



Birmingham City Centre Parking Study Appendices

Birmingham City Council

City Centre Parking Study

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Document history and status

Revision	Date	Description	By	Review	Approved
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1	23/08/2016	Revised Draft Report	HU	GS	GT
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Appendix A. BCC Car Parks

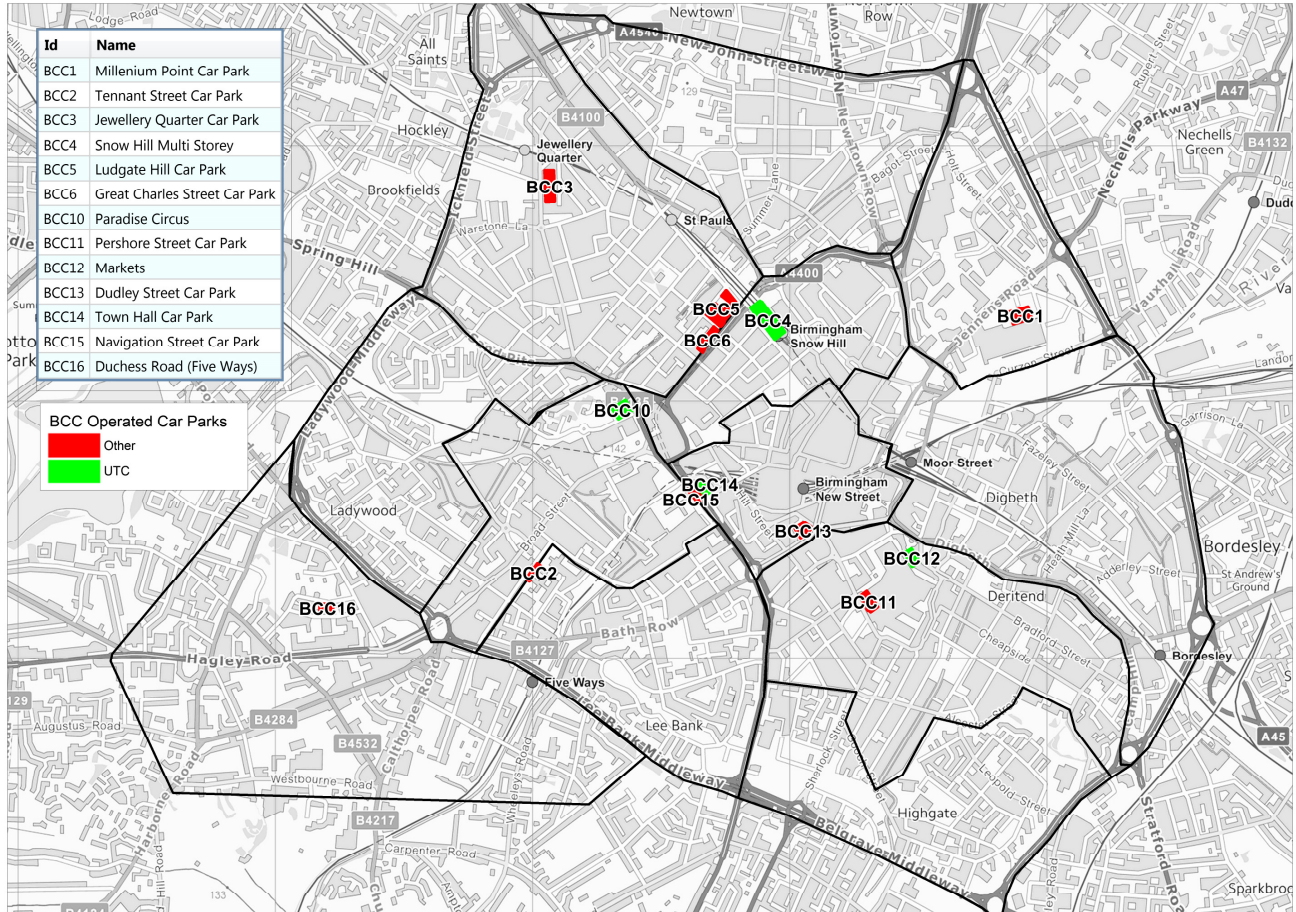


Figure A.1: BCC Operated Car Parks

Name	Location	Type	Quarter	Ordinary Spaces	Disabled Spaces	Total number of spaces
Millennium Point Car Park	Howe Street	Multi-Storey	Eastside Learning Quarter	934	50	984
Tennant Street Car Park	Tennant Street	Not covered	Broad Street Entertainment District	54	0	54
Jewellery Quarter Car Park	Vyse Street	Multi-Storey	Jewellery Quarter	550	3	553
Snow Hill Multi Storey	Livery Street	Multi-Storey	Civic & Business	843	20	863
Ludgate Hill Car Park	Ludgate Hill	Not covered	Jewellery Quarter	205	0	205
Great Charles Street Car Park	Great Charles Street	Not covered	Jewellery Quarter	82	0	82
Paradise Circus	Brindley Drive	Multi-Storey	Broad Street Entertainment District	602	8	610
Pershore Street Car Park	Pershore Street	Multi-Storey	Southern Gateway	317	0	317
Markets	Moat Lane	Multi-Storey	Southern Gateway	569	6	575
Dudley Street Car Park	Dudley Street	Covered	Leisure & Retail	55	2	57
Town Hall Car Park	Brunel Street	Multi-Storey	Leisure & Retail	381	6	387
Navigation Street Car Park	Navigation Street	Covered	Leisure & Retail	44	0	44
Duchess Road (Five Ways)	Duchess Road	Multi-Story	Five ways	93	0	93

Table A.1: BCC Operated Car Parks Quantum

Year	City Council	Privately Operated	Total
1993	9944	9740	19684
1995	10394	9791	20185
1997	10109	9566	19675
1998	9679	10186	19865
1999	9742	9379	19121
2000	9566	9139	18705
2001	9343	10574	19917
2002	8095	13566	21661
2003	8001	13543	21544
2004	7582	16393	23975
2005	7582	16193	23775
2006	7214	15824	23038
2007	7314	16581	23895
2008	7221	16485	23706
2009	7180	16619	23799
2010	6788	16755	23543
2011	7727	17762	25489

Table A.2: City Centre Car Park Spaces - Publicly Available (Source: Car Park Monitoring Database (BCC))

Operator	2005		2006		2007		2008		2009		2010		2011	
	Number of Car Parks	Spaces	Number of Car Parks	Spaces	Number of Car Parks	Spaces	Number of Car Parks	Spaces	Number of Car Parks	Spaces	Number of Car Parks	Spaces	Number of Car Parks	Spaces
Publicly Operated	30	7582	29	7214	29	7314	30	7221	31	7180	29	6788	29	7727
Privately Operated	51	16193	44	15824	46	16581	50	16485	59	16619	62	16755	73	17762
Total	81	23775	73	23038	75	23895	80	23706	90	23799	91	23543	102	25489

Table A.3: City Centre Car Parks and City Centre Car Parking Spaces - Publicly Available (Source: Car Park Monitoring Database (BCC))

Appendix B. Private Public Car Parks

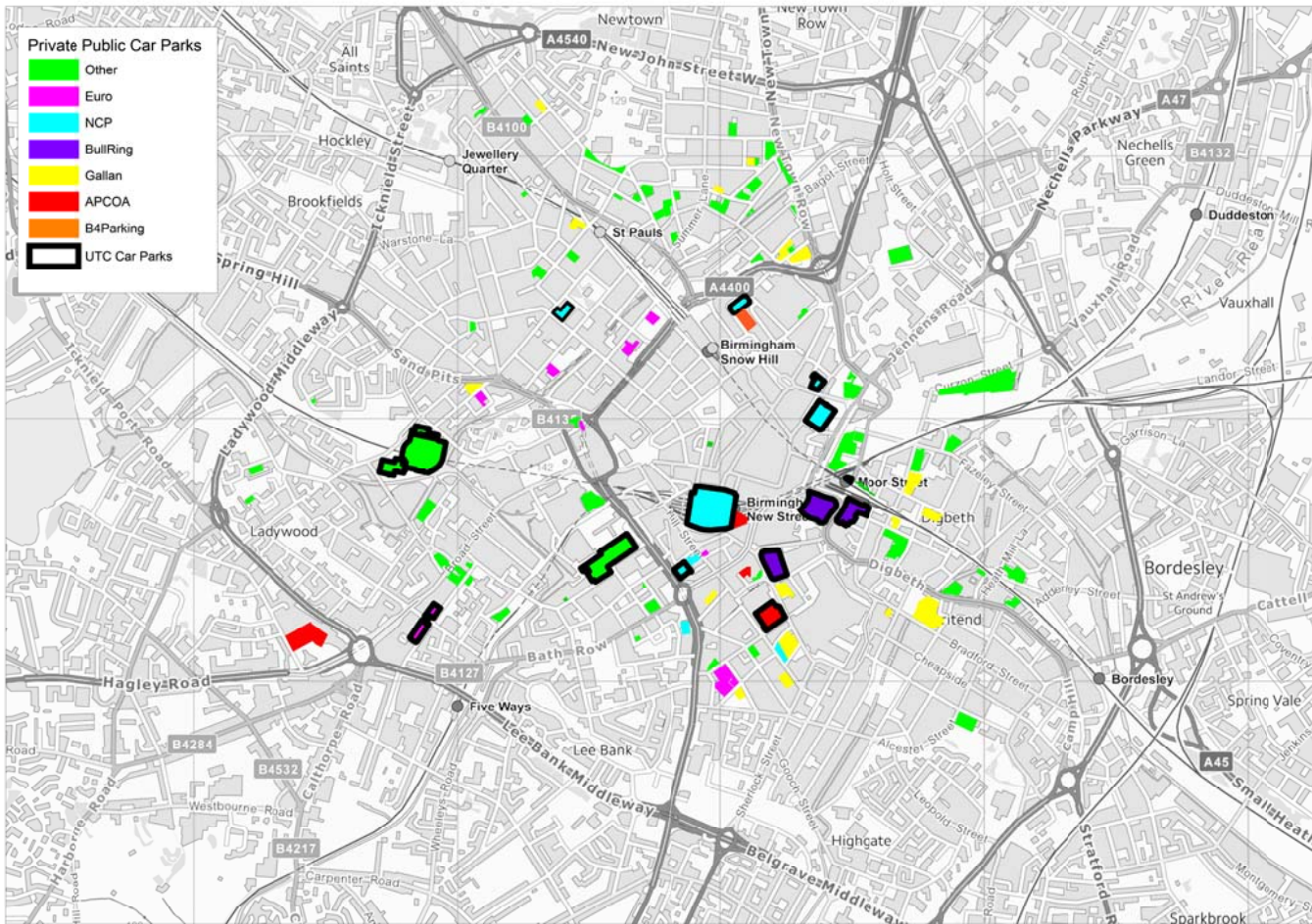


Figure B.1: Privately Operated Public Car Parks

ID	Car Park	Type	Operator	Quarter	Spaces
1	Broadway Plaza	Multi-storey	APCOA	Five Ways	1400
2	New Street Station	Multi-Storey	APCOA	Leisure & Retail	40
3	Arcadian	Multi-Storey	APCOA	Southern Gateway	508
4	Wrottesley Street	Multi-Storey	APCOA	Southern Gateway	162
5	Aston Street	Not covered	Aston University	Eastside Learning Quarter	24
6	B4 Parking (Weaman Street)	Multi-Storey	B4 Parking	Civic & Business	752
7	Mailbox	Multi-Storey	Birmingham Mail Box Ltd.	Broad Street Entertainment District	687
8	Brindley Place	Multi-Storey	Brindley Place PLC	Broad Street Entertainment District	890
9	Birmingham Central Travelodge	Not covered	Britannia Parking Ltd.	Broad Street Entertainment District	30
10	Arena Central	Multi-Storey	Brittania Car Parking	Broad Street Entertainment District	496
11	Ward Street	Not covered	Budget Car Parks	Gun Quarter	20
12	Moor Street	Multi-storey	Bullring Centre Management	Curzon	1194
13	Bullring Centre	Multi-storey	Bullring Centre Management	Leisure & Retail	1010
14	Edgbaston Street	Multi-storey	Bullring Centre Management	Southern Gateway	849
15	Shaw's Passage	Not covered	CCP	Curzon	32
16	Tennant Street (CCS)	Not covered	CCS	Broad Street Entertainment District	140
17	Legge Lane	Not covered	CCS	Jewellery Quarter	40
18	Bromsgrove Street	Not covered	CCS	Southern Gateway	50
19	Lower Essex Street	Not covered	CCS	Southern Gateway	80
20	Northwood Street	Not covered	Central Ticketing	Jewellery Quarter	56
21	Birmingham Children's Hospital NHS Found	Not covered	Children's Hospital	Civic & Business	30
22	Birmingham Children's Hospital NHS Found	Not covered	Children's Hospital	Civic & Business	26
23	Copthorne Hotel Car Park	Not covered	Copthorne Hotel	Civic & Business	30

24	New Canal Street	Not covered	CPS Midlands Ltd.	Curzon	150
25	Trinity Street	Not covered	Elite Management	Curzon	133
26	Zellig	Not covered	Elite Management	Curzon	100
27	North Yard	Not covered	Elite Management	Curzon	40
28	Hospital Street	Not covered	Elite Management	Gun Quarter	60
29	Paradise Circus	Not covered	Euro	Civic & Business	12
30	Lionel Street	Not covered	Euro	Jewellery Quarter	96
31	Charlotte Street	Not covered	Euro	Jewellery Quarter	55
32	Lower Lionel Street	Not covered	Euro	Jewellery Quarter	62
33	Northwood Street	Semi covered	Euro	Jewellery Quarter	46
34	Edward Street	Not covered	Euro	Ladywood	50
35	Hill Street / Hinckley Street	Not covered	Euro	Leisure & Retail	19
36	Bromsgrove Street	Not covered	Euro	Southern Gateway	219
37	Gooch Street North	Not covered	Euro	Southern Gateway	44
38	Fazeley Street/Seymour Street	Not covered	Excel Parking	Curzon	47
39	Albert Street	Not covered	Excel Parking	Curzon	263
40	Bordesley Street	Not covered	Gallan	Curzon	90
41	New Canal Street	Not covered	Gallan	Curzon	147
42	Fazeley Street	Not covered	Gallan	Curzon	60
43	Coventry Street	Reclaimed Land	Gallan	Curzon	78
44	Lench Street	Not covered	Gallan	Gun Quarter	130
45	Smith Street	Not covered	Gallan	Gun Quarter	35
46	Hanley Street	Not covered	Gallan	Gun Quarter	32
47	Ward Street	Not covered	Gallan	Gun Quarter	44
48	Vesey Street	Not covered	Gallan	Gun Quarter	77
49	Northwood Street	Not covered	Gallan	Jewellery Quarter	34
50	Edward Street/Sand Pits	Not covered	Gallan	Ladywood	50
51	Hurst Street	Covered	Gallan	Southern Gateway	81

52	Thorp Street	Not covered	Gallan	Southern Gateway	64
53	Pershore Street	Not covered	Gallan	Southern Gateway	183
54	Upper Dean Street	Not covered	Gallan	Southern Gateway	100
55	Connaught Square	Not covered	Gallan	Southern Gateway	200
56	Bradford Street	Not covered	Gallan	Southern Gateway	20
57	Kent Street	Not Covered	Gallan	Southern Gateway	56
58	Digbeth	Not covered	Green Parking Ltd.	Curzon	249
59	Ladywell Walk	Not covered	HM Car Park	Southern Gateway	23
60	Tennant Street (Midway Parks)	Not covered	Midway Car Parks	Broad Street Entertainment District	36
61	Park Street	Not covered	Midway Car Parks	Curzon	20
62	Lower Loveday Street	Not covered	Midway Car Parks	Gun Quarter	110
63	Hanley Street	Not covered	Midway Car Parks	Gun Quarter	16
64	Browsea Drive	Covered	Midway Car Parks	Westside	38
65	Blucher Street	Not covered	Midway Car Parks	Westside	30
66	Eastside	Not covered	n/a	Curzon	101
67	Cecil Street	n/a	n/a	Gun Quarter	85
68	Lower Tower Street	Not covered	n/a	Gun Quarter	39
69	Hospital Street	Not covered	n/a	Gun Quarter	94
70	Hampton Street	Not covered	n/a	Gun Quarter	59
71	Vesey Street	Not covered	n/a	Gun Quarter	23
72	Barr Street	Not covered	n/a	Jewellery Quarter	36
73	Mott Street	Not covered	n/a	Jewellery Quarter	15
74	Vyse Street	Not covered	n/a	Jewellery Quarter	35
75	Branston Street	Not covered	n/a	Jewellery Quarter	17
76	Sherborne Road	Not covered	n/a	Ladywood	14
77	Rodney Close	Not covered	n/a	Ladywood	45
78	Guild Close	Not covered	n/a	Ladywood	28
79	Hamptons Car Park	n/a	n/a	Westside	24

