HADRIAN – getting out and about.

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• Introducing AUNT-SUE
  – Accessibility and User Needs in Transport for Sustainable Urban Environments
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  – Accessibility and User Needs in Transport for Sustainable Urban Environments
  – Consortium of:
    • London Metropolitan University
    • University College London
    • Loughborough University
    • Camden Borough Council
    • Hertfordshire County Council
    • RNIB
    • other Councils, Transport for London, Ford Motor Co, Davis Associates, etc.
AUNT-SUE aim

To develop and test sustainable policies and practice that will deliver effective socially inclusive design and operation in transport and the public realm
**Inclusive Design** and transport inclusion

- **Macro level**, i.e. design and planning of transport system/ infrastructure

- **Meso level**, i.e. urban design, neighbourhood

- **Micro level**, i.e. design of vehicles and facilities, ergonomics/human factors
Whole Journey Environment

• Every journey starts or finishes with a walk or a cycle - the concept of the *whole journey environment* is therefore concerned with the journey from origin, i.e. home to destination, e.g. work, as well as spaces and facilities in between.

• In making their travel decisions, passengers do not differentiate between the elements of the journey but on their perception of the whole journey.
Aspects of the Journey Chain

- **Inside the home** (e.g. building regulations, planning and access for disabled people)
- **Outside the home** – semi-private space (stairs and entrance to buildings), semi-public space (front gardens) public space/realm (paths, bridges, lighting, children’s play area, community facilities), car parking, bike parking, security (CCTV)
- **Street** – local, main roads, pavements, signage, furniture
- **Roads** – crossing, islands, parking, cycle paths
- **Transport system** – bus stop, station (tube, rail) entrance, interchange, ticket points, information access, signage, public toilets
- **Transport vehicles** – bus, tram, train, community and disability transport
- **Facilities** (destinations) e.g. school, office/workplace, health, leisure, parks ……
Testbed (i) - Camden
Testbed (ii) - St. Albans, Herts.
'Design for all’ or Inclusive Design

• needs to move from a philosophical viewpoint to being an integral part of design practice

• commonly accepted view for mainstream design is to cater for only the 5th to 95th percentile users
  – this is designing for numbers, not people
  – no longer acceptable to ‘design out’ people who are in the top or bottom 5% of size or ability
Problems with percentiles
Subject selection by percentile values

males (n=10)

females (n=10)
SAMMIE CAD  3D human modelling
‘Design for all’ or Inclusive Design

- traditionally – very much a *physical* approach
- people can be excluded from using public transport because of a wide range of factors:
  - able to reach a control but not able to manipulate it
  - able to see a timetable but not able to plan a journey route
  - able to walk 100 metres but not confident enough to cross a busy road
  - able to climb stairs but not willing to walk past a group of teenagers in an environment dominated by graffiti
HADRIAN

Human

Anthropometric

Data

Requirements

Investigation &

Analysis
New database of 100 individuals
Participant 18
Participant 45
Subjects were asked to select a comfortable one-handed weight and to place it as far back on the top shelf as was comfortably possible. Weight.

Subjects were asked to sit in a low soft armchair in free space.
• Spend time investigating the data
• Can now make use of that data with a simple task analysis
SAMMIE System containing a simple ATM model to analyse
Building a Task

What does the user do?
For example, read the screen instructions
Choose the appropriate task command
For example, LOOK
Specify what to look at - using the SAMMIE model’s structure of the ATM
Building a Task – step 2

What does the user do next?

For example, insert card

Choose the appropriate task command

For example, REACH
Specify what to reach to - using the SAMMIE model’s structure of the ATM as before
Completed task definition
Push RUN to start the analysis.
10% of the sample population excluded
10 subjects, 9 successes, 1 failed
Subject 40 failed our task
He failed the reach task
The slot was out of reach by 28mm
Let us close the loop by looking at the result in the model.
Subject 40 with his best attempt
Subject 40 with his best attempt
Let us try moving the ATM 100 mm lower, to see what happens
Push RUN to re-run the analysis.
Now we have excluded 0% of the sample population
All of our subjects could complete the tasks
AUNT-SUE research plans

- Expand the HADRIAN database to include people performing transport-related tasks
- Designers can use HADRIAN to explore different options, be it for a ticket barrier, a train station or the interior of a tram
- ‘Door-to-door’ journeys need to be considered throughout the whole journey environment
Transport-related tasks

Managing uneven surfaces, ramps, escalators and steps
Transport-related tasks

Finding a bus stop
Need a rest?
Coping with the weather
Coping with perceived danger
Transport-related tasks

Entry & exit issues for buildings and vehicles (private cars, taxis, buses, coaches, trains, trams)
Transport-related tasks
Transport-related tasks

Street furniture and navigation
Transport-related tasks

- Reading and understanding timetable information
- Locating and reading signs
Progress to date

Design & piloting of a transport issues questionnaire covering physical, cognitive & emotional issues
Progress to date

Design & construction of an experimental rig for simulating ingress/egress from buses, coaches, and trains
Future research plans in Phase II

