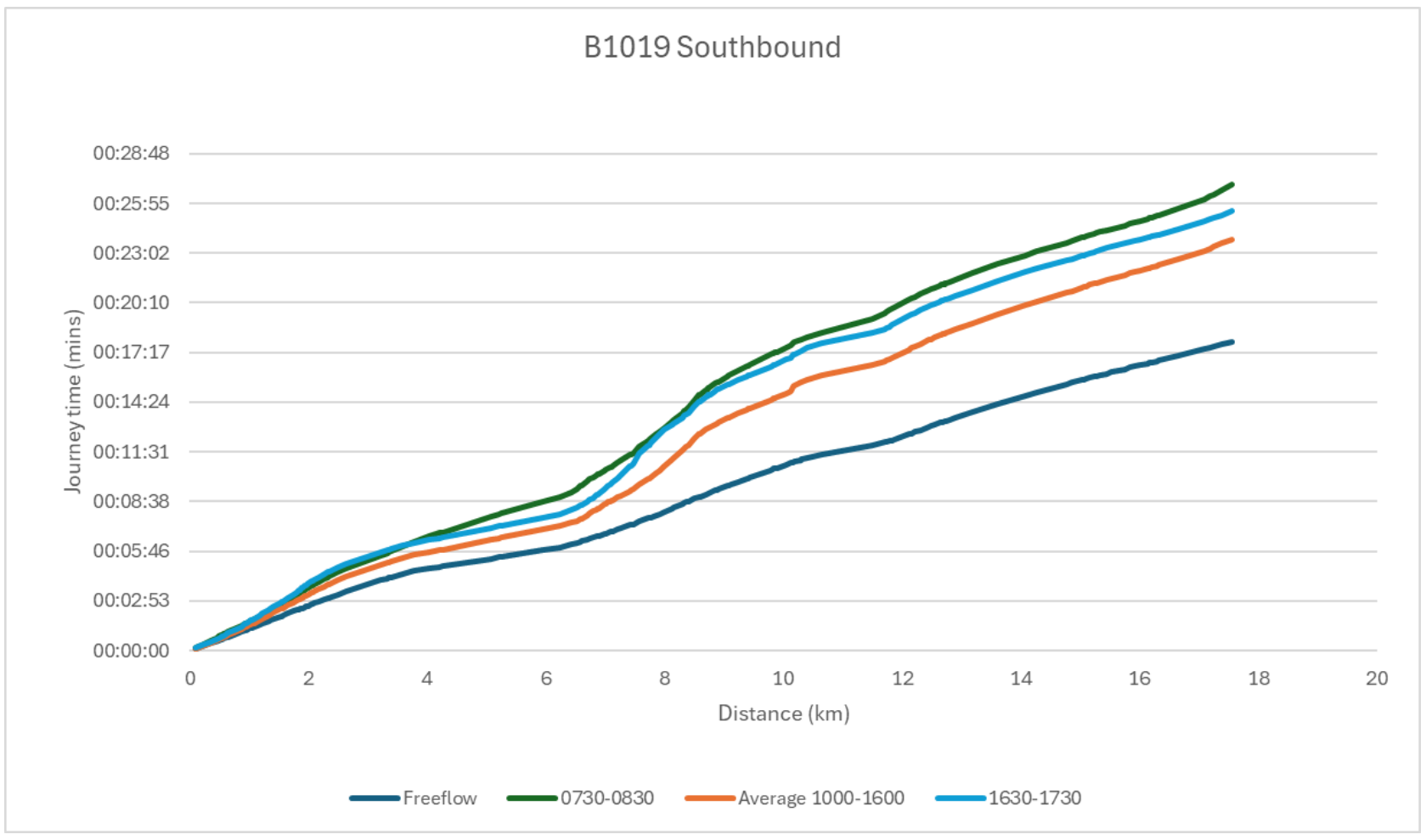

Figure F.4 – B019 southbound from A12 Junction 24 at Feering to junction with B1018 nr Heybridge

