Access to retail centres in Scotland – part of SIMD2006

As formulated in the 'SIMD2006 – Access domain development – specification' report, one of the variables to determine the SIMD is the public access to retail centres. The access to multiple outlets is important as: 'Retail centres with several outlets allow greater choice and price comparisons.'

Public access is quantified by calculating the walk- and drive-time from Census Output Area centroids to the nearest retail point. The size of a census output area is determined by the population density and can be as small as 83 meters square in a densely populated urban area and as large as 800 square kilometres in very sparsely populated rural areas.

Following is a spatial analysis of the two available retail datasets, pointX point-data and Caci polygon-data. To test the best use of these two datasets for the retail variable in SIMD2006, examples are given of walk-times calculated in three areas in Scotland.

PointX dataset

The dataset provided by PointX, consists of ten information groups, one of which is group 09: retail. Following is the list of retail types that fall into this information group. In total there are 19,292 retail points in the PointX dataset. From these a total of 11,127 retail points are located inside the CACI retail zones. The PointX dataset is owned and regularly updated by Ordnance Survey. The version used in SIMD2006 is version 1.91 2005.

Each record in the dataset represents an individual shop with exact coordinates fitting well with OS data, such as the 1:10k topographic map.

PointX point-classification

DESCRIPTION	SCOT LAND	CACI ZONE
Clothing	1851	1519
Footwear	365	314
Jewellery And Fashion Accessories	620	526
Lingerie And Hosiery	70	48
Bakeries	785	479
Butchers	721	350
Confectioners	152	116
Delicatessens	168	125
Fishmongers	159	102
Frozen Foods	91	75
Green And New Age Goods	11	5
Grocers	579	173
Herbs And Spices	4	2
Off Licences	562	341
Organic, Health And Kosher Foods	20	2
Books And Maps	504	353
Carpets, Rugs And Soft Furnishings	396	224
China And Glassware	24	18
Craft Supplies	131	58
Cycles And Accessories	134	69
Diy And Home Improvement	241	119
Drapery And Needlecraft	146	87
Furniture	367	221
Garden Centres And Nurseries	195	20
Garden Equipment	78	19
General Household Goods	54	38
Hobby And Pastime Products	204	135
Leather Goods, Luggage And Travel Accessories	34	24
Lighting	41	23
Music And Video	398	292
Musical Instruments	94	64
Pets And Pet Supplies	258	157
Sports Equipment	458	318
Tents And Camping Equipment	50	42
Travel Agencies	640	461
New Vehicles	611	137
Secondhand Vehicles	121	28
Vehicle Auctions	8	0
Vehicle Parts And Accessories	691	238

Convenience Stores	1017	270
Department Stores	225	195
Discount Stores	139	120
General Stores	643	133
Livestock Markets	21	2
Mail Order And Catalogue Stores	68	40
Markets	9	6
Newsagents And Tobacconists	1246	566
Shopping Centres And Retail Parks	131	98
Supermarkets	664	312
Surplus Goods	7	4
Art And Antiques	374	198
Charity Shops	369	302

Florists	600	381
Gifts And Cards	859	646
Party Goods And Novelties	78	54
Secondhand Goods	66	45
Computer Supplies	55	22
Domestic Appliances	59	30
Electrical Goods And Components	220	85
Photographic And Optical Equipment	54	45
Stationery Supplies	132	64
Telephones And Telephone Cards	220	187

Caci dataset

Caci Retail Footprint is a comprehensive retail model covering multiple outlet retail centres in total 3,300 in the UK and 320 in Scotland. This dataset is updated every three months and the version used for SIMD2006 is the most recent version on 20 March 2006.

Each record in the dataset represents a shape of one or more 500 metre squares indicating a retail zone with multiple shops.