80	NCP Londonderry House	Multi-Storey	NCP	Civic & Business	720
81	NCP Royal Angus	Multi-Storey	NCP	Civic & Business	600
82	NCP High Street	Multi-Storey	NCP	Curzon	1200
83	NCP Newhall Street	Multi-Storey	NCP	Jewellery Quarter	500
84	NCP New Street	Multi-Storey	NCP	Leisure & Retail	485
85	NCP Grand Central	Multi-Storey	NCP	Leisure & Retail	450
86	St. Judes Passage	Not covered	NCP	Leisure & Retail	55
87	Hurst Street	Not covered	NCP	Southern Gateway	55
88	Horsefair	Multi-Storey	NCP	Westside	302
89	NIA - North Car Park	Multi-Storey	NEC Group	Broad Street Entertainment District	493
90	NIA - South Upper M/S Car Park	Multi-Storey	NEC Group	Broad Street Entertainment District	836
91	NIA - West M/S Car Park	Multi-Storey	NEC Group	Broad Street Entertainment District	666
92	Paragon Hotel	Covered	Paragon Hotel	Highgate	130
93	Curzon Street	Not covered	PPL	Curzon	450
94	Digbeth Court	Not covered	Premier Parking Logistics	Curzon	53
95	Princip Street	Not Covered	Premier Parking Logistics	Gun Quarter	10
96	Cliveland Street	Not covered	Premier Parking Logistics	Gun Quarter	12
97	Buckingham Street	Not covered	Property Link	Gun Quarter	100
98	Mott Street / Hampton Street	Not covered	Property Link	Gun Quarter	28
99	Cecil Street	Not covered	Property Link	Gun Quarter	40
100	Cliveland Street	Not covered	Property Link	Gun Quarter	68
101	Buckingham Street	Not covered	Property Link	Gun Quarter	69
102	Cliveland Street	Not covered	Property Link	Gun Quarter	10
103	Chapel Street	Not covered	SIP Car Parks Limited	Curzon	276
104	Bath Street	Not covered	SIP Car Parks Limited	Gun Quarter	25
105	William Street North	Not covered	SIP Car Parks Limited	Gun Quarter	34
106	Holliday Street	Not covered	SIP Car Parks Limited	Westside	78
107	Somerset House Garage	Underground	Somerset House	Leisure & Retail	28

108	Cube Car Park	Underground	The Cube	Broad Street Entertainment District	339
109	Cecil Street	Not covered	Unknown	Gun Quarter	80
110	Broad Street (Five Ways)	Not covered	Urban Car Parks	Broad Street Entertainment District	95

Table B.1 : Private Public Car Parks Quantum

Appendix C. Off-Street Utilisation

C.1 UTC Car Park Location and Capacity

Name	Quarter	Total Spaces
Arcadian	Southern Gateway	508
Arena Central	Broad Street Entertainment District	496
Broad Street (Five Ways)	Broad Street Entertainment District	690
Bullring Centre	Leisure & Retail	1010
Edgbaston Street	Southern Gateway	849
Mailbox	Broad Street Entertainment District	687
Markets	Southern Gateway	575
Moor Street	Curzon	1194
NCP Grand Central	Leisure & Retail	450
NCP High Street	Curzon	1200
NCP Londonderry House	Civic & Business	720
NCP New Street	Leisure & Retail	485
NCP Newhall Street	Jewellery Quarter	500
NCP Royal Angus	Civic & Business	600
NIA - Community Hall + North Car Park	Broad Street Entertainment District	493
NIA - West M/S Car Park	Broad Street Entertainment District	666
NIA - South Upper M/S Car Park	Broad Street Entertainment District	836
Paradise Circus	Broad Street Entertainment District	610
Pershore Street Car Park	Southern Gateway	317
Snow Hill	Civic & Business	863
Town Hall Car Park	Leisure & Retail	387

Table C.1 : UTC Car Park Capacities

C.3 UTC Car Park Accumulation

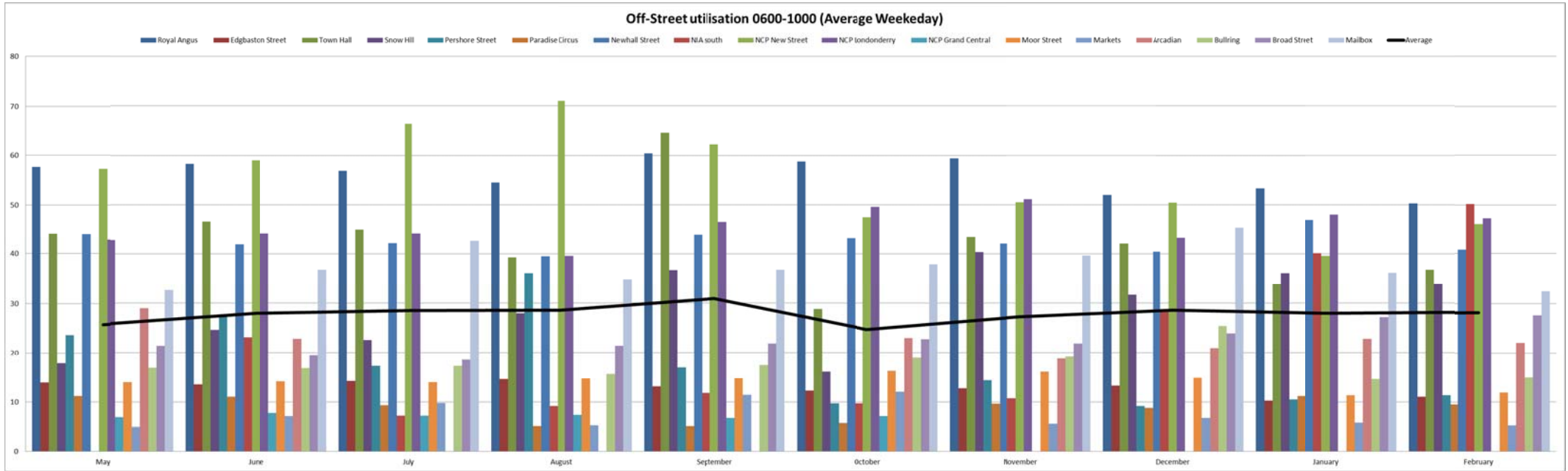


Figure C.1: Off-Street Utilisation 0600-1000 (Average weekday)

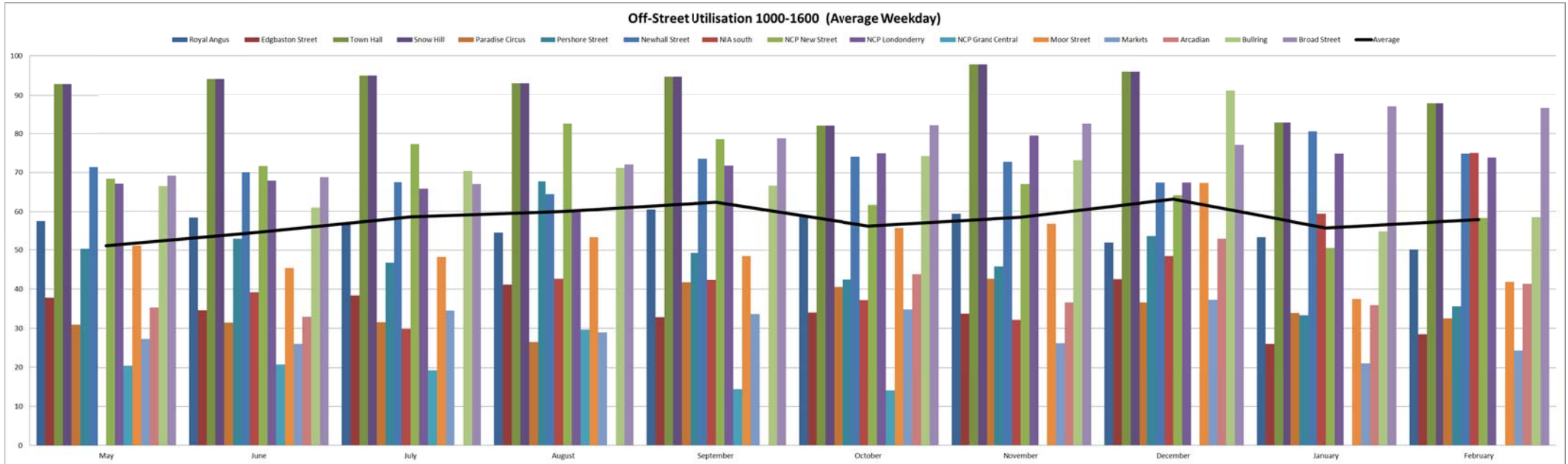


Figure C.2: Off-Street Utilisation 1000-1600 (Average Weekday)

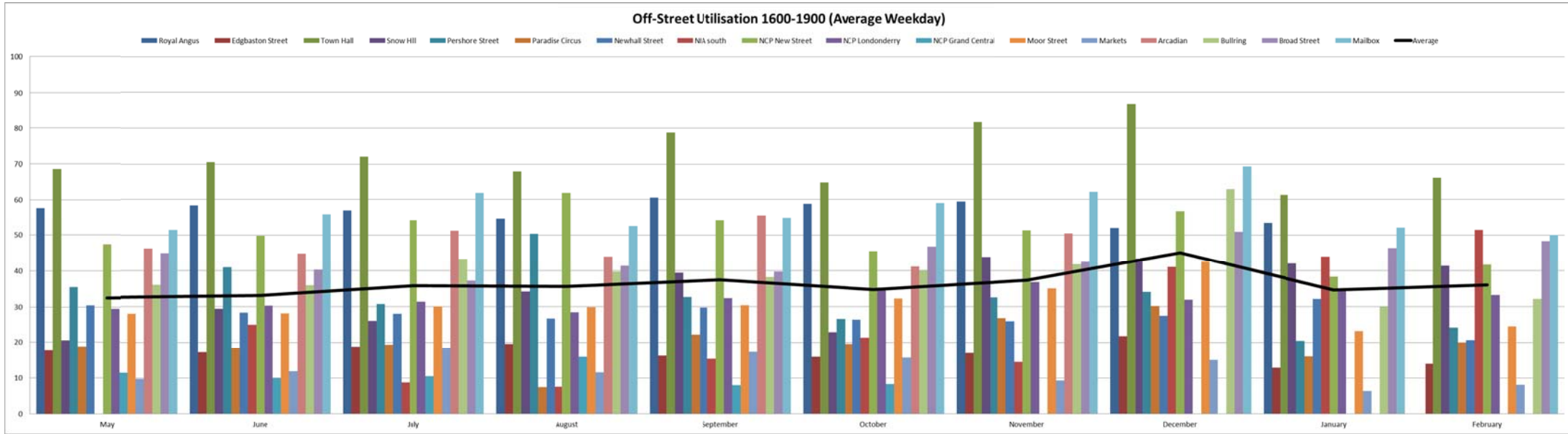


Figure C.3: Off-Street Utilisation 1600-1900 (Average Weekday)

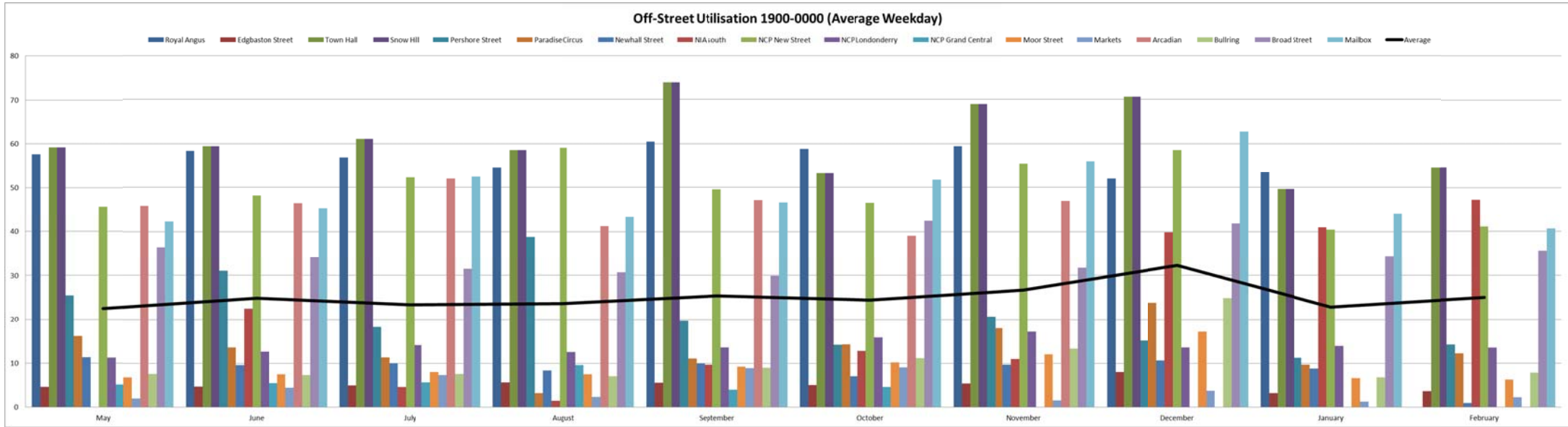


Figure C.4: Off-Street Utilisation 1900-0000 (Average Weekday)

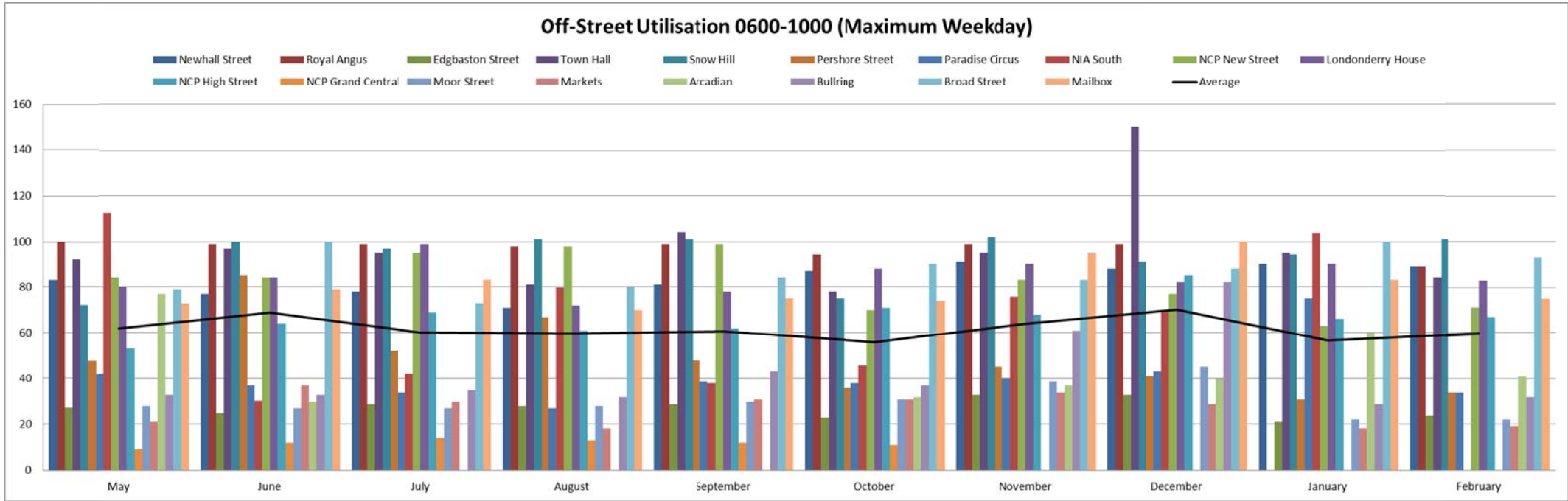


Figure C.5 : Off-Street Utilisation 0600-1000 (Maximum Weekday)

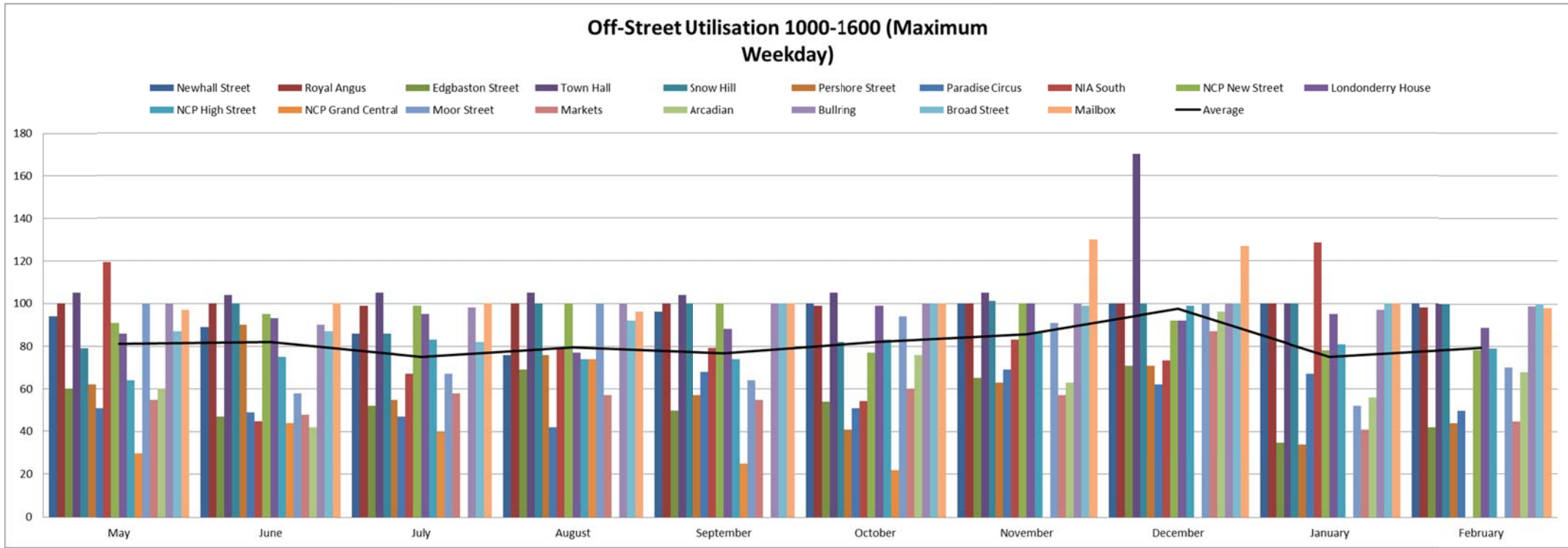


Figure C.6 : Off-Street Utilisation 1000-1600 (Maximum Weekday)

