

CASA Seminar: 1st November 2006



CAPABLE Project: Tracking Children from Home to School and Back

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London

The research

Children's

Activities

Perceptions

And

Behaviour in the

Local

Environment

The research

Children's

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Perceptions

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Behaviour in the

Local

Environment

CAPABLE

- Funded by EPSRC for 29 months from August 2004
- Joint project between CTS, CASA, Bartlett School and Psychology Department at UCL
- Approach:
 - Develop research tools to investigate children's spatial behaviour, perceptions and relationship networks, and parental attitudes
 - Analyse how children use open spaces
 - Develop new models of children's outdoor movement patterns

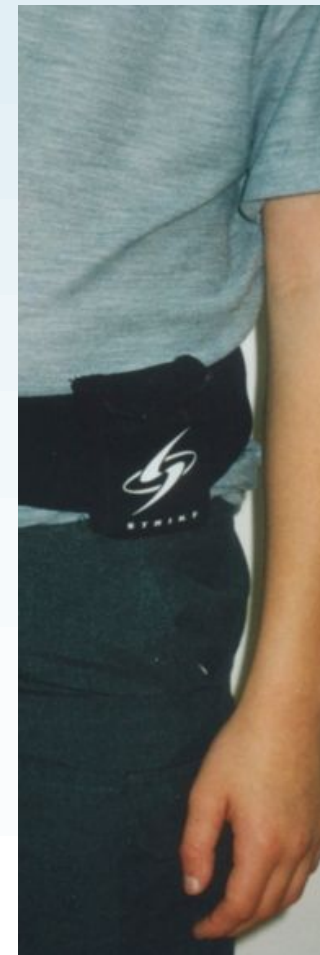
The research tools

- Monitoring children's travel and activity patterns:
 - Motion sensors (RT3s)
 - Diaries
 - GPS monitors
- Body composition measurement
- Questionnaires surveys of children and their parents, carried out through schools
- Interviews with parents and with children, including mapping exercises
- Children's drawing and mapping exercises
- Cameras
- Spatial reasoning tests

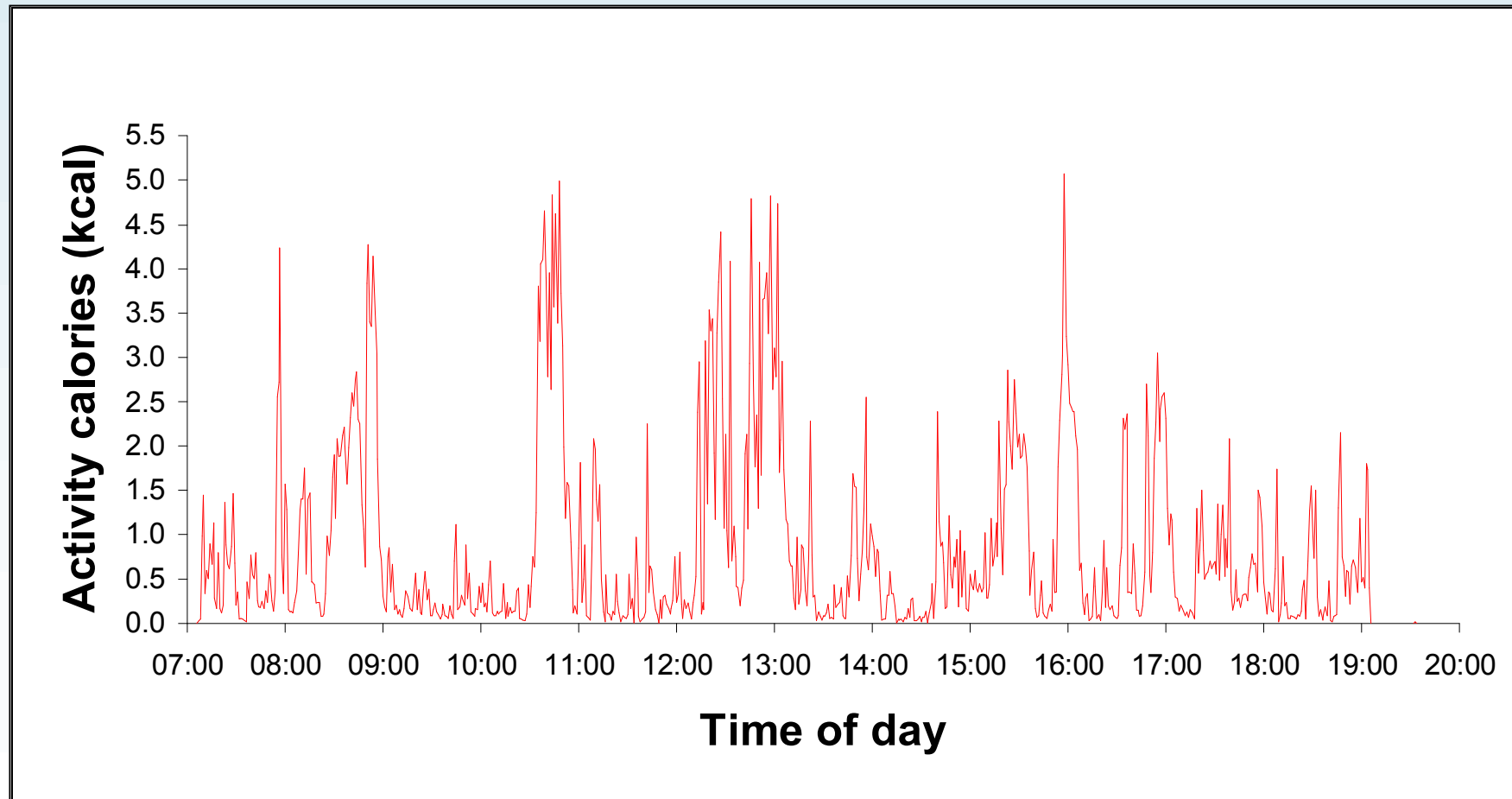
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The RT3 motion sensor



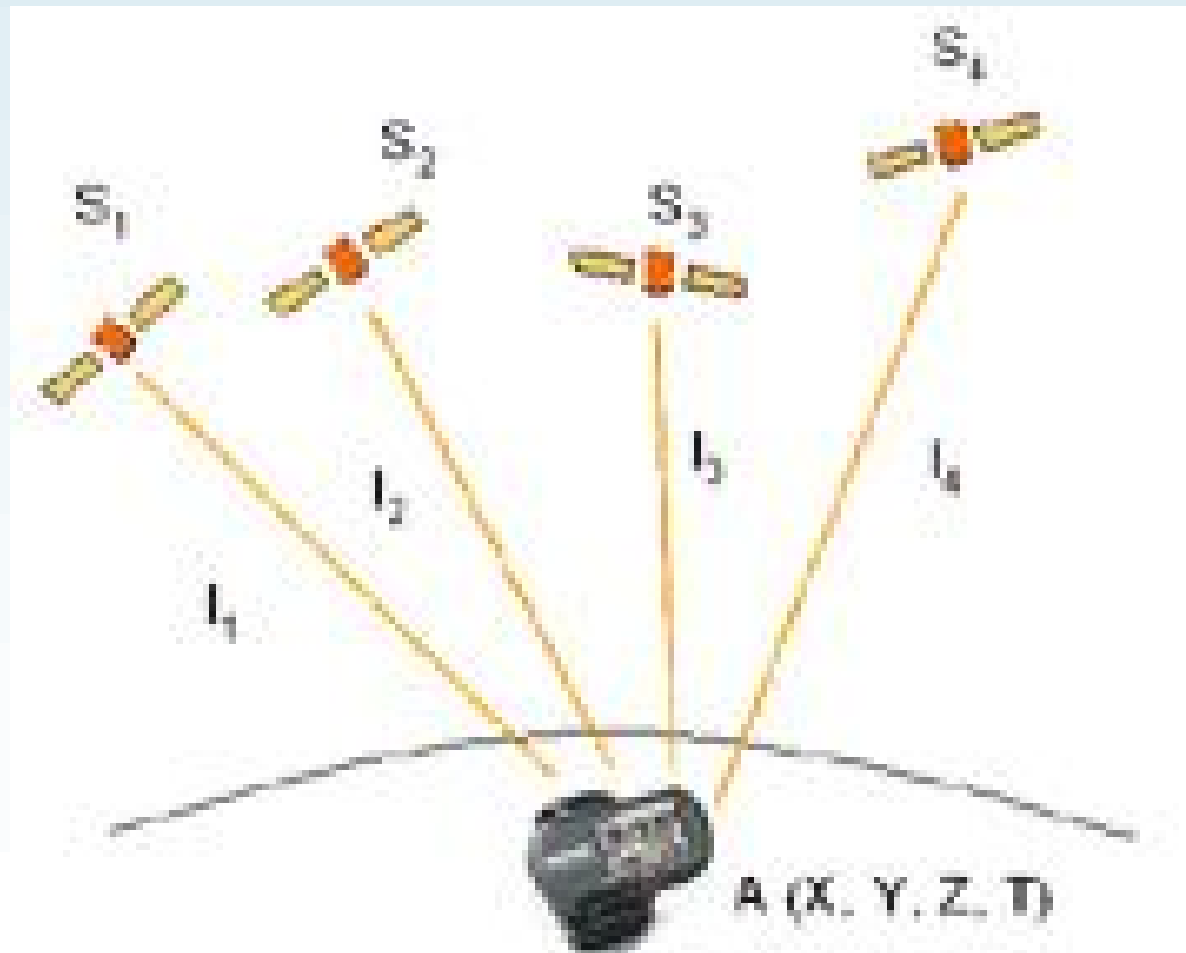
An example output from an RT3



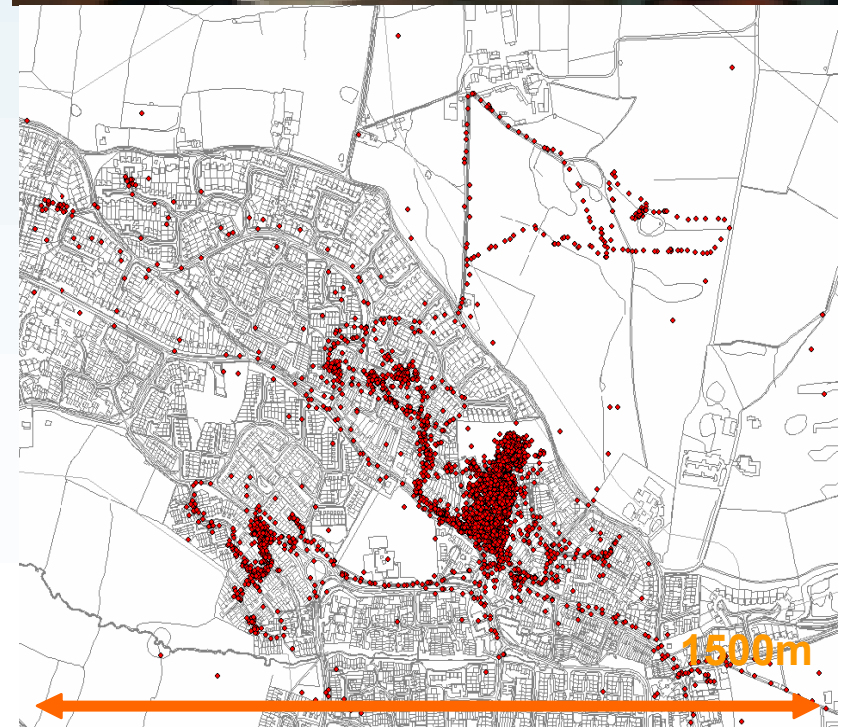
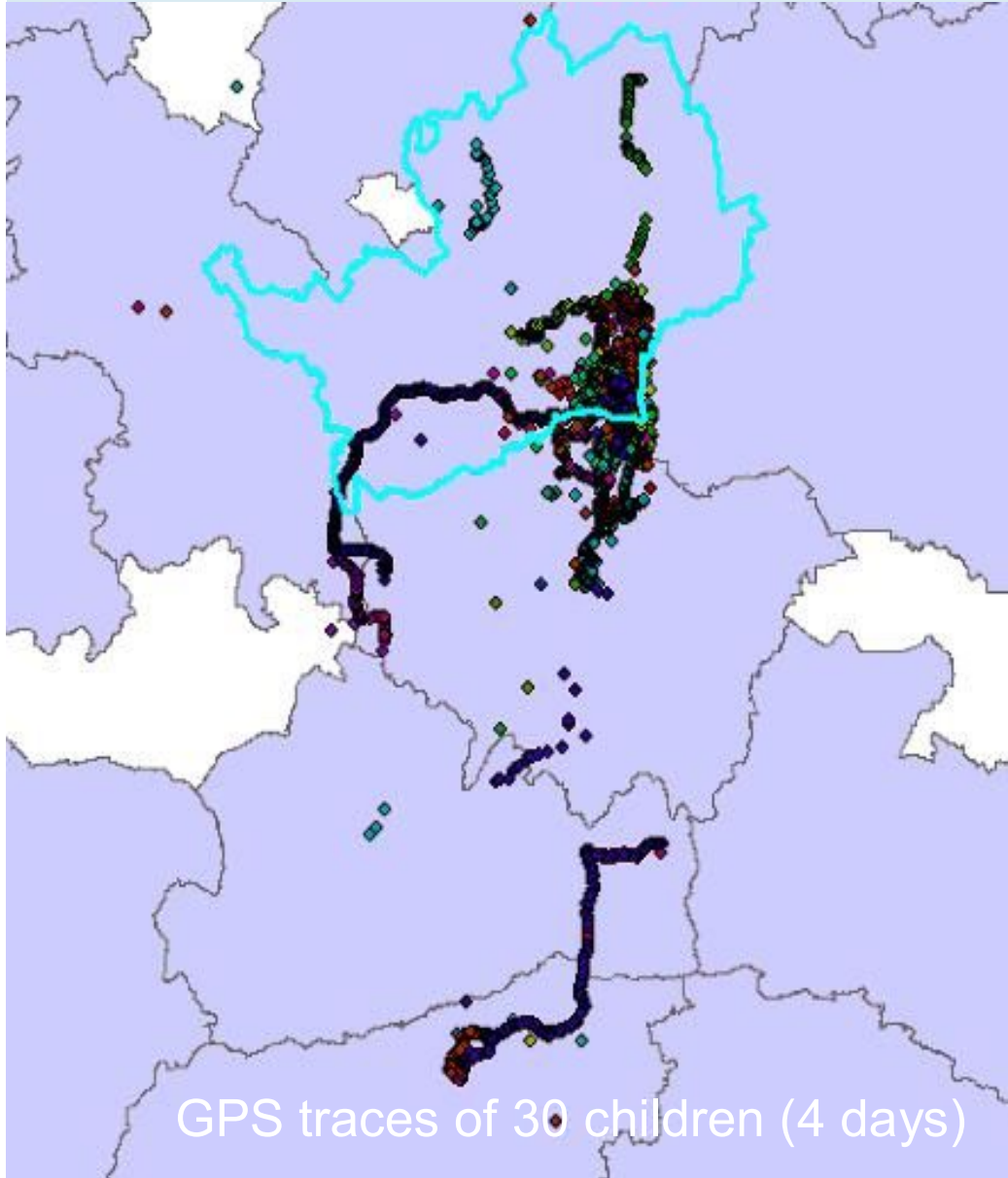
A child's travel and activity diary