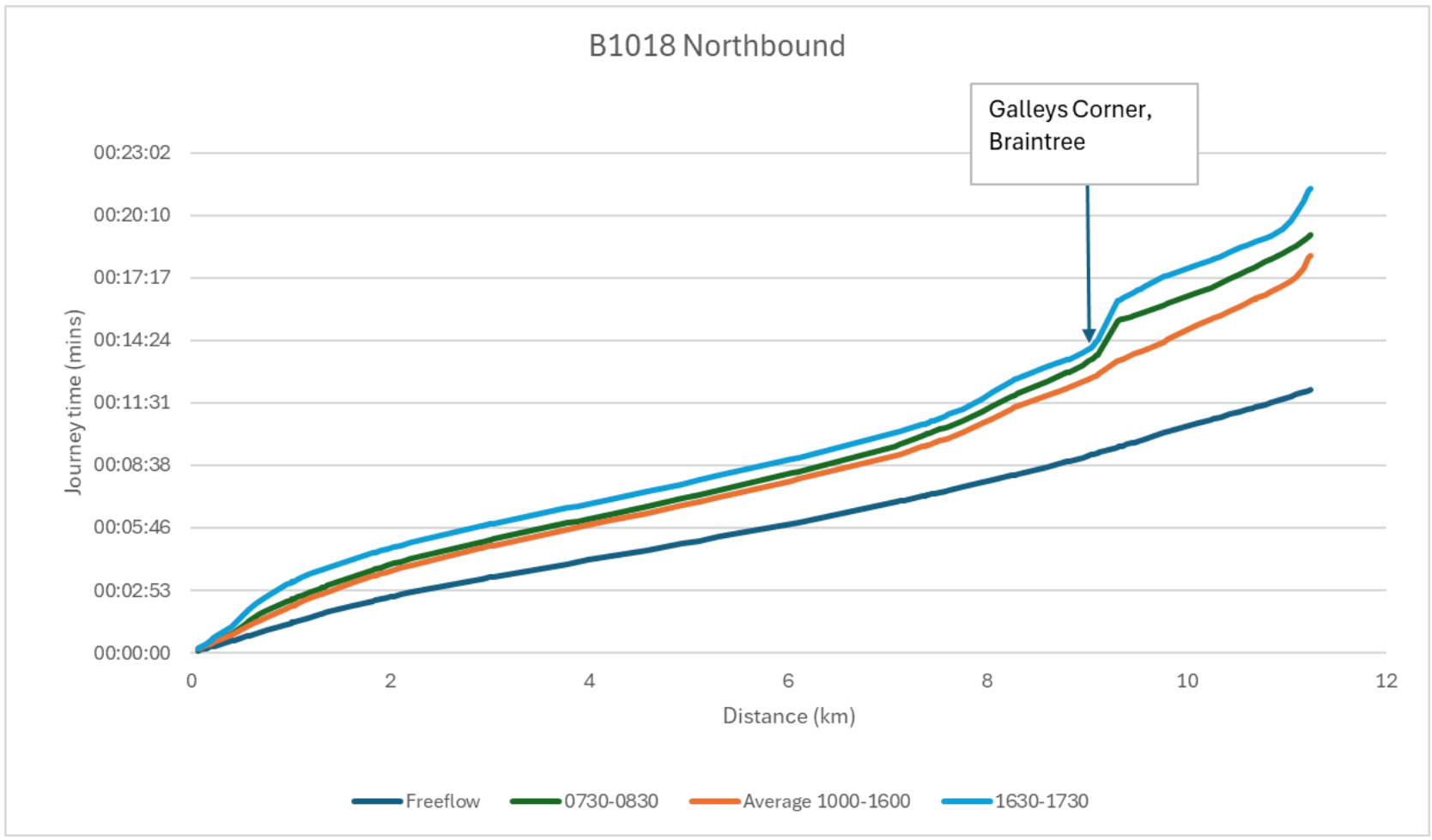

Figure F.5 – B018 northbound from junction with B1389 in Witham to Cressing Road junction with B1256 in Braintree