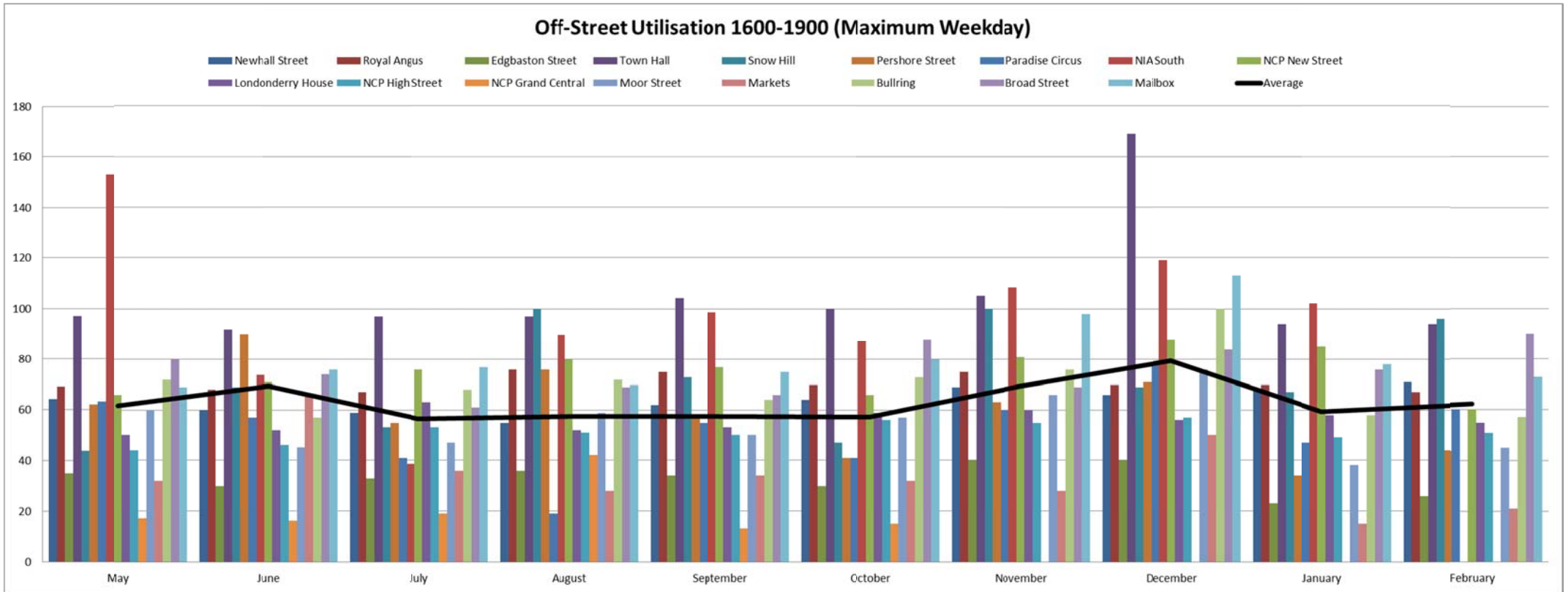


Figure C.7 : Off-Street Utilisation 1600-1900 (Maximum Weekday)

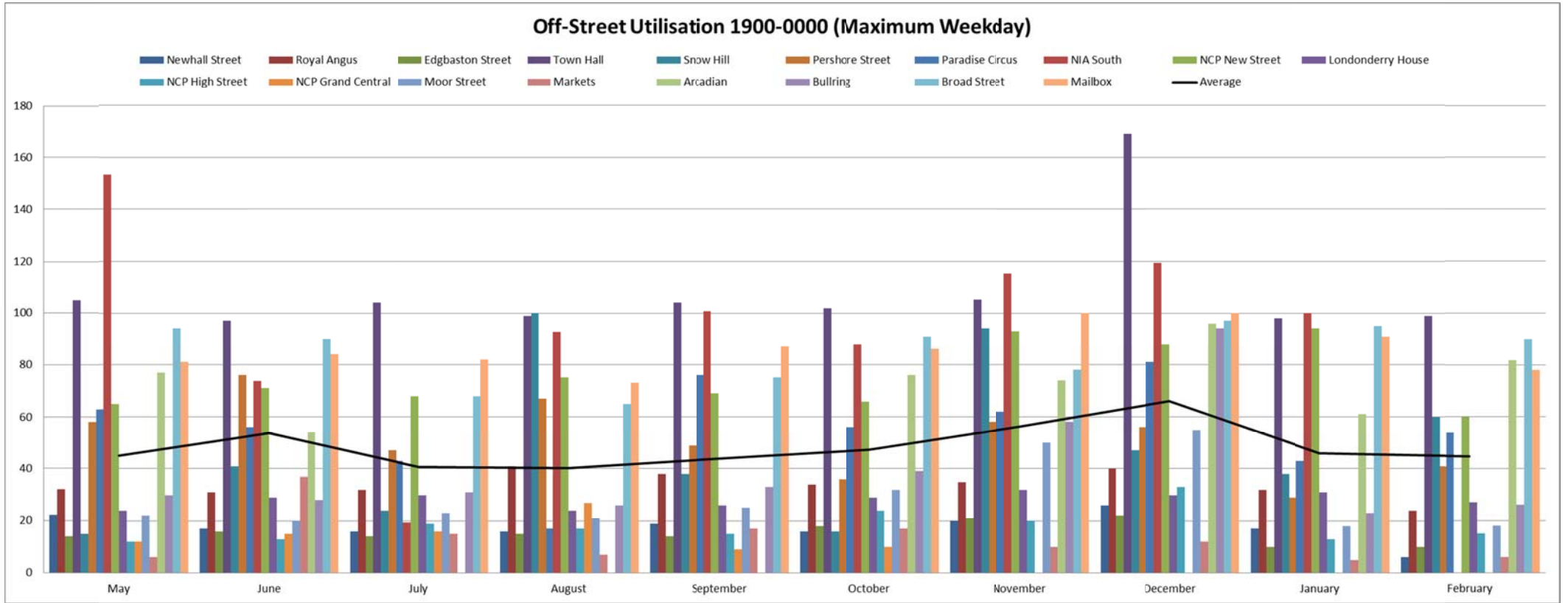


Figure C.8 : Off-Street Utilisation 1900-0000 (Maximum Weekday)

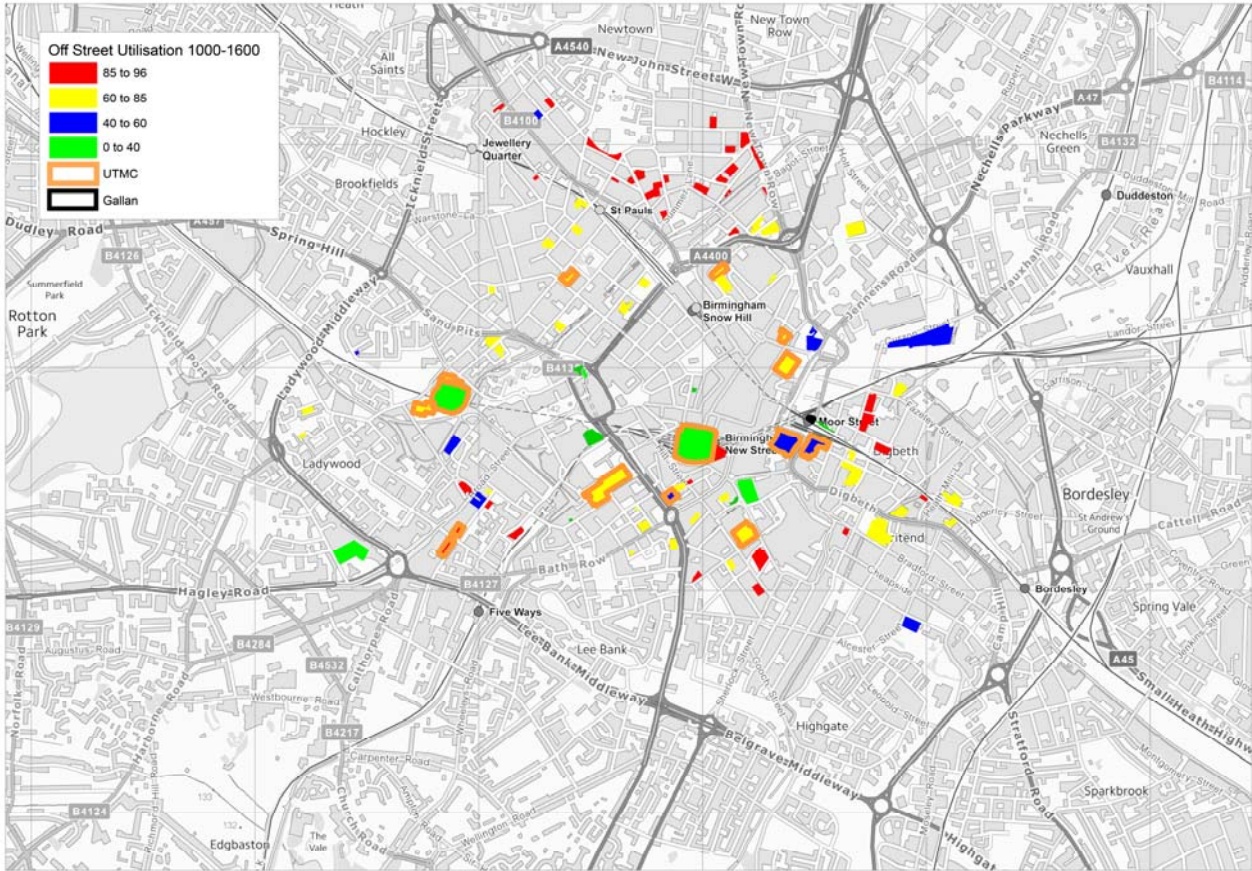


Figure C.9: Weekday Off-Street Utilisation

Weekday Ticket Sales	Less than 4 hours	More than 4 hours	Total	Less than 4 hours	More than 4 hours	Total
Dudley Street	2120	1165	3285	65%	35%	100%
Dudley Street Motorcycles	0	4	4	0%	100%	100%
Great Charles Street	8613	7107	15720	55%	45%	100%
Jewellery Quarter Multi Storey	2650	9370	12020	22%	78%	100%
Ludgate Hill	23354	19648	43002	54%	46%	100%
Ludgate Hill Day Ticket	0	16	16	0%	100%	100%
Markets Multi Storey Day Ticket	0	2	2	0%	100%	100%
Markets Multi-Storey	5092	2949	8041	63%	37%	100%
Navigation Street	4409	2524	6933	64%	36%	100%
Newhall Street	12940	5	12945	100%	0%	100%
Paradise Circus Multi-Storey	20930	16834	37764	55%	45%	100%
Pershore Street Multi Storey Day Ticket	2	16	18	11%	89%	100%
Pershore Street	139	0	139	100%	0%	100%
Pershore Street Multi-Storey	6691	4651	11342	59%	41%	100%
Pershore Street Multi-Storey 5 day ticket	0	4	4	0%	100%	100%
Snow Hill Multi-Storey	90346	56408	146754	62%	38%	100%
Snow Hill Multi-Storey Motorcycles	11	213	224	5%	95%	100%
Tennant Street Car park	621	3229	3850	16%	84%	100%
Total	177918	124145	302063	59%	41%	100%

Appendix D. Existing Tariff Structures and Rates

D.1 Comparison with Core Cities

A comparison of BCC tariff structures was compared against other core cities; Table D1 shows the average tariff for Council Operated car parks and D2 for privately operated public car parks.

The tariff structures vary considerably across the City Councils. Nottingham City Council does not offer a 1 hour charge. Solihull Council charges for individual hours then offers either a '3+' or '6+' charge. In Leicester, only the multi storey car parks have charges for every hour; the surface car parks tend to follow a 1, 2, 4 then 12 hour structure.

In terms of prices, both BCC and Nottingham have the biggest variance in prices across their car parks that seem to reflect their location in relation to the main attractions in the City Centre. Solihull, Leicester and Coventry on the other hand have very similar charges across their car parks regardless of location. Overall, BCC's prices are below average for every hour apart from hours 2 and 3.

City	1 Hour	2 Hours	3 Hours	4 Hours	6 Hours	24 Hours
Leicester City Council	£1.00	£1.00	£2.50	£4.00	£6.00	-
Birmingham BCC	£1.53	£2.43	£3.23	£3.72	£4.55	£6.75
Solihull	£2.30	£2.30	£3.10	£4.00	£5.60	£8.20
Coventry City Council	£2.00	£2.90	£3.40	£4.19	£7.69	£8.69
Nottingham Council	-	£1.85	£2.00	£3.55	£6.00	£5.38
Average	£1.83	£2.34	£2.98	£4.11	£6.96	£9.62

Table D.1 : Council Operated Car Parks

City	1 Hour	2 Hours	3 Hours	4 Hours	6 Hours	24 Hours
Coventry Private	£0.75	£1.80	£2.40	£3.25	£7.50	£8.50
Birmingham Private	£1.67	£2.86	£3.85	£4.49	£5.75	£9.31
Nottingham Private	£1.80	£3.33	£4.65	£5.83	£10.10	£11.16
Leicester Private	£1.98	£2.13	£2.45	£7.06	£8.06	£13.36
Manchester Private	£3.00	£3.67	£5.50	£6.00	£7.42	£11.33
Birmingham NCP	£4.18	£5.12	£8.01	£8.94	£13.68	£20.21
Manchester NCP	£1.10	£2.16	£2.83	£3.77	£4.40	£5.80
Average	£1.75	£3.30	£4.55	£6.05	£8.41	£12.56

Table D.2 : Privately Operated Car Parks

There appears to be more flexibility with the tariff structures in Private and NCP car parks compared to Council car parks. Almost every hour is offered compared to some Council car parks where there is a jump in price from 6 hours to 12 or 24, when some people may be planning on staying between these hours. Overall in terms of prices, BCC tariffs are consistently lower than private car parks in the City.

The Core Cities data came from a variety of sources, using different sample sizes due to the differing amounts and ownership of car parks in these cities. All Council car park tariff data came from the respective City Council websites. A sample size of 10 car parks was used to determine the average prices of private car parks in each city, using a mixture of NCP and other operators (where NCP is not counted separately). The sample for Coventry was slightly smaller, as it seems that the majority of car parks in the city centre are Council operated.

D.2 Off Street

D.2.1 BCC Operated Car Parks

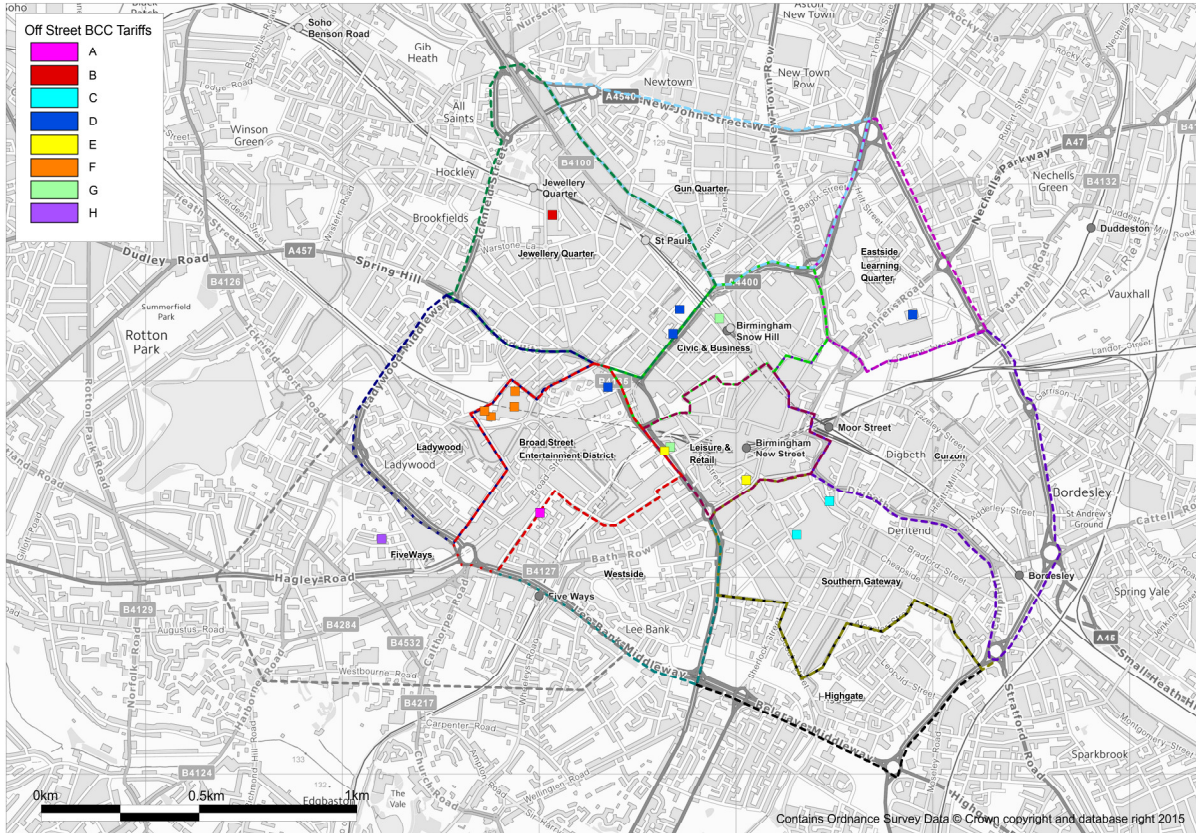


Figure D.1: BCC Operated Car Parks Tariff Structures on Weekdays

Weekday Tariff Structure	0-1hrs	1-2hrs	2-4hrs	4-6hrs	6-12hrs	12+
A	£0.80	£1.60	£3.00	£4.00	£5.80	-
B	£1.00	£1.70	£2.70	£4.00	£4.60	-
C	£1.10	£1.70	£3.20	£3.80	£4.00	-
D	£1.40	£2.60	£4.50	£5.80	-	-
E	£1.60	£2.80	£5.50	£8.60	-	-
F	£2.30	£3.50	£6.80	£6.80	£6.80	£8.00
G	£1.40	£2.70	£5.20	£8.00	£11.60	-
H	£0.50	£1.00	£2.00	£3.00	£4.50	-