Location		What did you do there?
Morning	I began the day at Home <input type="checkbox"/> Somewhere else <input type="checkbox"/> Please say where	I woke up at [] : [] I put my sensors on at [] : [] I left at [] : []
	Then I went to []	I got there at [] : [] I travelled by [] I travelled: <ul style="list-style-type: none"> • by myself <input type="checkbox"/> • with an adult <input type="checkbox"/> • with other children <input type="checkbox"/> I left at [] : []
	Then I went to []	I got there at [] : [] I travelled by [] I travelled: <ul style="list-style-type: none"> • by myself <input type="checkbox"/> • with an adult <input type="checkbox"/> • with other children <input type="checkbox"/> I left at [] : []

The GPS equipment



GPS monitors



The Garmin Rangers



Map annotation exercises

- Children are asked to mark on maps places of significance to them
- These can be interpreted directly or used in an interview

Map drawing

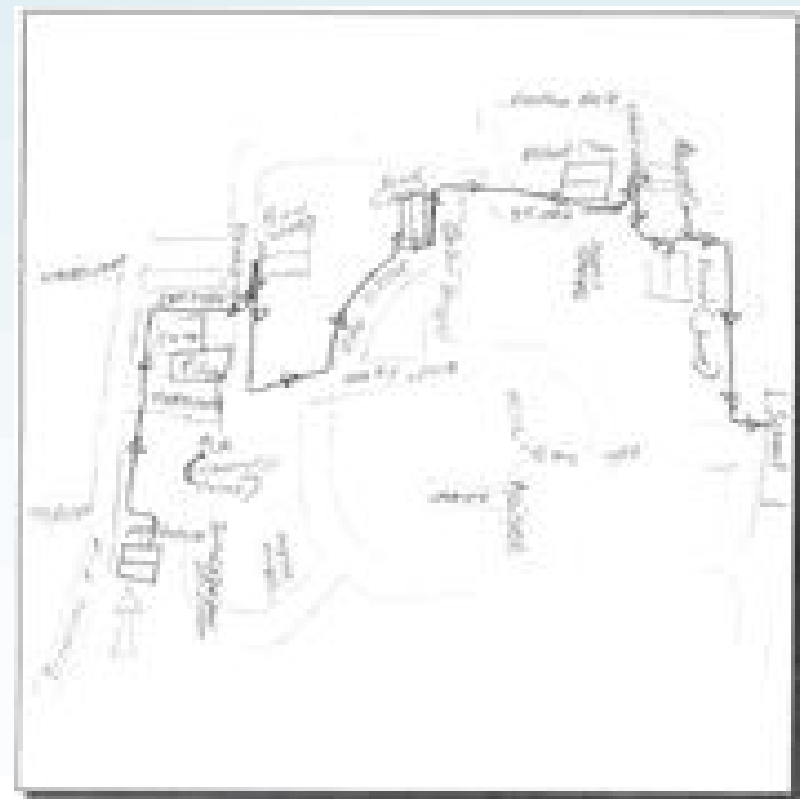
- Used to obtain information from children about their perceptions and interpretation of the world about them
- Differences may arise between child who walk a lot and those who mainly travel by car
- There may be differences in cognitive development between children in these two groups

