



Creating effective places Integrating transport & urban design

Rail~Volution 2011, Washington DC
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UCL Space Syntax

Space Syntax Limited

London, Boston, Sydney...

Strategic consulting

Urban planning & design

Spatial economics

Human behaviour analysis



Space Syntax Laboratory

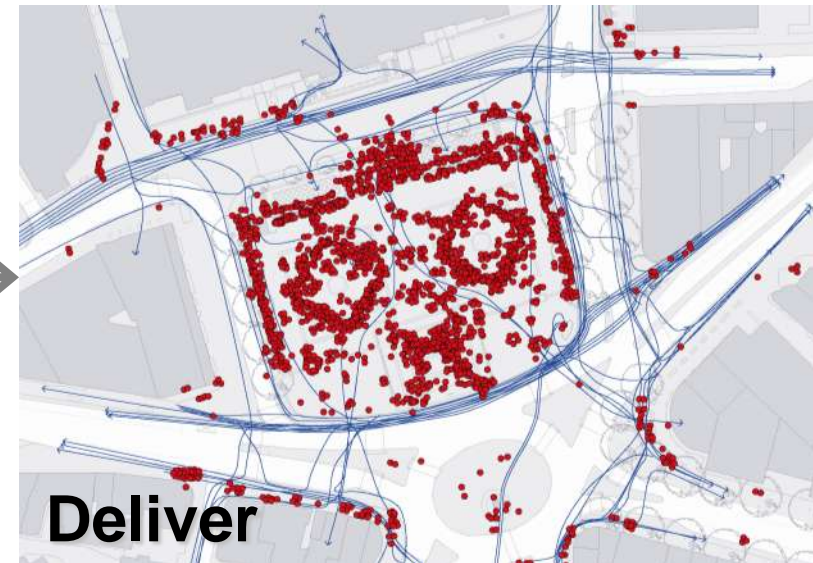
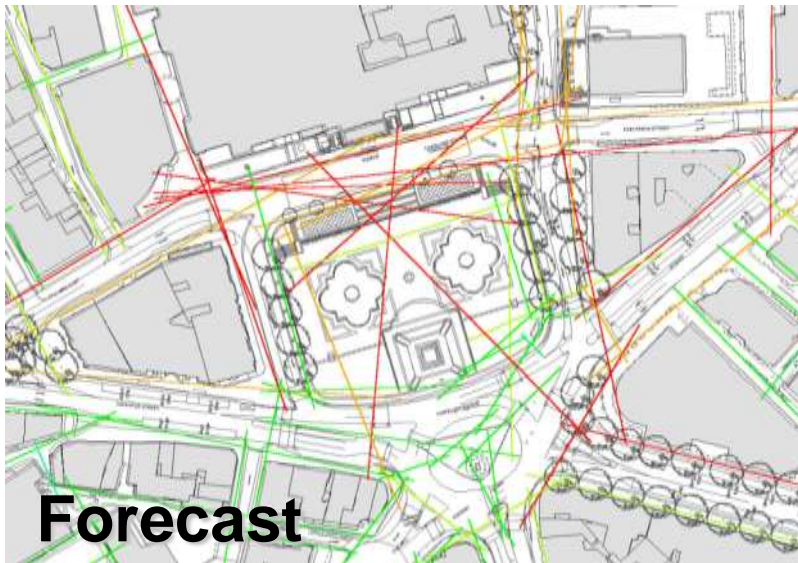
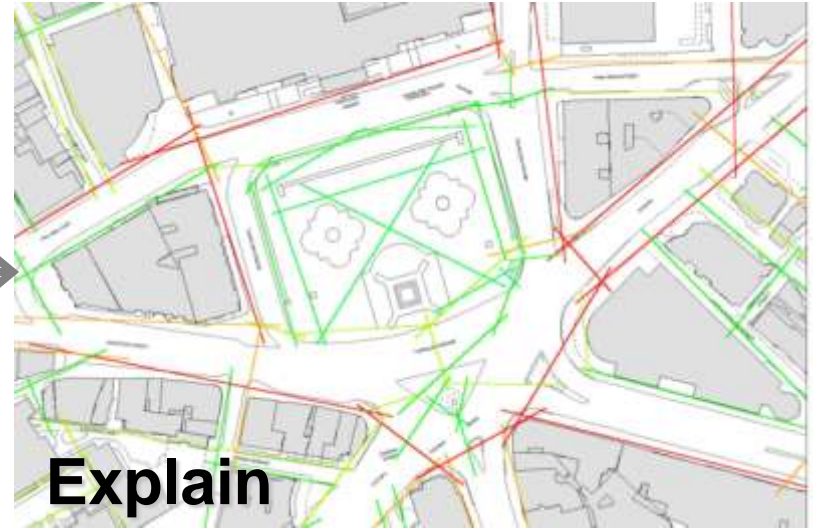
University College London