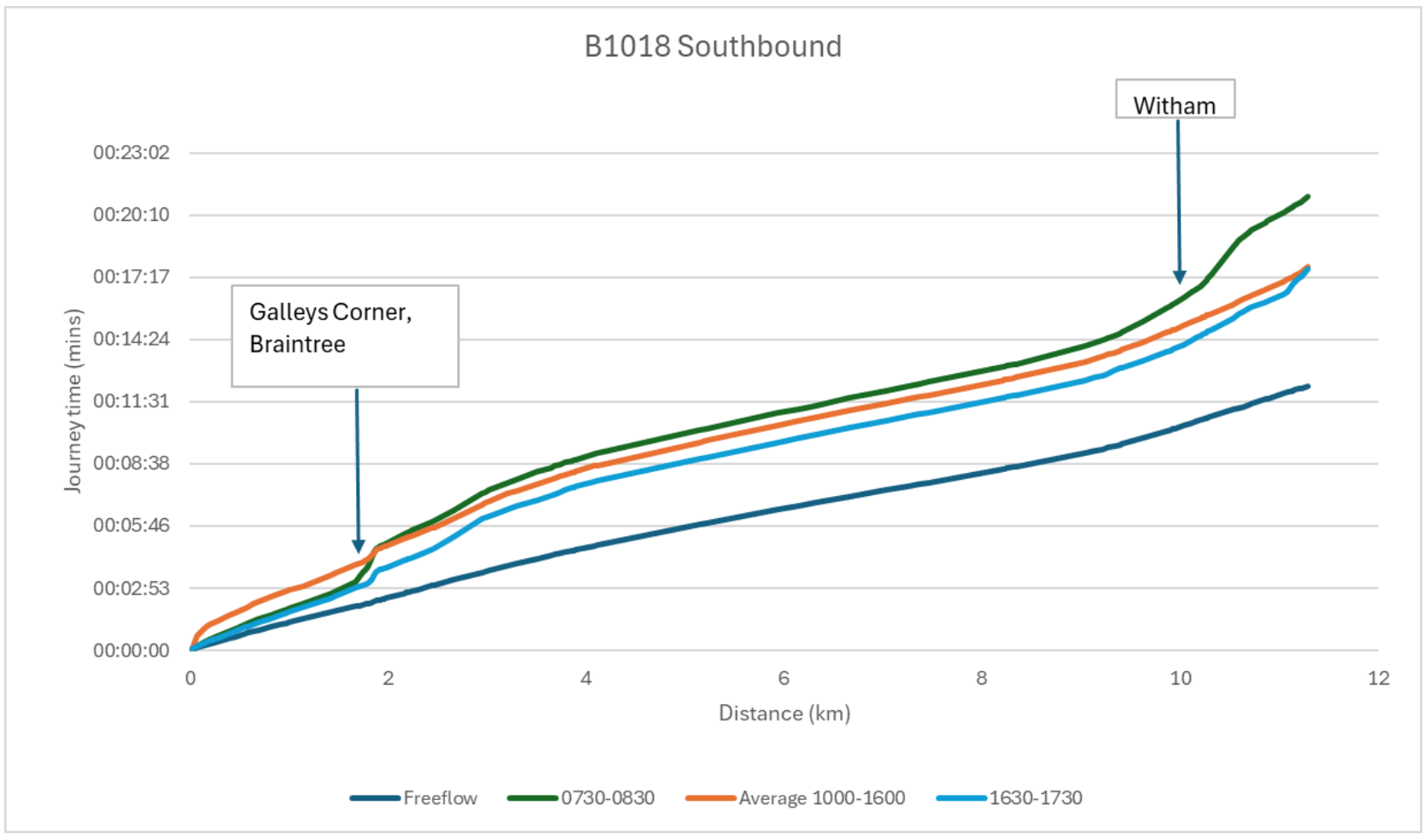

Figure F.6 – B018 southbound from Cressing Road junction with B1256 in Braintree to the junction with B1389 in Witham