Analysis of children's maps

Area maps



Route maps



Classifying Maps

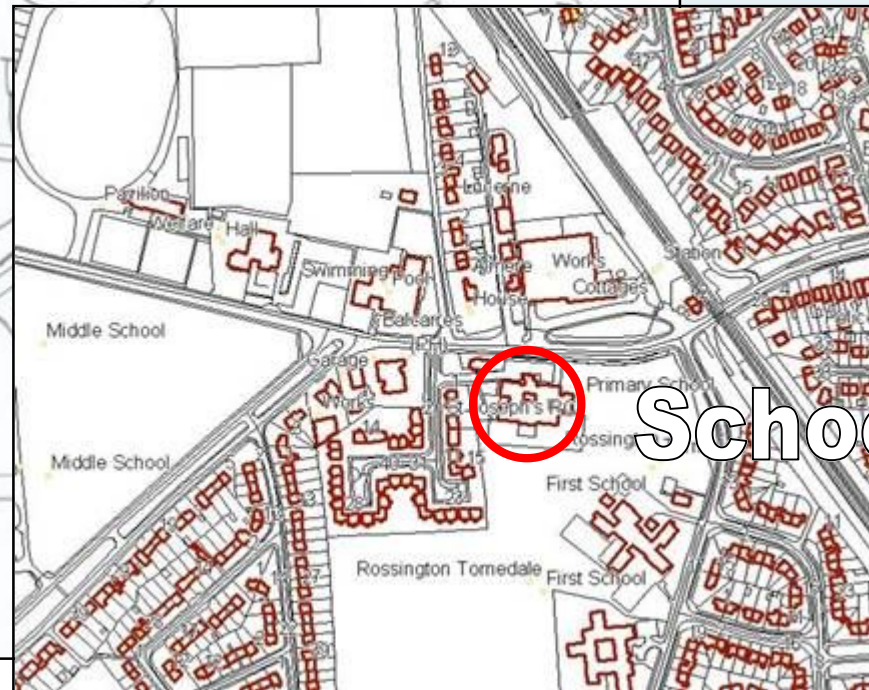


Landmarks present but disorganised

Landmarks with some organisation

Very map like representation

Map of the area

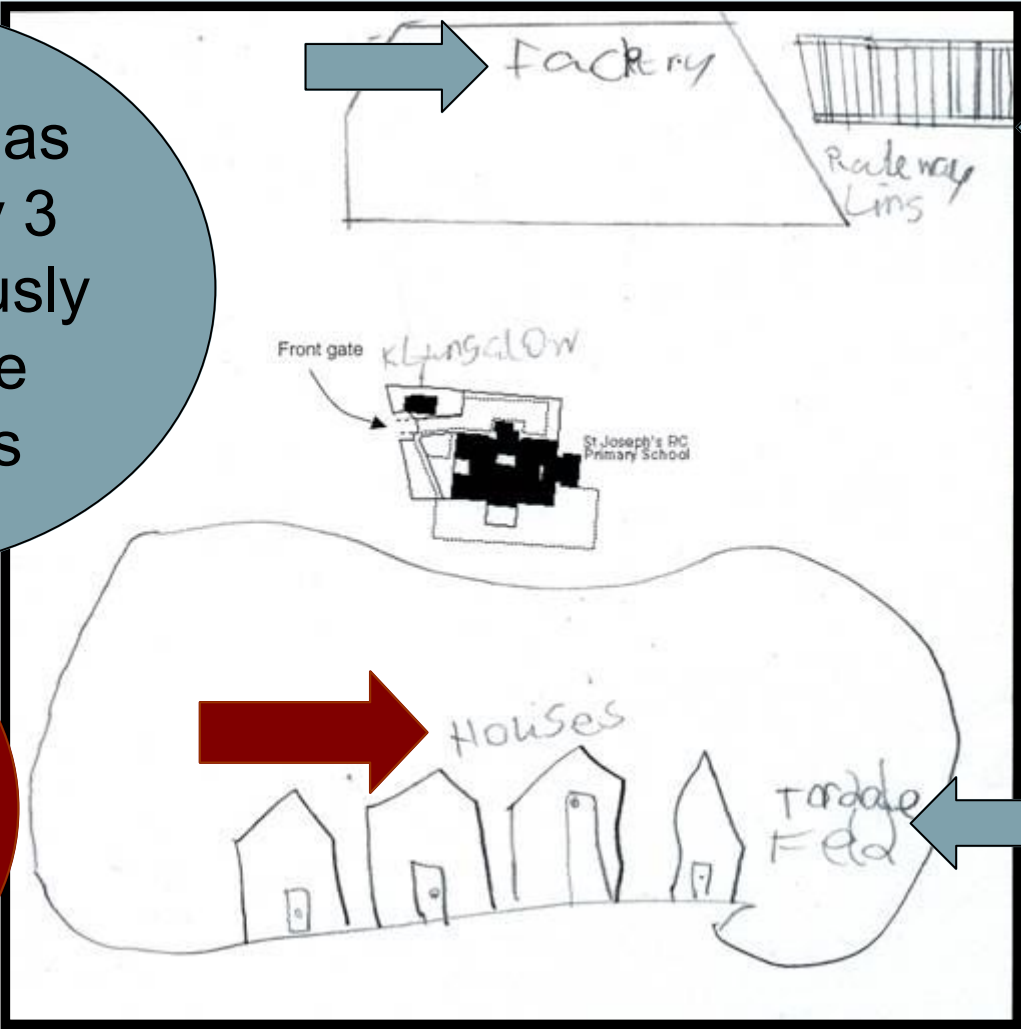


School

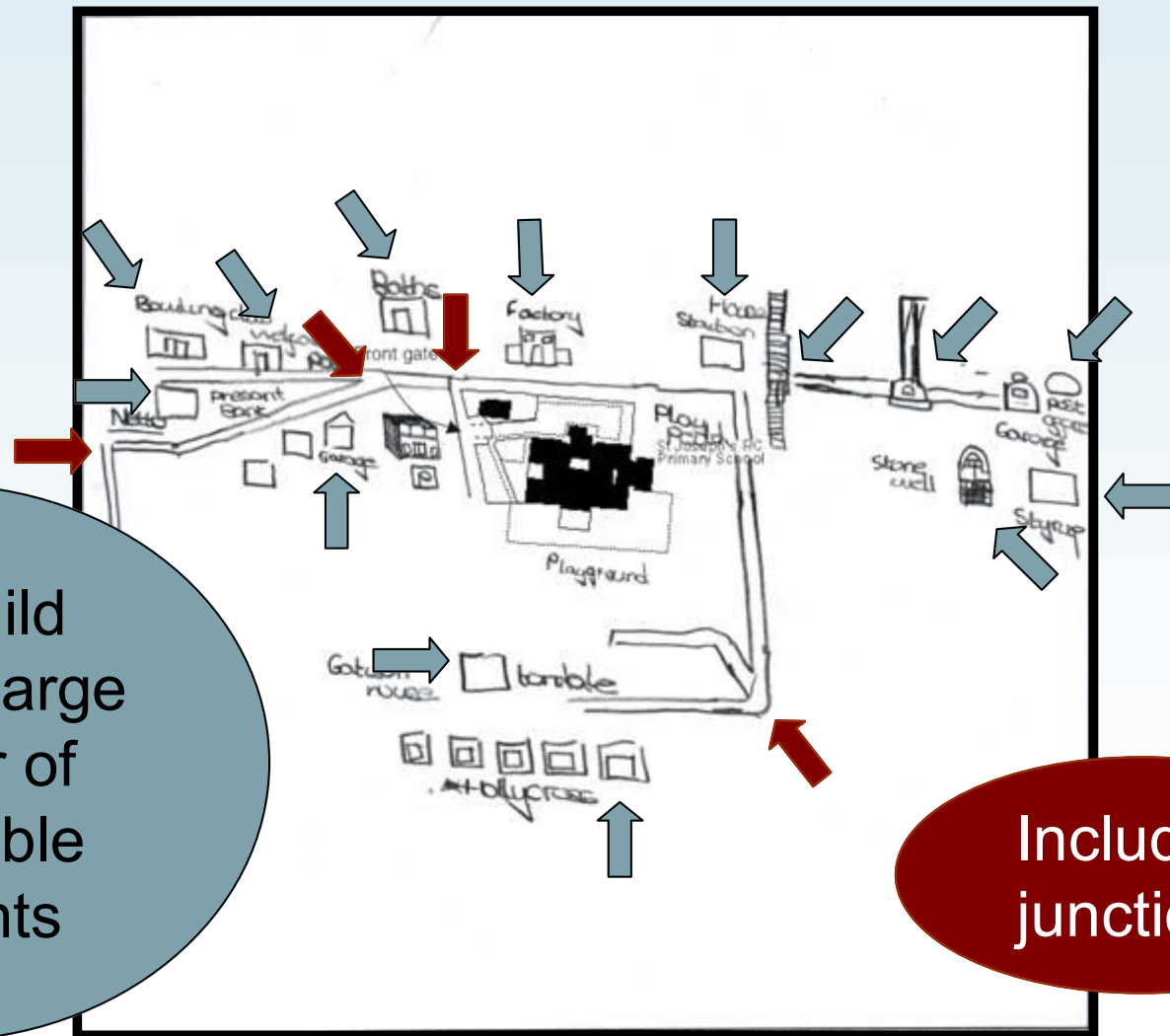
Low Element Example

This child has added only 3 unambiguously identifiable landmarks

Further ambiguous elements present



High Element Example



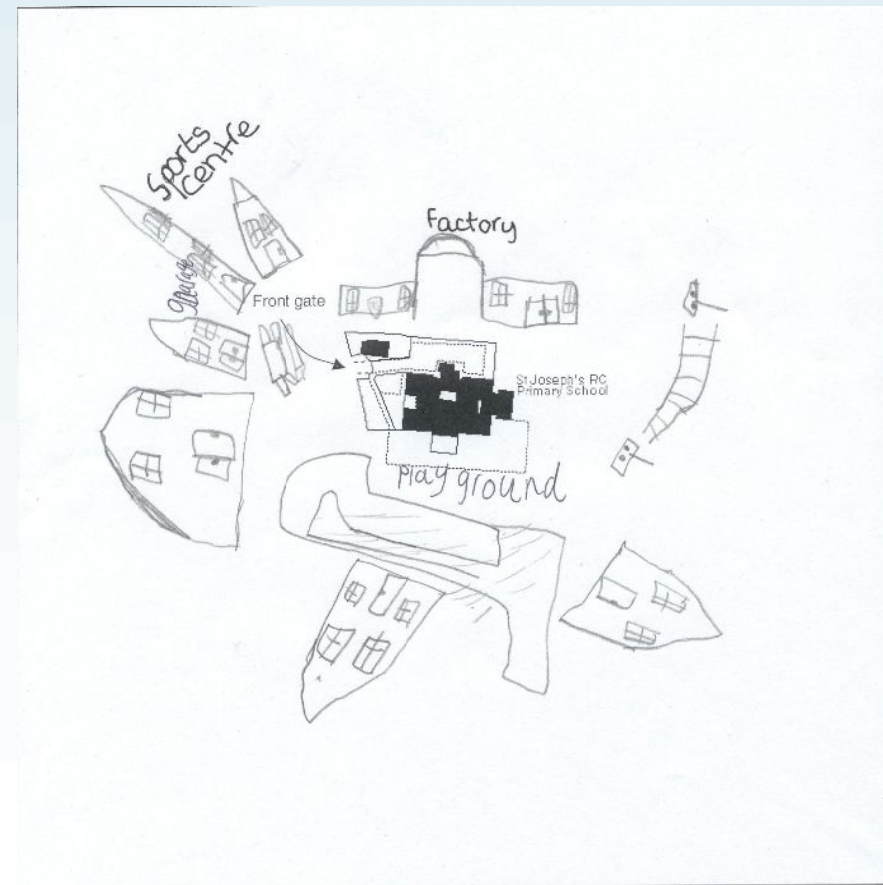
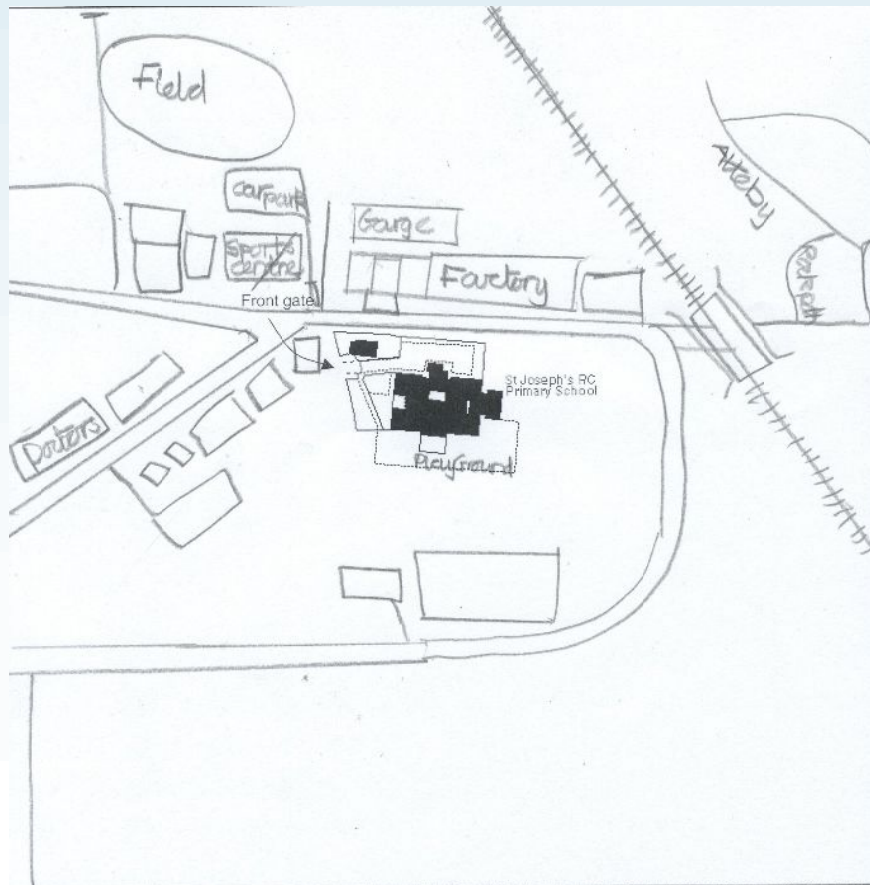
This child added a large number of identifiable elements

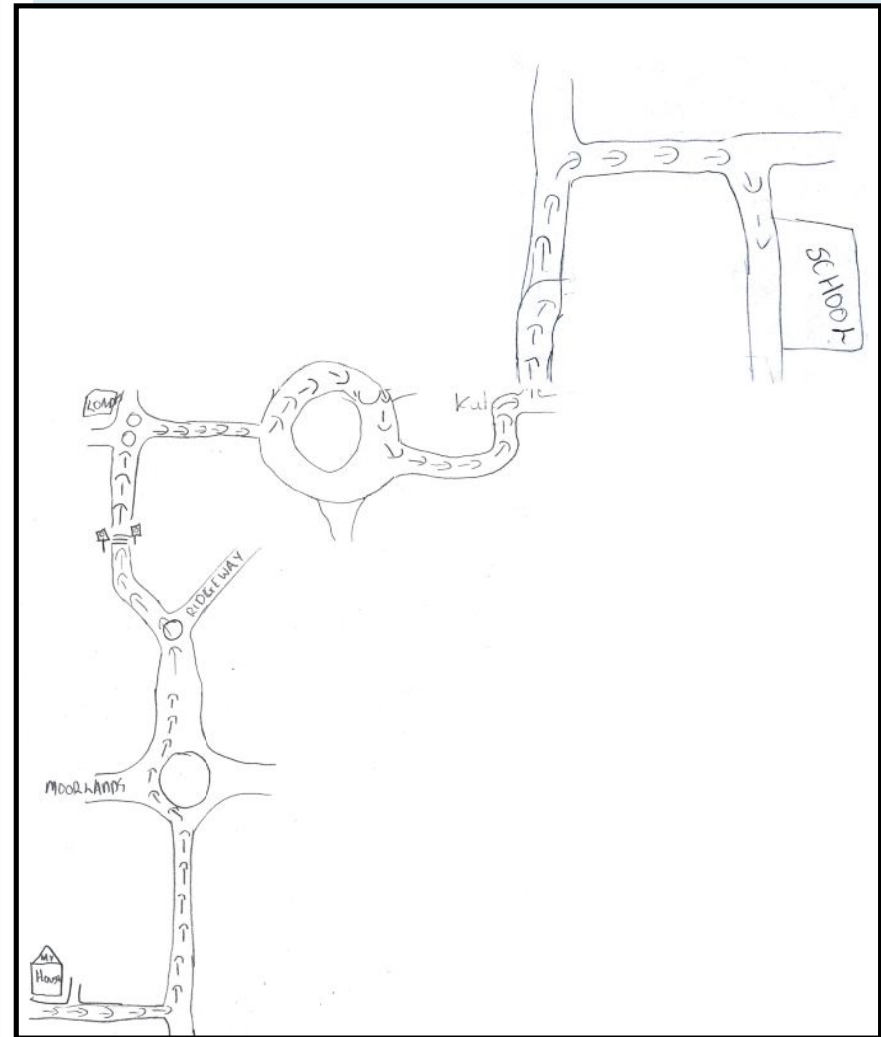
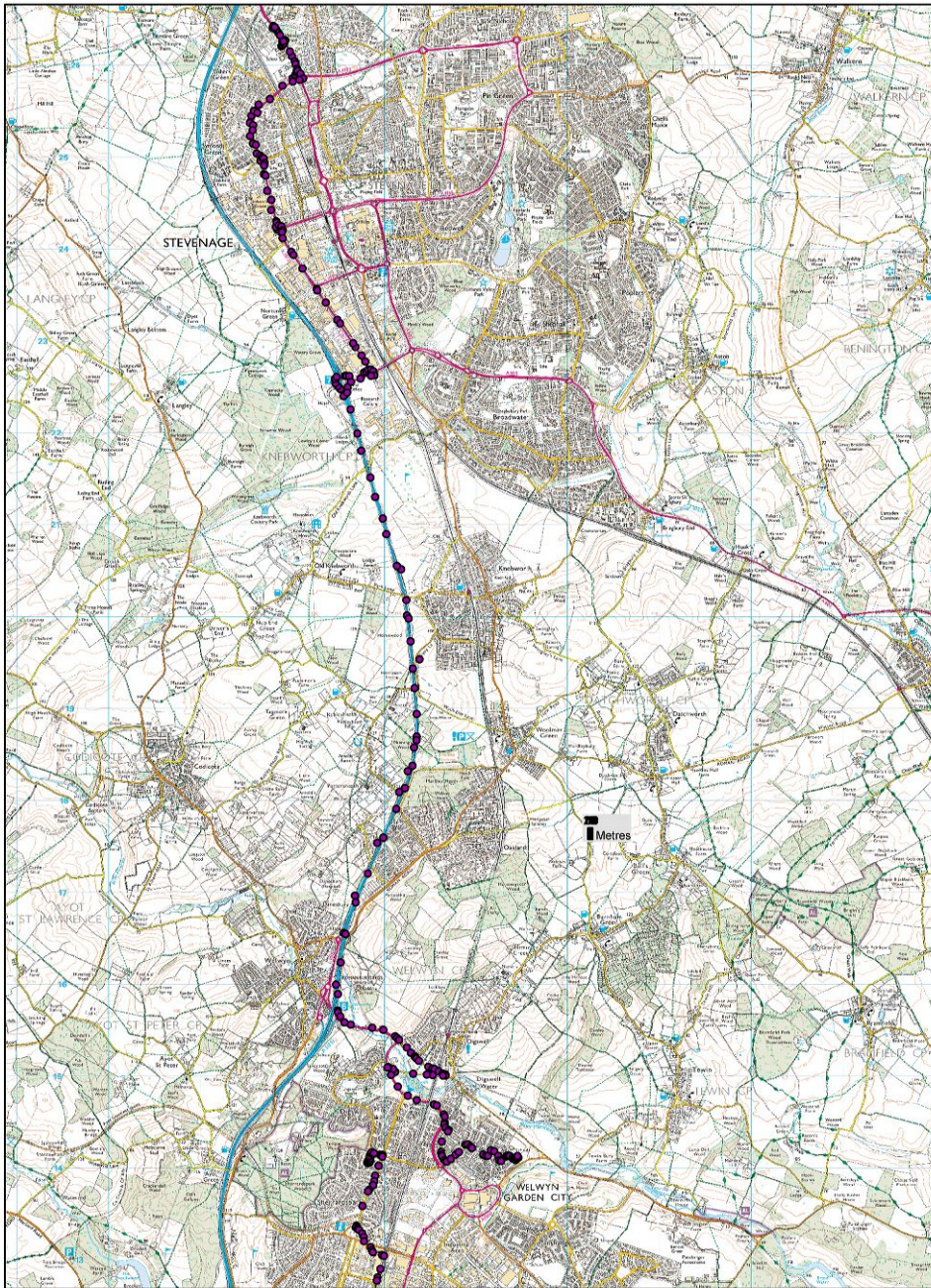
Including junctions

