

i  
intelligent space

# healthcare



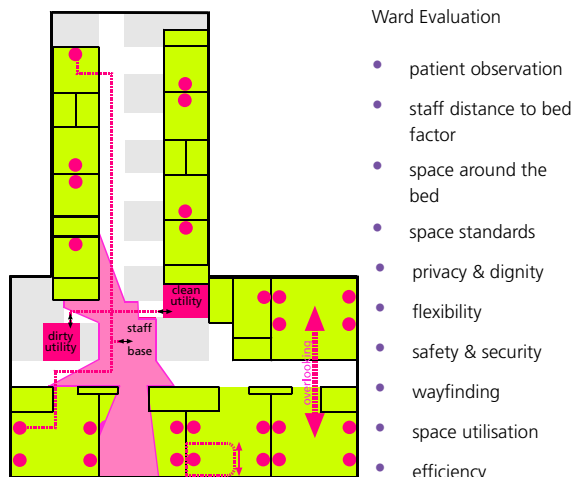
*Intelligent Space Partnership (ISP) is a leading space use analysis consultancy. We have developed unique design evaluation tools to benchmark the quality and functionality of healthcare buildings. Based in central London, we work internationally and have worked on over 30 hospitals. We provide expert advice on schemes at all stages of the development process from briefing through design, implementation to management.*

## Design Evaluation

ISP have developed a suite of tools to benchmark building designs using objective and repeatable methods.

The benefits include:

- enhanced design performance
  - clear evidence on how well planned designs will support key objectives such as patient observation, flexibility & adaptability
  - insight on the future functioning of buildings
  - pre-emptive problem resolution
  - assessment ranging from whole hospital to individual rooms for functionality & usage
  - enabling direction comparisons between different hospitals or designs
  - evidence to support design decisions
- pinpointing of capacity problems
  - evidence based signage & wayfinding strategies
  - identification of informal uses
  - testing usability of future departments/extensions through projections from current use patterns



## Research

ISP have the skills and resources to undertake bespoke research and consultancy based on the functionality of buildings and how the design impacts on usage.

Previous research has included:

- Assessing the design quality of PFI hospitals on behalf of the National Audit Office to identify both if hospitals meet the recommendations in health guidance notes and importantly if they provide any design innovation or improvements.
- Evaluating how different A&E designs impact on the way that care is delivered in A&E departments. This looked at how different layouts were able to respond to the changing clinical processes over time and identified which design features built in redundancy for the future.

## Post Occupancy Assessment

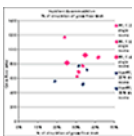
ISP use advanced surveys and computer modelling to visualise evidence on the functioning of buildings in use.

The benefits include:

- evidence on actual use patterns
- identification of underutilised space

# recent projects

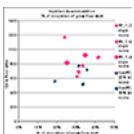
## healthcare



### FORTH VALLEY ACUTE HOSPITAL

Scotland | 2005 | Laing O'Rourke

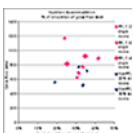
Design review during bid stage.



### SOUTH GLASGOW ACUTE HOSPITAL

Scotland | 2005 | NHS Greater Glasgow

Part of trust advisory team led by Avanti Architects.



### VALUE FOR MONEY OF PFI HOSPITALS

England | 2005 | National Audit Office PFI VFM Team

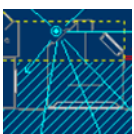
Benchmarking the design functionality of PFI hospitals through comparison of 8 PFI and 8 conventionally procured hospitals. This will inform the Value For Money Audit being undertaken by the National Audit Office



### WARD DESIGN

England | 2005 | Intelligent Space Partnership & Anshen Dyer

Testing of the functional performance of different ward designs including: Peninsula; Triangle; L-shaped; and Y shaped wards.



### SAFER HOSPITALS, REVISITED

Birmingham | 2005 | Home Office

Post occupancy assessment of Heartlands Hospital to identify how movement and crime levels have been impacted by the design and infrastructure changes.



### CRIME REDUCTION WEBSITE

England | 2004 | Home Office

Web based toolkit to enable schools and hospitals to analyse their sites for weaknesses and support the principles of "designing out crime".



### WARD LAYOUT AND PATIENT CARE

England | 2004 | NHS Estates with MAAP Architects

Evaluating the impact of single rooms and multi-bed bays on patient care in NHS hospitals.



