Multiperspective Visualisation of the Spatial Behaviour of Smartphone Users

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Content

- Objective of the research
- Experiment
- Effect – one visualisation: four mapping methods
- Conclusions

Objective of the research

- **Elaborating a multiperspective cartographic visualisation of the spatial behaviour of smartphone users.**

- **Answers to the following questions:**

> To what extent should cartographic visualisation simplify the perception of the behaviour of pedestrians in the city?

> Does the complementarity of visualisation make it easier to analyse the specificity of behaviour of smartphone users in urban space?

Usefulness of the proposed visualisation methods for analysing and interpreting…

… the following features:

- track geometry
- track surroundings
- motivation for getting to the finish point
- walking time
- speed of walking and stopping points, and
- photographs

Experiment

- **30 participants** walking independently about 2 km between two points: *from the Main Railway Station to the Town Hall.*

- **At the Railway Station, the first assistant:**

>>> asked the respondent to answer a few questions concerning the frequency of usage of his/her smartphone

>>> attached a GPS receiver to the respondent's arm

>>> informed him/her of the task:

Please walk from the main train station to the town hall using a freely selected route and take photographs of interesting places, objects or situations.

Experiment

- **The second assistant** waited at the Town Hall for successively arriving respondents:

>>> recorded the track in the memory of the GPS device

>>> asked for the motivation for their method of movement**.**

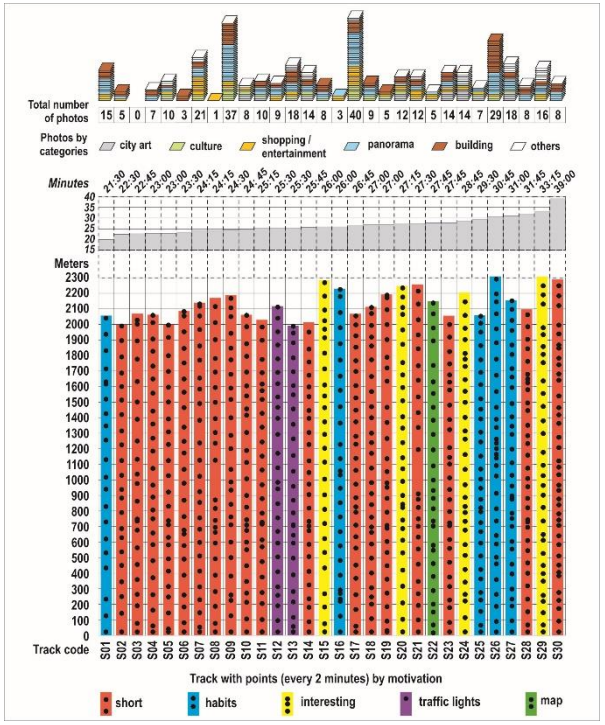
‘Raw’ presentation of 30 tracks

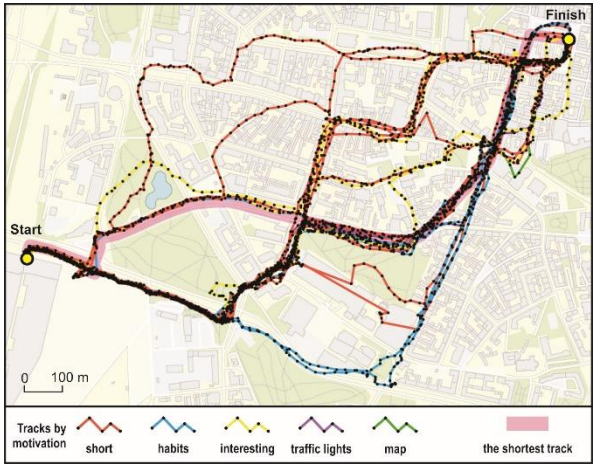
The simple view of 30 GPS tracks with start and finish points