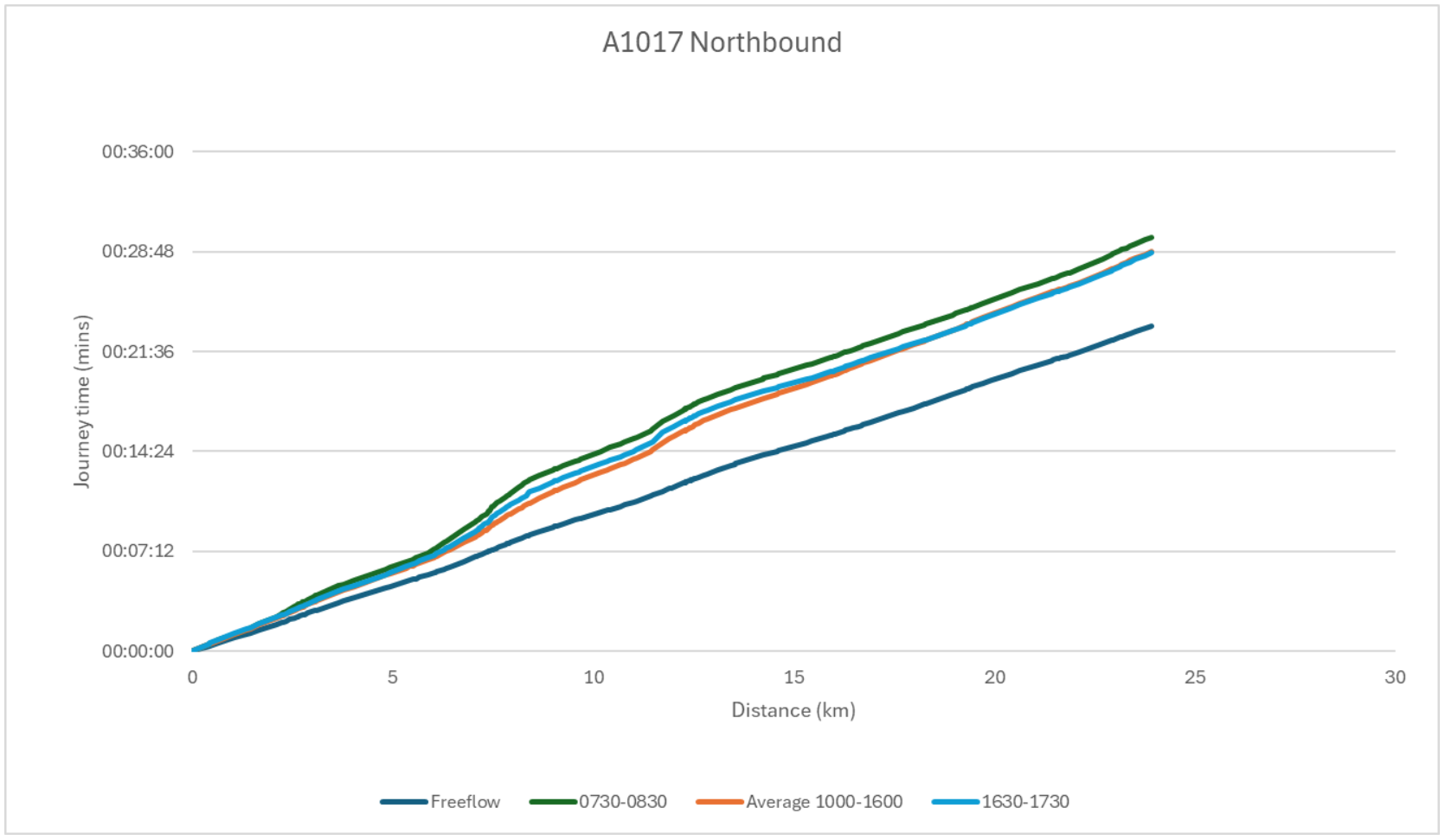

Figure F.7 – A1017 northbound from junction with A131 in High Garrett to junction with A143 in Haverhill