Caci polygon-classification

1. Major High Street	City and large town centres with a wide variety of stores including department and major clothing stores e.g. Edinburgh city centre
2. Local centre	Centres satisfying everyday local needs with mixture of independent and chain stores with a focus on convenience services such as shoe shops and healthcare outlets e.g. Leith, Stockbridge.
3. Out of town shopping centre	Highly accessible out of town centres with good parking but a more limited range than a major high street e.g. Gyle, Ocean Terminal, Fort Kinnaird.
4. Outlet Centre	Out of town centres selling excess and end of season merchandise from well-known brands in areas such as fashion, sport and homeware e.g. McArthur Glen in Livingston, Sterling Mills in Tillicoultry.
5. Retail Park	Typically located in edge of town locations, or city suburbs, these centres typically serve the household goods market (e.g. furniture, DIY, electrical goods) and may also include a supermarket and fashion outlets e.g. Meadowbank, Craigleith.

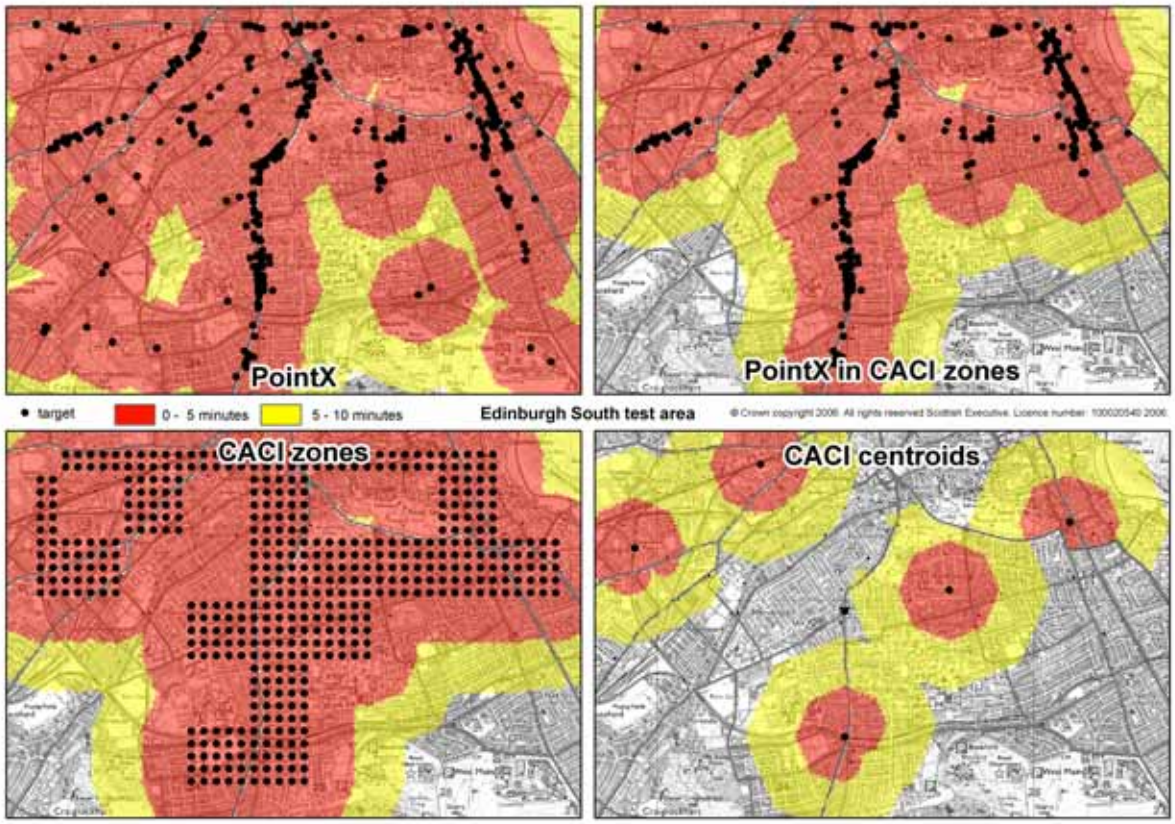
Walk-time calculations

To test the use of the two datasets, walk-times are calculated for three areas in Scotland:

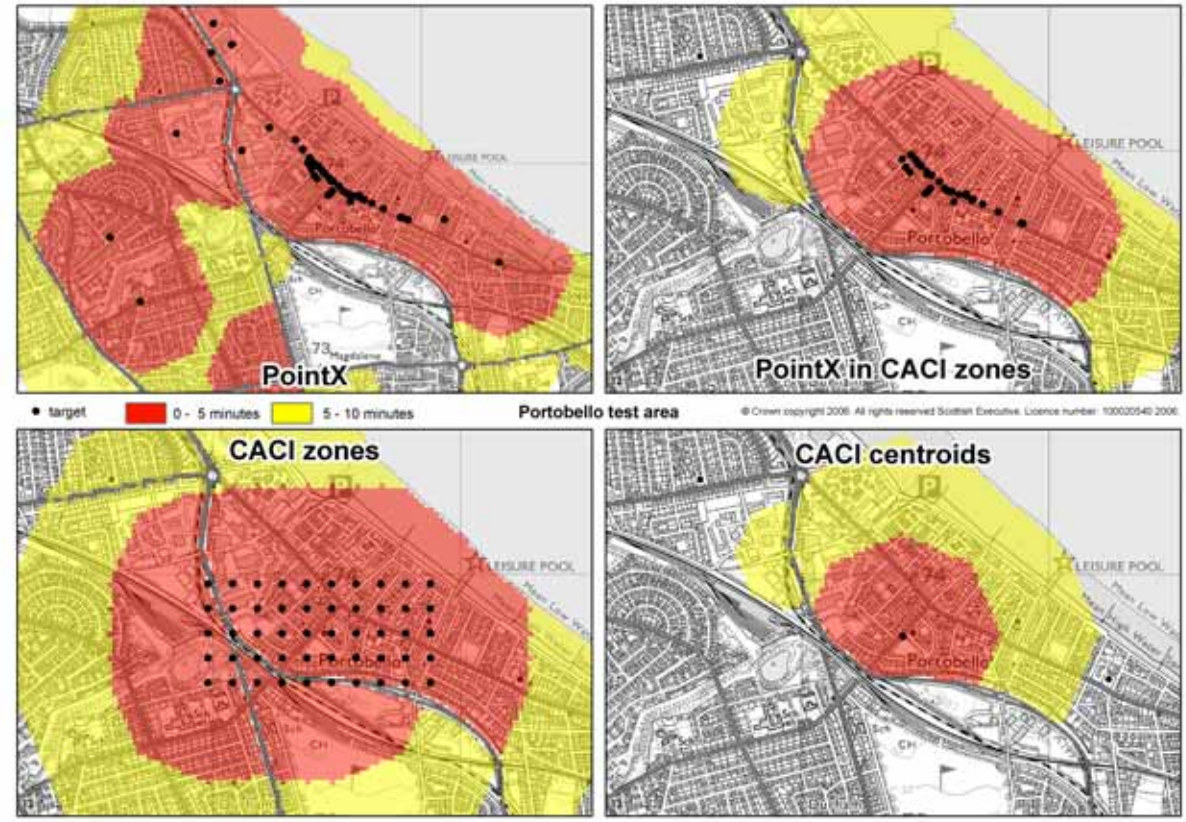
1. Urban: Edinburgh-South;
2. Peri-urban: Portobello;
3. Rural: Ullapool.

To visualise the different results the walk-time is divided into two time slices, 5 (red) and 10 (yellow) minutes. In the top-left figure, all pointX datapoints are used. In the top-right figure only the pointX datapoitns that fall inside a Caci retail zone are used. In the bottom left figure, the Caci retail zones are used as rectangular shapes. In the bottom right figure, the Caci retail zones are used as centroids.