Fundamental research

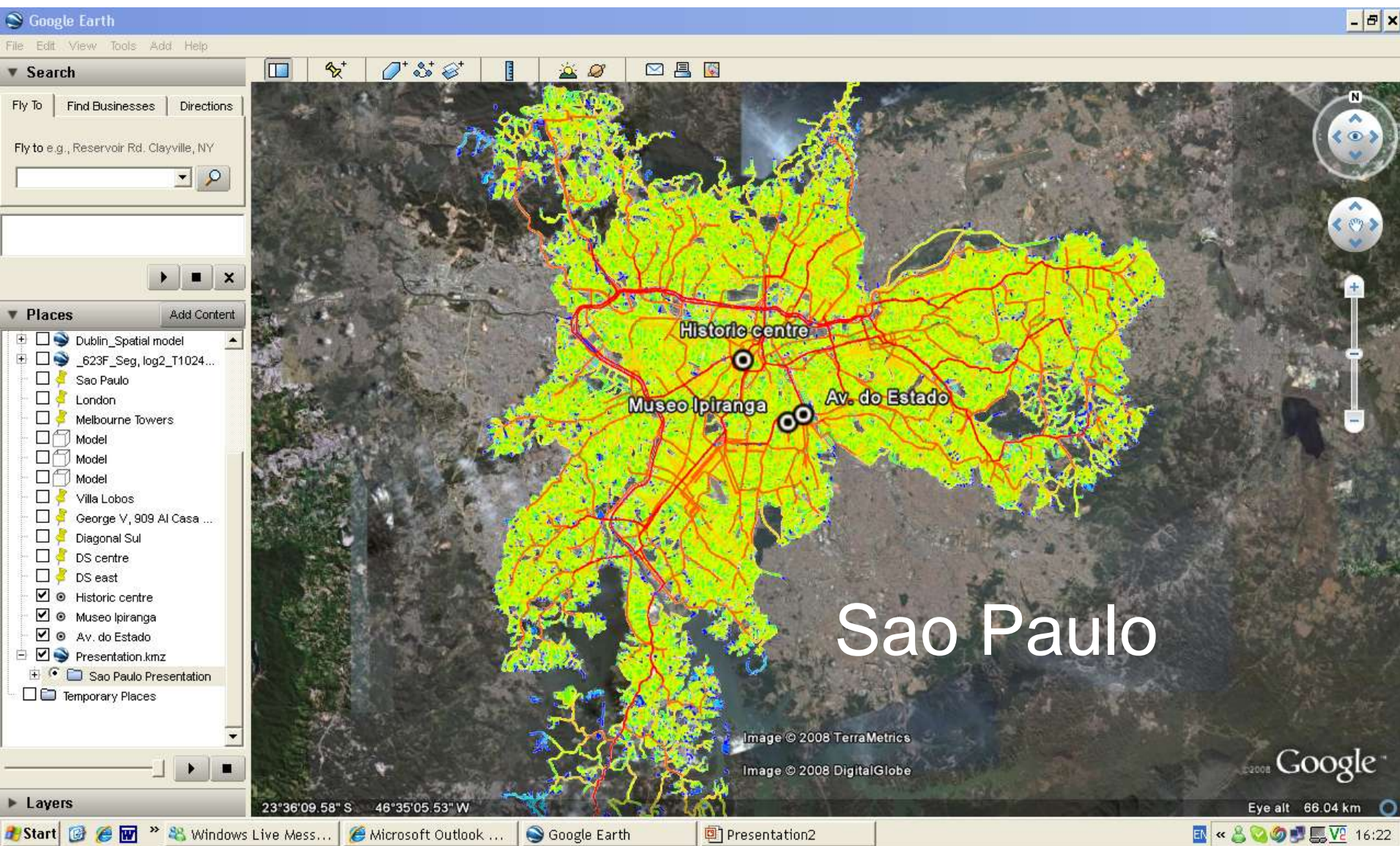
Technology development



Space Syntax Evidence-based urban planning & design



Sao Paulo



St Pancras International Station, London



Masdar, Abu Dhabi



Movement types

Pedestrian

Cycling

Vehicle

Public transport Bus, tram, metro

A single modelling environment