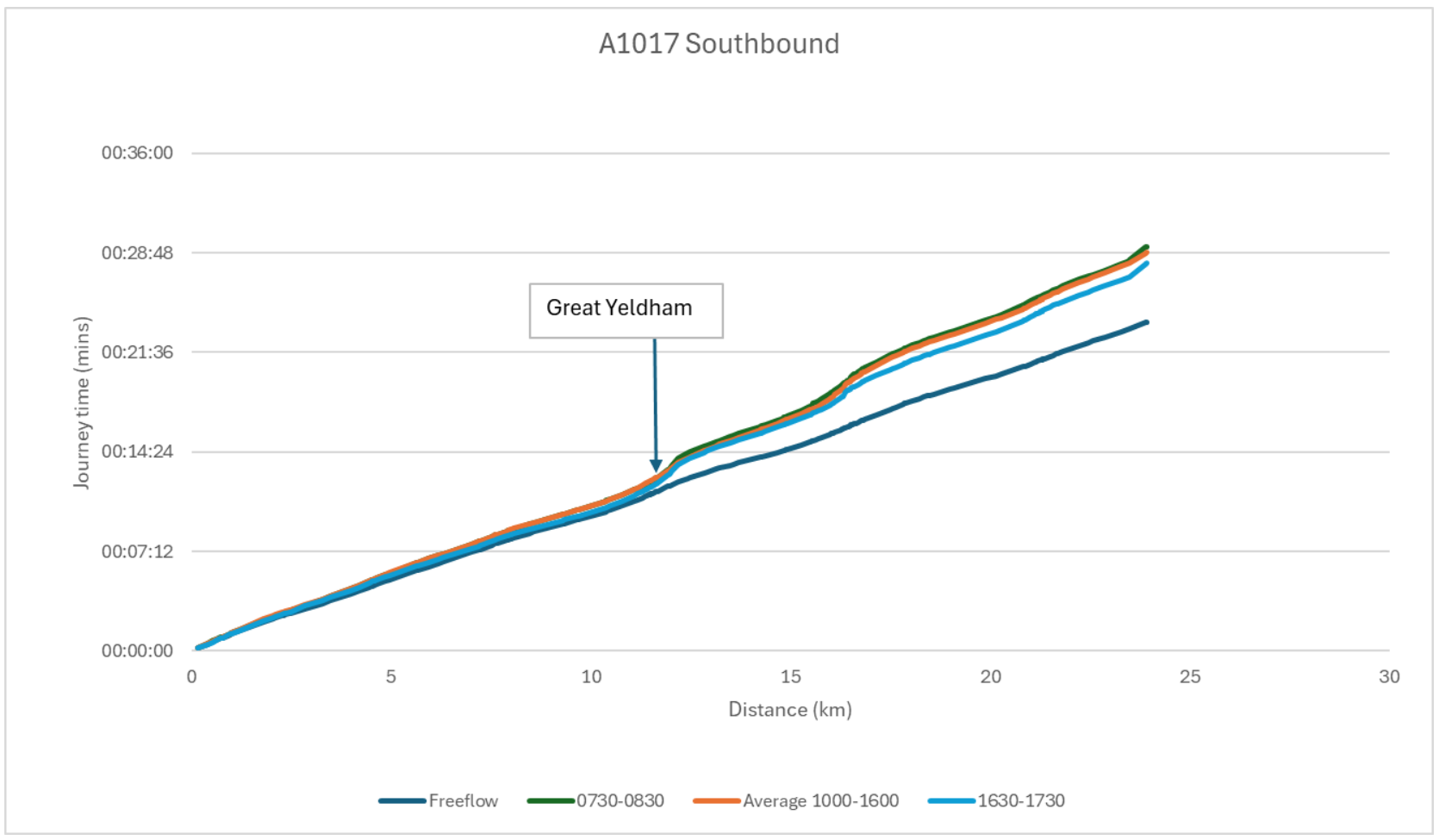

Figure F.8 – A1017 southbound from junction with A143 in Haverhill to the junction with A131 in High Garrett

