The use of Cellphone Technology in Activity and Travel Data Collection

This poster is a proof-of-concept study to determine whether it is 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, 60m 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).

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.