

The use of Cellphone Technology in Activity and Travel Data Collection

¹DR S KRYGSMAN AND ²P SCHMITZ

¹Department of Logistics, University of Stellenbosch, Merriman Avenue, Stellenbosch

²CSIR Built Environment, PO Box 395, Pretoria 0001

²Email: pschmitz@csir.co.za

This poster is a proof-of-concept study to determine whether it possible to obtain a *full spatial* and temporal path of individual activity engagement using location-aware technologies such as cellphones.

OBJECTIVES

- Assess technical feasibility of obtaining spatial and temporal activity/travel data;
- Consistency of the data (i.e. full record);
- Accuracy of the data; and
- Integration of the data.

LITERATURE REVIEW

Few studies have been undertaken on passive tracking of individuals

- GPS and RFID dominate in freight tracking and logistics;
- Used to provide dynamic routing, scheduling and locational information;
- Developed world: Japan, Germany, UK, USA; and
- Limited use of cellphones used to obtain activity/travel behaviour.

Two prototype cellphone activity-travel diaries:

- TeleTravel System (Germany);
- Commercial cellphone including electronic questionnaire (100m accuracy);
- Personal Handy Phone System, PHS (Japan);
- Commercial cellphone, 60 m accuracy, tested at sports events; and
- Other smaller scale studies in USA and UK.

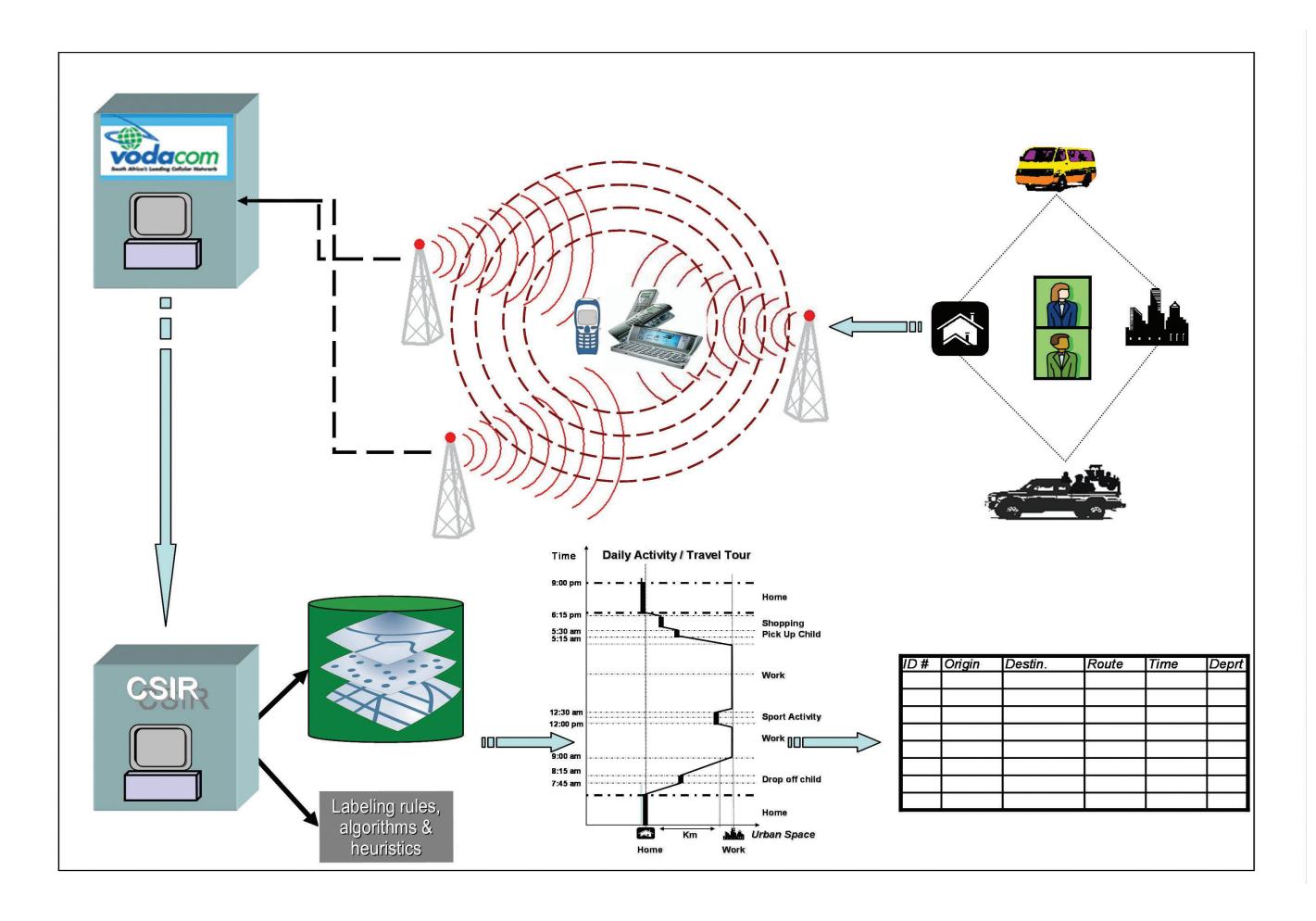
Important 'enabling' institutional requirement

