A user-led approach to exploring perceptions of personal safety in public spaces

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University of Glamorgan

you live, you learn
VR ‘walkthrough panorama’ technology to assess public perceptions of personal safety on railway stations

From a conference paper by:
Jeremy Whitaker (Client)
Richard Neale (Grant Holder)
Paul Cozens (Research Fellow)
First steam locomotive, Abercynon, 1804
Richard Trevithick
The Valley Lines station context

- Network of 67 stations, centred on Cardiff, capital of Wales, radial routes south to coastal towns and north to the valleys
- Cardiff and surrounding areas relatively prosperous
- Decline in traditional industries has led to serious economic decline in the South Wales Valleys
- This causes social challenges, e.g. vandalism, anti-social behaviour
- Stations are old, some now in inappropriate places as the industry and population they served have gone
Client’s business case

- 73% of journeys (50:50 commuting:leisure) into central Cardiff take place during the day
- 40% growth in last three years, to 7.5 million passenger journeys per annum
- Trains full at peak times – can only grow business outside these hours or in opposite direction, or to other stations than Cardiff
- Customers concerned about their personal safety, although actual recorded crime is low
- Only 15 stations are staffed
- Half stations had CCTV
Client’s business case

• Impetus from advertising focus group in one of Cardiff’s most affluent suburbs, well equipped and newly refurbished station
• High level of disquiet about travel after dark and to unfamiliar stations
• Access routes and other features outside the ownership and control of the company, so external authorities had to be convinced to invest
• Therefore, need for an investigation with a robust and convincing methodology
• Project over 3 years, cost approx UK£200k
Client’s business case

Figure 2.1 The Cycle of Fear

FEAR

Reduction in the number of people travelling.

Reduction in real (‘objective’) levels of safety in numbers.

Reduction in the perceived (‘subjective’) effects of safety in numbers.
Methodology

- Preliminary questionnaire, questions added to the mandatory biannual ‘Customer Satisfaction Survey’, 1000 respondents, some interviewed
- All 67 stations visited, surveyed, photographed
- Six ‘station families’ identified, typical station within ‘family’ selected
- ‘QuickTime’ used to film the station and approaches
- Focus group recruited from around each station
- ‘Home and away’ stations presented to each group
- Open-ended questioning and discussion
- Ask to suggest measures to increase their sense of personal safety
Client’s business case
From the preliminary survey

Table 4.2. Feeling ‘Unsafe’ on the Railways During the ‘Daytime’ (6 Stations)
% of respondents who stated that they Felt ‘Unsafe’

<table>
<thead>
<tr>
<th>Station</th>
<th>Approaching the station</th>
<th>Waiting inside the platform shelter</th>
<th>Waiting on the platform</th>
<th>Using the station car park</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bargoed</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Radyr</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Cardiff Queen St</td>
<td>4</td>
<td>6</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Barry Dock</td>
<td>29</td>
<td>39</td>
<td>36</td>
<td>38</td>
</tr>
<tr>
<td>Ystrad Mynach</td>
<td>8</td>
<td>12</td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td>Cadoxton</td>
<td>6</td>
<td>25</td>
<td>13</td>
<td>38</td>
</tr>
</tbody>
</table>
Selection of six ‘station families’

Figure 3.1. A Situational Station Safety Index
Selection of six ‘station families’
Situational station safety index

5 Informal Surveillance: Stations that were clearly overlooked by people engaged in other land uses (residential, commercial, industrial, retail) received a score of '1' while stations lacking such informal surveillance scored '0'.

6 Access from the street: Stations judged to provide open access routes from the surrounding streets thereby optimizing visibility and minimizing isolation, scored '1'. Stations with long and or secluded / isolated access from the local community scored '0'.

7 Absence of an underpass: Stations without an underpass scored '1', stations with an underpass scored '0'.
Selection of six ‘station families’

Station 'Family' 1. In / Near the city, affluent, well used and staffed with high SSSI levels, car parking and a frequent service.

*Radyr* was selected to represent this group. It is located on the outskirts of the city of Cardiff in an affluent area. The station is well used, staffed, with an SSSI score of 7, a car park and a frequent service (9/10 trains per hour).

Specific problem features include the lack of overlooking activities, poor access from street and the presence of an underpass - all identified as concerns in the Pilot Study.
Selection of six ‘station families’
Situational station safety index

Station family 6. Valleys, deprived, low patronage, un-staffed, low SSSI, no car parking and an infrequent service.

*Pentrebach* was selected. It is located in the Valleys, in a deprived area, with low levels of patronage and an infrequent service (2 trains per hour). Un-staffed, SSSI score of 2, no car park.