Table D.3 : Weekday Tariff Structure – BCC Operated Car Parks

Saturday Tariff Structure	0-1hrs	1-2hrs	2-4hrs	4-6hrs	6-12hrs	12+
A	£1.40	£2.60	£3.50	£3.50	£3.50	£3.50

Table D.4 : Saturday Tariff Structure- BCC operated Car Parks

Sunday Tariff Structure	0-1hrs	1-2hrs	2-4hrs	4-6hrs	6-12hrs	12+
A	£1.60	£2.80	£3.50	£3.50	£3.50	£3.50
B			£1.00		£2.00	
C	£1.40	£2.60	£3.50	£3.50	£3.50	£3.50
D	£1.10	£1.70	£3.20	£4.00	£4.00	£4.00
E						£3.50
F	£1.10	£1.70	£3.20			£4.00
G	FREE	FREE	FREE	FREE	FREE	FREE

Table D.5 : Sunday Tariff Structure- BCC operated Car Parks

Car Park	Tariff Structure- Weekdays	Tariff Structure- Saturday	Tariff Structure- Sunday
Tennant Street	A	***	G
Jewellery Quarter M/S	B	***	Closed
Markets M/S	C	***	D
Pershore Street	C	***	F
Great Charles Street	D	A	A
Ludgate Hill	D	A	C
Millennium Point M/S	D	***	E
Paradise Circus M/S	D	***	C
Dudley Street	E*	***	A
Navigation Street	E*	***	A
NIA North	F**	***	E
NIA South	F**	***	E
NIA West	F**	***	E
NIA Community Hall	F**	***	E
Snow Hill M/S	G	***	C
Town Hall M/S	G*	***	E
Duchess Road	H	***	B

Table D.6: Tariff Structures

* Slightly cheaper tariff after 18:00

** Price for 1-3 hours more expensive after 18:00

***Same charges as a weekday apply

D.2.2 Private Public Car Parks

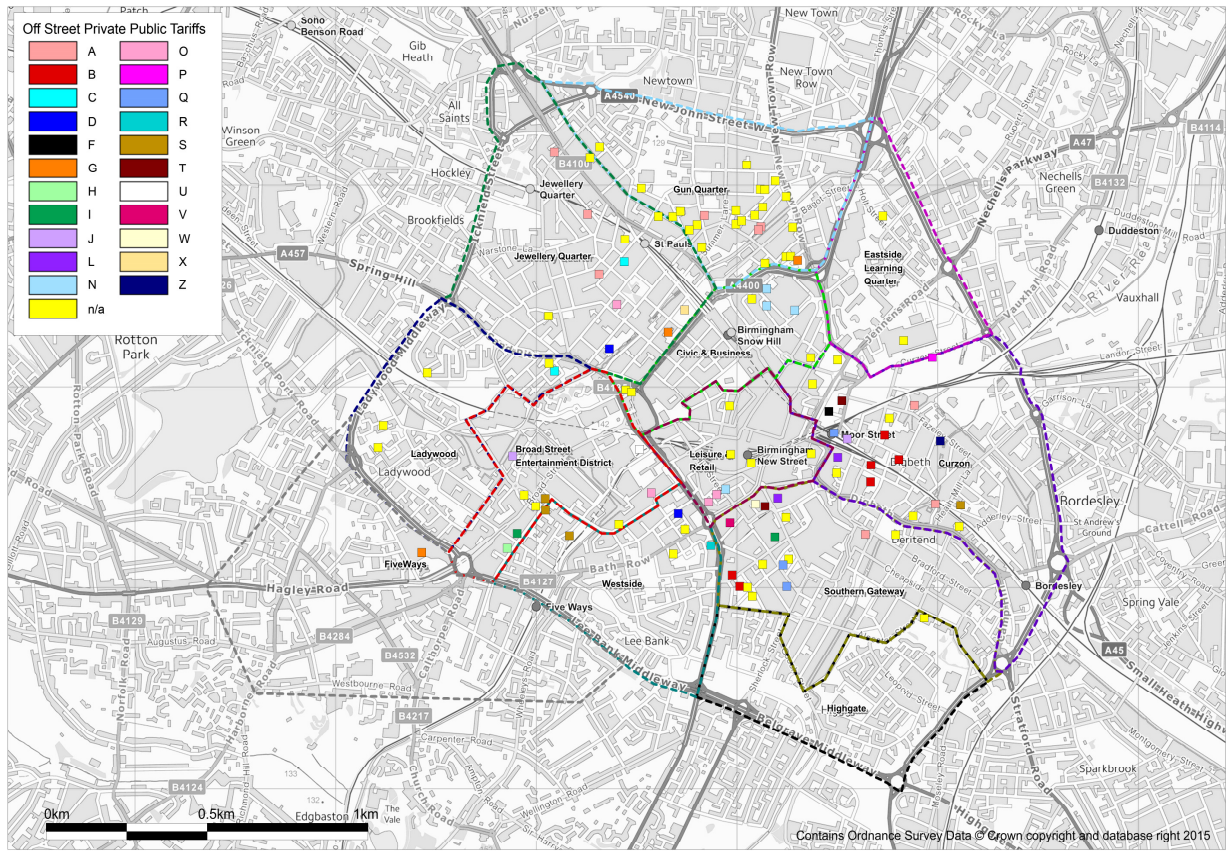


Figure D.2 : Private Public Car Parks Tariff Structures Mon-Sat

Mon-Sat	0-1hrs	0-12hrs	1-2hrs	2-3hrs	2-4hrs	4-6hrs	6-8hrs	6-12hrs	12+
A	£0.50	-	£1.00	£1.60	-	£4.20	£4.20	£4.20	-
B	£0.80	-	-	-	-	-	-	-	-
C	£1.00	£4.20	£1.60	£2.20	£4.20	-	-	-	-
D	£1.00	£3.50	£1.50	£2.00	£2.50	£3.50	£3.50	£3.50	-
E	£1.20	£21.00	£2.20	£3.20	£4.20	£6.20	£8.20	£21.00	£21.00
F	£1.20	-	£2.40	£3.40	£4.40	£7.00	£7.00	-	-
G	£1.20	-	£2.50	£2.50	£4.00	£6.00	£12.50	£12.50	£12.50
H	£1.50	-	£2.50	£3.00	£4.00	£4.80	£5.50	£8.00	-
I	£1.50	-	£2.80	£3.50	£3.80	£4.50	£4.80	£4.80	£7.00
J	£2.00	-	£2.00	£4.00	£5.50	£7.50	£7.50	£10.00	£15.00
K	£2.00	-	£4.00	£6.00	£8.00	£10.00	£10.50	£14.50	£15.50
L	£2.50	-	£5.00	£7.50	£10.00	£12.00	£15.00	£20.00	£25.00
M	£2.50	-	£4.50	£6.50	£7.00	£8.00	£12.00	£16.00	-
N	£3.00	£10.00	£3.00	£5.00	£5.00	£7.00	£9.00	£10.00	£15.00
O	£4.00	£5.00	£5.00	£6.00	£6.00	£8.00	£8.00	£10.00	£10.00
P	£5.00	£25.00	£7.50	£10.00	£12.50	£15.00	£20.00	£25.00	£30.00
Q	£7.50	-	£7.50	£15.00	£15.00	£26.00	£26.00	£26.00	£26.00
R	-	£3.00	-	-	-	-	-	-	-
S	-	£3.90	-	-	-	-	-	-	-
T	-	£5.00	-	-	-	-	-	-	-
U	-	£6.00	-	-	-	-	-	-	-
V	-	-	-	-	-	-	-	£8.00	£12.00
W	-	-	-	-	-	-	-	-	£5.80
X	-	£4.50	-	-	-	-	-	-	£12.50
Y	-	£10.00	-	-	-	-	-	-	£18.00
Z	-	-	-	-	-	-	-	£2.50	-

Table D.7 : Tariff Structures for Private Public Car Parks- Monday to Saturday

Sunday	0-1hrs	0-12hrs	1-2hrs	2-3hrs	2-4hrs	4-6hrs	6-8hrs	6-12hrs	12+
A									3.50
B									4.50
C									3.00
D	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE

Table D.8 : Tariff Structures for Private Public Car Parks- Sunday

D.2.3 On Street

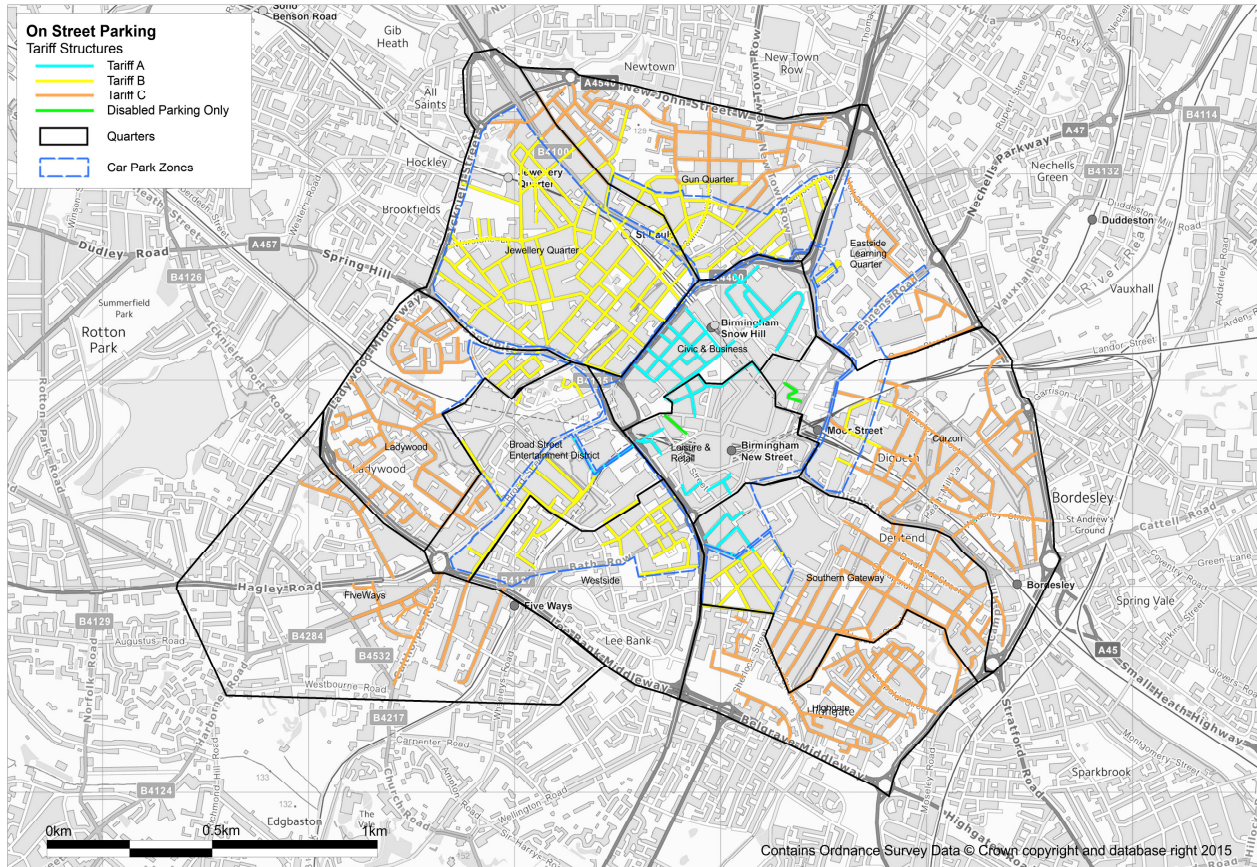


Figure D.3 : On Street Parking Tariff Structures

Tariff Structure	Up to 30 mins	Up to 1 hour	Up to 2 hours	Up to 3 hours	Up to 4 hours
A	£1.70	£3.30	£5.90		
B		£0.80	£1.60	£2.30	£3.00
C	FREE	FREE	FREE	FREE	FREE

Table D.9 : On Street Parking Tariff Structures

D.2.4 Parking Revenues

2004 Tariffs(£)

	<i>1 Hour</i>	<i>2 Hours</i>	<i>3 Hours</i>	<i>4 Hours</i>	<i>6 Hours</i>	<i>24 Hours</i>
<i>Dudley St</i>	1.00	1.70	2.20	2.90	4.00	8.00
<i>Gt Charles St</i>	1.00	1.70	2.20	2.90	4.00	8.00
<i>JQ</i>	0.40	0.90	1.40	1.80	2.70	3.20
<i>Ludgate Hill</i>	1.00	1.70	2.20	2.90	4.00	8.00
<i>Markets</i>	0.50	1.00	1.50	2.50	3.20	6.50
<i>Navigation St</i>	1.00	1.90	2.50	3.10	4.30	11.00
<i>Paradise</i>	1.00	1.70	2.20	2.90	4.00	8.00
<i>Pershore</i>	0.50	1.00	1.50	2.50	3.20	6.50
<i>Snow Hill</i>	1.00	1.90	2.70	3.60	5.30	10.00
<i>Tennant St</i>	0.40	0.80	1.60	2.20	3.00	3.90
<i>Town Hall</i>	1.00	1.90	2.50	3.10	4.30	11.00

Table D.10: 2004 Tariffs

2016 Tariffs(£)

	<i>1 Hour</i>	<i>2 Hours</i>	<i>3 Hours</i>	<i>4 Hours</i>	<i>6 Hours</i>	<i>24 Hours</i>
<i>Dudley St</i>	1.60	2.80	4.20	5.50	8.60	
<i>Gt Charles St</i>	1.40	2.60	3.70	4.50	5.80	6.90
<i>JQ</i>	1.00	1.70	2.20	2.70	4.00	4.60
<i>Ludgate Hill</i>	1.40	2.60	3.70	4.50	5.80	6.90
<i>Markets</i>	1.10	1.70	2.80	3.20	3.80	4.00
<i>Navigation St</i>	1.60	2.80	4.20	5.50	8.60	
<i>Paradise</i>	1.40	2.60	3.70	4.50	5.80	9.50
<i>Pershore</i>	1.10	1.70	2.80	3.20	2.80	4.00
<i>Snow Hill</i>	1.40	2.70	3.90	5.20	8.00	11.60
<i>Tennant St</i>	0.80	1.60	2.20	3.00	4.00	5.80
<i>Town Hall</i>	1.40	2.70	3.90	5.20	8.00	11.60

Table D.11: 2016 Tariffs

2016 compared to 2004 (£)

	1 Hour	2 Hours	3 Hours	4 Hours	6 Hours	24 Hours
Dudley St	0.60	1.10	2.00	2.60	4.60	
Gt Charles St	0.40	0.90	1.50	1.60	1.80	-1.10
JQ	0.60	0.80	0.80	0.90	1.30	1.40
Ludgate Hill	0.40	0.90	1.50	1.60	1.80	-1.10
Markets	0.60	0.70	1.30	0.70	0.60	-2.50
Navigation St	0.60	0.90	1.70	2.40	4.30	
Paradise	0.40	0.90	1.50	1.60	1.80	1.50
Pershore	0.60	0.70	1.30	0.70	-0.40	-2.50
Snow Hill	0.40	0.80	1.20	1.60	2.70	1.60
Tennant St	0.40	0.80	0.60	0.80	1.00	1.90
Town hall	0.40	0.80	1.40	2.10	3.70	0.60

Table D.12: 2016 compared to 2004

2016 compared to 2016 RPI inflation based (£)

	1 Hour	2 Hours	3 Hours	4 Hours	6 Hours	24 Hours
Dudley St	0.20	0.40	1.10	1.40	3.00	
Gt Charles St	0.00	0.20	0.60	0.40	0.20	-4.40
JQ	0.40	0.40	0.20	0.20	0.20	0.10
Ludgate Hill	0.00	0.20	0.60	0.40	0.20	-4.40
Markets	0.40	0.30	0.70	-0.30	-0.70	-5.10
Navigation St	0.20	0.10	0.70	1.10	2.50	
Paradise	0.00	0.20	0.60	0.40	0.20	-1.80
Pershore	0.40	0.30	0.70	-0.30	-1.70	-5.10
Snow Hill	0.00	0.00	0.10	0.10	0.50	-2.50
Tennant St	0.20	0.50	-0.10	-0.10	-0.20	0.30
Town hall	0.00	0.00	0.40	0.80	1.90	-3.90