### ROYAL SUSSEX COUNTY HOSPITAL

Brighton | 2004 | Brighton and Sussex University Hospitals NHS Trust  
Post occupancy evaluation of the A&E department to identify locations for future improvement.



### ACCIDENT AND EMERGENCY DEPARTMENT DESIGN EVALUATION

England | 2003 | NHS Estates.

Evaluation of two proposed A&E departments: BECaD at Central Middlesex Hospital and an exemplar plan.



### SAFER HOSPITALS

Birmingham | 2003 | Home Office

Design evaluation and assessment of Heartlands A&E to identify how the design affected movement and the locations of crimes and incidents. This evidence was used to identify where changes to the design were required to reduce the risks of crimes occurring.



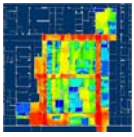
### SUPPORT SERVICES IN A&E

England | 2003 | NHS Estates

An evaluation of the effect that support services have on care provision in eight Accident and Emergency departments.

# recent projects

## healthcare

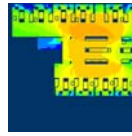


### A&E DESIGN

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England | 2002 | NHS Estates

The Impact of the Built Environment On Care Within Accident and Emergency Departments. A research project evaluating space use and design functionality in eight hospitals to support new NHS design guidance



### NHS CRITICAL CARE AREAS

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England | 2002 | NHS Estates  
A research project to develop spatial key performance indices for ward design

## The Impact of the Built Environment On Care within A&E Departments

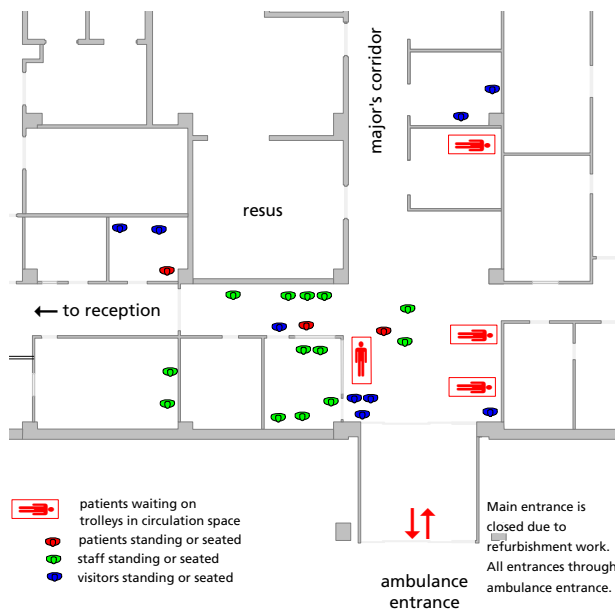
*A research project evaluating space use and design functionality in eight hospitals to support new NHS design guidance.*

CLIENT NHS ESTATES  
LOCATION ENGLAND  
YEAR 2002

NHS Estates commissioned Intelligent Space Partnership to research the influence of building design on the care of patients in A&E departments. The findings of the research provide an evaluation of the key design issues faced in A&E departments and recommendations for future A&E design.

The aims of the project were to:

- Support guidance for the building of future departments;
- Provide measures to evaluate planned A&E departments
- Identify potential problems prior to the construction of new departments; and
- Identify methods for post occupancy evaluation of departments.



Eight existing A&E departments were analysed as a basis for the research. Comprehensive surveys were carried out in each department to identify current use patterns. In addition, computer modelling was used to benchmark design characteristics such as visibility and surveillance. The role of the building design in the delivery of care at each stage of the patient's journey was analysed.

### BENEFITS

"The key findings and recommendations from this work are now available and would be extremely useful to any trust redesigning or going through the new build of an A&E department.

The following types of issues are picked up:

- Patient flows
- Walking distances
- Visibility
- Wayfinding
- Privacy and Dignity
- Space use etc."

Source NHS Estates

### RELATED WORK BY ISP

- Design Guidance for Safer Hospitals for the Home Office, 2003. Analysis of building layout, crime and movement in Accident and Emergency departments.
- Support Services in A&E Departments for NHS Estates, 2003.
- Spatial Analysis of Critical Care Wards for NHS Estates, 2002. Analysis of surveillance levels in several ward layouts.



# A&E Design Evaluation

*Evaluation of two proposed accident and emergency departments: Brent Emergency Care and Diagnostic Centre at Central Middlesex Hospital and an exemplar plan.*

CLIENT NHS ESTATES  
LOCATION ENGLAND  
YEAR 2003

This report evaluates the design of two proposed A&E departments: Brent Emergency Care and Diagnostic Centre (BECaD) and an Exemplar plan developed as a guide for trusts undertaking new build schemes.