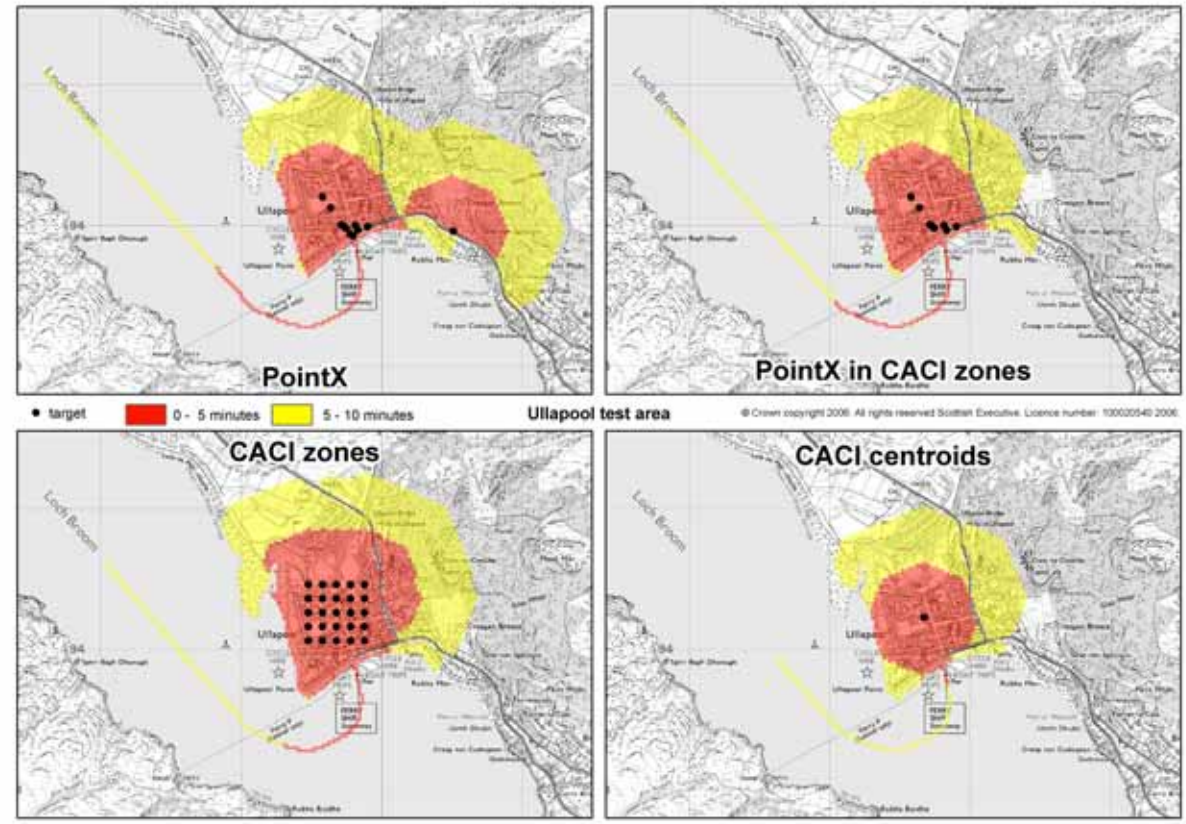
Urban area: Edinburgh-South



Peri-urban area: Portobello (Edinburgh):



Rural area: Ullapool (Northern Highlands):



Conclusion

For SIMD2006 the retail variable should give the walk- and drive- time to multiple retail centres. There is a problem with using the two datasets on their own, which can be solved if they are combined

Using PointX would include the single supermarkets or corner-shops and is therefore not suitable on its own for this analysis. This problem is most evident in rural areas, where one shop would change the walk -and drive-time variable for a large area. The Caci dataset does provide multiple outlet centres, but causes problems in densely populated areas. The size of the Caci zones (500 metres or more) is larger than the size of output areas (83 metres or more) and will give an incorrect walk-time value for areas close to retail centres. This scale related problem is less relevant at some distance away from the retail centres looking at drive-times.

If only those pointX datapoints are used that fall inside a Caci zone, both problems would be solved (top –right figures above). While the exact locations of shops are used, the single corner shops are excluded. This way, in more densely populated areas, the accuracy of the shop locations is improved, while only shops that are part of multiple outlet centres are included.