Table D.13: 2016 compared to 2016 RPI inflation based

%change 2004-2016

	1 Hour	2 Hours	3 Hours	4 Hours	6 Hours	24 Hours
<i>Dudley St</i>	0.60	0.65	0.91	0.90	1.15	
<i>Gt Charles St</i>	0.40	0.53	0.68	0.55	0.45	-0.14
<i>JQ</i>	1.50	0.89	0.57	0.50	0.48	0.44
<i>Ludgate Hill</i>	0.40	0.53	0.68	0.55	0.45	-0.14
<i>Markets</i>	1.20	0.70	0.87	0.28	0.19	-0.38
<i>Navigation St</i>	0.60	0.47	0.68	0.77	1.00	
<i>Paradise</i>	0.40	0.53	0.68	0.55	0.45	0.19
<i>Pershore</i>	1.20	0.70	0.87	0.28	-0.13	-0.38
<i>Snow Hill</i>	0.40	0.42	0.44	0.44	0.51	0.16
<i>Tennant St</i>	1.00	1.00	0.38	0.36	0.33	0.49
<i>Town Hall</i>	0.40	0.42	0.56	0.68	0.86	0.05

Table D.14: Percentage change 2004-2016

2016 RPI	1 Hour	2 Hours	3 Hours	4 Hours	6 Hours	24 Hours
<i>Dudley St</i>	1.4	2.4	3.1	4.1	5.7	
<i>Gt Charles St</i>	1.4	2.4	3.1	4.1	5.7	11.3
<i>JQ</i>	0.6	1.3	2	2.5	3.8	4.5
<i>Ludgate Hill</i>	1.4	2.4	3.1	4.1	5.7	11.3
<i>Markets</i>	0.7	1.4	2.1	3.5	4.5	9.2
<i>Navigation St</i>	1.4	2.7	3.5	4.4	6.1	
<i>Paradise</i>	1.4	2.4	3.1	4.1	5.7	11.3
<i>Pershore</i>	0.7	1.4	2.1	3.5	4.5	9.2
<i>Snow Hill</i>	1.4	2.7	3.8	5.1	7.5	14.1
<i>Tennant St</i>	0.6	1.1	2.3	3.1	4.2	5.5
<i>Town Hall</i>	1.4	2.7	3.5	4.4	6.1	15.6

Table D.15: 2016 RPI

Appendix E. On Street Utilisation

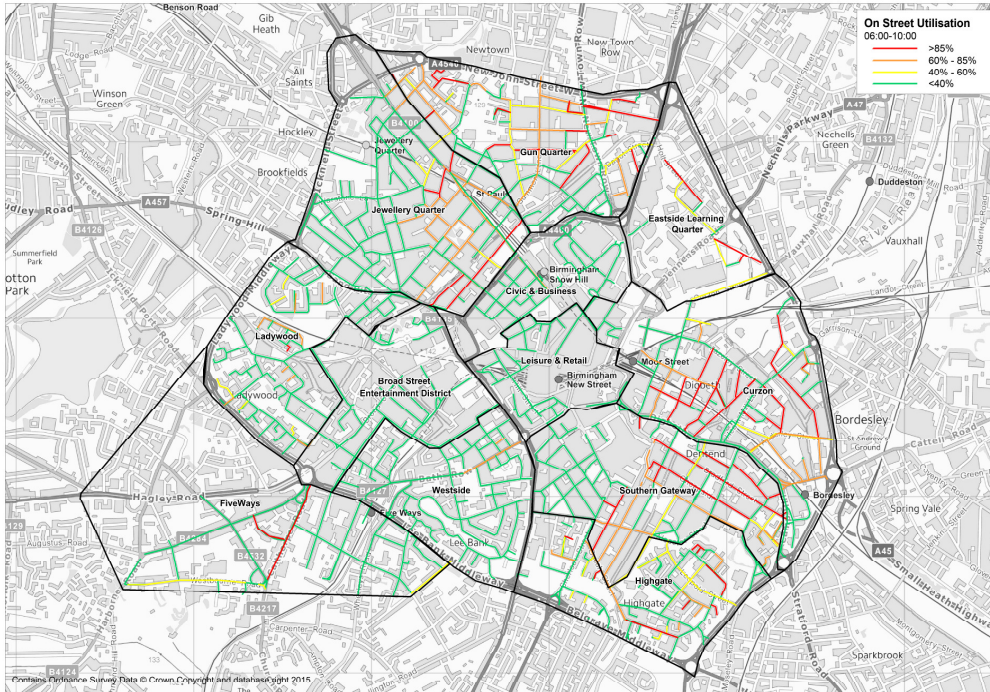


Figure E.1 : On Street Utilisation 06:00-10:00

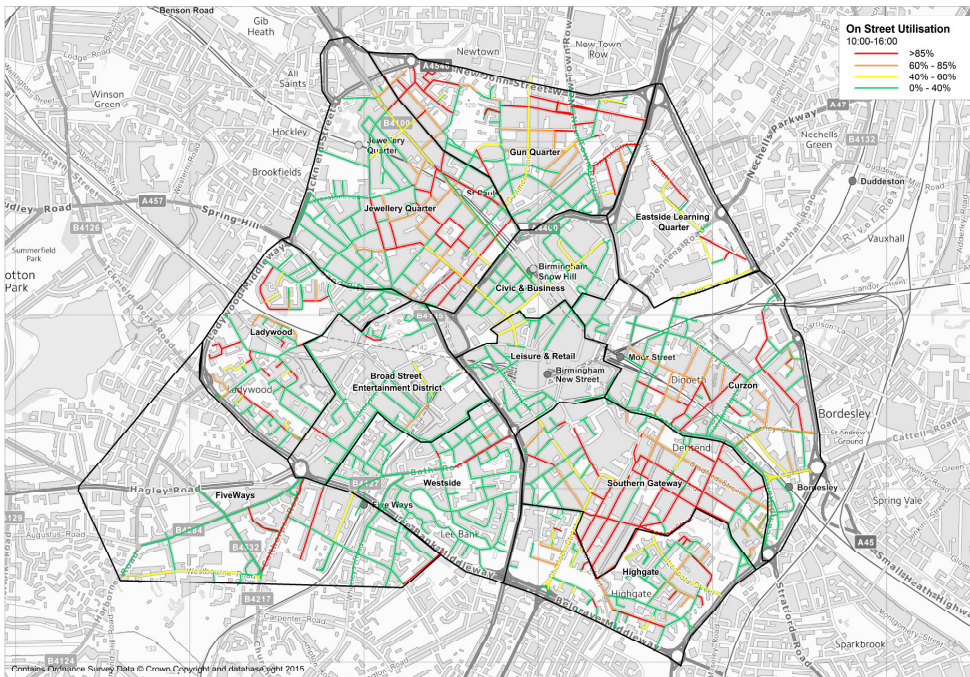


Figure E.2 : On Street Utilisation 10:00-16:00

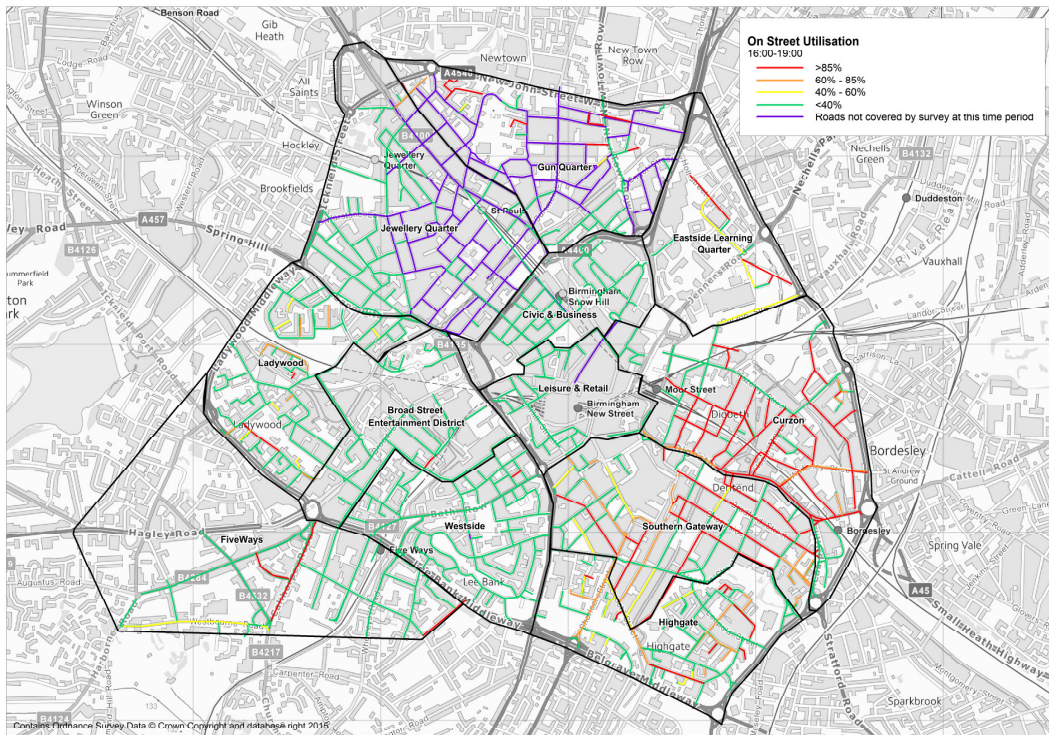


Figure E.3 : On Street Utilisation 16:00-19:00. One survey route was not completely covered during this time period.

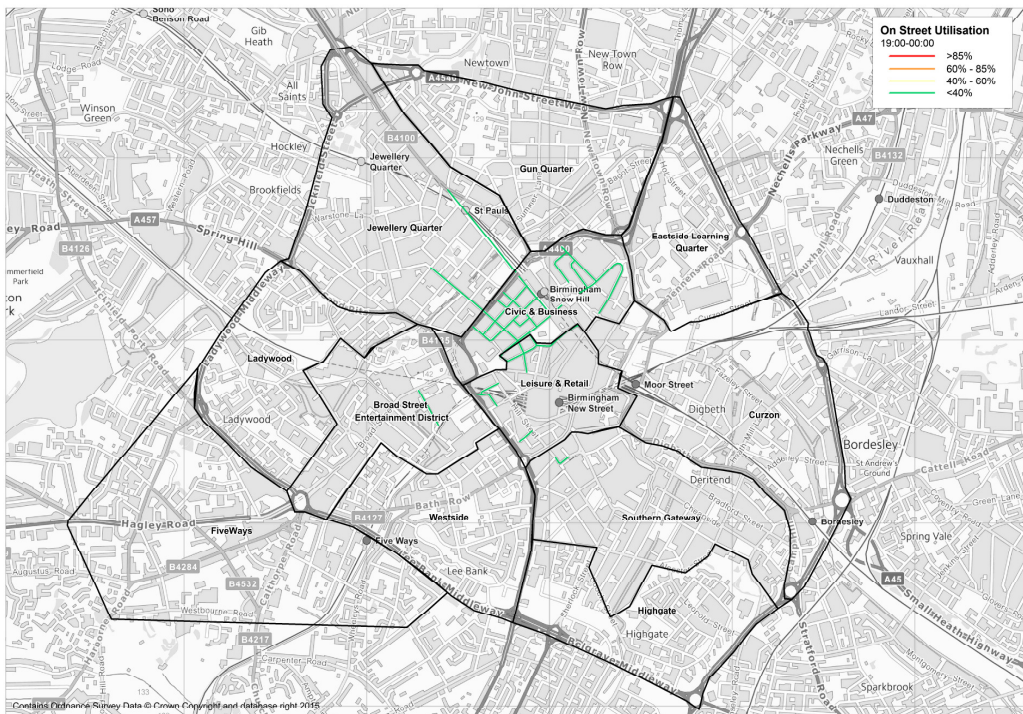


Figure E.4 : On Street Utilisation 19:00-00:00. Only charged parking is shown as during this time period no survey was undertaken and data for streets not covered by survey are not representative of parking at night.

Appendix F. Survey Routes

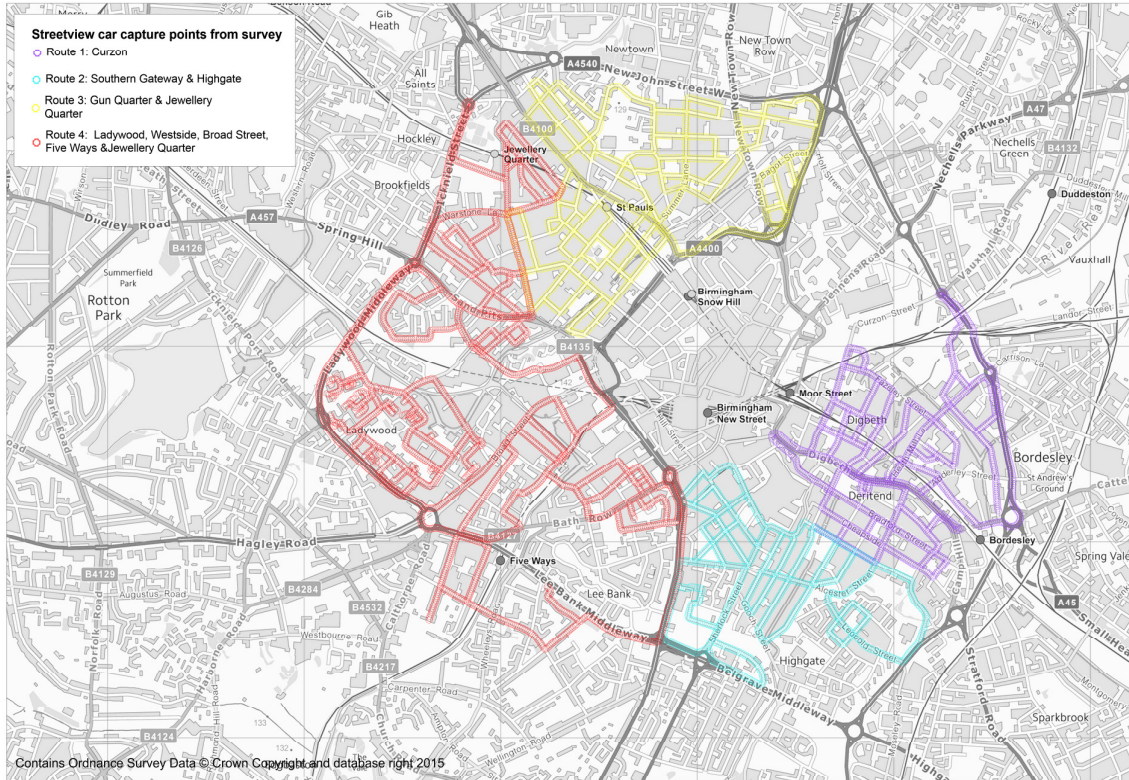


Figure F.1: Data caption points from survey

Route number	Date	Duration
Route 1	19/04/2016	1 hour continual route
Route 2	20/04/2016	1 hour continual route
Route 3	21/04/2016	1 hour continual route
Route 4	26/04/2016	2 hour continual route

Table F.1: Data collection dates and survey time periods

	Route 1	Route 2	Route 3	Route 4
Before 10	Survey 1-4	Survey 1-4	Survey 1-4	Survey 1-2
10:00-16:00	Survey 5-10	Survey 5-10	Survey 5-10	Survey 3-5
After 16:00	Survey 11-12	Survey 11-13	*	Survey 6

*No data from survey

Table F.2: Surveys used for each time period

Appendix G. Private Non-residential

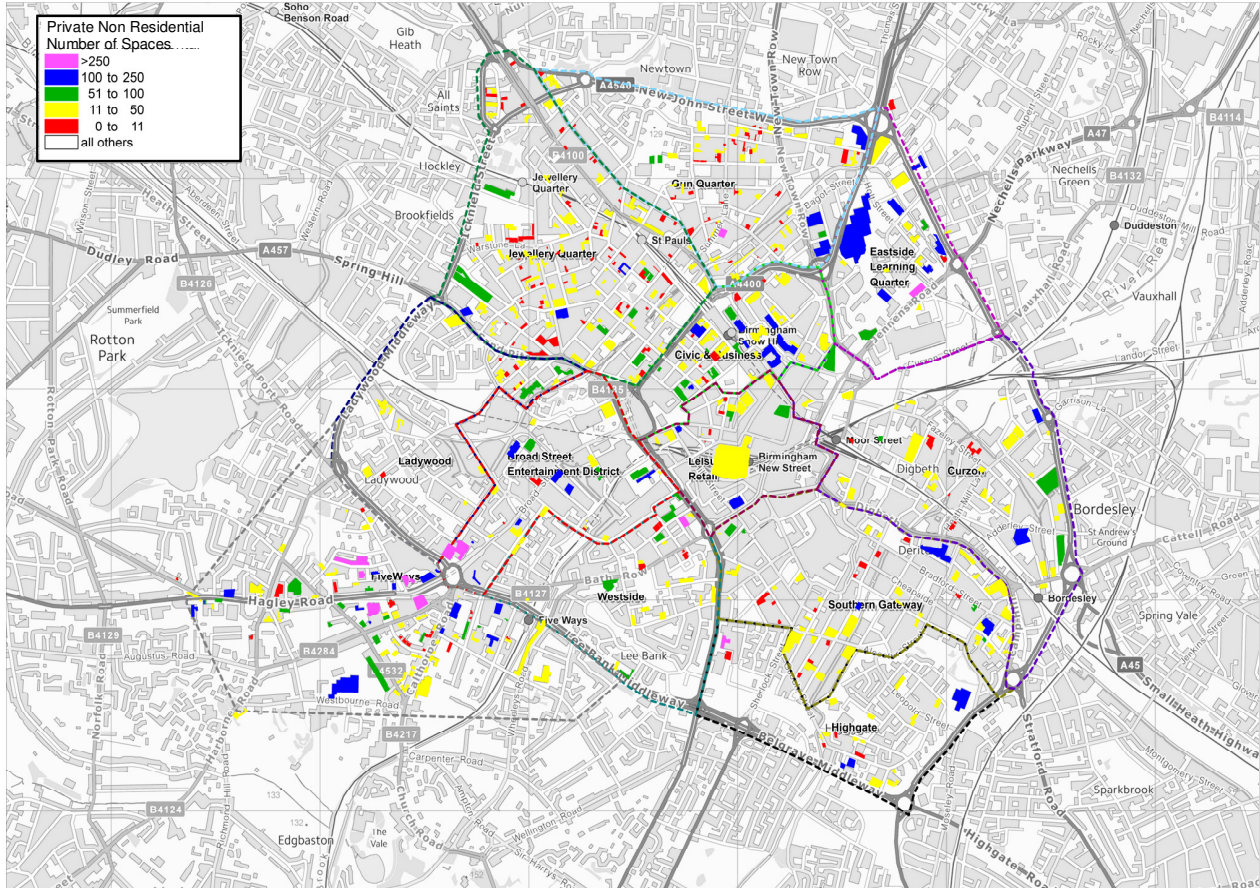


Figure G.1: Private Non-residential

Appendix H. Residential Parking

Quarter	Number of spaces per quarter	Number of dwellings per quarter	Number of spaces per dwelling
Broad Street Entertainment District	483	734	0.66
Civic and Business	180	332	0.54
Curzon	1094	368*	2.97
Eastside Learning Quarter	1673	800	2.09
Gun Quarter	139	1961	0.07
Jewellery Quarter	897	1393	0.64
Ladywood	231	330	0.7
Leisure and Retail	10	95	0.11
Southern Gateway	713	1541*	0.46
Westside	1070	2284	0.47
Total	6490	7929	0.8

*2008/00460/PA and 2011/00917/PA planning applications are not included because the total number of dwellings are unknown.