The Exemplar Plan and the A&E services within BECaD were evaluated using key performance indices identified in previous work by ISP, "The Impact of the Built Environment on Care within A&E". This was used to assess the following locations:

- Circulation areas
- Arrival and entrances
- Reception and waiting
- Triage and assessment
- Treatment rooms

Comparison with observed use patterns in two existing A&E departments were used to assess occupancy and capacity issues both plans may experience.

## THE IMPACT OF THE BUILT ENVIRONMENT ON CARE WITHIN A&E, NHS ESTATES 2002

In 2002 NHS Estates commissioned Intelligent Space Partnership to research the influence of building design on the care of patients in A&E departments. The findings of the research provide an evaluation of the key design issues faced in A&E departments and recommendations for future A&E design. The aims of the project were:

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## RELATED WORK BY ISP

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- Support Services in A&E Departments for NHS Estates, 2003.
- Spatial Analysis of Critical Care Wards for NHS Estates, 2002. Analysis of surveillance levels in several ward layouts.

TRANSPORT PLANNING	YEAR	CLIENT	MASTERPLANNING Continued.	YEAR	CLIENT
West Wickham	2003	TfL	West India Quay	2004	DKRL
Goswell Road	2005	Islington Council	Paddington Village Masterplan	2004	Sainsbury's Supermarket Ltd
Archway Road	2005	TfL	Spatial Analysis of Wyndham Growth Area	2004	Victoria Department of
Reading Pedestrian Model Phase 2	2005	Reading Borough Council	Sustainability and Environment	2004	Wycombe District Council.
Clapham Park Masterplan	2005	Andrew Wright Associates	High Wycombe Masterplan	2004	Skanska
Angel Crossing	2005	Islington Council	Masterplan analysis	2003	Cheltenham Borough Council
Oxford street Pedestrian flow survey	2005	GfK Prisma Institut	Cheltenham Brewery	2003	Meridian Delta Limited
Parliament Square	2004	Transport for London	Pedestrian Modelling of the Greenwich Peninsula Masterplan	2002	AFH Shaw Sprunt.
Extension of London's Functional Walking Network	2004	CLP	Evelyn Street Pedestrian Audit	2002	University of Cambridge
Notting Hill Gate Pedestrian Movement Surveys	2004	RBKC	Public Space Consulting for the Sidgwick Site Masterplan	2001	Vivico Real Estate
Borough High Street	2004	TfL	Europa Viertel Boulevard Masterplan	2001	IBAPE Consultants
West India Quay	2004	DKRL	Preliminary Analysis of Anhangabaú Regeneration Schemes	2000	
Tram Spaces and Places	2004	Cross River Partnership			
A1 Rethinking the Road	2004	Alsop Architects			
Spatial Analysis of Hume and Melton Growth Areas	2004	Victoria Department of Sustainability and Environment			
Reading Pedestrian Model Council	2004	Reading Borough			
Harlow Town Centre North	2004	Harlow Council			
Pedestrian Strategy for Homebush Bay Bridge	2004	Noosphere			
Southport Pedestrian Observation Study	2004	Sefton council			
Clear Zone Walking Initiative	2004	Camden Council			
Spatial Analysis of Wyndham Growth Area	2004	Victoria Department of Sustainability and Environment			
Streatham High Road Follow Up Study	2004	Transport For London			
High Wycombe Masterplan Council.	2004	Wycombe District			
Update on Walking Initiatives in Central London Partnership	2004	Central London			
Tracking Pedestrian Volumes Partnership	2004	Central London			
London's Functional Walking Network Partnership	2004	Central London			
Shoreditch Triangle Follow-up Study	2003	ISP			
Pedestrian Modelling of E1 Development, Regent Street	2003	Crown Estates			
Lifford's Place Traffic and Parking survey	2003	Long and Burr Architects			
Lewisham Town Centre Scoping Study	2003	Slough Estates			
Database of Walking Infrastructure Initiatives Partnership	2003	Central London			
The London Pedestrian Model Phase 2	2003	Transport for London and			
Central London Partnership					
Streatham High Road: "Drive-Through To Destination"	2003	Transport for London			
Cheltenham Brewery Pedestrian Movement Report	2003	Cheltenham Borough Council			
Pedestrian Movement Analysis of Duisburg Town Centre	2002	City of Duisburg.			
Evelyn Street Pedestrian Audit	2002	AFH Shaw Sprunt.			
Wimbledon Pedestrian Audit	2002	Transport For London			
London Pedestrian Model	2002	Transport for London			
Shoreditch Triangle	2001	Shoreditch Town Hall Trust			
St Giles Circus Pedestrian Safety Study	2000	Camden Council			
<b>MASTERPLANNING</b>			<b>RETAIL</b>		
Clapham Park Masterplan Associates	2005	Andrew Wright	Oracle Centre	2005	Hammerson PCL
Caltongate Pedestrian Movement Analysis	2005	Mountgrange Ltd.	Pedestrian Modelling of Liverpool PSDA	2005	Gosvenor Estate
