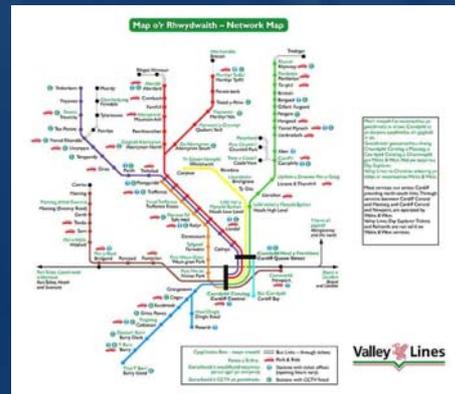


VR 'walkthrough panorama' technology to assess public perceptions of personal safety on railway stations

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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, eg 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



Methodology

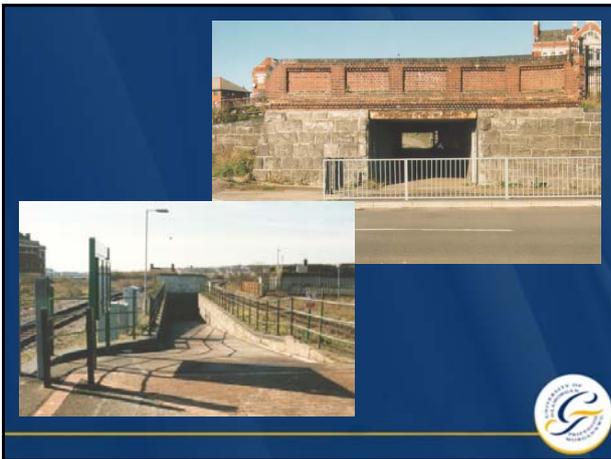
- Preliminary questionnaire, questions added to the mandatory biannual 'Customer Satisfaction Survey', 1000 respondents, some interviewed
- All 67 stations visited, surveyed, photographed
- Six 'station families' identified, typical station within 'family' selected
- 'QuickTime' used to film the station 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'

Station	Approaching the station	Waiting inside the platform shelter	Waiting on the platform	Using the station car park
Bargoed	0	0	0	0
Radyr	0	0	0	5
Cardiff Queen St	4	6	5	10
Barry Dock	29	39	36	38
Ystrad Mynach	8	12	12	21
Cadoxton	6	25	13	38



Selection of six 'station families'

Figure 3.1.4. Situational Station Safety Index

Station	Access		Surveillance		Isolation		Underpass	
	Score	Weighted	Score	Weighted	Score	Weighted	Score	Weighted
Bargoed	0	0	0	0	0	0	0	0
Radyr	0	0	0	0	0	0	0	0
Cardiff Queen St	4	4	6	6	5	5	10	10
Barry Dock	29	29	39	39	36	36	38	38
Ystrad Mynach	8	8	12	12	12	12	21	21
Cadoxton	6	6	25	25	13	13	38	38



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'

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.



Table 1. Personal Security Concerns at Stations

Personal Security Concerns	Females %	Males %	All %
When waiting for a train on the station platform after dark.	93	53	75
When approaching the station after dark.	93	49	73
For the security of vehicle in car park after dark.	78	58	66
For the security of vehicle in car park in the day.	72	58	63
When travelling on the train after dark.	80	37	60
When using the car park after dark.	63	58	60
Due to an infrequent service after dark.	57	36	51
When waiting for a train on the station platform in the day.	17	18	19
When travelling on the train in the day.	15	18	16
When approaching the station in the day.	20	6	16
Due to an infrequent service in the day.	13	12	15
When using the car park in the day.	0	22	12



Table 2. A Hierarchy of Proposed Improvements

Ranking of Improvements – Females %	Ranking of Improvements - Males %
81 More/better lighting	81 CCTV
82 CCTV	82 More/better lighting
58 Transparent shelters	58 More staff
38 More staff	38 Cleaner stations
35 Cleaner stations	35 Longer trains
35 Cut back vegetation	35 Less underpasses/better bridges
27 Longer trains	27 Cut back vegetation
27 Less underpasses/better bridges	27 Get rid of gangs/yobs
27 Better signage	27 More reliable service
19 Help points/panic buttons	19 Transparent shelters
19 Get rid of gangs/yobs	19 More frequent trains
19 More frequent trains	19 Clearer information
15 Coat of paint	15 Better signage
14 Make platform more open	14 Make platform more open



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