Table H.1: Scenario A + Scenario B residential analysis per quarter including mixed-use developments

Quarter	Number of spaces per quarter	Number of dwellings per quarter	Number of spaces per dwelling
Broad Street Entertainment District	0	0	0
Civic and Business	0	0	0
Curzon	0	0	0
Eastside Learning Quarter	0	0	0
Gun Quarter	120	658	0.18
Jewellery Quarter	163	204	0.80
Ladywood	0	0	0
Leisure and Retail	0	0	0
Southern Gateway	0	0	0
Westside	179	155	1.15
Total	462	1017	0.45

Table H.2: Scenario A Residential analysis per quarter excluding mixed-use developments. Data only includes numbers for planning applications with known numbers of spaces and dwellings.

Quarter	Number of spaces per quarter	Number of dwellings per quarter	Number of spaces per dwelling
Broad Street Entertainment District	0	0	0
Civic and Business	0	0	0
Curzon	0	0	0
Eastside Learning Quarter	0	0	0
Gun Quarter	139	1861	0.07
Jewellery Quarter	548	900	0.61
Ladywood	0	0	0
Leisure and Retail	0	0	0
Southern Gateway	0	0	0
Westside	761	1864	0.41
Total	1448	4625	0.31

Table H.3: Scenario B Residential analysis per quarter excluding mixed-use developments. Data only includes numbers for planning applications with known numbers of spaces and dwellings.

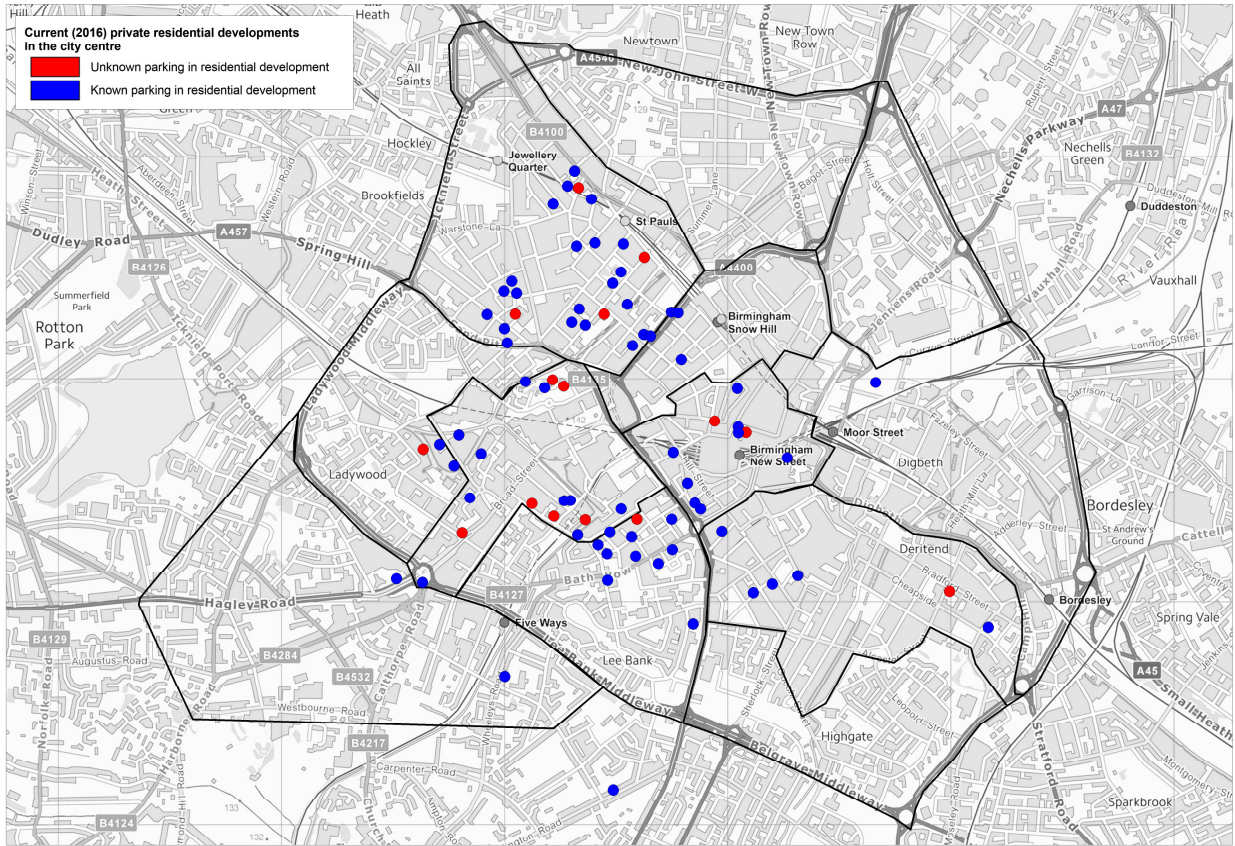


Figure H.3 : Current residential parking. Note- this does not include BCC housing stock

Appendix I. Existing Charging Mechanisms and Innovations and Technology Options

Mechanism	Operator	Description
www.parkmobile.co.uk Parkmobile app 020 3003 2527	BCC	Enables users to pay for their parking in a BCC car park by phone, either by calling or using the website/app. Users need to register their details first, and every time they use a car park after that they simply key in the location of the car park and the duration they would like to park for. A text message is sent when the parking session is about to expire.
www.paybyphone.co.uk Paybyphone app	Britannia Parking Euro NCP SIP	Enables users of certain private car park operators to pay online. A text message is sent when the parking session is about to expire.
VMS Signs linked to UTC Car Parks		Variable message signs stating whether car parks have spaces or are full/number of spaces available in UTC car parks in Birmingham.
Birmingham Data Factory 'Parking in Birmingham' file		Updated every 30 minutes, shows the availability of car parks in Birmingham.

Table I.1 : Current Charging mechanisms and information

Technology	Description	Implemented	Evaluation
Automatic Number Plate Recognition (ANPR)	CCTV cameras at the entrance and exit of the car park take timed photographs of the vehicle's number plate. The stay duration is calculated from the times and if the user has exceeded the period they have paid for, they are either prevented from leaving or issued a retrospective ticket.	Telford's Princess Royal Hospital (PRH)	<p>Positives:</p> <ul style="list-style-type: none"> Accurate fees applied High level of user data <p>Negatives:</p> <ul style="list-style-type: none"> Privacy Repeat users within 24 hours or in/out motorists who do not park maybe wrongly charged.
Pay-By-Plate	Drivers enter their number plate at a kiosk, pay by card, cash or app and go on their way	Pittsburgh	<p>Positives:</p> <ul style="list-style-type: none"> Increase in revenue, despite a decline in tickets issued. The technology makes paying easier while increasing the risk of not paying. Easier for enforcement officials to monitor parking activity. <p>Negatives:</p> <ul style="list-style-type: none"> Cost of machines Relies on the accuracy of the database.
Ticketless Parking	Similar to Pay-By-Plate, however the number plate is automatically scanned on enter and exit. The user then has numerous options of payment at the exit barrier.	Canterbury	<p>Positives</p> <ul style="list-style-type: none"> Prevention of misuse <p>Negatives</p> <ul style="list-style-type: none"> Cost of machines Only applicable to multi-storey car parks Relies on the accuracy of the database
CO ₂ based pricing	The user inputs their number plate, which tells the system the make and model of vehicle. The parking rate is based upon emissions, with cleaner vehicles paying less. This can also be applied to the pricing of permits within long stay car parks.	Madrid	<p>Positives</p> <ul style="list-style-type: none"> Encourages cleaner cars Improves local air quality <p>Negatives</p> <ul style="list-style-type: none"> Users may feel discriminated

Technology	Description	Implemented	Evaluation
			<ul style="list-style-type: none"> Requires pay-by-plate technology
Vehicle Length Pricing	As curb space is a limited commodity, users are charged a variable rate depending on their vehicles length.	Norwich	<p>Positives</p> <ul style="list-style-type: none"> Encourages smaller cars which are generally more fuel efficient <p>Negatives</p> <ul style="list-style-type: none"> Users may feel discriminated Only appropriate for on street parking Requires pay-by-plate technology
Special Residents Rates	Using pay-by-plate technology, local residents receive a lower parking rate while visitors pay an enhanced fee.	Miami Beach	<p>Positives</p> <ul style="list-style-type: none"> Local residents who already pay for local services, are encouraged to use them, which therefore reduces congestion <p>Negatives</p> <ul style="list-style-type: none"> Requires personal data (home address) Discriminates visitors, so not appropriate for areas wishing to encourage tourism. Requires pay-by-plate technology
Bay Sensor Parking	Wireless sensors detect parking space occupancy therefore providing a real time map of available spaces.	San Francisco	<p>Positives</p> <ul style="list-style-type: none"> A real time map of spaces is available Demand responsive pricing can be implemented Drivers can be directed to available spaces <p>Negatives</p> <ul style="list-style-type: none"> Cost of sensors Reliability of sensor technology
Electronic Roadside Display Boards	On routes into the city, electronic roadside display boards show the number of available spaces in a variety of car parks	Hamilton New Zealand	<p>Positives</p> <ul style="list-style-type: none"> Provides users with a real time snapshot of available spaces

Technology	Description	Implemented	Evaluation
Event Based Pricing	Tariffs are reduced where occupancy rate is being negatively impacted by lower tariffs nearby. Vice Versa, tariffs are increased in the evening as certain car parks are primarily used to attend events.	London – O2 Arena	<p>Positives</p> <ul style="list-style-type: none"> An increase of occupancy in car parks <p>Negatives</p> <ul style="list-style-type: none"> Users may feel unfairly charged
Contactless Payment	Allows contactless payment at payment machines. Could be encouraged by providing cheaper tariffs for contactless payment.	Southampton	<p>Positives</p> <ul style="list-style-type: none"> Provides users with a quick and easy alternative payment method <p>Negatives</p> <ul style="list-style-type: none"> Cost of contactless payment devices
App Payment	Payment for parking is paid for through a mobile application.	ParkMobile (Utilised in 73 Uk cities and private operators such as NCP)	<p>Positives</p> <ul style="list-style-type: none"> Provides users with a quick and easy alternative to coin payment <p>Negatives</p> <ul style="list-style-type: none"> There are numerous different apps that all require registration details. Standardising them across a region may solve this issue.
Parking Location Apps	Alongside bay sensor parking and ANPR data, a real time map of car parking spaces can be produced. The user then uses a mobile app to locate available spaces.	Manuka, Canberra. Use of ParkCBR parking availability app.	<p>Positives</p> <ul style="list-style-type: none"> Provides users with a real time snapshot of available spaces <p>Negatives</p> <ul style="list-style-type: none"> There is a large variety of different apps Requires accurate bay sensor parking and ANPR data
Electric Cars (Solar Energy Charging)	The use of electric cars is encouraged by providing free permits/lower tariffs, exclusive parking spaces, permission to drive in bus lanes and convenient charging locations. This can be further supplemented by adding solar panels to car parks that provide the energy for charging.	London, Nottingham, Bristol and Milton Keynes	<p>Positives</p> <ul style="list-style-type: none"> Environmentally sustainable <p>Negatives</p> <ul style="list-style-type: none"> Costly installation Reduces the number of spaces for normal

Technology	Description	Implemented	Evaluation
			vehicles users.
Second Permit Pricing	The user is required to pay more for a second parking permit per household.	Edinburgh	Positives <ul style="list-style-type: none"> Reduces congestion of car parks
Automated Monitoring	A vehicle equipped with cameras and a computer takes photos of parked cars and their license plates. If a violation is detected, this is then confirmed by a human officer and a ticket along with photographic evidence is produced.	Lafayette, USA	Positives <ul style="list-style-type: none"> The method is faster and more accurate than the human equivalent Provides photographic evidence of an offence. Negatives <ul style="list-style-type: none"> Cost of technology, vehicle and fuel. Less environmentally friendly than the human equivalent
Valet Parking Service	The user drops off their car at a destination of their choice. The car is then taken by an approved driver to a pre-approved secure car park. The car is returned to a chosen location within 15 minutes of a request.	Central London	Positives <ul style="list-style-type: none"> Users do not waste time, cause pollution and congestion Negatives <ul style="list-style-type: none"> Users are occupying a parking space Drivers are expensive
Car Clubs	Members of the clubs are able to hire vehicles parked in specifically reserved spaces.	London	Positives <ul style="list-style-type: none"> Decreases congestion Decreases car park occupancy levels Negatives <ul style="list-style-type: none"> Currently 85% of UK Car Club members are in London
Mobility as a Service	Complete Journey Planning App linked to databases & real time information. Giving Pre and in journey travel advice	Finland	Positives <ul style="list-style-type: none"> Influences total journey and mode of travel choice Real time information

Technology	Description	Implemented	Evaluation
			Negatives <ul style="list-style-type: none"> • Cost to set up and maintain • Reliability of information • Reach
Workplace parking Levy	Businesses pay a levy for every parking space they provide to their employees.	Nottingham City Council	Positives <ul style="list-style-type: none"> • Reduces total number of parking spaces- some employees would relinquish their parking space if they had to pay or businesses remove spaces so they do not have to pay the levy Negatives <ul style="list-style-type: none"> • Could cause congestion elsewhere, people seeking alternative parking options.
<i>Open Data Api for car park space prediction</i>	Uses real time occupancy data to predict car park space availability and route driver to an appropriate car park.	Trial in Paris	Positives <ul style="list-style-type: none"> • Would reduce circulating traffic as would provide real time information to drivers. Negatives <ul style="list-style-type: none"> • As utilisation increases routing is vital, to ensure car parking spaces are still available when the user arrives at their destination car park.