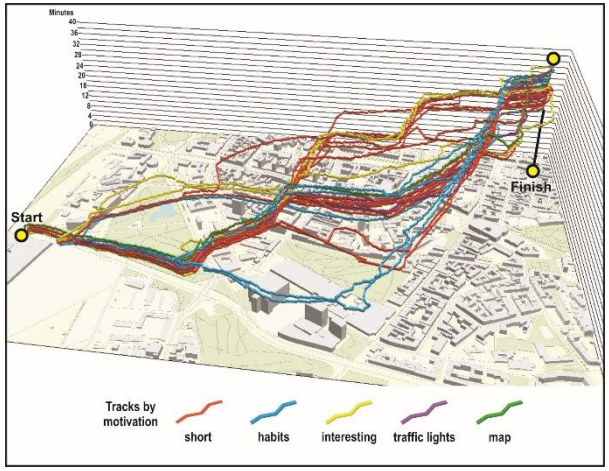
Cartographical multiperspective visualisation

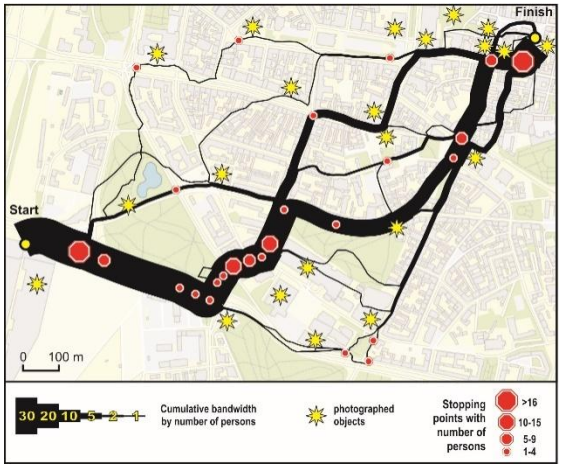
Methods of cartographic visualisation used to present the spatial behaviour of a pedestrian with a smartphone:

- **Classic Map,**
- **Space-Time Cube,**
- **Vertical Column Diagram, and**
- **Cumulative Flow Cartodiagram.**