• Extend and improve HADRIAN to meet the needs and preferences of designers

• Conduct design case studies by offering free consultancy support

• Develop a prototype journey planner for use within the Testbed areas
Prototype journey planner

Outward journeys for Fri 20 Nov 19 leaving after 08:45

<table>
<thead>
<tr>
<th>Option</th>
<th>Transport</th>
<th>Changes</th>
<th>Leave</th>
<th>Arrive</th>
<th>Duration</th>
<th>Select</th>
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<tbody>
<tr>
<td>1</td>
<td>Bus, Walk</td>
<td>1</td>
<td>10:18</td>
<td>11:21</td>
<td>1 hour, 03 mins</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Bus, Train, Walk</td>
<td>1</td>
<td>10:20</td>
<td>11:35</td>
<td>1 hour, 15 mins</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bus, Train, Walk</td>
<td>3</td>
<td>10:35</td>
<td>11:42</td>
<td>1 hour, 07 mins</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Bus, Walk</td>
<td>2</td>
<td>10:39</td>
<td>12:01</td>
<td>1 hour, 22 mins</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Car</td>
<td>0</td>
<td>09:45</td>
<td>10:34</td>
<td>49 mins / 22.9 miles</td>
<td></td>
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</tbody>
</table>

Details: Outward journey 1

Start

- Leave 10:18
- Loughborough: Forest Road (opp 914)
  - Walk to Loughborough: Forest Road (opp 914)
  - Take Paul & Wilson Coaches/120 towards Loughborough: Baxter Gate (Stand H)
- Loughborough: High Street (Stand B)
  - Walk to Loughborough: Baxter Gate (Stand H)
- Loughborough: Baxter Gate (Stand H)
  - Arrive 10:27

4 mins

www.transportdirect.info
**Prototype journey planner**

### Travel Points
- **Journey plan from:** My house in Camden
- **To:** My friend’s house in St. Albans

### Travel Details
- **Date of travel - out:** 26th October 2006
- **Time of travel - out:** 2:30pm

<table>
<thead>
<tr>
<th>Option</th>
<th>Transport Type</th>
<th>Changes</th>
<th>Leave</th>
<th>Arrive</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Walk, Bus</td>
<td>2</td>
<td>2:30pm</td>
<td>4:30pm</td>
<td>2 hours</td>
</tr>
<tr>
<td>2</td>
<td>Walk, Train</td>
<td>2</td>
<td>2:30pm</td>
<td>4:15pm</td>
<td>1 hour, 45 minutes</td>
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<tr>
<td>3</td>
<td>Walk, Car, Train</td>
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<td>2:30pm</td>
<td>4:05pm</td>
<td>1 hour, 35 minutes</td>
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<tr>
<td>4</td>
<td>Taxi</td>
<td>0</td>
<td>2:30pm</td>
<td>3:55pm</td>
<td>1 hour, 25 minutes</td>
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</table>

### Travel Route - 2
- **Leave - My House in Camden**
  - 2:30pm
  - 15 minute walk

- **Arrive - Kings Cross Railway Station**
  - 2:45pm
  - 1 hour, 10 minute train journey

- **Leave - Kings Cross Railway Station**
  - 2:55pm

- **Arrive - St. Albans Railway Station**
  - 4:05pm
  - 10 minute walk

- **Leave - St. Albans Railway Station**
  - 4:05pm

- **Arrive - My friend’s house in St. Albans**
  - 4:15pm

### Notes
- Multiple levels
- Escalator and lift access
- Flush platform
- Self service ticket machines
- Staffed ticket service
- Assistance available
- Toilet facilities - station
- Toilet facilities - train
- Cafe
- Trackside seating
- Well lit
Prototype journey planner

TRAVEL POINTS
Journey plan from: My house in Camden
via:
to: My friend’s house in St. Albans

TRAVEL DETAILS
Date of travel - out: 26th October 2006
Date of travel - return: 

TRAVEL DETAILS
Option | Transport Type
1 | Walk, Bus
2 | Walk, Train
3 | Walk, Car, Train
4 | Taxi

TRAVEL ROUTE - 2
Leave - My House in Camden
2:30pm
15 minute walk

Arrive - Kings Cross Railway Station
2:45pm
1 hour, 10 minute train journey

Leave - Kings Cross Railway Station
2:55pm

Arrive - St. Albans Railway Station
4:05pm
10 minute walk

Leave - St. Albans Railway Station
4:05pm

2 public crossings
drop kerbs with tactile paving
1 bus stop with seats
Well lit
Crowding possible at this time
1 public telephone boxes
Mobile phone network coverage

Subject 27
Cannot complete Walk 1
Distance too far without rest

% Excluded
12% Walk 1 - 15 minutes
19% Train 1 - 1 hour, 10 minutes
5% Walk 2 - 10 minutes

Notes
Future research plans in Phase II

- To predict whether specific door-to-door journeys are achievable by particular individuals
  - match the physical, cognitive & emotional demands of a journey against the abilities & preferences of that person
  - is the planned journey achievable by that person unaided?
  - can an alternative route be found that is achievable?
  - is the journey achievable with support from others?
  - If no, then that person is likely to feel socially excluded
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www.aunt-sue.org.uk