USA: E-911 (a drive for the enhancement of cellphone technology to provide location accuracy up to 100 meters for emergency response).

It is feasible

- Accurate (relative), consistent information on daily activities and travel;
- Information on longer time periods;
- Combine / supplement standards surveys;
- Accuracy 60 200 meters; and
- Location-aware technology and location-based services are drawing significant investment (public and private).

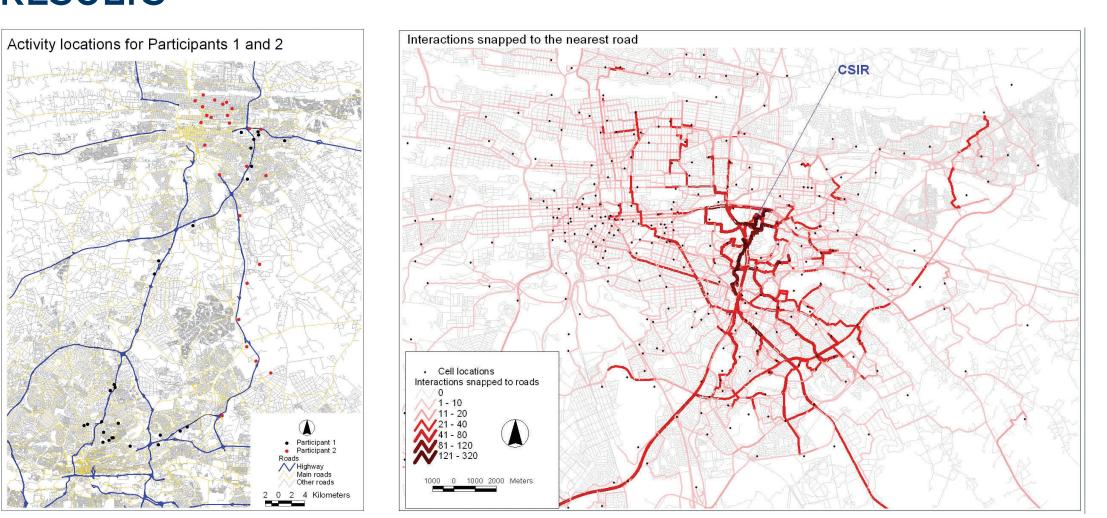
CONCEPT

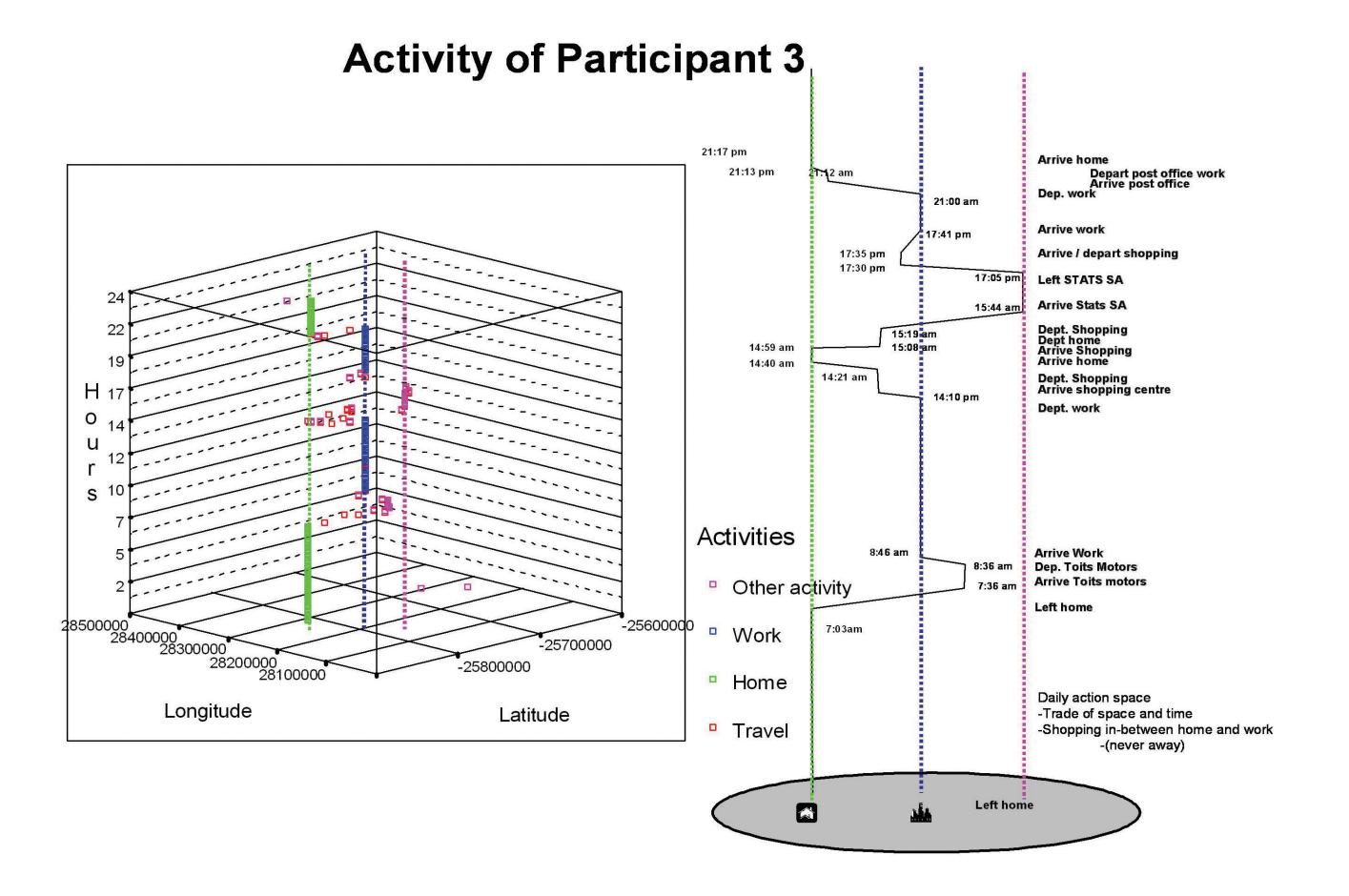


CSIR CASE STUDY

- The case study was undertaken on the CSIR Pretoria site
 - 1730 employees very low response
 - +/- 100 agreed, 66 selected;
- Would have preferred to have minimum of 100 to check for 'mistakes' and problems;
- Tracked from 15th 17th March (05h00 06h00)
- Several employees took long distance trips (Stellenbosch and Hartebeeshoek); and
- Obtained contextual information
 - Land use, satellite images, road networks, transport zones
 - Brief household surveys, obtained home locations.

RESULTS





CONCLUSION

- Technically feasible, consistent records, accuracy can improve;
- Origins/destinations are relatively simple;
- Daily spatial and temporal pattern more complex rules; and
- Improvements necessary on a technical and analytical level.