Spinningfields Masterplan Development	2005	Allied London	Pedestrian Modelling of Eastgate Masterplan Phases 3 & 4	2004	Hammerson PLC and Town Centre Securities
Rope Walks Masterplan	2005	Turley Associates	Paddington Village Masterplan	2004	Sainsbury's Supermarket Limited
Folkstone Masterplan	2005	Foster and Partners	Leeds Eastgate Masterplan	2004	Hammerson PLC and Town Centre Securities
Pedestrian Modelling of Liverpool PSDA	2005	Grosvenor Estate	Evidence for the centre:mk planning submission	2002	Lend Lease
Paddington Village Follow Up	2005	Sainsbury's Supermarket Ltd	Pedestrian Modelling of "the centre:mk"	2001	Lend Lease
Peterborough Station Quarter	2004	Peterborough City Council			
Pedestrian Modelling of Eastgate Masterplan Phase 3&4	2004	Hammerson PLC and Town Centre Securities			
<b>MASTERPLANNING</b>			<b>HEALTHCARE</b>		
Clapham Park Masterplan Associates	2005	Andrew Wright	Ward Layout Research	2005	ISP with Anshen Dyer
Caltongate Pedestrian Movement Analysis	2005	Mountgrange Ltd.	Safer Hospitals Revisited	2005	Home Office
Spinningfields Masterplan Development	2005	Allied London	Value for Money of PFI Hospitals	2004	National Audit Office
Rope Walks Masterplan	2005	Turley Associates	Creating Safer Schools and Hospitals	2004	Home Office
Folkstone Masterplan	2005	Foster and Partners	Ward Layout and Patient Care	2004	NHS Estates
Pedestrian Modelling of Liverpool PSDA	2005	Grosvenor Estate	Design Guidance for the Royal Sussex County Hospital	2004	Brighton and Sussex University Hospitals NHS Trust
Paddington Village Follow Up	2005	Sainsbury's Supermarket Ltd	Accident and Emergency Department Design Evaluation	2003	NHS Estates
Peterborough Station Quarter	2004	Peterborough City Council	Support Services in Accident and Emergency Departments	2003	NHS Estates
Pedestrian Modelling of Eastgate Masterplan Phase 3&4	2004	Hammerson PLC and Town Centre Securities	Safer Hospitals	2003	Home Office
			The impact of the built environment on care within A&E departments	2002	NHS Estates
			NHS Critical Care Areas	2002	NHS Estates
<b>MASTERPLANNING</b>			<b>BUILDINGS</b>		
Clapham Park Masterplan Associates	2005	Andrew Wright	Crime Reduction Toolkit for Schools & Hospitals	2004	Home Office
Caltongate Pedestrian Movement Analysis	2005	Mountgrange Ltd.	Design Guidance for Safer Schools	2003	Home Office
Spinningfields Masterplan Development	2005	Allied London	The Treasury	2001	National Audit Office
Rope Walks Masterplan	2005	Turley Associates	Pedestrian Modelling of "the centre:mk"	2001	Lend Lease
Folkstone Masterplan	2005	Foster and Partners	Design Evaluation of Corporate Headquarters Office	2000	Blauel Architects
Pedestrian Modelling of Liverpool PSDA	2005	Grosvenor Estate	Bow Church Redevelopment	2000	Gardiner and Theobald Engineers
Paddington Village Follow Up	2005	Sainsbury's Supermarket Ltd			
Peterborough Station Quarter	2004	Peterborough City Council			
Pedestrian Modelling of Eastgate Masterplan Phase 3&4	2004	Hammerson PLC and Town Centre Securities			
<b>MASTERPLANNING</b>			<b>CRIME PREVENTION</b>		
Clapham Park Masterplan Associates	2005	Andrew Wright	Stop and Search Research	2005	Home Office
Caltongate Pedestrian Movement Analysis	2005	Mountgrange Ltd.	Mapping Street Crime Risk	2004	Central London Partnership
Spinningfields Masterplan Development	2005	Allied London	Crime Reduction Toolkit for Schools & Hospitals	2004	Home Office
Rope Walks Masterplan	2005	Turley Associates	Safer Schools and Hospitals Projects	2003-5	Home Office
Folkstone Masterplan	2005	Foster and Partners			
Pedestrian Modelling of Liverpool PSDA	2005	Grosvenor Estate			
Paddington Village Follow Up	2005	Sainsbury's Supermarket Ltd			
Peterborough Station Quarter	2004	Peterborough City Council			
Pedestrian Modelling of Eastgate Masterplan Phase 3&4	2004	Hammerson PLC and Town Centre Securities			
<b>MASTERPLANNING</b>			<b>EVENTS</b>		
Clapham Park Masterplan Associates	2005	Andrew Wright	Notting Hill Carnival Judging Point Briefing Report	2003	Westminster City Council
Caltongate Pedestrian Movement Analysis	2005	Mountgrange Ltd.	Notting Hill Carnival Observation Study 2002	2002	Greater London Authority
Spinningfields Masterplan Development	2005	Allied London	The Notting Hill Carnival Public Safety Project	2001	Greater London Authority
Rope Walks Masterplan	2005	Turley Associates			
Folkstone Masterplan	2005	Foster and Partners			
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Intelligent Space Partnership is a specialist consultancy providing expertise on pedestrian movement and space use.