Specific problem features include a lack of overlooking activities, poor access from street, low visibility brick shelters, the absence of both CCTV and electronic information and the presence of an underpass.
QuickTime VR Panorama camera
<table>
<thead>
<tr>
<th>Personal Security Concerns</th>
<th>Females %</th>
<th>Males %</th>
<th>All %</th>
</tr>
</thead>
<tbody>
<tr>
<td>When waiting for a train on the station platform after dark</td>
<td>93</td>
<td>53</td>
<td>75</td>
</tr>
<tr>
<td>When approaching the station after dark</td>
<td>93</td>
<td>49</td>
<td>73</td>
</tr>
<tr>
<td>For the security of vehicle in car park after dark</td>
<td>78</td>
<td>58</td>
<td>66</td>
</tr>
<tr>
<td>For the security of vehicle in car park in the day</td>
<td>72</td>
<td>58</td>
<td>63</td>
</tr>
<tr>
<td>When travelling on the train after dark</td>
<td>80</td>
<td>37</td>
<td>60</td>
</tr>
<tr>
<td>When using the car park after dark</td>
<td>63</td>
<td>58</td>
<td>60</td>
</tr>
<tr>
<td>Due to an infrequent service after dark</td>
<td>57</td>
<td>36</td>
<td>51</td>
</tr>
<tr>
<td>When waiting for a train on the station platform in the day</td>
<td>17</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>When travelling on the train in the day</td>
<td>15</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>When approaching the station in the day</td>
<td>20</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>Due to an infrequent service in the day</td>
<td>13</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>When using the car park in the day</td>
<td>0</td>
<td>22</td>
<td>12</td>
</tr>
<tr>
<td>Ranking of Improvements – Females</td>
<td>%</td>
<td>Ranking of Improvements - Males</td>
<td>%</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---</td>
<td>---------------------------------</td>
<td>---</td>
</tr>
<tr>
<td>More/better lighting</td>
<td>81</td>
<td>CCTV</td>
<td>62</td>
</tr>
<tr>
<td>CCTV</td>
<td>62</td>
<td>More/better lighting</td>
<td>52</td>
</tr>
<tr>
<td>Transparent shelters</td>
<td>58</td>
<td>More staff</td>
<td>48</td>
</tr>
<tr>
<td>More staff</td>
<td>38</td>
<td>Cleaner stations</td>
<td>43</td>
</tr>
<tr>
<td>Cleaner stations</td>
<td>35</td>
<td>Longer trains</td>
<td>43</td>
</tr>
<tr>
<td>Cut back vegetation</td>
<td>35</td>
<td>Less underpasses/better bridges</td>
<td>29</td>
</tr>
<tr>
<td>Longer trains</td>
<td>27</td>
<td>Cut back vegetation</td>
<td>24</td>
</tr>
<tr>
<td>Less underpasses/better bridges</td>
<td>27</td>
<td>Get rid of gangs/yobs</td>
<td>24</td>
</tr>
<tr>
<td>Better signage</td>
<td>27</td>
<td>More reliable service</td>
<td>24</td>
</tr>
<tr>
<td>Help points/panic buttons</td>
<td>19</td>
<td>Transparent shelters</td>
<td>24</td>
</tr>
<tr>
<td>Get rid of gangs/yobs</td>
<td>19</td>
<td>More frequent trains</td>
<td>19</td>
</tr>
<tr>
<td>More frequent trains</td>
<td>19</td>
<td>Clearer information</td>
<td>19</td>
</tr>
<tr>
<td>Coat of paint</td>
<td>15</td>
<td>Better signage</td>
<td>14</td>
</tr>
<tr>
<td>Better/easier access</td>
<td>12</td>
<td>Make platform more open</td>
<td>14</td>
</tr>
</tbody>
</table>
Improvements – ‘visibility is the key’

• Vegetation clearance
• More CCTV
• New shelters, transparent
• Improved lighting – the effectiveness of this was assessed
• Cleaner stations
• Efforts being made to improve train capacity and frequency
Conclusions

• Cleaner, brighter stations which are perceived to be safer
• QuickTime VR walkthrough proved to be an excellent ‘visual stimulus’ for focus groups
• Presented standardised images, same for all focus groups
• Focus groups could ‘walk where they wanted’
• Very versatile and cost effective
• A comprehensive and effective methodology developed
• Produced workable hierarchy of suggested improvements
• Methodology could be used in other applications
The production and use of QuickTime© VR Panoramas in Personal Safety Focus Groups

Kevin Mears
The Virtual Reality Panorama Tool

Uses QuickTime software and digital photography to produce an interactive environmental stimulus
Virtual Reality Panorama filming of routes
Virtual Reality Panorama Explanation
Virtual Reality Panorama filming of routes