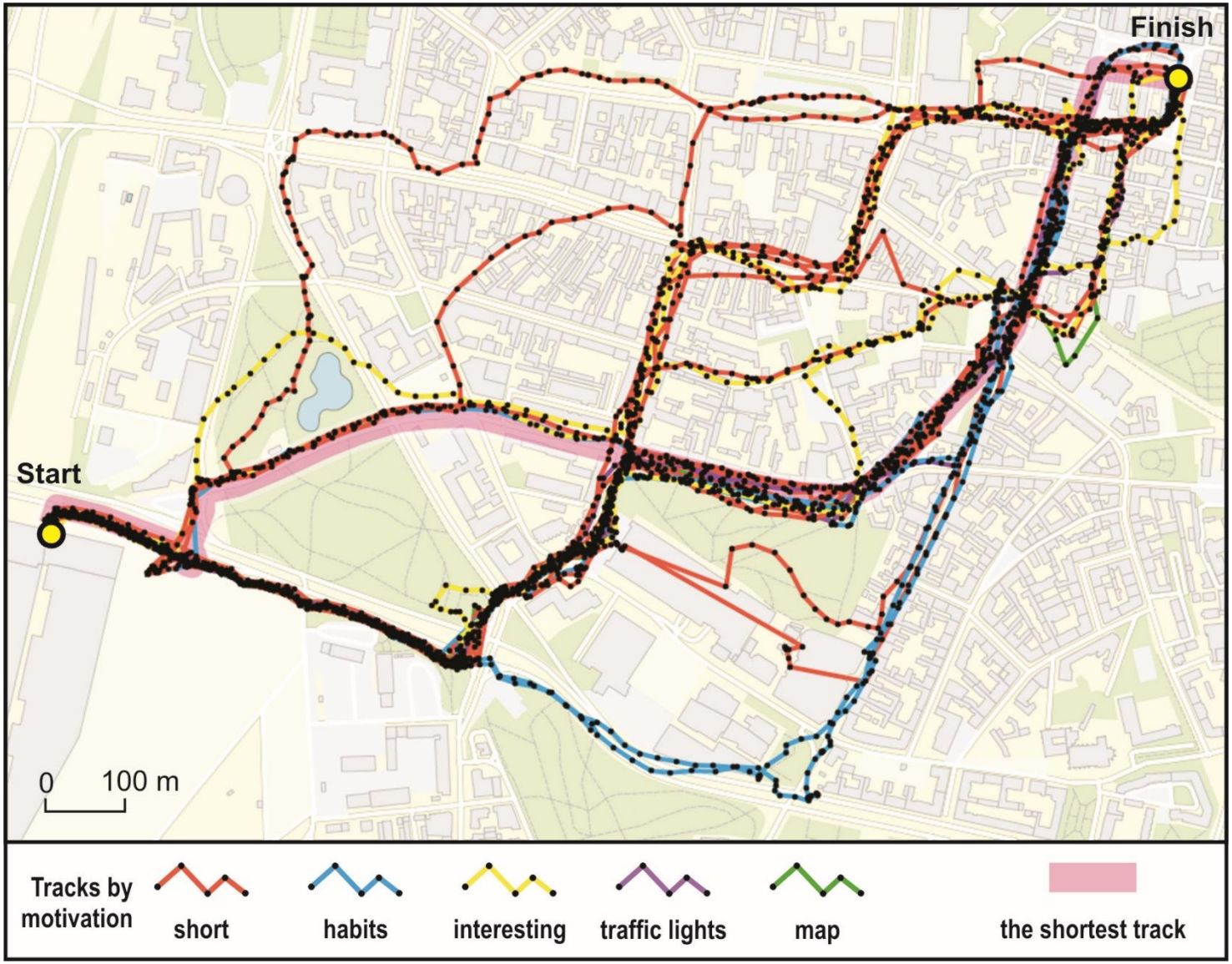




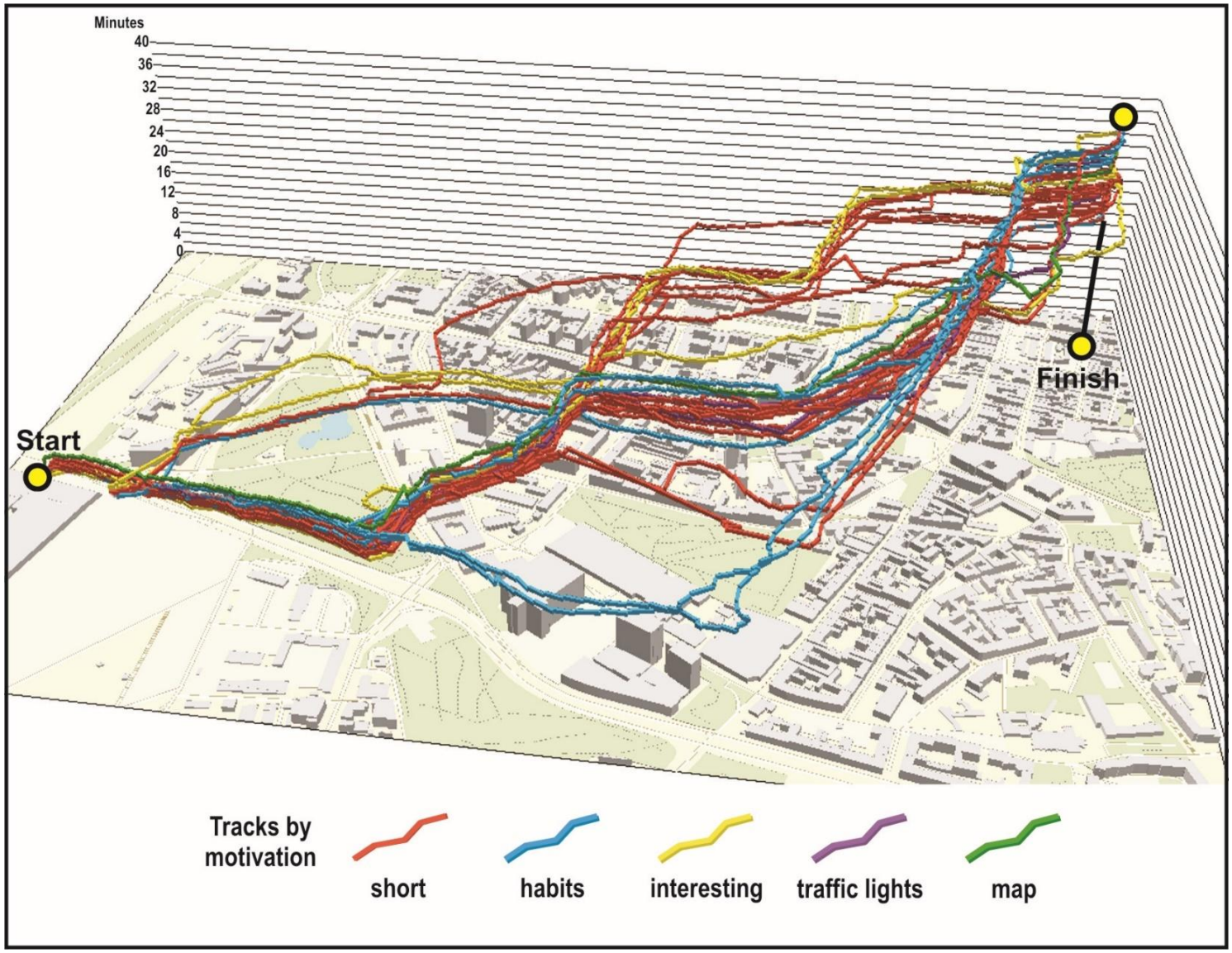




Classic Map with 30 tracks and track points every 15 seconds

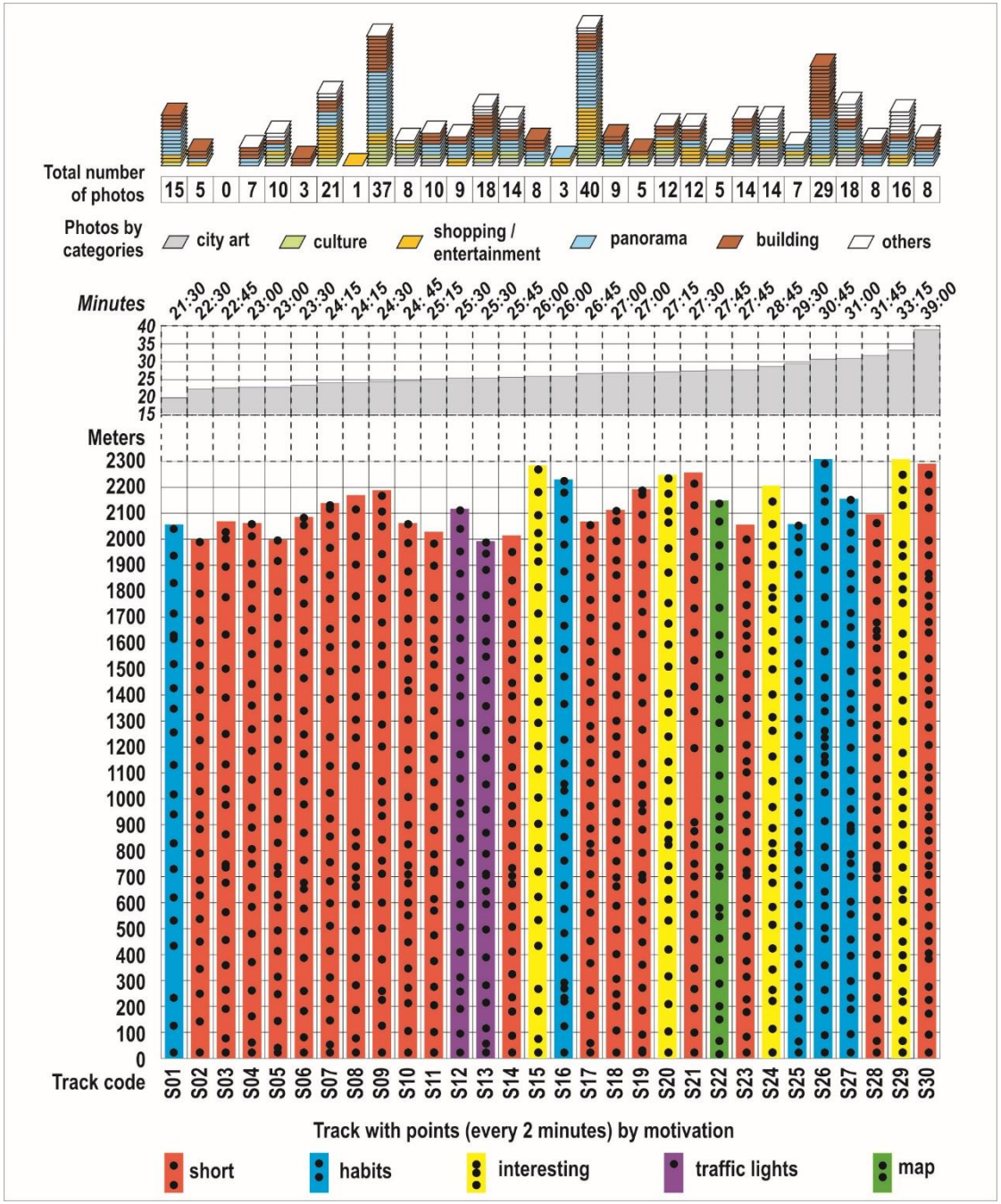


Space-Time Cube

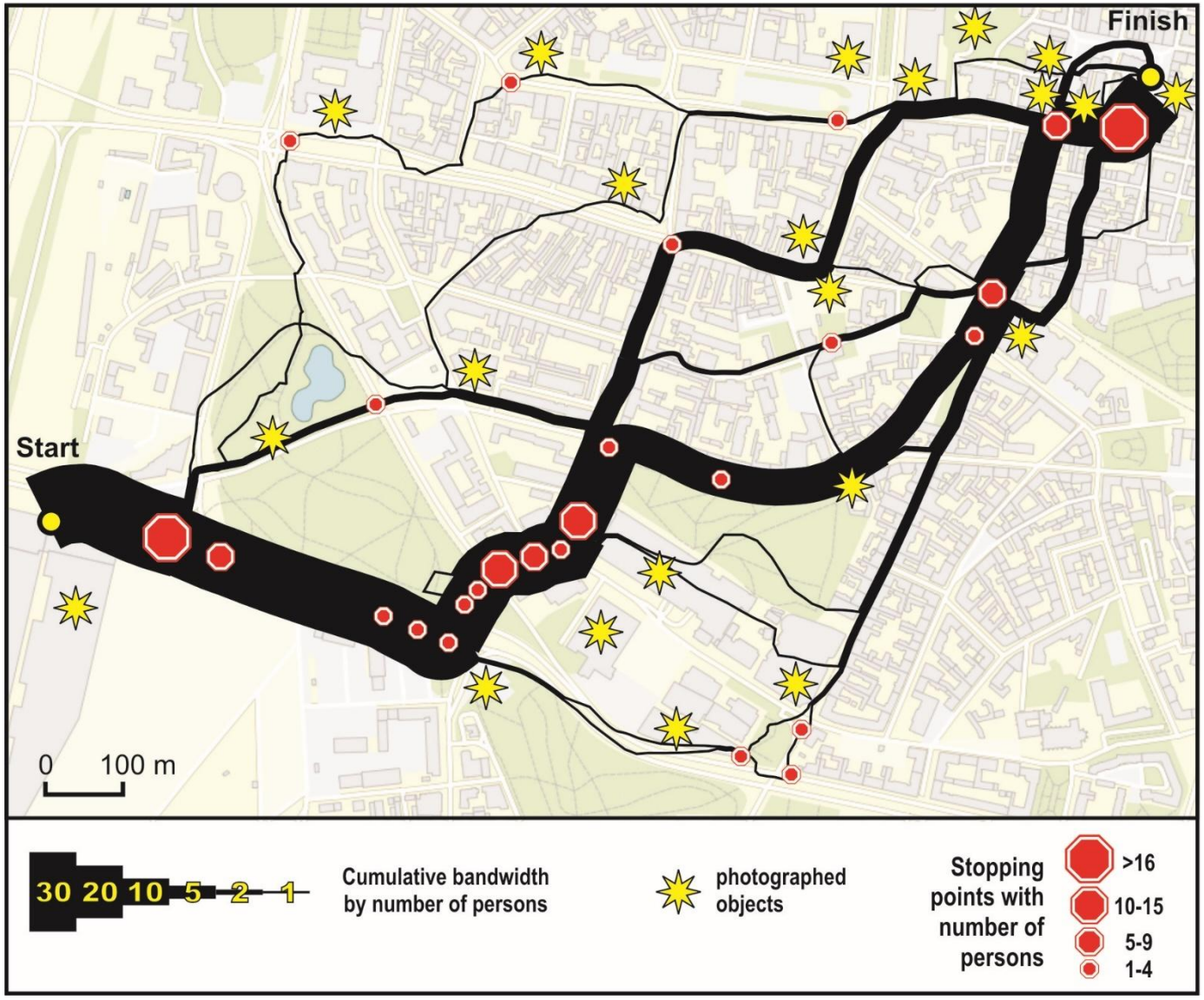


Vertical Column Diagram

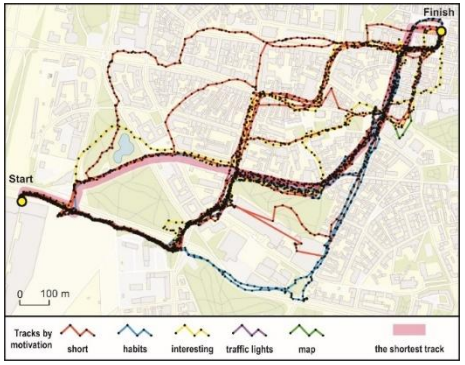
- Vertical column diagram in a linear composition with classified 30 tracks