Area maps for children who travel to school by different modes

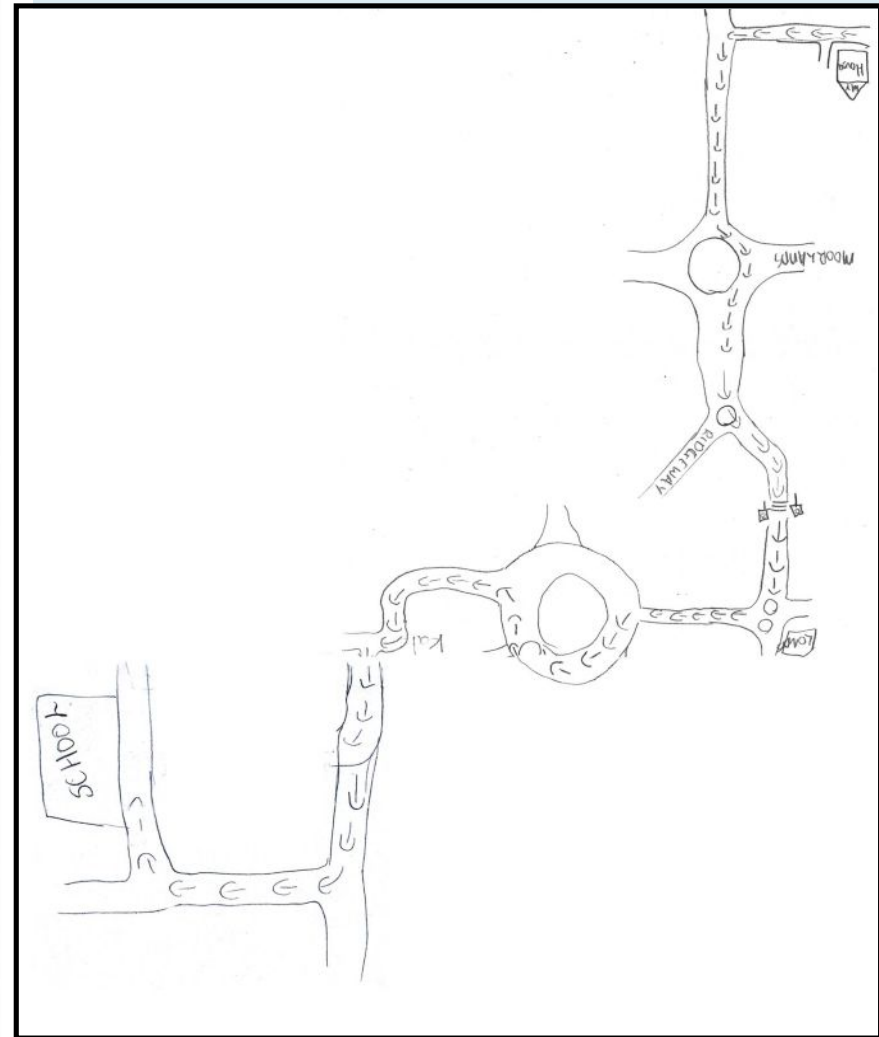
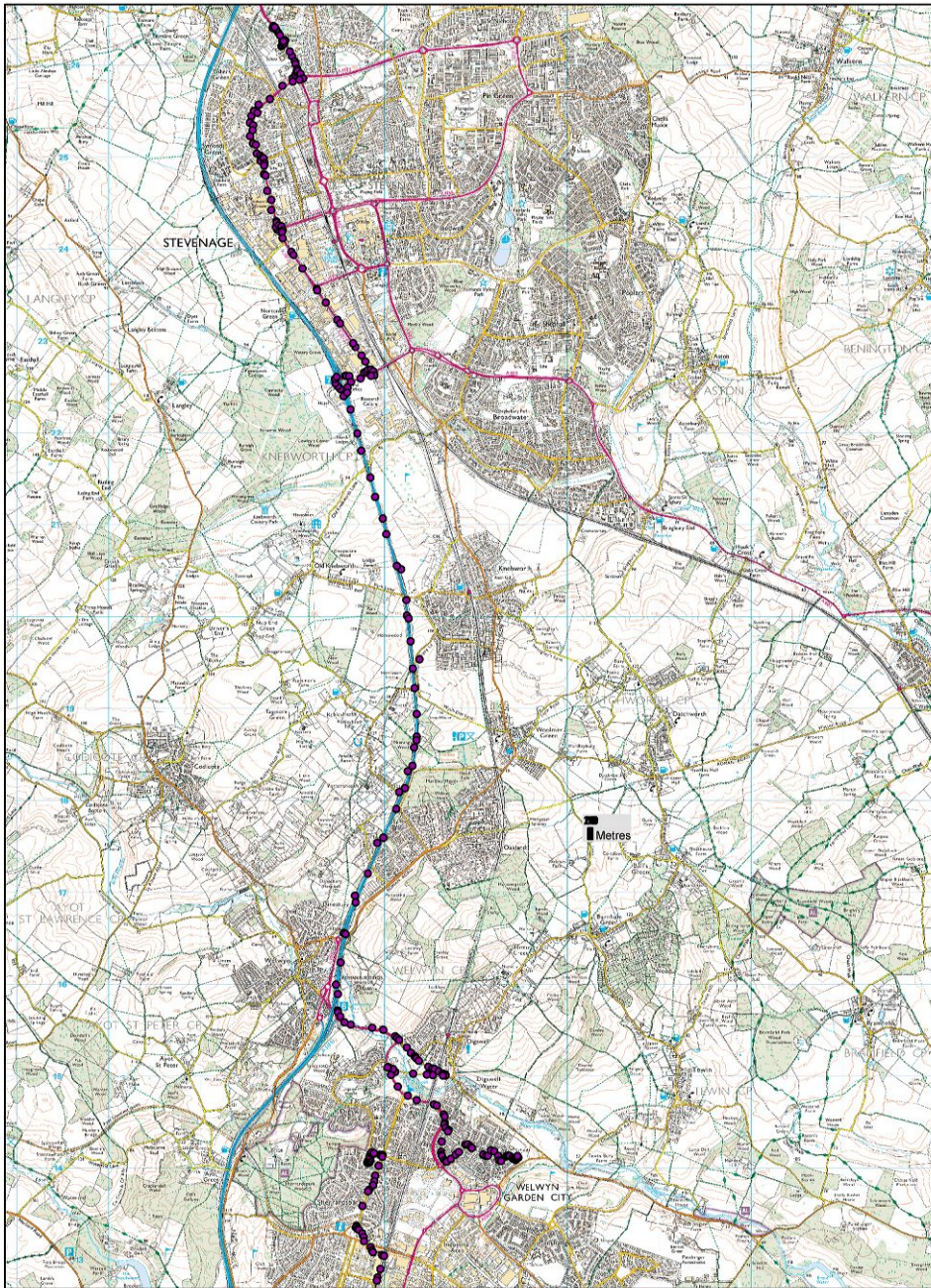
Walks to school

Driven to school

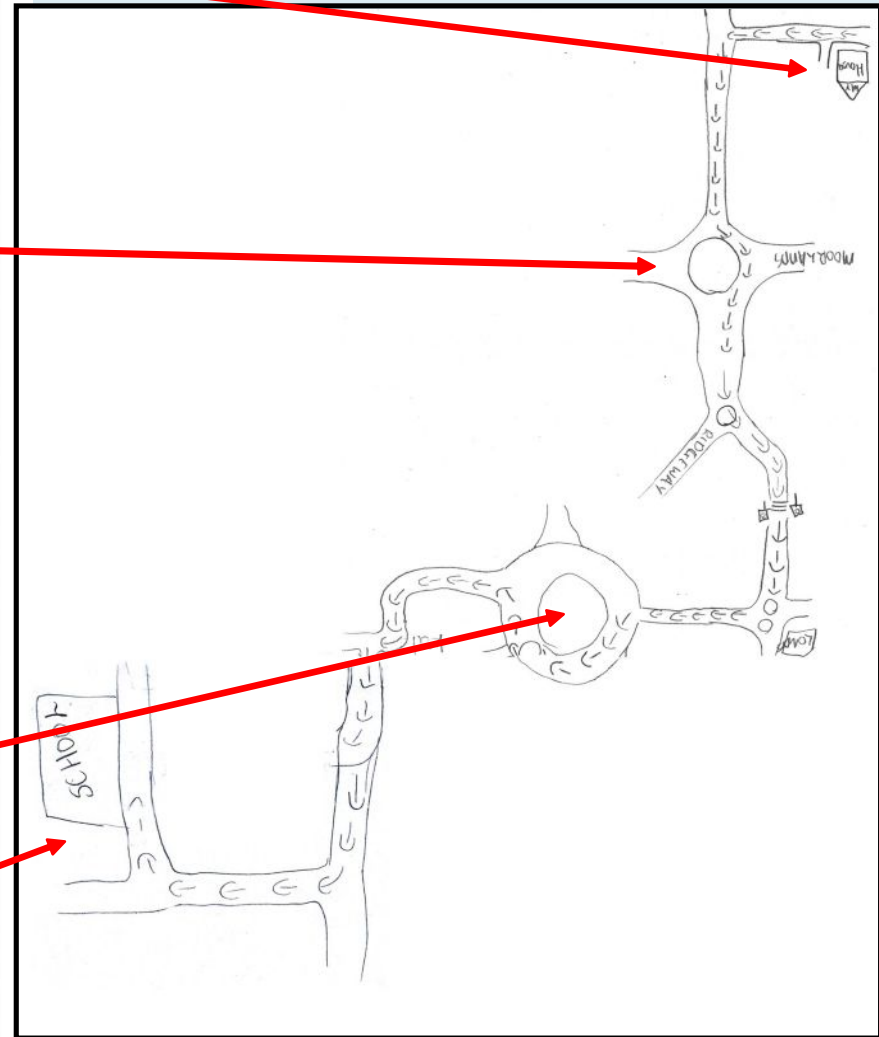
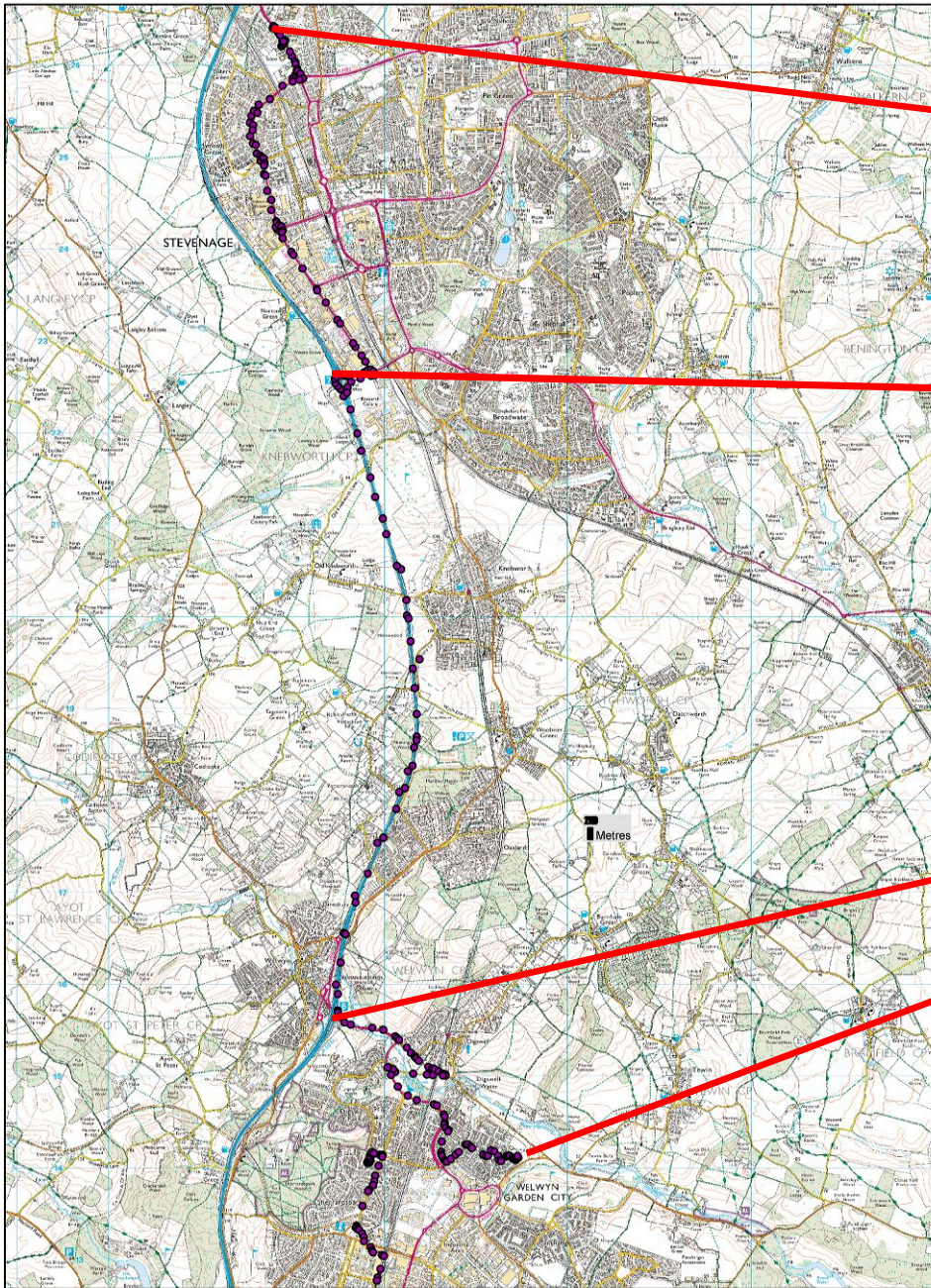