ISP has developed pedestrian modeling software to model pedestrian flows in street networks and within buildings. The practice has also developed detailed survey methodologies to support the evidence based analysis that ISP specialises in.


ISP is based in central London and carries out projects on an international level. Since its foundation in 2000, ISP has been working for renowned clients among government bodies, property owners, developers and consultants.

The work of the practice is cited in the Department for Transport's good practice casebook "Walking: The Way Ahead" and the recent publication by the National Audit Office "Improving Emergency Care in England".

ISP won the 2002 AGI Innovation Award for the analysis of crowding at the Notting Hill Carnival and ISP was independent cross party technical advisors to the 2002 Parliamentary debate on Walking in Towns and Cities.



**intelligent space**  
pedestrian movement consulting



ISP pedestrian planning & design review

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# Safer Hospitals

*Analysis of building layout, crime and movement in Accident and Emergency departments.*

CLIENT HOME OFFICE SCIENTIFIC DEVELOPMENT BRANCH  
LOCATION BIRMINGHAM  
YEAR 2003

This research formed part of The Safer Hospitals initiative headed by the Police Scientific Development Branch (PSDB) of the Home Office. The aim of the research programme was to evaluate whether the risk of crime and anti-social behaviour can be reduced in healthcare buildings through the application of integrated systems emphasising the use of innovative technology.

This work was based in the Accident and Emergency Department in Birmingham Heartlands Hospital, selected due to the high levels of crime that it has faced in recent years. The project included:

- Surveys of space use and movement,
- Modelling of wayfinding,
- Analysis of natural and artificial surveillance, and
- Analysis of crime patterns

The proposals that Intelligent Space produced in conjunction with the PSDB are now being implemented by the Trust and should be complete in early 2004.

## BENEFITS

The benefits for Heartlands Included:

- Mapping of crime locations
- Identification of how the locations of crimes related to the building layout, the level of natural or CCTV surveillance and the use patterns
- Identification of locations that could not be overseen either by staff or CCTV that may exhibit a high crime risk and where additional security measures may be required
- Evidence on how staff patients and visitors moved around the department and where they were generally located
- Increased privacy for patients arriving by ambulance through separation of movement streams
- Supported internal and external wayfinding to channel movement through public areas rather than past treatment rooms

The figure alongside shows the routes that people take walking through the A&E department, the areas which can be overseen by staff members (shown in blue), the locations that can be overseen by CCTV (shown in green) and the location where 58% of all crimes occur.

The location that faces these high crime rates is the most sensitive part of the A&E department, where patients requiring the use of resuscitation or who have major injuries are located. The high crime rate in this location is likely to be due to the lack of access control over entrants to the corridor and the lack of observation of the treatment rooms by staff at the base.