- Useful Stimulus for the group discussion
- Photographic representation is familiar to users
- Less directed than video
- More flexible than stills
- Easy for participants to manoeuvre through walkthroughs
Previous projects

- Campus safety
  - University of Glamorgan
  - Loughborough University
- Local railways - Valley Lines
Focus groups - analysis of key themes in discussion
Valley Lines

- Study in Personal Safety on Valley lines
- Selection of six ‘station families’ Situational Station Safety Index
View of Train Station in South Wales Before and After Environmental Improvements

Original form of Dingle Road station
Dingle Road station after improvements
Current project

Used in SPARC project to show walkthroughs of deprived communities to older residents
Our SPARC project

Design and community regeneration: investigating personal safety concerns of older people in socio-economically deprived communities in South Wales

Dr Joanna Waters
Our project - an identified need for the research

- Literature claims that older people often experience a high fear of crime
- There is often a discrepancy between fear and actual crime levels
- Previous research based mainly on quantitative techniques
- Pain (1997: 119) claimed that “the missing discourse in work on crime and elderly people is the perceptions of elderly people themselves.”
- A qualitative perceptual approach provides revealing insights into how the design and maintenance of communities impact on personal safety
Aims and objectives

• To identify the personal safety and fear of crime needs of older people in their communities by exploring how older people use their environment.
• To develop and refine a package of user-led recommendations and design guidelines for a range of appropriate and cost-effective solutions intended to contribute to reducing crime and personal safety concerns.
• To make a contribution to the academic literature by providing a new focus in safety and crime research by emphasising active participation and user-driven methodologies.
• To disseminate our findings to practitioners to promote the design of buildings and environments with access and personal safety in mind and make a contribution to promoting inclusive communities.
Local context - Wales

- Wales has the oldest population in the UK
- The total number of people over the age of 60 in Wales is 657,700 (2001 census)
- This is 22.7% of the population as a whole
- Addressing the needs of older people is therefore an increasingly important concern, socially and politically
- The Strategy for Older People in Wales – WAG, published in 2003
Local context - RCT

- The research was carried out within the Borough of Rhondda Cynon Taff (RCT), one of the most socially and economically deprived regions in Wales
- RCT has a population of over 88,000 people over the age of 55
- Two communities were used as case studies which represent areas of considerable socio-economical deprivation
Sampling frame to identify the two case studies

- Welsh Index of Multiple Deprivation 2000
- 11 wards from RCT are in top 50 most deprived in Wales
- Capitalise on established University-Community relationships
- Attend Partnership meetings
- Talking to residents
- Gaining trust
- Giving potential participants project information and time to think
The selected case study communities

- Tylorstown
- Cwm Clydach
Selected Communities - Tylorstown

- Linear community
- Doctors surgery, post office, pubs, working men's clubs, supermarket, unmanned police station
- Older people's group once a week
Selected Communities - Cwm Clydach

- End of valley
- Shops, churches, pubs, no police station, surgery, chemist
- Partnership meetings once a month
Identifying the routes

- Interviews were problematic
- Amended methodology – questionnaires
- High response rate
- Identified main pedestrian routes and key concerns over crime and safety
Questionnaire analysis 1 – Route identification

• Asked respondents for the two routes they use most frequently in their community
• Downloaded community maps from DigiMap
• Manually drew all routes on to hard copy of maps
• Identified 6 representative pedestrian routes in each community
• Routes were amalgamated for ease of filming and presentation
Questionnaire analysis 2 – General perceptions of crime and safety in the community

Tylorstown:
• 48% been victim of crime
• 84% concerned over personal safety
• 63% avoided parts of Tylorstown because of safety concerns
• 37% avoided using some facilities because of safety concerns

Cwm Clydach:
• 54% been victim of crime
• 67% concerned over personal safety
• 40% avoided parts of Cwm Clydach because of safety concerns
• 0% avoided using some facilities because of safety concerns
Street Segment Personal Safety Index

- Binary framework
- Measure of environmental characteristics along each route
- Ten safety domains, including presence of CCTV, street lighting and vegetation
- Provides objective data to compare with user perceptions
VR filming and focus groups

- Daytime filming not a problem
- But night time filming had to be abandoned
- Had to adjust focus group questions accordingly
- Four focus groups in each community
Preliminary findings

- Social environment main concern
- Built environment not a primary problem because of familiarity and local knowledge
- Many respondents didn’t go out at night but didn’t perceive this as limiting their activities
- Main factors influencing perceptions of personal safety were concern over gangs of youths, drugs and issues related to rented properties
- Respondents very comfortable using VR
Practical outcomes based on user-led research:

• Improved environmental conditions based directly on the views and needs of older people
• Reduced fear in the community for older residents in deprived areas
• Improved quality of life
• Provision of a more profound insight into personal safety issues confronting older people