Sketch map rotated 180°



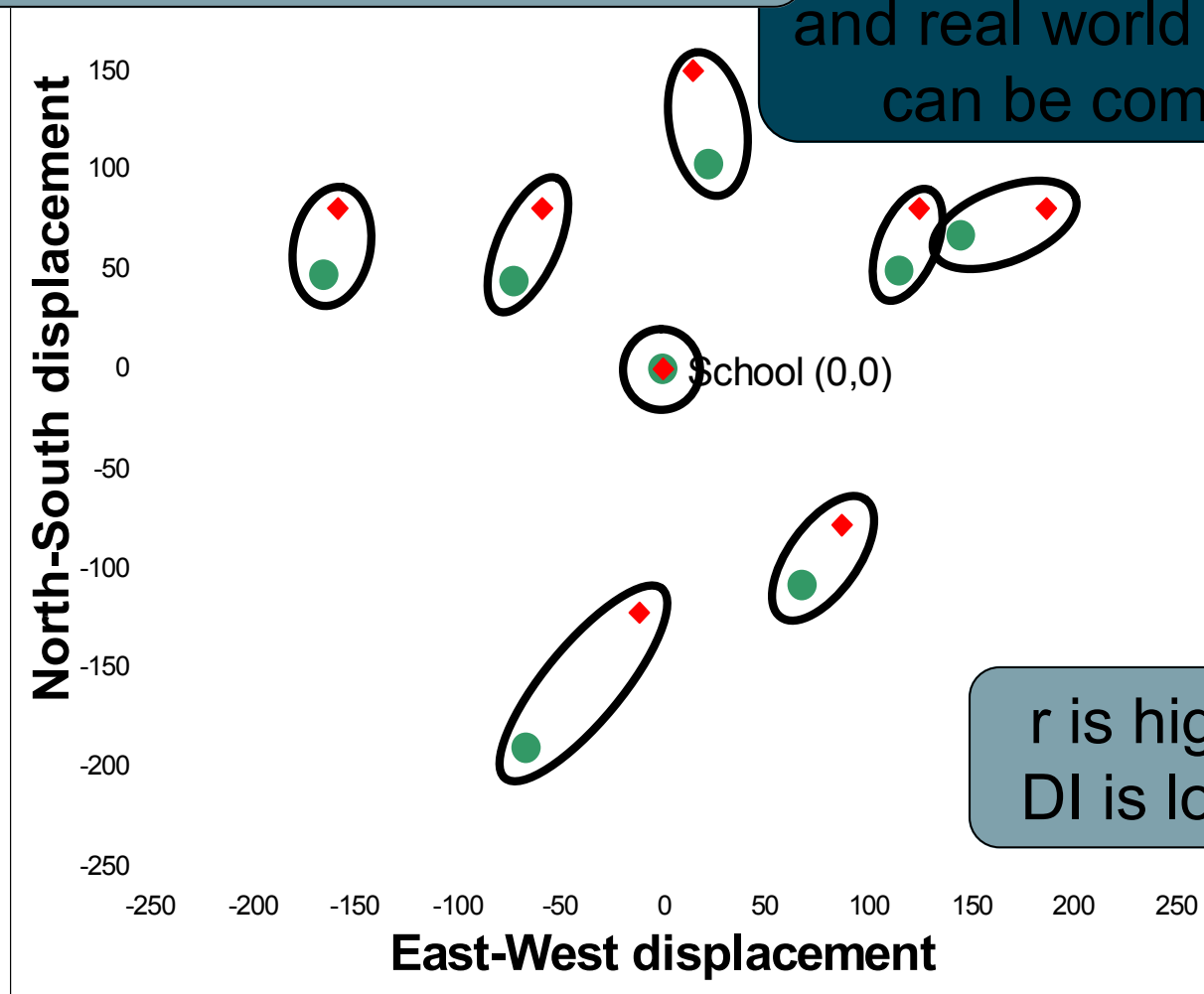
Sketch map rotated 180°



Example of Accuracy Analysis

In this example sketch map positions are close to the real world locations

Sketch map positions and real world positions can be compared

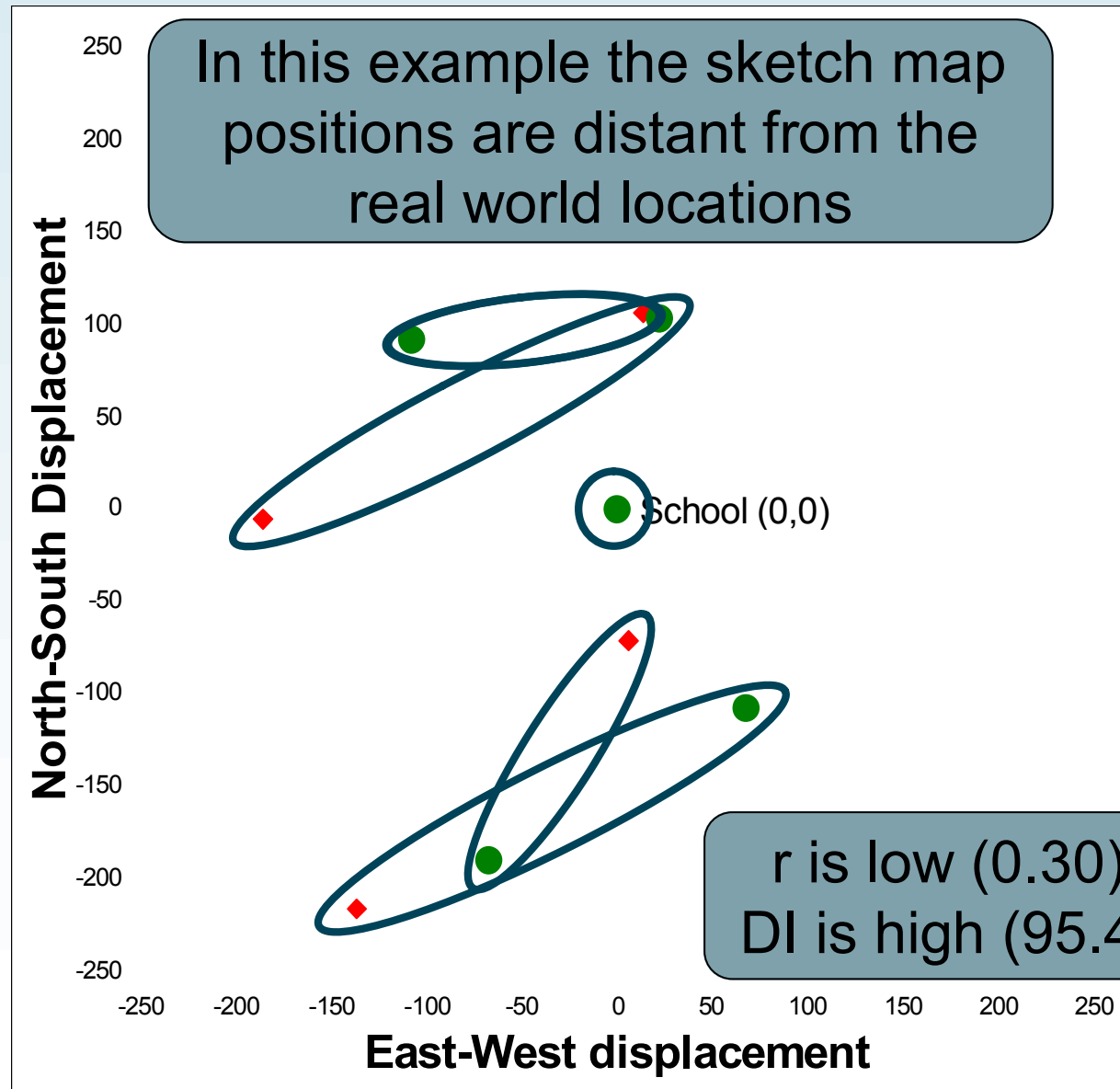


at centres found

coordinates inverted

r is high (0.98)
DI is low (20.2)

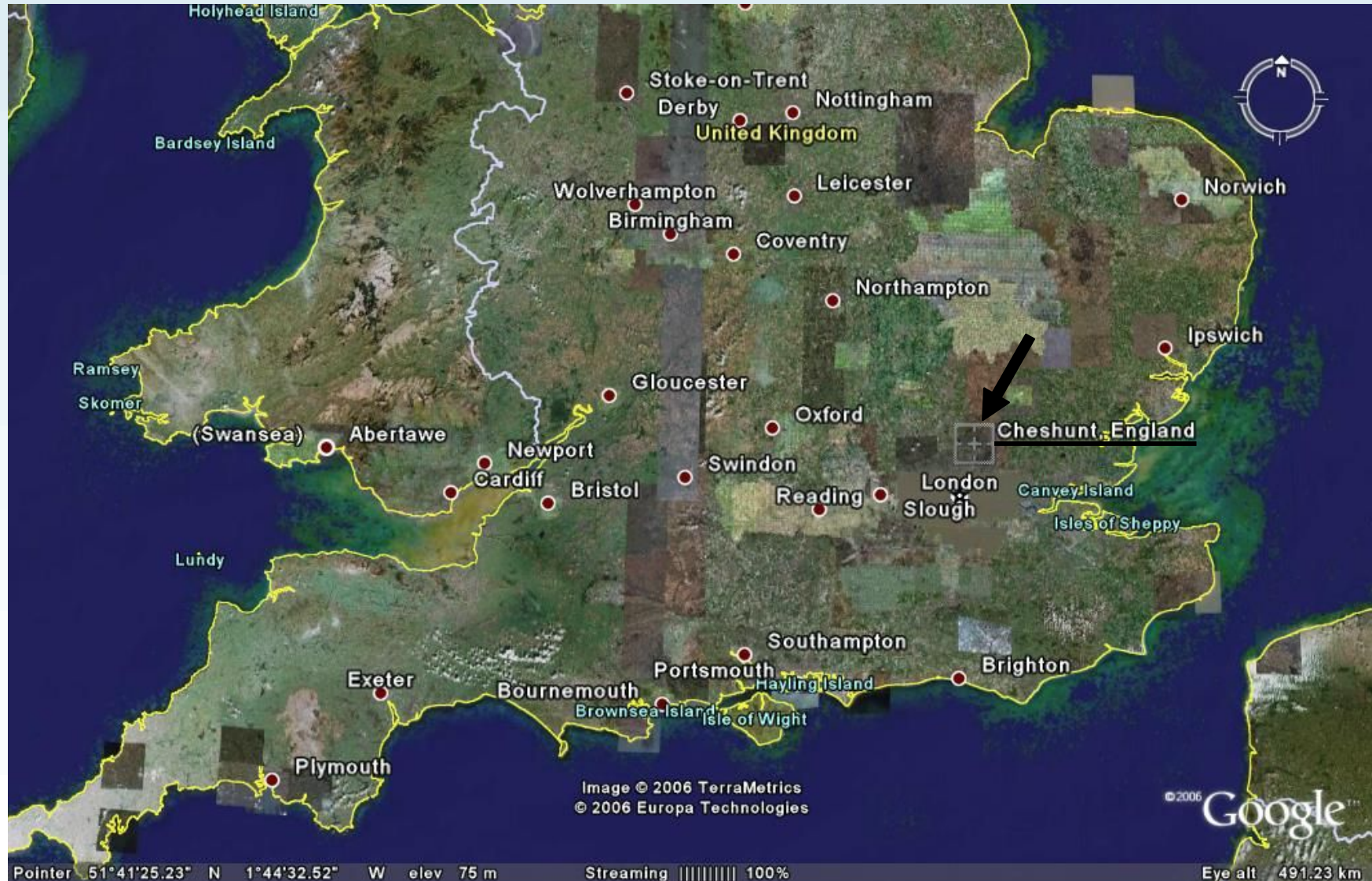
Fit and Distortion Index



Results for Accuracy

	N	Mean	SD
Car usually used for the journey to school	31	51.7	22.6
Other mode usually used for the journey to school	28	41.0	18.9
Male	32	44.7	19.6
Female	27	48.9	23.5
Year 4	28	47.4	20.1
Year 6	31	45.9	22.8
Overall	59	46.6	21.4

The study area - Cheshunt, Herts

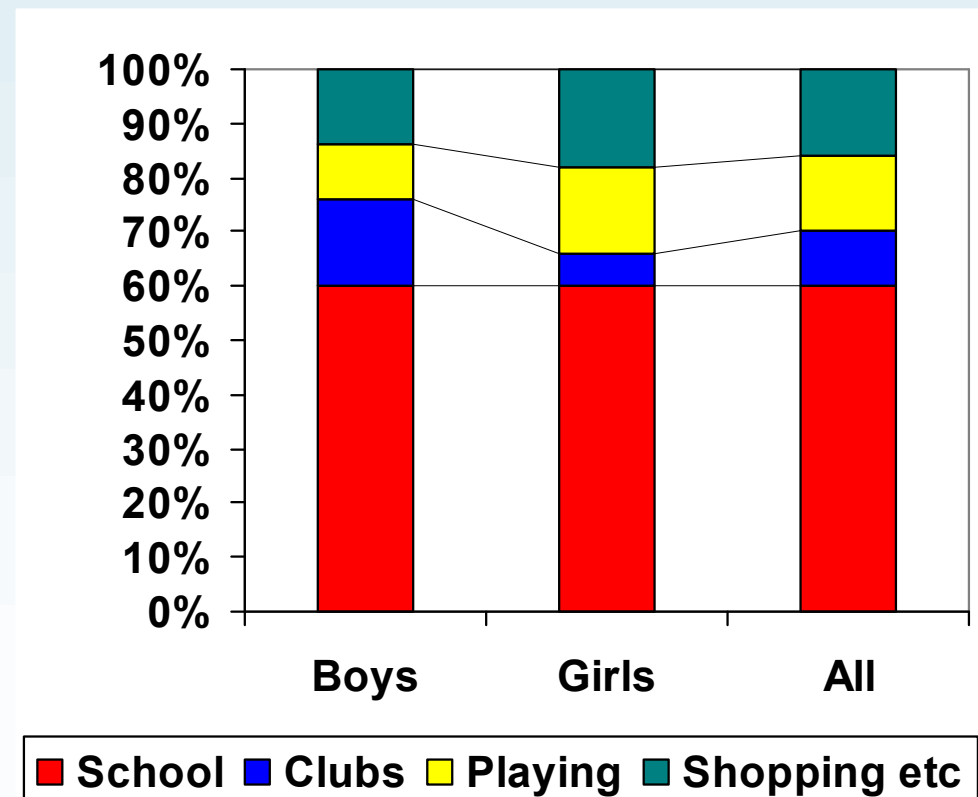


The children in the sample

	Boys	Girls	Total
Year 4 (aged 8-9)	25	32	57
Year 5 (aged 9-10)	33	36	69
Year 6 (aged 10-11)	16	20	36
Total	74	88	162

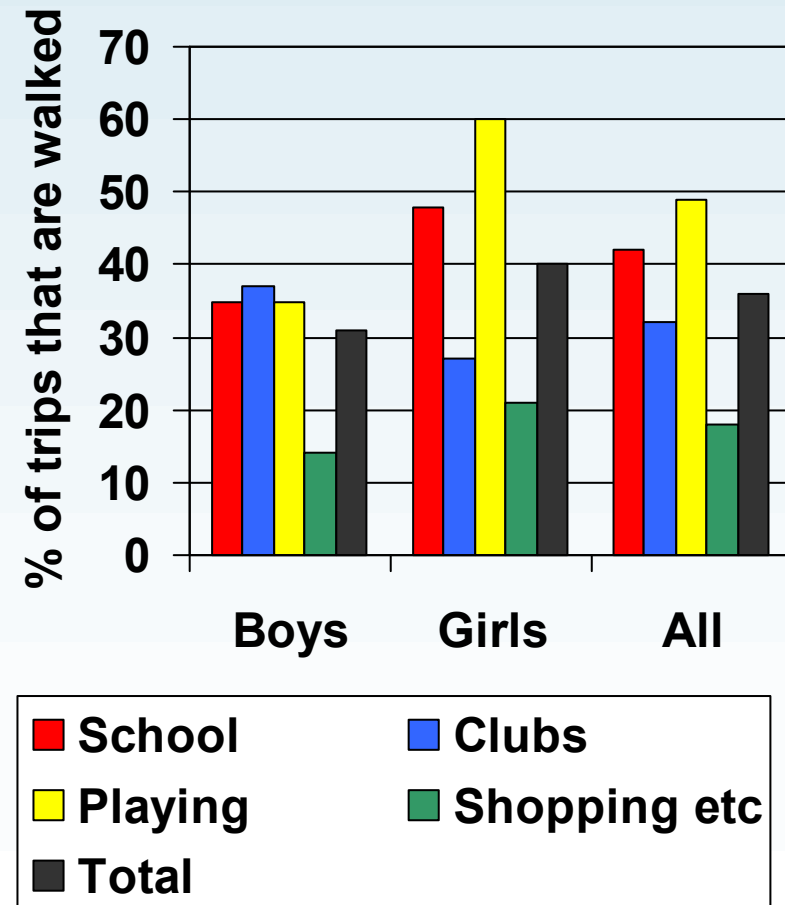
The events that children walk to (%)

- School is the main event that children walk to.
- Shopping etc is the next most popular, especially for girls.
- Boys tend to walk to after-school clubs.