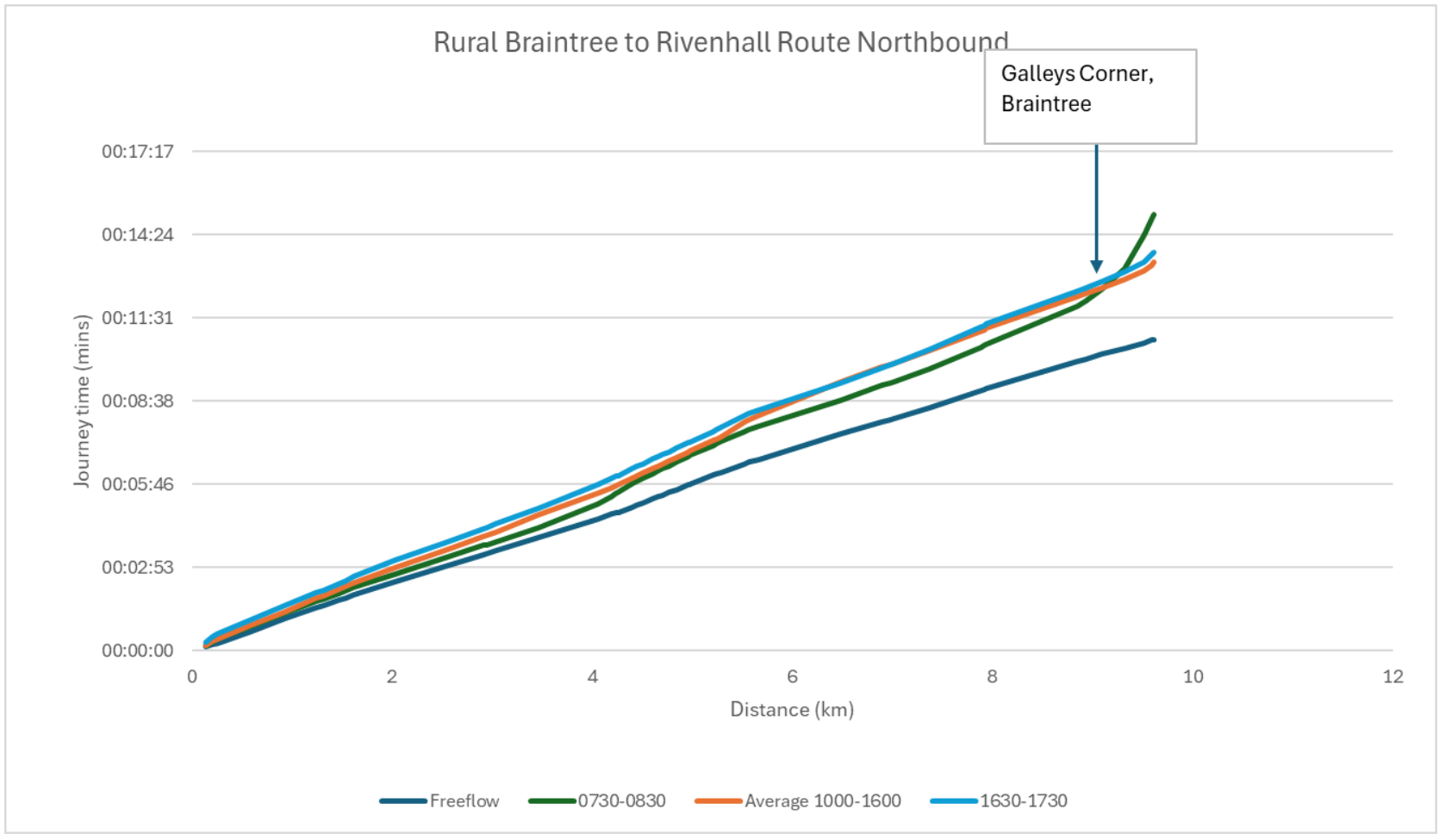

Figure F.9 – Rural route northbound from A12 junction at Rivenhall End to A120 Galleys Corner