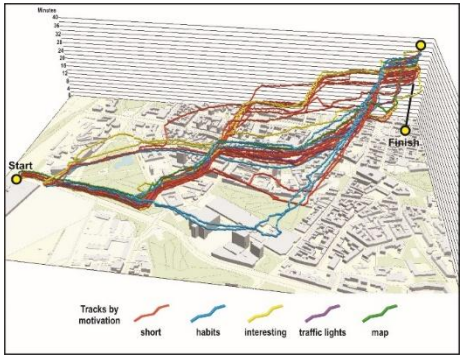


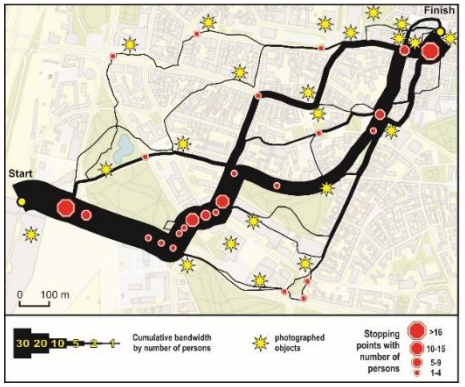
Cumulative Flow Cartodiagram

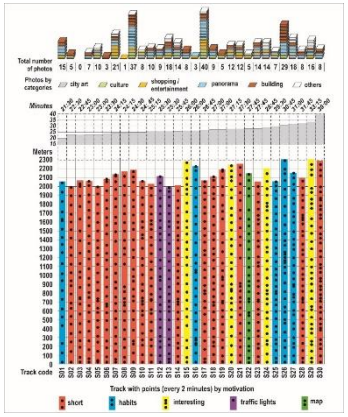


Cartographical Multiperspective Visualisation









Analyzed features \ Type of a visualization	Classic Map	Space-Time Cube	Vertical Column Diagram	Cumulative Flow Cartodiagram
Geometry	very good	good	not possible	very good
Spatial surrounding	very good	good	not possible	good
Motivation	very good	very good	very good	not possible
Time	not possible	good	very good	not possible
Pace/ stops	possible	not possible	possible	very good
Photos	not possible	not possible	good	good

- **Usefulness of the proposed visualisation methods for analysing and interpreting selected features**

Conclusions

- The four methods of cartographic presentation, utilising different perspectives of spatial perception, should be considered as a single set of multiperspective visualisation of spatial behaviour.

- There is no universal method of presenting numerous features, but the addition of successive mapping techniques may also make it difficult to find simple and unquestionable dependences in spatial behaviour.

Thank you for your attention!