Percentage of trips to events that were walked

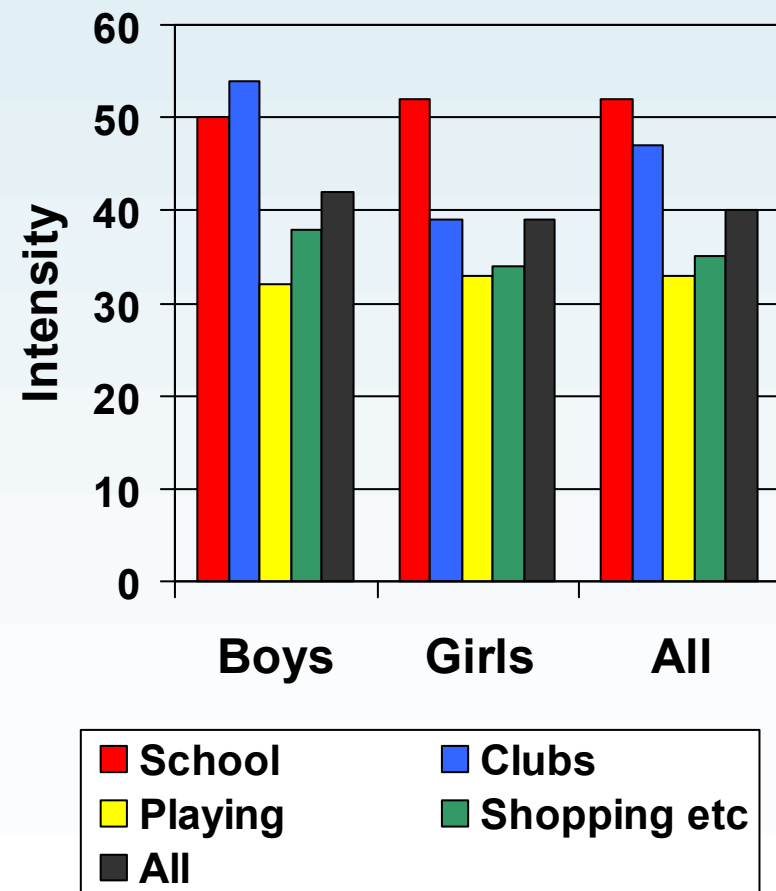
- 36% of the children's trips were walked.
- Girls walked to more events than boys.



Intensity of walking to events

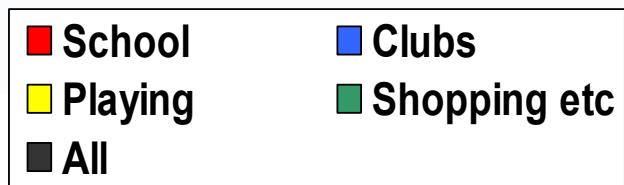
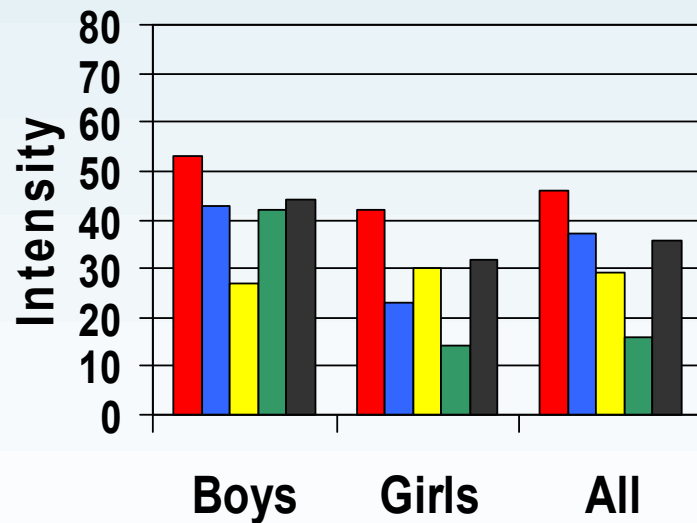
(in 10^{-2} activity calories per kg of body weight)

- Boys use more energy than girls when walking.
- Walking to school tends to be the more intensive type of walking.
- But, boys tend to walk even more intensively when walking to clubs.
- Walking to play tends to be the least intensive.

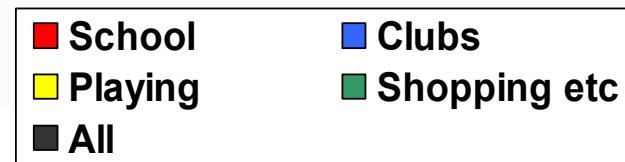
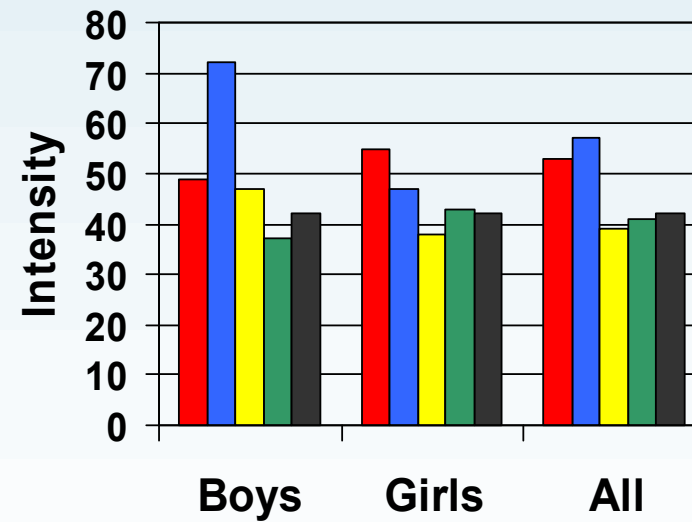


Intensity of walking to events (in 10^{-2} activity calories per kg of body weight)

Not accompanied by an adult



Accompanied by an adult

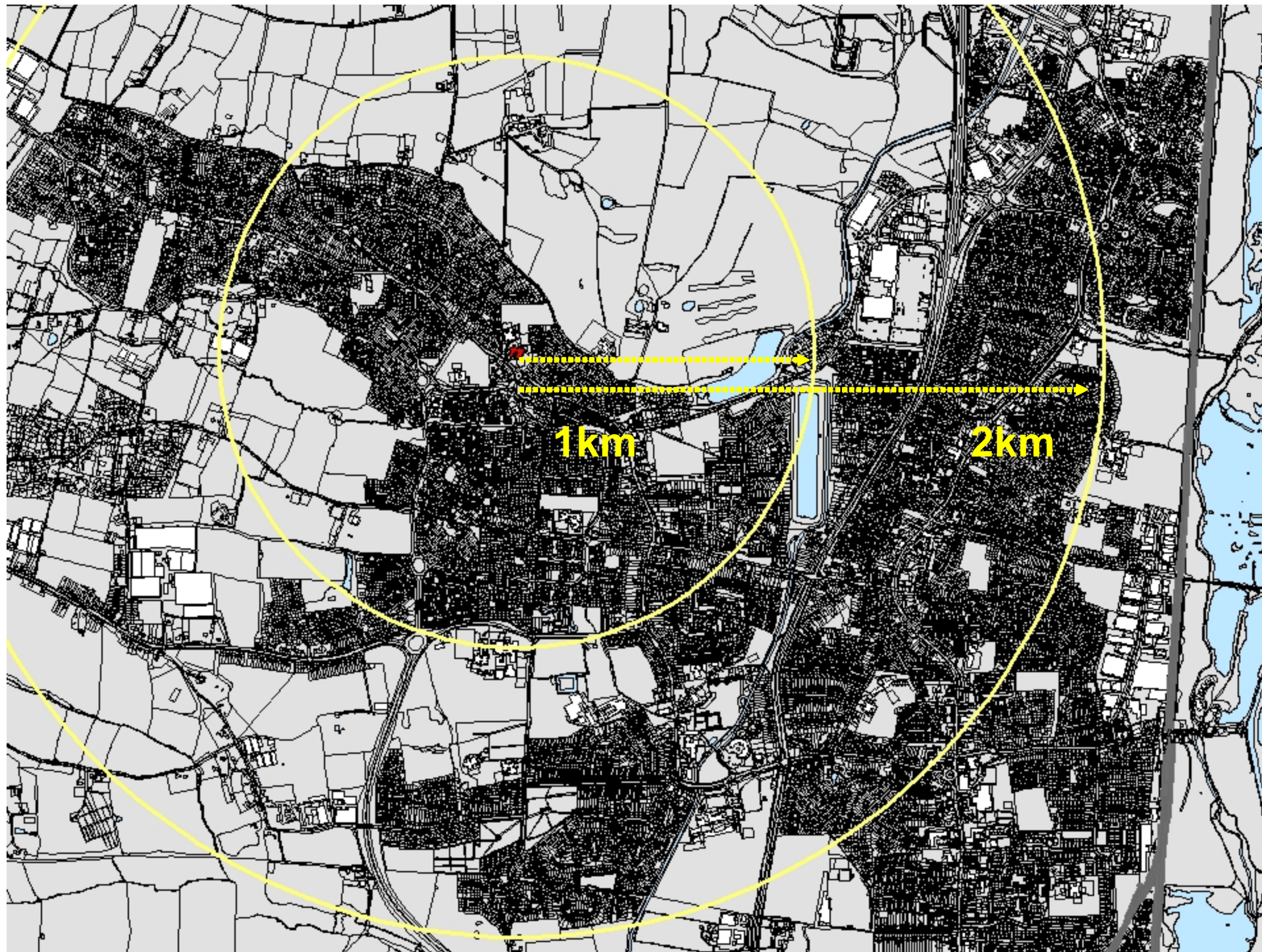


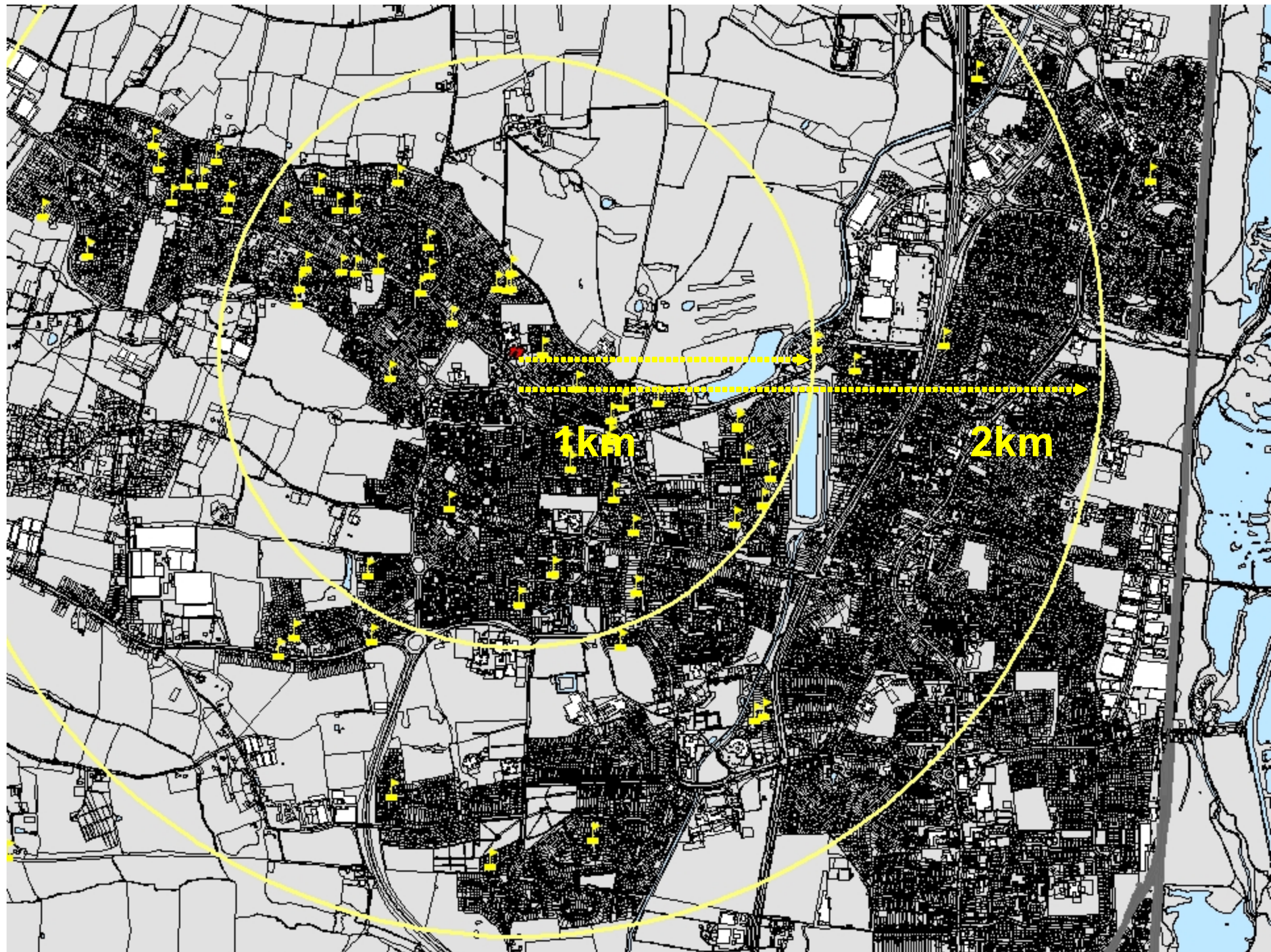
What can the GPS traces of children tell us?

- How children choose their route to school
- Where children go without adults
- Where children go on foot
- Where children play or be active



Are there any environmental factors that influence children's spatial movement?