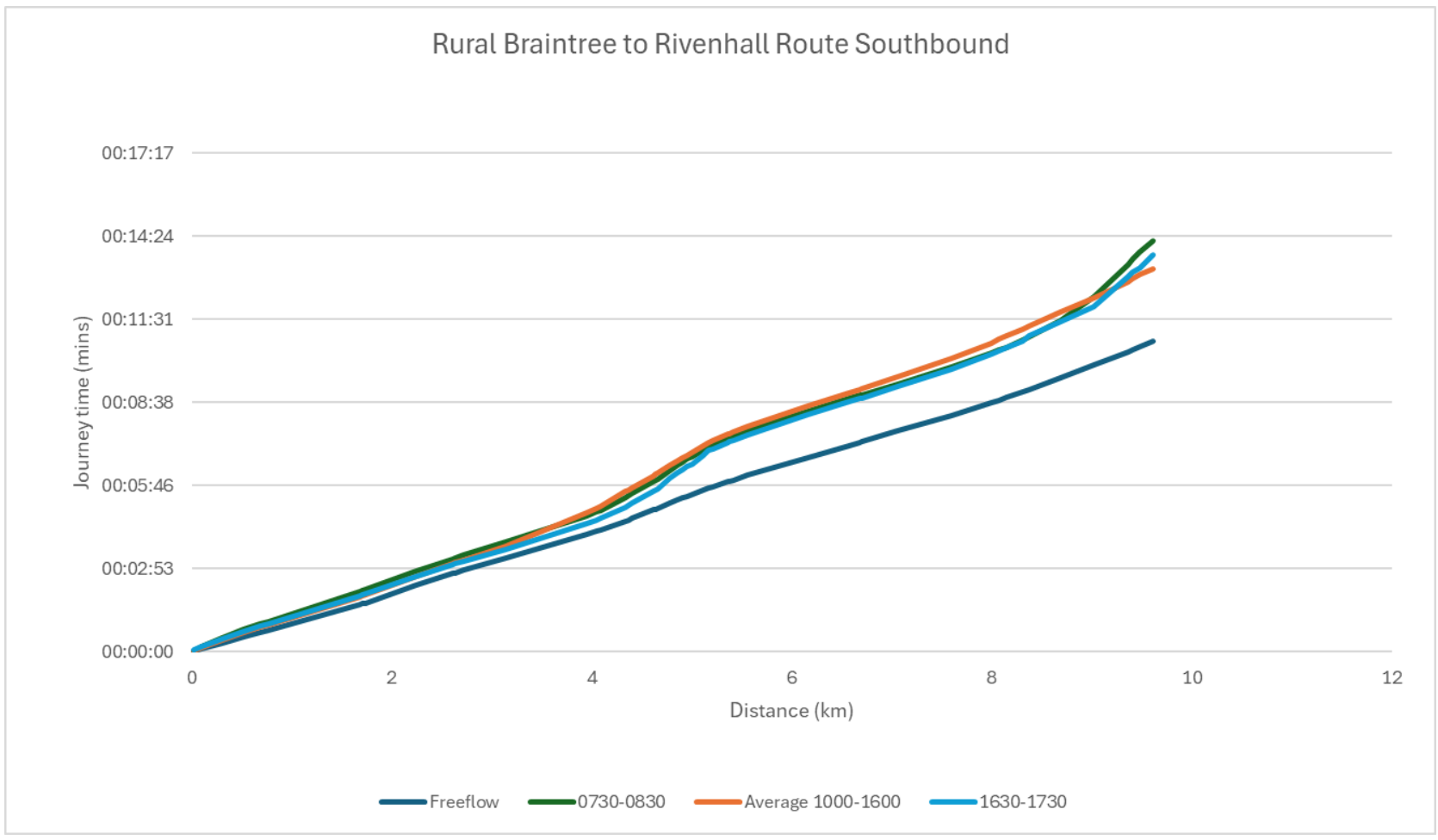

Figure F.10 – Rural route southbound from A120 Galleys Corner to A12 junction at Rivenhall End

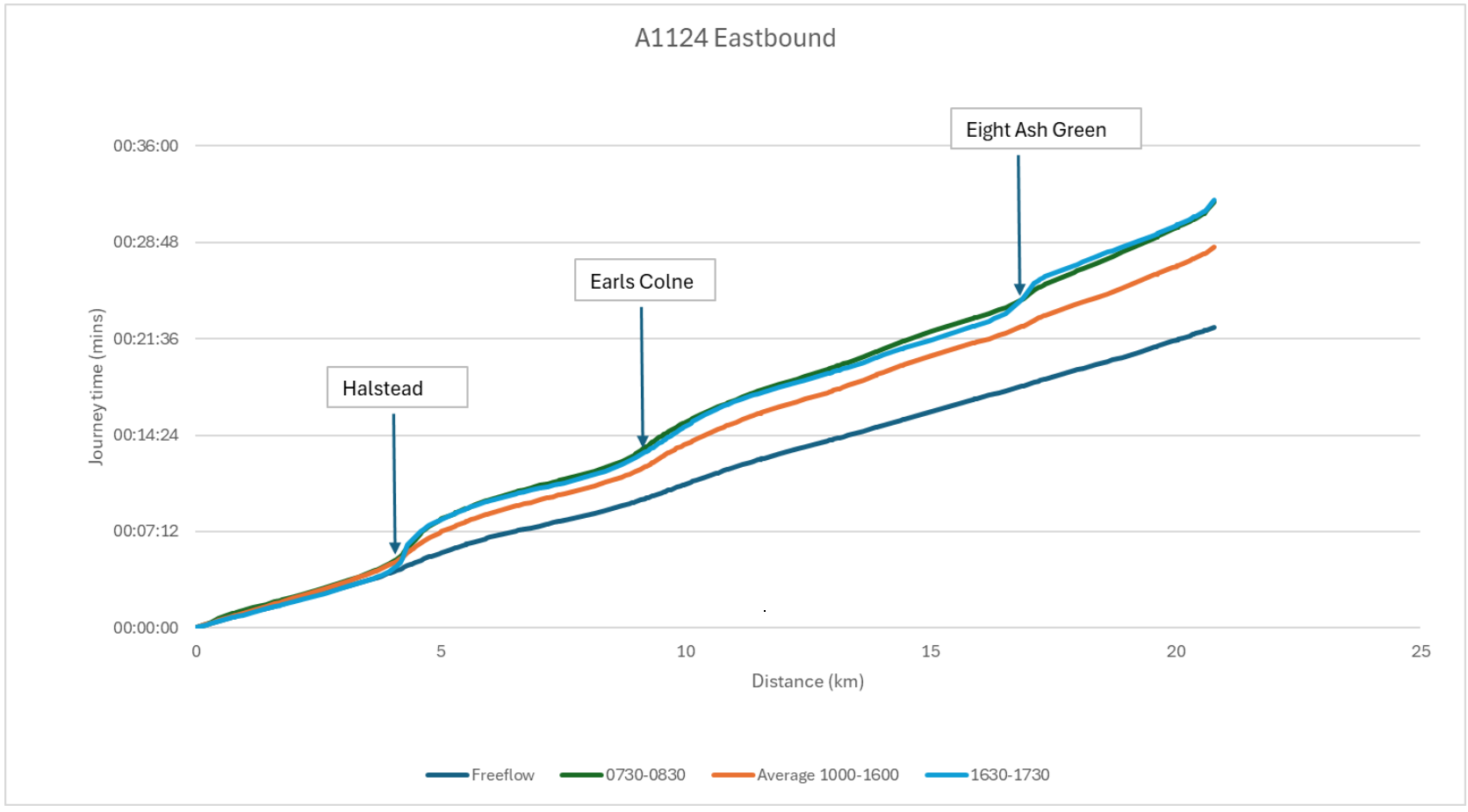

Figure F.11 – A1124 eastbound from junction with A1017 in Sible Hedingham to A12 junction 26 at Eight Ash Green