Table I.2: Innovations and Technology Options

Appendix J. Full Early Sifting Results

Name	Option Type	Option	Origin	Environmental / Sustainability	Economic - Growth / Viability	Economic - Performance / Deliverability	Social / Acceptability	Decision	Justification of Decision
DN-01	Let the Market Decide - Do Nothing	Keep the existing SPD standards in place and remove/increase parking as schemes/developers occur	BCC					✘	Difficult to assess impact as wholly dependent on planning applications.
DN-02	Let the Market Decide - Do Nothing	Remove the SPD standards for the city centre and remove/increase parking as schemes/developers occur	BCC					✘	With no standards it would be difficult to influence car park design and quality.
DN-03	Let the Market Decide - Do Nothing	BCC to sell off all off-street parking (for development or privately operated parking)	BCC					✘	Potentially relinquish influence on parking tariffs and supply.
DN-04	Let the Market Decide - Do Nothing	BCC to keep existing on-street parking supply in existing locations	BCC					✘	Though may not provide the flexibility to implement/support change for new cycle lanes/on street infrastructure.
PC-01	Parking Cap	Establish a maximum amount of traffic (peak and inter-peak) that is acceptable to enter/leave the city centre and link to short and long-stay parking	BCC					✘	Difficult to implement a traffic cap, significant infrastructure would be required to insure the system was operational.
PC-02	Parking Cap	Establish a maximum amount of traffic (peak and inter-peak) that is acceptable to enter/leave the city centre and link to PNR with a freeze on public parking	BCC					✘	Difficult to implement a traffic cap, significant infrastructure would be required to insure the system was operational.
PF-01	Parking Freeze	Freeze public parking at current levels and only allow new public parking as existing is removed	BCC					✘	Would maintain a level of public parking though costs would be incurred in maintenance and would possible not to deter bombsite car parks.
PF-02	Parking Freeze	Freeze public parking at current levels and don't provide any new parking as existing is removed	BCC					✘	Would encourage modal shift through removal of spaces, it would have to be carefully managed to insure spaces are lost from appropriate locations.
PF-03	Parking Freeze	Freeze PNR parking levels and only provide new public parking as demand requires	BCC					✘	Would encourage commuting by non car modes, though restricting PNR could increase demand for public parking- would be a fine balance.
PF-04	Parking Freeze	Freeze PNR parking levels and don't provide any new parking even if existing is removed	BCC					✘	Reduction in PNR could impact on Business Rate Revenue. Future parking usage may change with demographics of the quarters adapt.
PF-05	Parking Freeze	Freeze PNR parking levels and only allow new public parking as existing PNR is removed	BCC					✘	This potentially would not deter people driving to work and could impact on availability of spaces for other purposes.
PD-01	Parking in Determined Locations / Amounts	Remove all on-street parking in the Inner Zone	BCC					✘	This potentially would generate a lose of income from tickets but high value for other purposes which could be used for urban realm improvements.
PD-02	Parking in Determined Locations / Amounts	Remove all on-street parking with high accessibility to other modes (i.e. BCR routes, SPRINT, Metro)	BCC					✔	The impact would vary across the quarters, but would provide a good opportunity to influence modal shift
PD-03	Parking in Determined Locations / Amounts	Designate areas and set maximum parking provision for on-street and off-street (higher than existing supply levels) to best serve the needs of the area	BCC					✘	Though this would provide capacity it would be difficult to encourage modal shift with a potential abundance of parking.
PD-04	Parking in Determined Locations / Amounts	Designate areas and set maximum parking provision for on-street and off-street (lower than existing supply levels) to best serve the needs of the area	BCC					✔	This would provide an opportunity to reduce spaces and encourage modal shift whilst providing opportunity to respond to changes within the quarters.
PD-05	Parking in Determined Locations / Amounts	Designate areas and set minimum parking provision for on-street and off-street to best serve the needs of the area	BCC					✘	This option would provide flexibility to the quarters but with a minimum amount of parking would not encourage modal shift or provide a grounds to enforce reduced parking.
PD-06	Parking in Determined Locations / Amounts	Designate areas and set minimum parking provision for on-street and off-street to best serve the needs of the area, but allow cash in-lieu of parking	BCC					✘	Cash-in-Lieu of Parking (Canada, Ottawa) encourages modal shift and sustainable developments where deemed acceptable by BCC. But the minimum parking standards could potentially undermine the cash-in-lieu policy.
PD-07	Parking in Determined Locations / Amounts	Designate areas and freeze public parking but allow new PNR to existing standards	BCC					✘	Parking in designated areas would ensure parking only increased where BCC desired. But an increase in PNR potentially would not encourage commuting by other modes.
PD-08	Parking in Determined Locations / Amounts	Designate areas and freeze public parking but allow new PNR to tighter standards	BCC					✘	Parking in designated areas would ensure parking only increased where BCC desired. But an increase in PNR potentially would not encourage commuting by other modes, though this could be mitigated through tighter standards
PD-09	Parking in Determined Locations / Amounts	Designate areas and set maximum parking provision for on-street and off-street (lower than existing supply levels) to best serve the needs of the area with a % cap for accessible locations	Jacobs					✔	Would allow the maximum standard to be lowered dependent on location and accessibility.
PD-10	Parking in Determined Locations / Amounts	Designate areas and freeze public parking but allow new PNR to relaxed standards	BCC					✘	Relaxing PNR parking could encourage economic growth but also discourage modal shift. A parking freeze would constrain future supply and could impact on trips for non work purposes.
LP-01	License Parking	Licence long-stay parking to ensure planning conditions are met	BCC					✔	By introducing a license BCC would be able to monitor long stay parking use which would enable them to inform decision making. But the system would not influence visitor parking to the city i.e. non residents and non commuters.
LP-02	License Parking	Prescribe cash in-lieu of PNR parking provision	BCC					✔	Cash-in-Lieu of Parking (Canada, Ottawa) encourages modal shift for commuting and sustainable developments where deemed acceptable by BCC. For the system to influence PNR other schemes would have to be introduced for example active monitoring of Business Travel Plans.
LP-03	License Parking	No free, unrestricted on-street parking	BCC					✔	This scheme is likely to be opposed by areas with free parking, though CPZ are to be introduced across the city in the near future. When new CPZ are implemented free parking could be removed systematically. The scheme is less likely to be accepted if no free street parking is for 24 hours or a determined time. A no free on street parking system would have to be appropriately managed/enforced to ensure that it is being utilised correctly.
LP-04	License Parking	Define short-stay, long-stay parking standards and car park standards	BCC					✔	If dependent on location/accessibility(Hants) this option could provide more flexibility by quarter. Birmingham at present doesn't distinguish between durations.

LP-05	License Parking	Set an early-bird parking standard (BCC off-street parking)	BCC					✓	Early bird parking could encourage travel out of peak hours, dependent on car parks selected it could influence travel through the city and encourage parking further out leaving central locations for leisure and business trips
LP-06	License Parking	Introduce a parking Levy	BCC					✓	Parking levy combined with other measures can encourage modal shift and discourage car use for commuting.
OT-01	Other	Simple flexible payment system for the whole Birmingham Transport Network	BMAP pg. 34					✓	Singapore. This has been integrated in to tolling as well as car parks. Deliverability is an issue as it would require collaboration across the city and sustainable modes for the system to be successful.
OT-02	Other	Provide parking at key SPRINT stops	Jacobs					✓	Would incorporate park and ride facilities into the city potentially reducing demand on key corridors.
OT-03	Other	Improvements to public realm; walking and cycling	BMAP pg. 36					✓	Improvements to the public realm may require the loss of on street parking facilities, but an improved environment would encourage movement within the core by none car modes.
OT-04	Other	Park & Cycle, incorporated into the Birmingham Cycle Revolution	Jacobs					✓	Could encourage more cycling and would maximise the benefits of Birmingham Cycle Revolution.
OT-05	Other	review existing parking signage and VMS; expand to include data on Sustainable modes	Jacobs					✓	Could influence route choice before cars enter the city centre, if details of spaces available at park and ride station included it could encourage mode choice.
OT-06	Other	Expand UTC data to all BCC car parks	Jacobs					✓	This would provide an ongoing data collection and allow BCC to react to change, and inform users through VMS and other potential mediums.
OT-07	Other	All new car parks must subscribe to open data collection	Jacobs					✓	This would provide an ongoing data collection and allow BCC to react to change, and inform users through VMS and other potential mediums.
OT-08	Other	Add UTC data to Opticities Corridors (Walsall Road, Hagley Road, Bristol Road)	Jacobs					✓	This would allow BCC to inform users of parking availability and inform route choice before they enter the city.
OT-09	Other	Encourage carpooling	Jacobs					✓	The purpose of this is to reduce single occupancy vehicles.
OT-10	Other	Introduce GOSMART system to provide information and reward sustainable travel	Jacobs					✓	This would require collaboration and agreement across all service providers, Public Transport and Parking.
OT-11	Other	Introduce on street parking disc system	Jacobs					✗	This option would enable parking permits to be checked and verified on street.
OT-12	Other	Cash in Lieu of parking or commuted payments - developers contribute more; reflecting the higher profit made from not constructing parking	Jacobs					✗	Canada. This would allow for the council to encourage sustainable developments and provide capital to improve sustainable transport measures.
OT-13	Other	encourage stays less than 6 hours though tariff	Jacobs					✓	This would discourage commuter parking in BCC car parks, and allow for parking for leisure and economic activity.
OT-14	Other	Introduce max on street parking density figures	Jacobs					✓	This would option would favour residential areas, allowing more parking on street based on the density of the population. It would be difficult to deliver depending on how often population figures are collated for the City.
OT-15	Other	Introduce on street reservation system	Jacobs					✗	A trial for sensors was unsuccessful. Benefits are it would reduce circulating traffic as drivers have a destination but to be successful people would have to park in the designated space to reduce displacement.
OT-16	Other	Introduce a monthly payment system for all transport services	Jacobs					✗	Deliverability is an issue as it would require collaboration across the city and sustainable modes for the system to be successful.
OT-17	Other	Introduce parking sensor to ensure appropriate bay use	Jacobs					✗	A trial for sensors was unsuccessful. Benefits are it would discourage appropriate use.
OT-18	Other	Develop live occupancy figures for car parks	Jacobs					✓	By providing live occupancy figures through application and on key corridors into the city, BCC could influence route choice and reduce circulation in the city.
OT-19	Other	Lower parking charges for low emission vehicles	Jacobs					✓	This would encourage more sustainable car choices, and would be easily implemented for permit applications.
OT-20	Other	Real time occupancy and payment through in vehicle navigation systems IPark4U	Jacobs					✓	This system has limited reach, as it would benefit the users of the system as opposed to a wider audience.
OT-21	Other	Introduce Park and Ride Hubs	Jacobs					✓	Park and ride hubs focus on building park and ride site with other amenities, for example an out of town shopping centre. The success of this option would depend on the facilities incorporated into the hub and the location selected.
OT-22	Other	Develop a push and pull policy (To implement a policy which both encourages sustainable modes and discourages private car use)	Jacobs					✓	The success of this policy is dependent on collaborative affect of individual policies, with the main goal to encourage modal shift and reduce car travel.
OT-23	Other	Introduced dynamic parking pricing model	Jacobs					✓	This would allow for BCC to react to demand and influence travel patterns through amending on street pricing tariffs. It would require monthly analysis of traffic and parking demand. An advantage is it would also give BCC flexibility to react to change or instigate change.
OT-24	Other	Introduce differentiated parking model price per hour changes depending on time of day	Jacobs					✗	Differentiated parking would be similar to San Francisco model but without the flexibility, having a price per hour which.
OT-25	Other	Introduce pre paid parking cards	Jacobs					✗	Introduction of pre paid cards would require the introduction of new systems and technology and uptake for the scheme to be successful.
OT-26	Other	Introduce a space per inhabitant ratio per zone	Jacobs					✓	This would provide a dynamic parking cap which would be based on residents but would require data collection on population for the figures to be current.

OT-27	Other	Introduce car free days	Jacobs					✓	This is likely to be unpopular but could improve the urban realm experience if for example shopping districts benefit from pedestrianised streets on the weekends.
OT-28	Other	Introduce Park and Ride Site/Hub on Aldridge Road - on existing platinum bus service	Jacobs					✓	This would encourage modal shift and provide an a park and ride alternative.
OT-29	Other	Incorporate large dedicated park and ride sites on each Sprint route	Jacobs					✓	This would maximise on new schemes coming forward and encourage modal shift
OT-30	Other	Incorporate park and ride with Midland Metro	Jacobs					✓	This would maximise on new schemes coming forward and encourage modal shift
OT-31	Other	Open Park and Ride Station at Duddeston	Jacobs					✓	This would provide an opportunity to establish a park and ride facility within close proximity to the city centre and accessible from A38M
OT-32	Other	Introduce multi storey parking or parking Hub at Ludgate Hill or Great Charles Street or Tennant Street (only non multi storey car park)	Jacobs					✗	Construction and maintenance costs could be considerable.
OT-33	Other	Build new car park in Shopping District	Jacobs					✗	The question is whether this is the best use of space for the prime location.
OT-34	Other	Increase the number of spaces at Barclay Card Arena	Jacobs					✗	This would resolve issues demand when events are on but this car park is under utilised the majority of the time.

Appendix K. Full Appraisal Analysis Results

Order by Name							SO1	SO2	SO3	SO4	SO5	SO6	SO7	SO8	SO9	Decision		
Order By Rank							Weighting											
Name	Option Type	Option	Notes	In Practice	Rank	Total	Reduce congestion on the local network; in particular vehicle volumes and vehicle mileage	Will it ensure an adequate supply of parking for social/economic needs i.e.15% publically available parking	Promotes considerate parking - reducing anti social behaviour	Promotes modal shift to sustainable modes & Supports BCC sustainable travel policies	Technical Justification; has it been implemented successfully before	Administration and enforcement; will it be easy to introduce and enforce	Flexibility can it adapt to changes in policy or the market	Implementation ; can it be introduced under existing legislation	Commercial viability	Decision	Justification of Decision	
LP-03	License Parking	No free, unrestricted on-street parking	This scheme is likely to be opposed by areas with free parking, though CPZ are to be introduced across the city in the near future. When new CPZ	-	1	22	2	2	2	2	2	1	2	1	2	✓	Would be difficult to maintain and enforce which would require significant infrastructure to be implemented.	
OT-22	Other	Develop a push and pull policy (To implement a policy which both encourages sustainable modes and discourages private car use)	The success of this policy is dependent on collaborative affect of individual policies, with the main goal to encourage modal shift and reduce	Nottingham	2	20	2	1	1	2	2	2	2	2	1	✓	Requires collaboration with Public Transport Authorities and Operators. Push policies may not be acceptable to public and have longer term	
OT-29	Other	Incorporate large dedicated park and ride sites on each Sprint route	This would maximise on new schemes coming forward and encourage modal shift	-	2	20	2	2	1	2	2	2	0	2	1	✓	If Sprint goes ahead it will operate on Opticities corridors so link with information.	
OT-05	Other	review existing parking signage and VMS; expand to include data on Sustainable modes	Could influence route choice before cars enter the city centre, if details of spaces available at park and ride station included it could encourage mode	-	4	19	1	1	1	2	2	2	2	2	2	✓	Would have more impact on visitors than commuters but would enhance ability to cope with peaks including Christmas.	
OT-44	Other	Set short stay/ long stay spaces in BCC off street car parks.	Set a proportion of spaces in BCC car Parks for Short Stay (Max 4 hours) for example the first floor and move permit holders to another floor.	-	4	19	1	2	1	1	2	2	2	2	2	✓	See notes.	
OT-13	Other	encourage stays less than 6 hours though tariff	This would discourage commuter parking in BCC car parks, and allow for parking for leisure and economic activity.	-	6	18	1	2	0	1	2	2	2	2	2	✓	In line with policy and would raise revenue. Deliverable within existing systems and structures.	
OT-06	Other	Expand UTC data to all BCC car parks	This would provide an ongoing data collection and allow BCC to react to change, and inform users through VMS and other potential mediums.	-	7	15	2	0	1	0	2	2	2	2	2	✓	Makes better use of parking supply and could be extended to onstreet.	
OT-27	Other	Introduce car free days	This is likely to be unpopular but could improve the urban realm experience if for example shopping districts benefit from pedestrianised streets on the weekends.	Osaka	7	15	2	2	1	2	2	-1	1	2	-2	✓	Only a short term measure targetted at commuting and encouraging people to try public transport. Free parking day may be an alternative to encourage people to try Birmingham.	
OT-39	Other	Create park and ride at Tyseley and / or Small Heath Stations	This would provide a convenient park and ride station within close proximity of the ring road.	-	7	15	2	1	1	2	2	0	0	2	0	✓	Could encourage railheading but would add to Centro's station car parking capacity to reduce commuting into the City Centre.	
PD-09	Parking in Determined Locations / Amounts	Designate areas and set maximum parking provision for on-street and off-street (lower than existing supply levels) to best serve the needs of the area with a % cap for accessible locations	Would allow the maximum standard to be lowered dependent on location and accessibility.	Brighton & Hove	10	14	1	1	1	2	1	1	2	1	0	✓	This option would give BCC the ability to have parking where required to meet economic goals. The Percentage cap would ensure that sustainable developments are encouraged in	
OT-08	Other	Add UTC data to Opticities Corridors (Walsall Road, Hagley Road, Bristol Road)	This would allow BCC to inform users of parking availability and inform route choice before they enter the city.	-	10	14	1	0	1	1	2	2	2	2	1	✓	Operational implications but would have flexibility to work with dynamic pricing based on real time demand	
OT-37	Other	Encourage car free residential developments	This would encourage sustainable car free development in sustainable locations, it potentially may not be popular with existing residents and businesses if it increases demand.	Stockholm	10	14	2	1	-1	2	2	1	0	1	1	✓	Suitable for highly accessible locations. Need to control on street provision and use and availability of permits in private car parks to be effective.	
PD-04	Parking in Determined Locations / Amounts	Designate areas and set maximum parking provision for on-street and off-street (lower than existing supply levels) to best serve the needs of the area	This would provide an opportunity to reduce spaces and encourage modal shift whilst providing opportunity to respond to changes within the quarters.	-	13	13	1	1	1	2	0	1	2	1	0	✓	This option would give BCC the ability to have parking where required to meet economic goals., but would not be as effective as having a parking cap for sustainable locations for encouraging	
LP-02	License Parking	Prescribe cash in-lieu of PNR parking provision	Cash-in-Lieu of Parking (Canada, Ottawa) encourages modal shift for commuting and sustainable developments where deemed acceptable by BCC. For the system to influence	Canada, Ottawa	14	12	2	0	0	2	1	1	1	0	1	✓	See notes.	
LP-04	License Parking	Define short-stay, long-stay parking standards and car park standards	If dependent on location/accessibility(Hants) this option could provide more flexibility by quarter. Birmingham at present doesn't distinguish between durations.	-	14	12	1	1	1	1	1	1	1	1	1	✓	This option would provide flexibility to the quarters and encourage long/short stay parking to be in the most appropriate locations.	
LP-06	License Parking	Introduce a parking Levy	Parking levy combined with other measures can encourage modal shift and discourage car use for commuting.	Nottingham	14	12	2	0	0	1	2	-1	1	2	2	✓	Viable option to raise funding form transport improvements - needs to be a defined deliverable plan to secure agreement from stakeholders.	
OT-07	Other	All new car parks must subscribe to open data collection	This would provide an ongoing data collection and allow BCC to react to change, and inform users through VMS and other potential mediums.	-	14	12	2	0	1	0	2	2	0	2	1	✓	Makes best use of existing systems and ensures council costs for extending are covered.	
OT-18	Other	Develop live occupancy figures for car parks	By providing live occupancy figures through application and on key corridors into the city, BCC could influence route choice and reduce circulation in the city.	Brighton & Hove	14	12	1	0	1	1	2	1	1	2	1	✓	Operational - Fits with UTC, CBD and MaaS development. Link to Internet and Apps would aid selling Birmingham and making travel easier.	