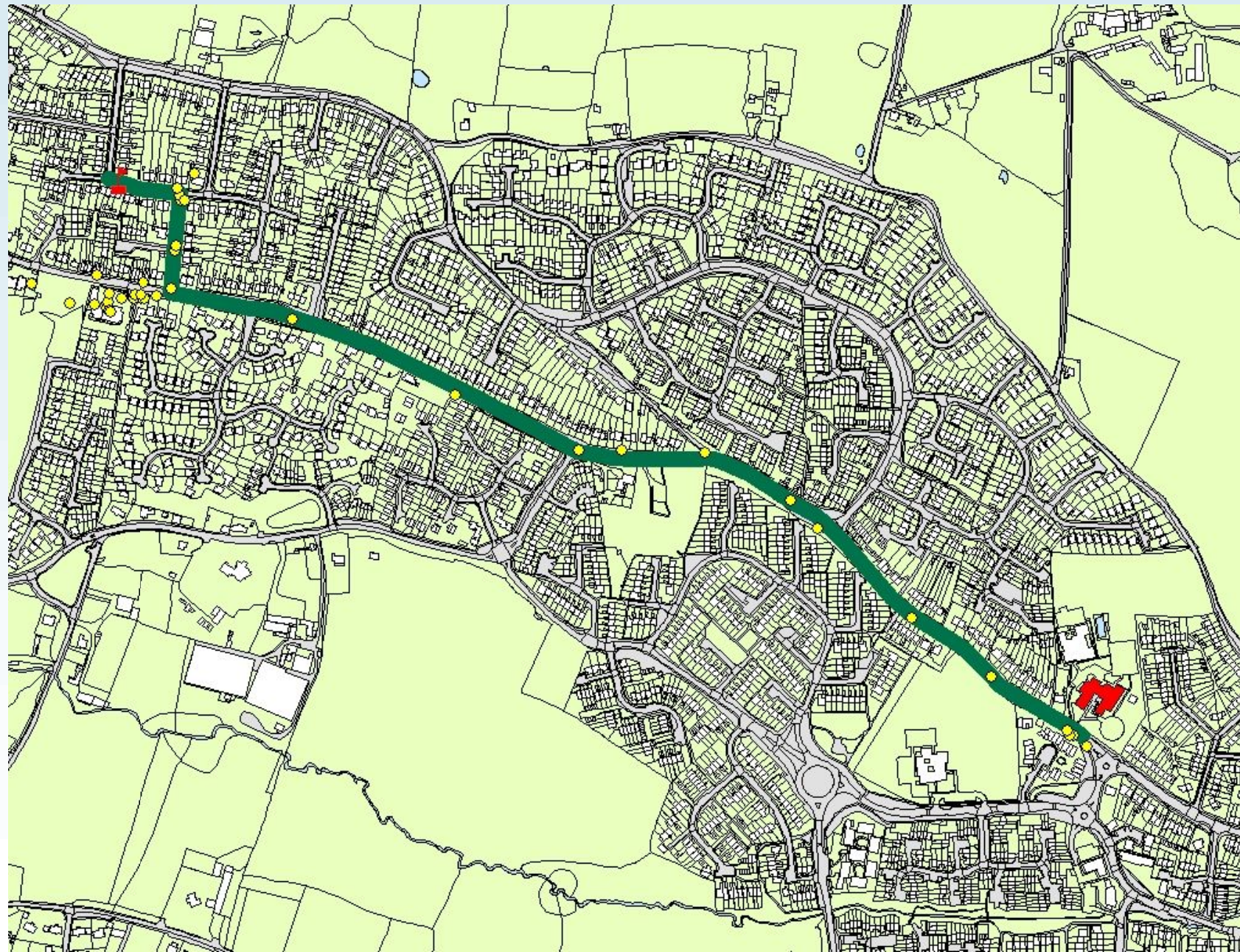




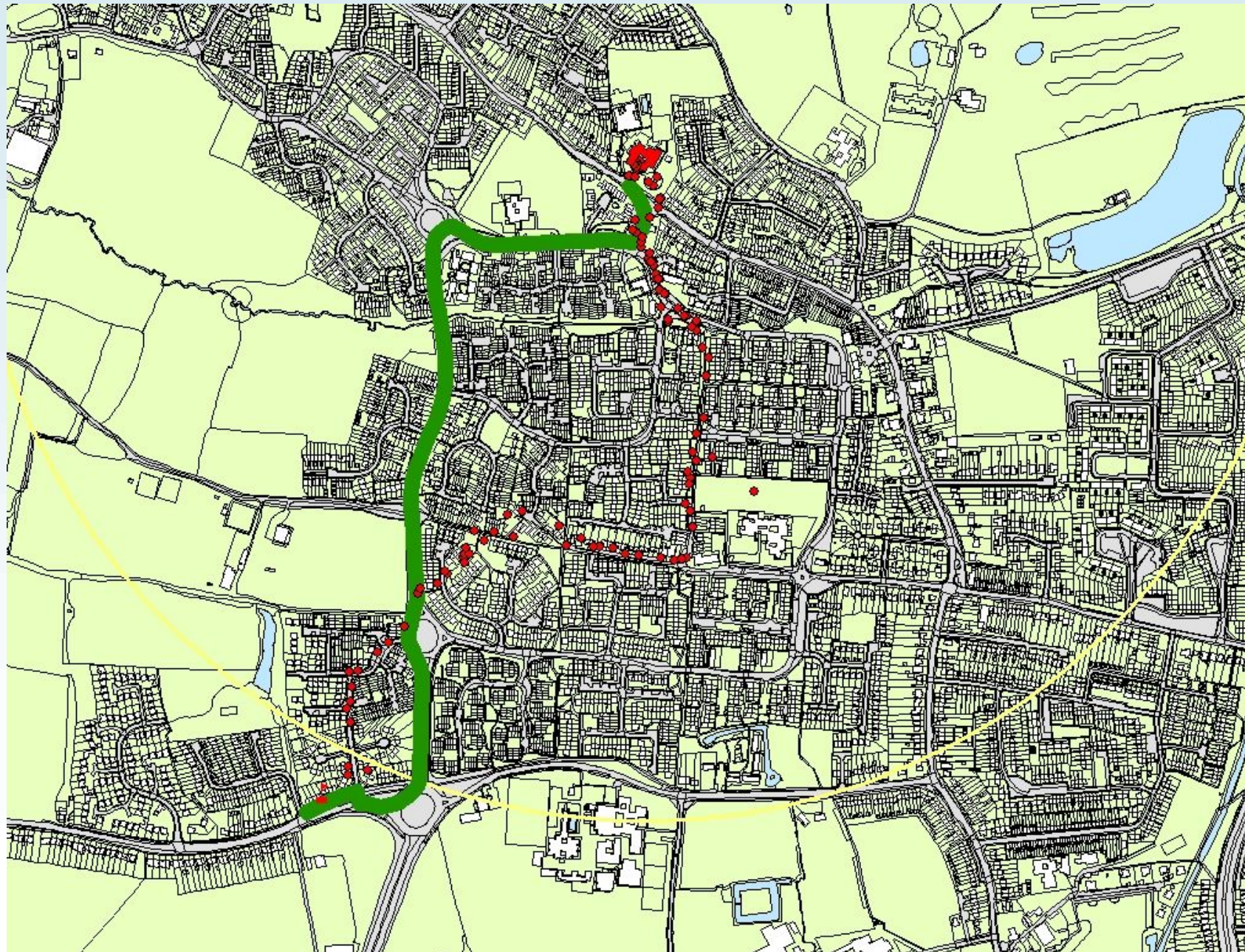




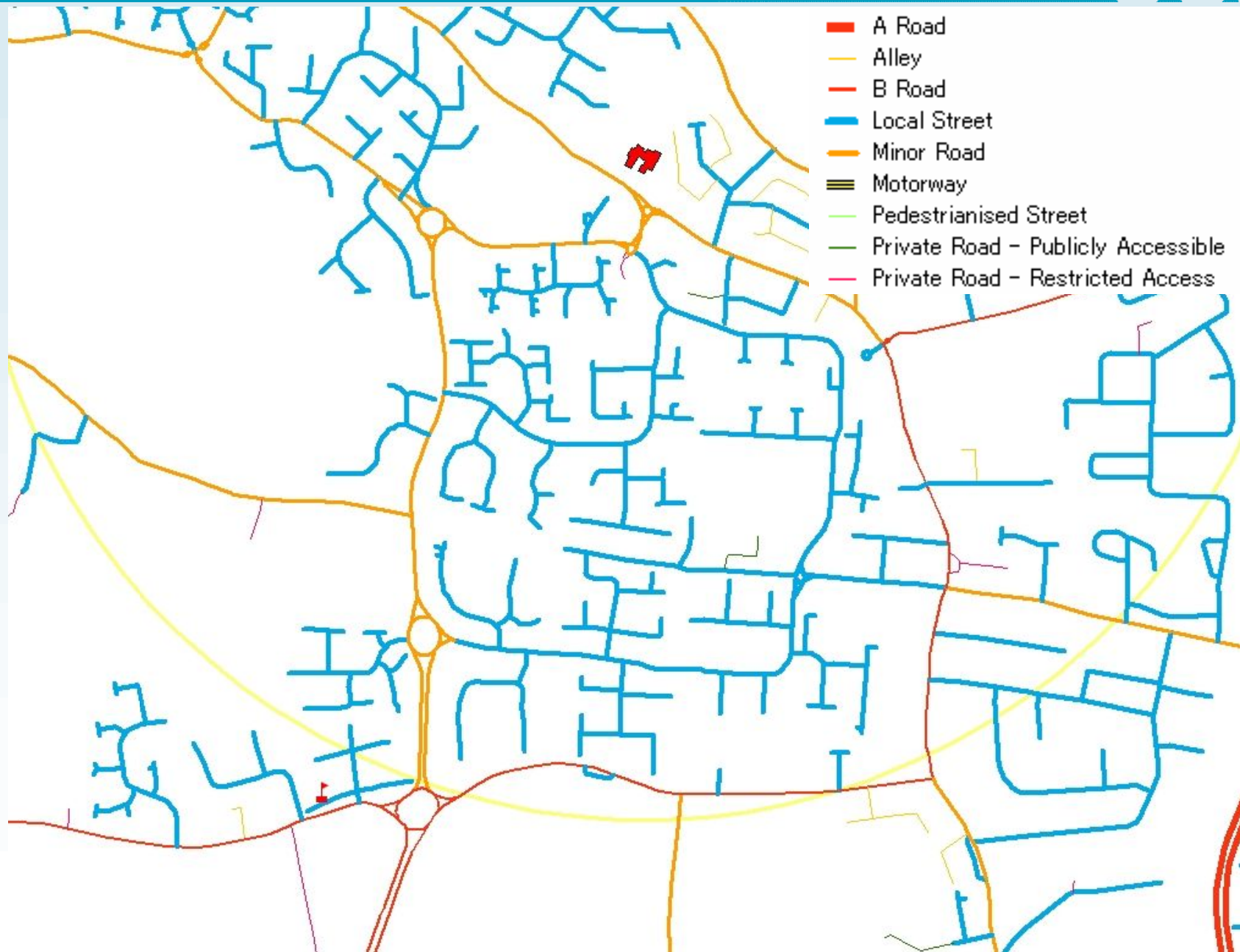
Route to school (by car)



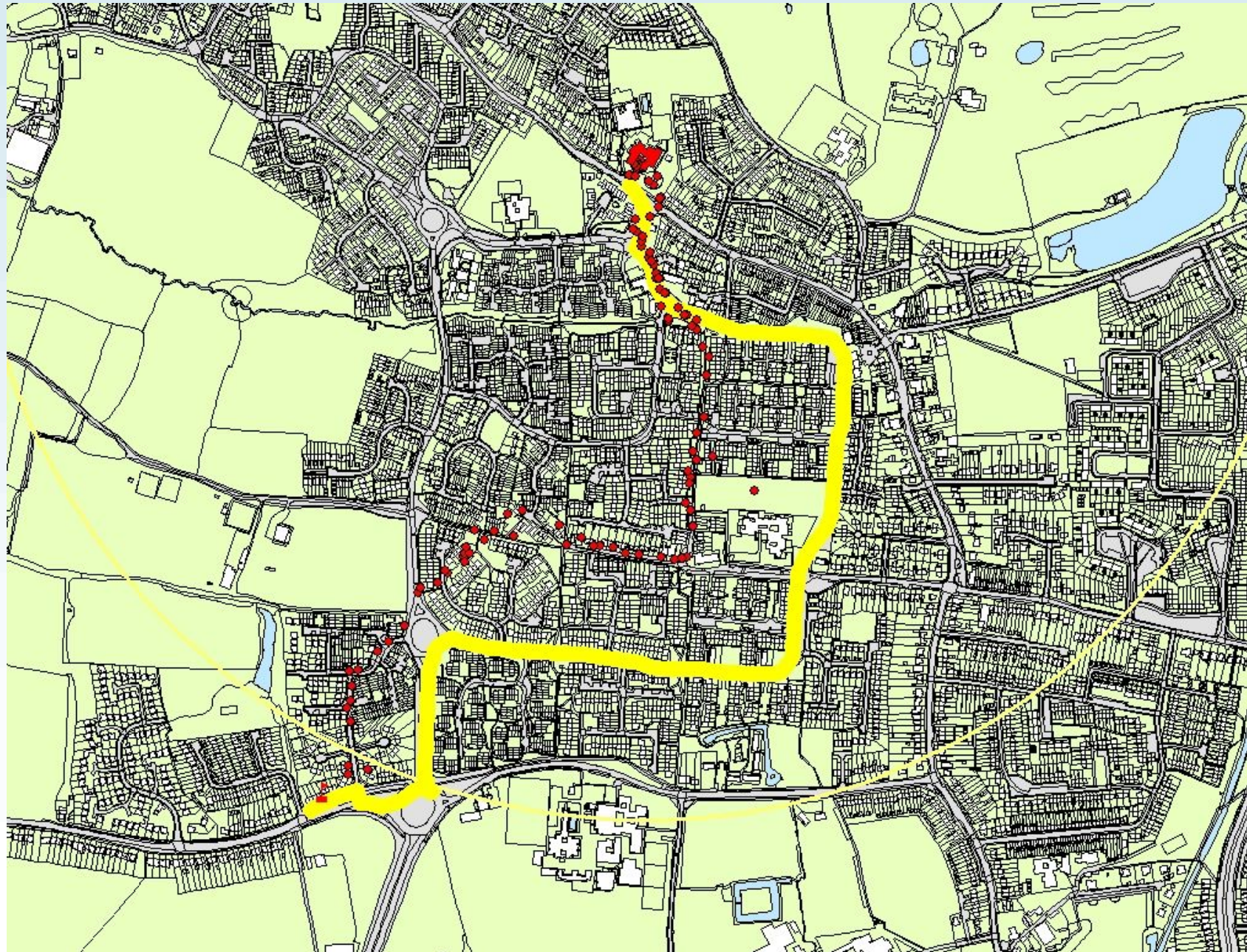
Route to school (on foot)