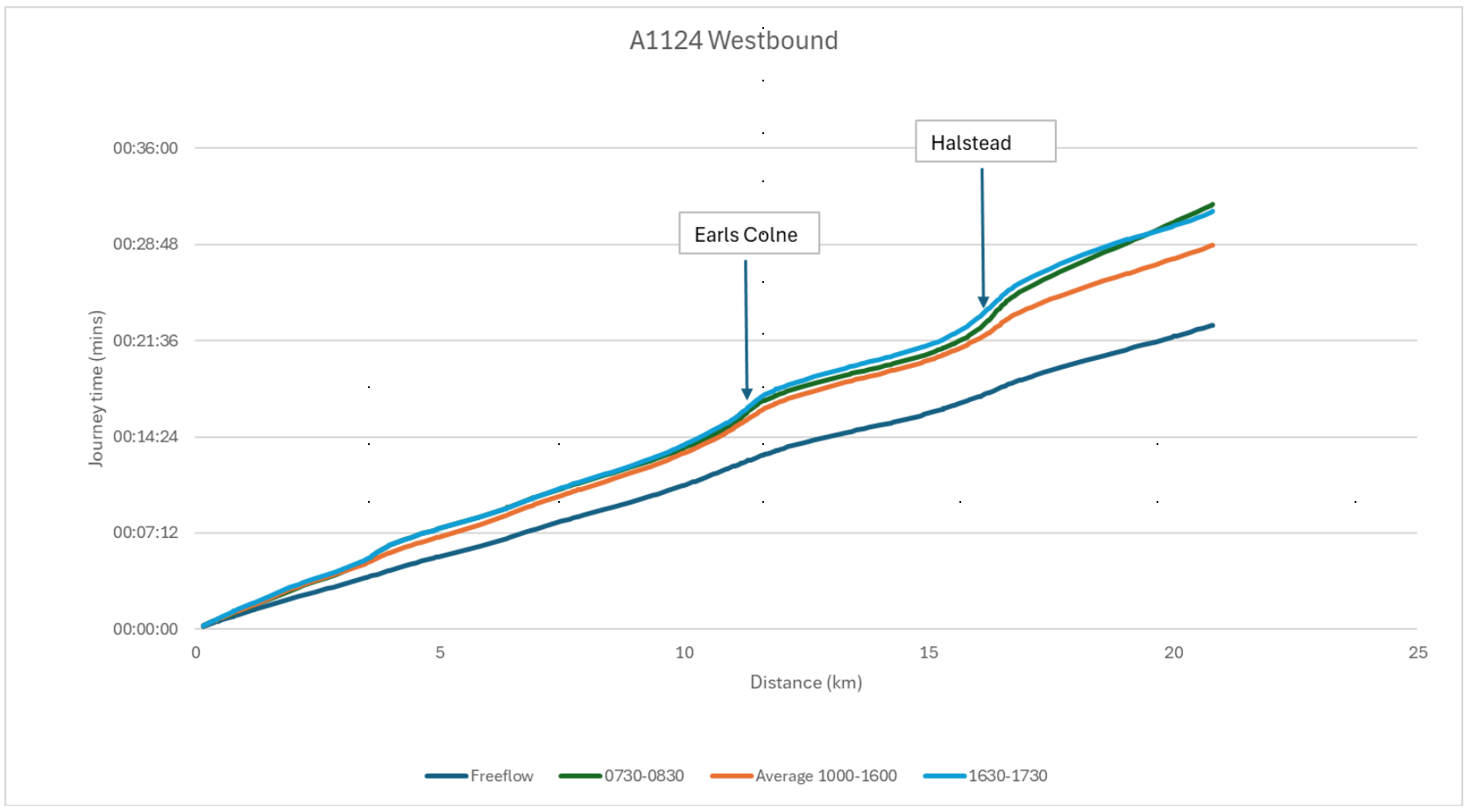

Figure F.12 - A1124 westbound from A12 junction 26 at Eight Ash Green to junction with A1017 in Sible Hedingham