Order by Name							SO1	SO2	SO3	SO4	SO5	SO6	SO7	SO8	SO9	Decision	
Order By Rank							Weighting										
Name	Option Type	Option	Notes	In Practice	Rank	Total	2	2	1	2	1	1	1	1	1	Decision	Justification of Decision
							Reduce congestion on the local network; in particular vehicle volumes and vehicle mileage	Will it ensure an adequate supply of parking for social/economic needs i.e.15% publicly available parking	Promotes considerate parking - reducing anti social behaviour	Promotes modal shift to sustainable modes & Supports BCC sustainable travel policies	Technical Justification; has it been implemented successfully before	Administration and enforcement; will it be easy to introduce and enforce	Flexibility can it adapt to changes in policy or the market	Implementation ; can it be introduced under existing legislation	Commercial viability		
OT-31	Other	Open Park and Ride Station at Duddeston	This would provide an opportunity to establish a park and ride facility within close proximity to the city centre and accessible from A38M	-	14	12	1	1	1	2	2	-1	0	2	0	✓	Could encourage park and walk. Requires all trains to call or extension of Midland Metro. Issue of capturing revenue for short trips may require gating station.
OT-40	Other	Introduce a park & ride hub at Star City	Star city is conveniently located and has amenities which would benefit users of a park and ride hub, though a question of practicality on whether it has capacity to provide parking for commuters.	Antwerp	14	12	1	1	1	2	2	-1	1	2	-1	✓	Would encourage driving to Star City and would need agreement with businesses. Commercial risk in operating the public transport service. Need to control free on street supply. Possible longer term option.
OT-01	Other	Simple flexible payment system for the whole Birmingham Transport Network	Singapore. This has been integrated in to tolling as well as car parks. Deliverability is an issue as it would require collaboration across the city and sustainable modes for the system to be successful.	-	21	10	1	1	0	2	2	-2	2	2	-2	✓	This is aspirational and would require collaboration with the West Midlands Combined Authority; but would be beneficial in the long term linked to LEZ and VMS systems.
LP-05	License Parking	Set an early-bird parking standard (BCC off-street parking)	Early bird parking could encourage travel out of peak hours, dependent on car parks selected it could influence travel through the city and encourage parking further out leaving central locations for leisure and business trips	Sydney/ Melbourne	22	9	1	0	0	0	2	2	1	2	0	✓	This would not encourage modal shift but would encourage people to drive outside the morning peak, and impact limited as BCC can only implement in BCC operated car parks and not across the city
OT-21	Other	Introduce Park and Ride Hubs	Park and ride hubs focus on building park and ride site with other amenities, for example an out of town shopping centre. The success of this option would depend on the facilities incorporated into the hub and the location selected.	Antwerp	22	9	1	2	2	2	-1	-2	0	2	-2	✓	Park and ride hubs encourage trip chaining and reducing the overall number of trips but there is a large land issue and questionable operational sustainability of the public transport services. Could be a longer term option.
OT-30	Other	Incorporate park and ride with Midland Metro	This would maximise on new schemes coming forward and encourage modal shift	-	22	9	1	0	0	2	1	1	0	1	0	✓	Though it would encourage modal shift, the impact would be dependent on the extent and time frames set by Midland Metro and would not provide a short to medium term solution.
OT-36	Other	Encourage high quality car parks	This policy would aim to reduce the number of poor quality car park and encourage premium parking services.	-	22	9	0	0	1	1	1	1	1	1	2	✓	Will improve the quality of private parking to visitors. Likely increase in costs to cover investment could encourage take-up of BCC parking supply.
OT-38	Other	Parking cap with reduce % standard for accessible locations	This would encourage developments with less parking in the most accessible locations and encourage travel by non car modes.	Hants	22	9	1	0	1	1	1	1	0	1	1	✓	See notes.
OT-02	Other	Provide parking at key SPRINT stops	Would incorporate park and ride facilities into the city potentially reducing demand on key corridors.	-	27	8	1	0	1	1	1	1	0	1	0	✓	Though it would encourage modal shift, the impact would be dependent on the extent and time frames set by SPRINT and would not provide a short to medium term solution.
OT-26	Other	Introduce a space per inhabitant ratio per zone	This would provide a dynamic parking cap which would be based on residents but would require data collection on population for the figures to be current.	Stockholm	27	8	1	1	1	1	1	-1	1	-1	1	✓	See notes.
PD-02	Parking in Determined Locations / Amounts	Remove all on-street parking with high accessibility to other modes (i.e. BCR routes, SPRINT, Metro)	The impact would vary across the quarters, but would provide a good opportunity to influence modal shift	-	29	7	1	0	1	1	1	1	0	0	0	✓	See notes.
OT-14	Other	Introduce max on street parking density figures	This would option would favour residential areas, allowing more parking on street based on the density of the population. It would be difficult to deliver depending on how often population figures	Stockholm	29	7	1	1	1	1	1	-1	1	-1	0	✓	Success is dependent on the car parking caps put in place.
OT-23	Other	Introduced dynamic parking pricing model	This would allow for BCC to react to demand and influence travel patterns through amending on street pricing tariffs. It would require monthly	San Francisco	29	7	1	1	1	0	2	-2	2	-1	1	✓	To update the prices on a monthly basis would require detailed analysis undertaken every month and the modification of signs and other mediums
LP-01	License Parking	Licence long-stay parking to ensure planning conditions are met	By introducing a license BCC would be able to monitor long stay parking use which would enable them to inform decision making. But the system would not influence visitor parking to the city i.e.	-	32	6	1	1	1	-1	1	1	1	1	-1	✓	Could encourage higher standards, also control temporary parking but could be difficult to control oversupply and encouragement of commuting if not controlled by council planning policy.
OT-03	Other	Improvements to public realm; walking and cycling	Improvements to the public realm may require the loss of on street parking facilities, but an improved environment would encourage movement within	To encourage more sustainable trips	32	6	1	0	0	1	1	1	0	1	-1	✓	See notes.
OT-04	Other	Park & Cycle, incorporated into the Birmingham Cycle Revolution	Could encourage more cycling and would maximise the benefits of Birmingham Cycle Revolution.	Cambridge and Hereford	32	6	1	0	0	1	1	1	0	1	-1	✓	See notes.

Order by Name							SO1	SO2	SO3	SO4	SO5	SO6	SO7	SO8	SO9	Decision	
Order By Rank							Weighting										
Name	Option Type	Option	Notes	In Practice	Rank	Total	Reduce congestion on the local network; in particular vehicle volumes and vehicle mileage	Will it ensure an adequate supply of parking for social/economic needs i.e.15% publically available parking	Promotes considerate parking - reducing anti social behaviour	Promotes modal shift to sustainable modes & Supports BCC sustainable travel policies	Technical Justification; has it been implemented successfully before	Administration and enforcement; will it be easy to introduce and inforce	Flexibility can it adapt to changes in policy or the market	Implementation ; can it be introduced under existing legislation	Commercial viability	Decision	Justification of Decision
OT-10	Other	Introduce GOSMART system to provide information and reward sustainable travel	This would require collaboration and agreement across all service providers, Public Transport and Parking.	Optcities - Gothenberg	32	6	1	0	1	1	1	-1	1	1	-1	✓	See notes.
OT-28	Other	Introduce Park and Ride Site/Hub on Aldridge Road - on existing platinum bus service	This would encourage modal shift and provide an a park and ride alternative.	-	32	6	1	0	0	1	1	1	0	1	-1	✓	See notes.
OT-41	Other	Develop park and ride hub at Birmingham City University Campus site Perry Barr	Would provide an convenient location to provide a Park and ride hub. This would be dependent on site availability and practicality	Antwerp	37	4	1	0	0	1	1	1	0	-1	-1	✓	Would be difficult to implement at an existing site as would require collaboration with the site owner and would require bus priority measures to be implemented.
OT-42	Other	Introduce a park & ride hub at ASDA Kings Heath	Would provide a convenient Park and Ride Hub but would be dependent on collaboration and practicalities of whether it has capacity to provide parking for commuters.	Antwerp	37	4	1	0	0	1	1	1	0	-1	-1	✓	Would be difficult to implement at an existing site as would require collaboration with the site owner and would require bus priority measures to be implemented.
OT-43	Other	Introduce a park & ride hub at Windmill Shopping Centre on A457	Would provide a convenient Park and Ride Hub but would be dependent on collaboration and practicalities of whether it has capacity to provide parking for commuters.	Antwerp	37	4	1	0	0	1	1	1	0	-1	-1	✓	Would be difficult to implement at an existing site as would require collaboration with the site owner and would require bus priority measures to be implemented.
OT-09	Other	Encourage carpooling	The purpose of this is to reduce single occupancy vehicles.	Optcities -Lyon	40	3	1	0	1	-1	2	1	-1	1	-1	✓	Would need dedicated spaces and enforcement. Operational.
OT-20	Other	Real time occupancy and payment through in vehicle navigation systems IPark4U	This system has limited reach, as it would benefit the users of the system as opposed to a wider audience.	Bruges/ Antwerp and Gent	70	-7	-1	-1	0	-1	1	-1	0	1	-2	✗	Would limit to a single provider - difficult to deliver through BCC low share of market and longer term aspiration.
OT-19	Other	Lower parking charges for low emission vehicles	This would encourage more sustainable car choices, and would be easily implemented for permit applications.	Brighton & Hove	71	-9	-1	-1	0	-1	-1	-2	1	0	-1	✗	Could undermine commercial viability especially long term.

Appendix L. Future targets

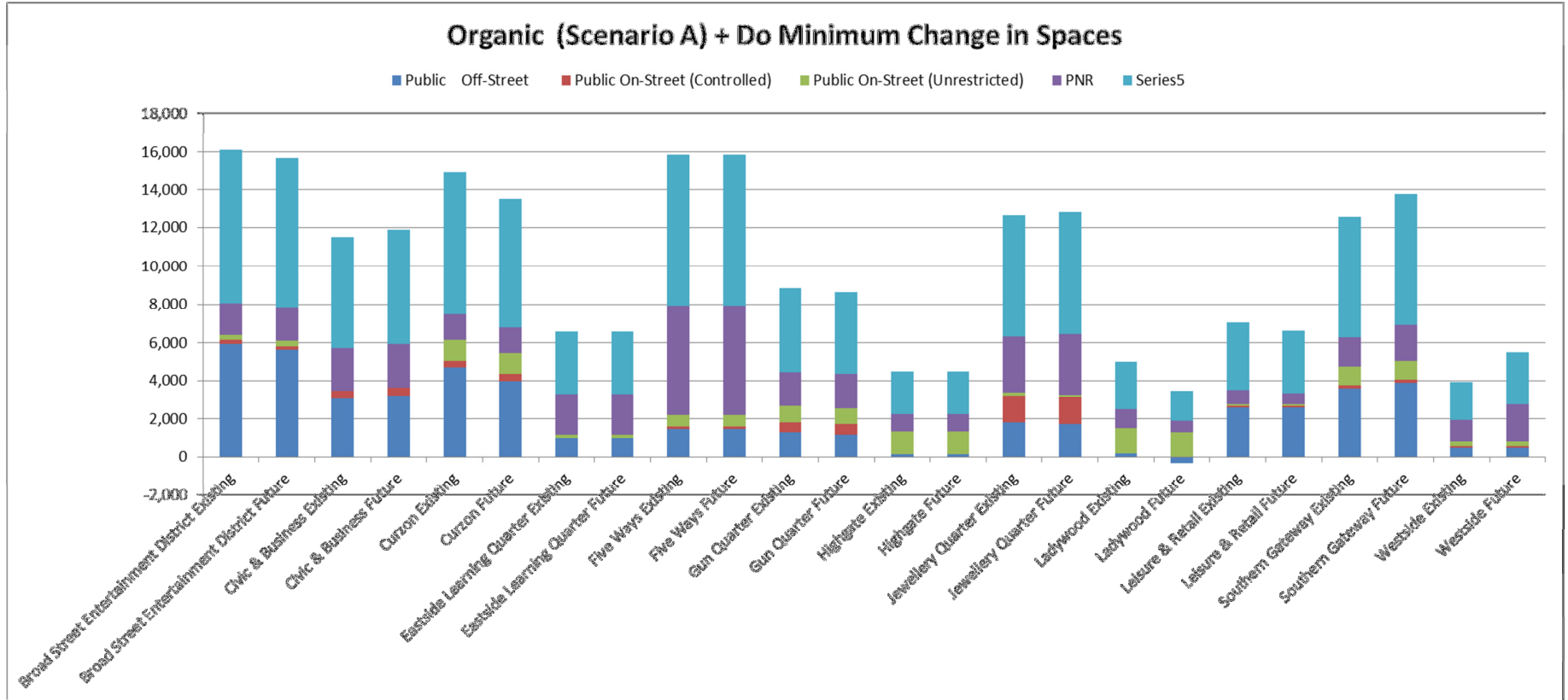


Figure L.1 : Organic (Scenario A) + Do Minimum Change in Spaces

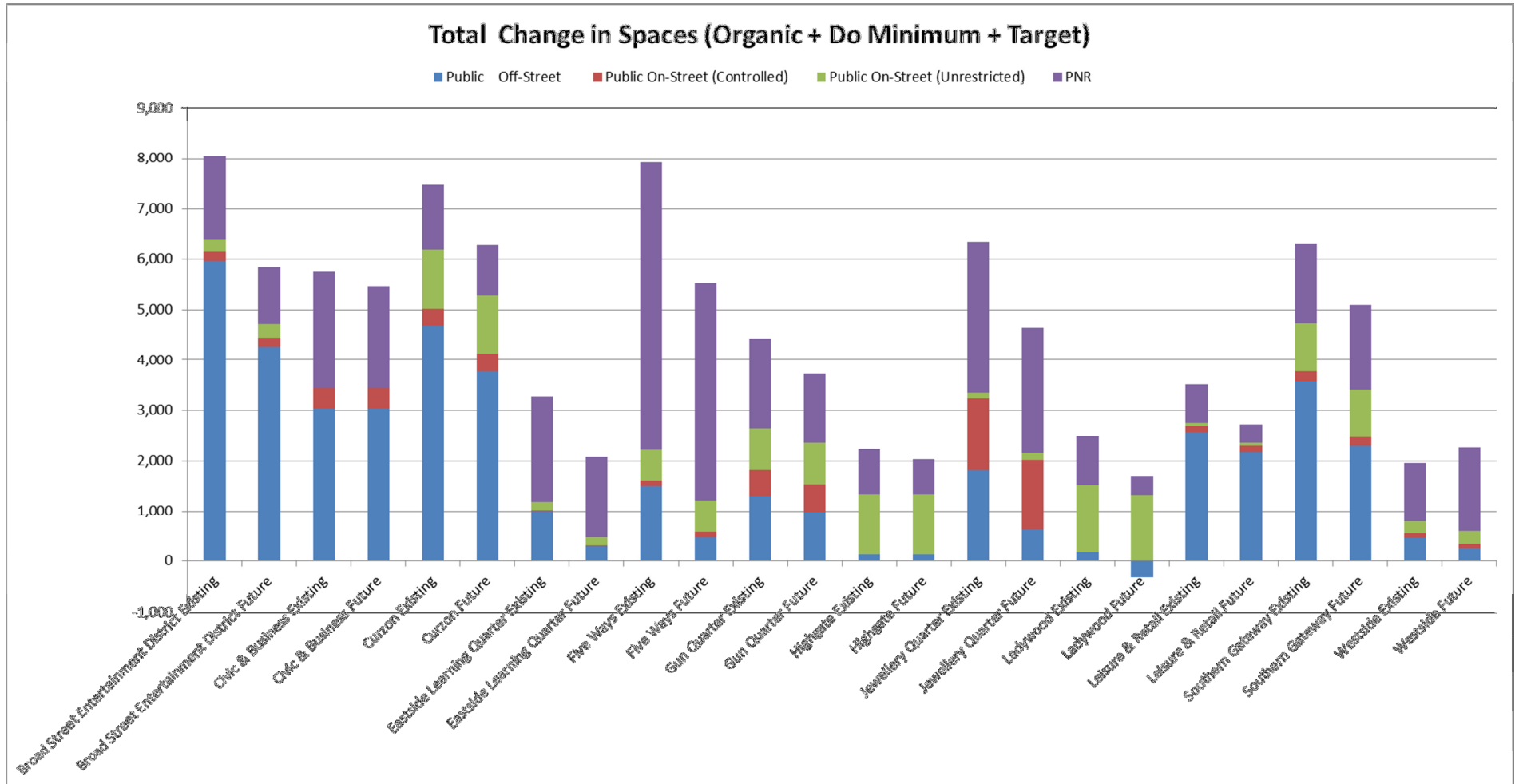


Figure L.2 : Total Change in Spaces (Organic + Do Minimum + Target)