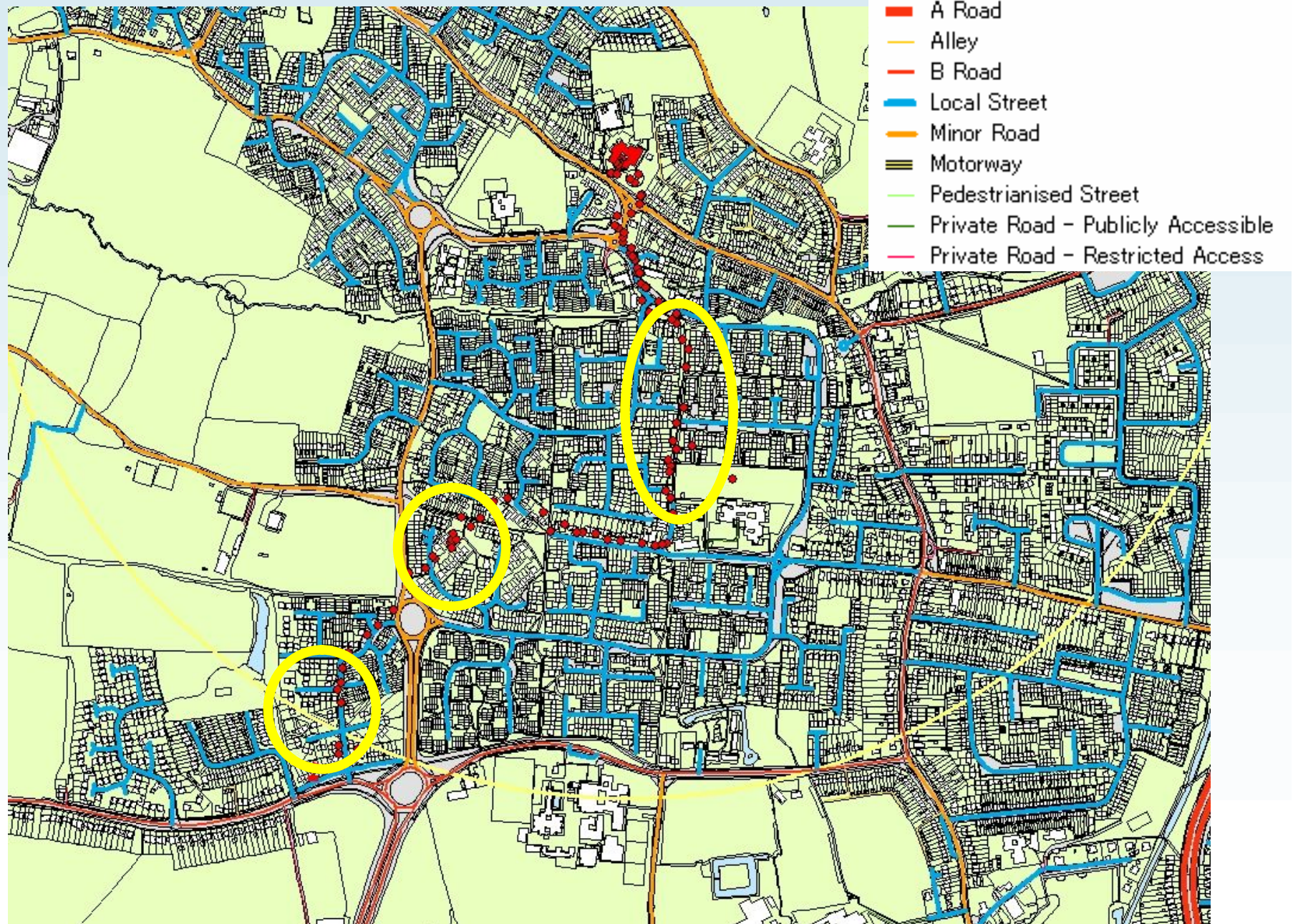
Road types



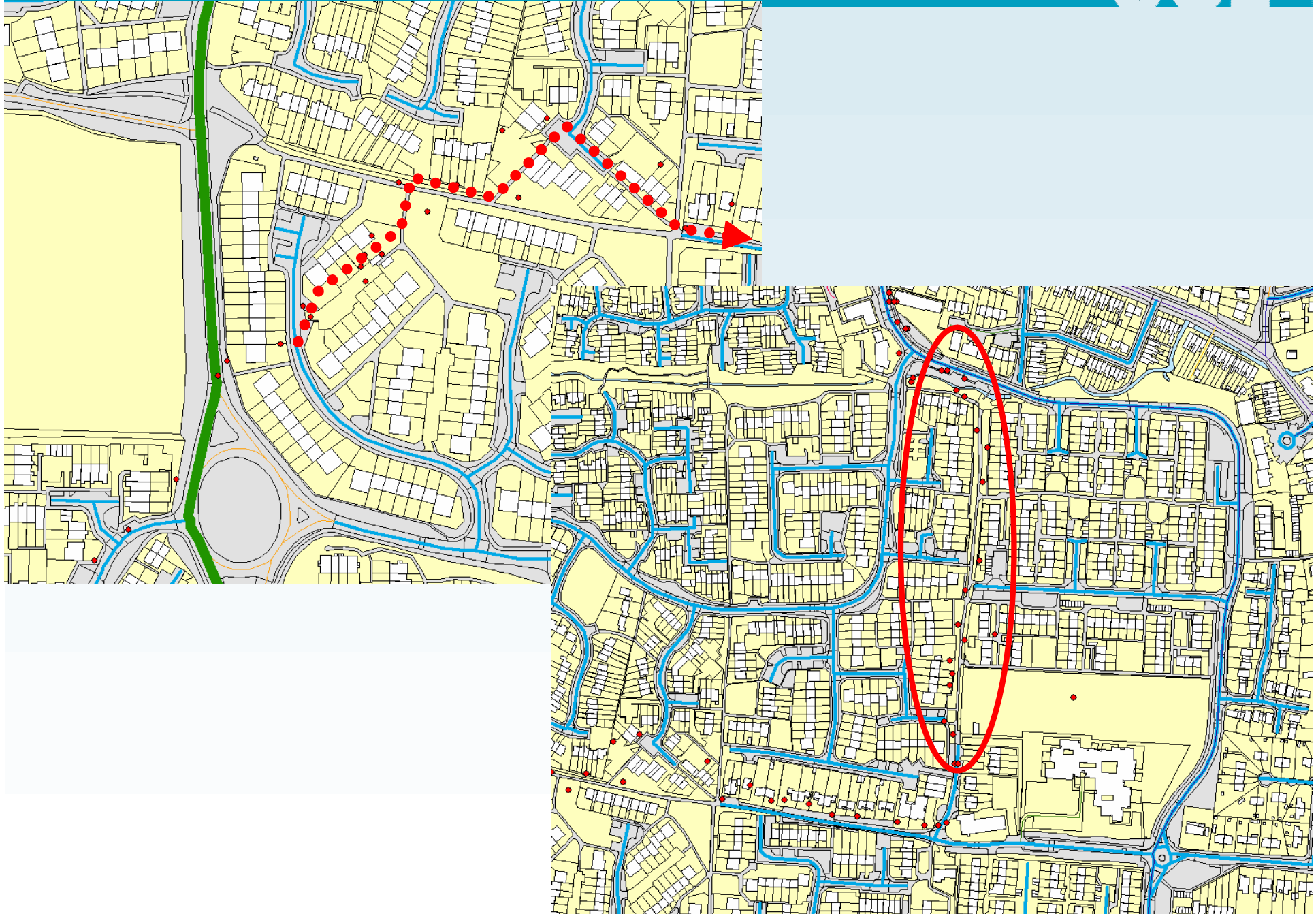
Route to school (on foot) – avoid roads with traffic



Any other environmental factors?



Children use non-roads



Children use non-roads



Lands (non-roads)



Local streets

What can the GPS traces of children tell us?

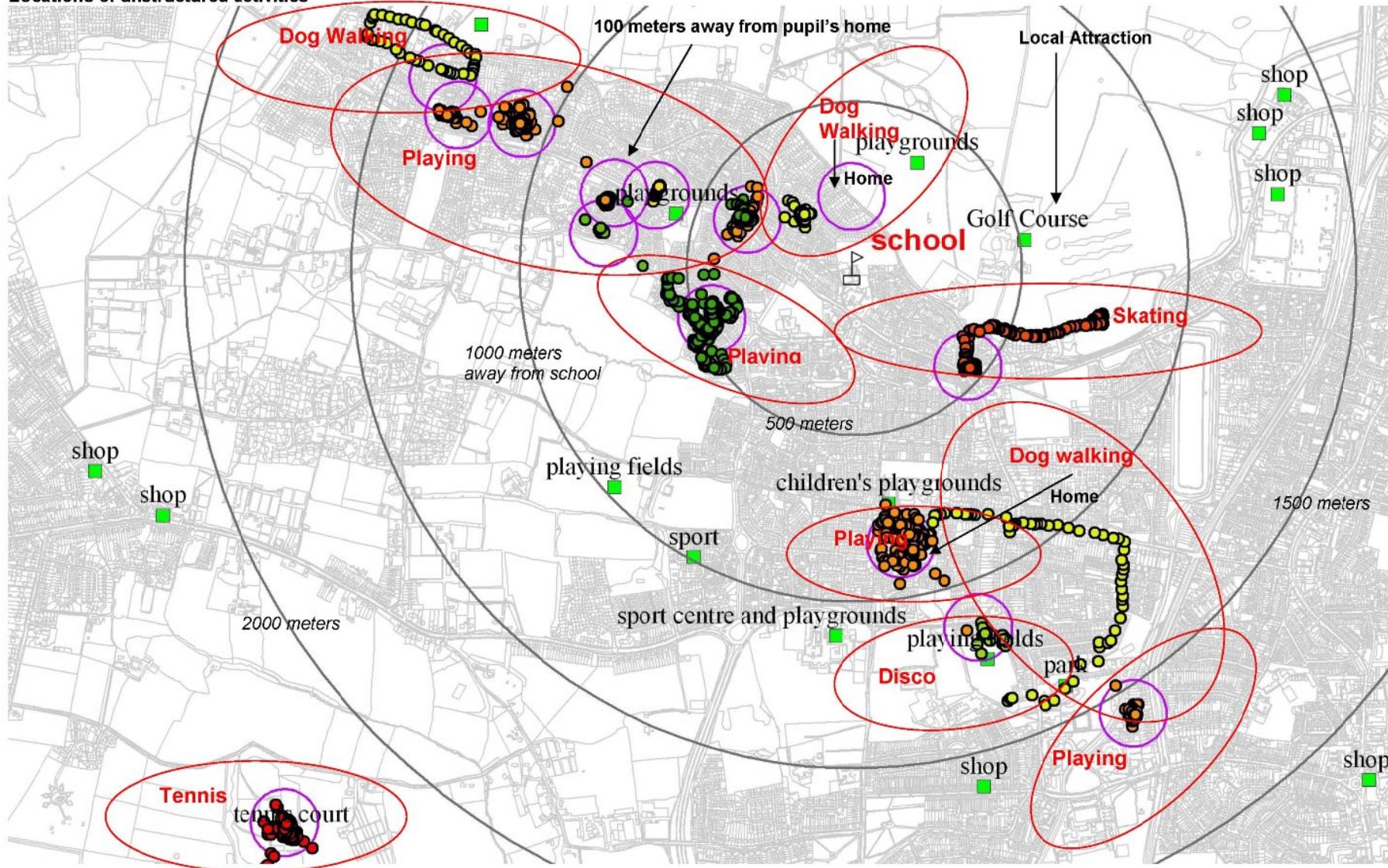
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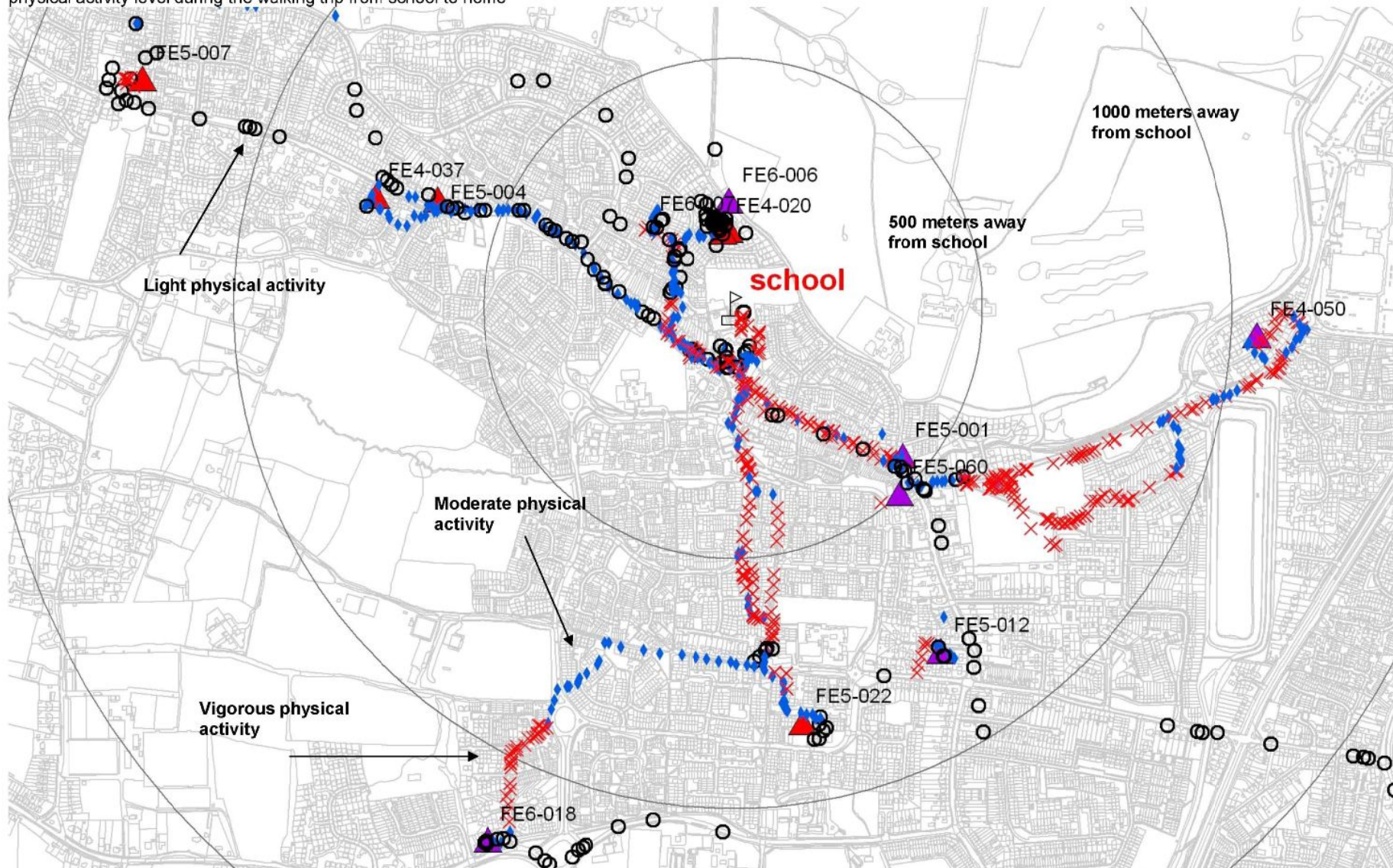
The location of unstructured activities (play)

Locations of unstructured activities



Physical activity levels walking home from school

physical activity level during the walking trip from school to home



Thank you

- CAPABLE project website

<http://www.casa.ucl.ac.uk/capableproject/>