Movement inputs

Land use Type, density

Environmental comfort Sun/shade, wind, surface, lighting

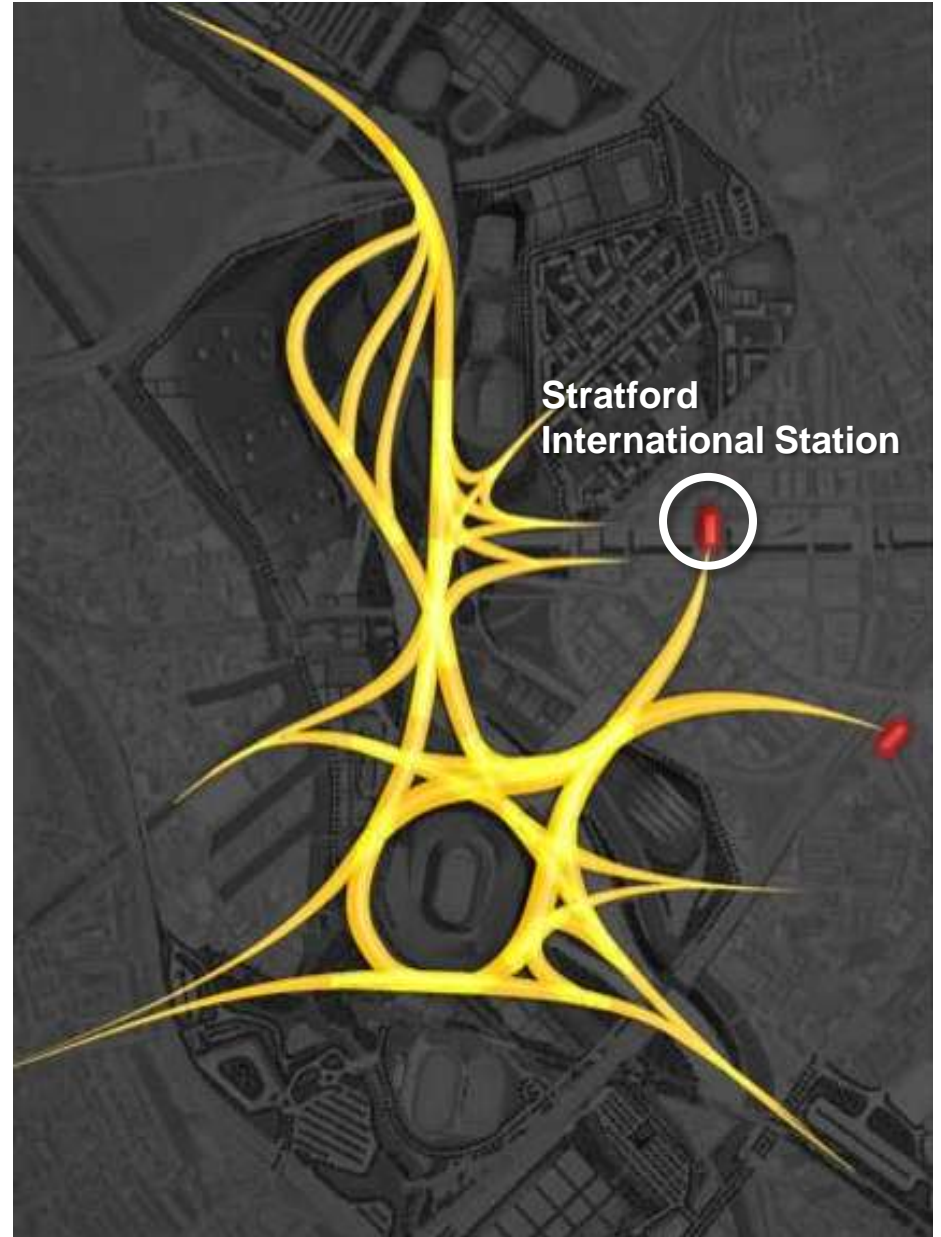
Capacity Path width, directional conflict

Comfort Bus, tram, metro

Spatial layout accessibility Connectedness & betweenness

Spatial & temporal Dynamic outputs

Stratford City, London



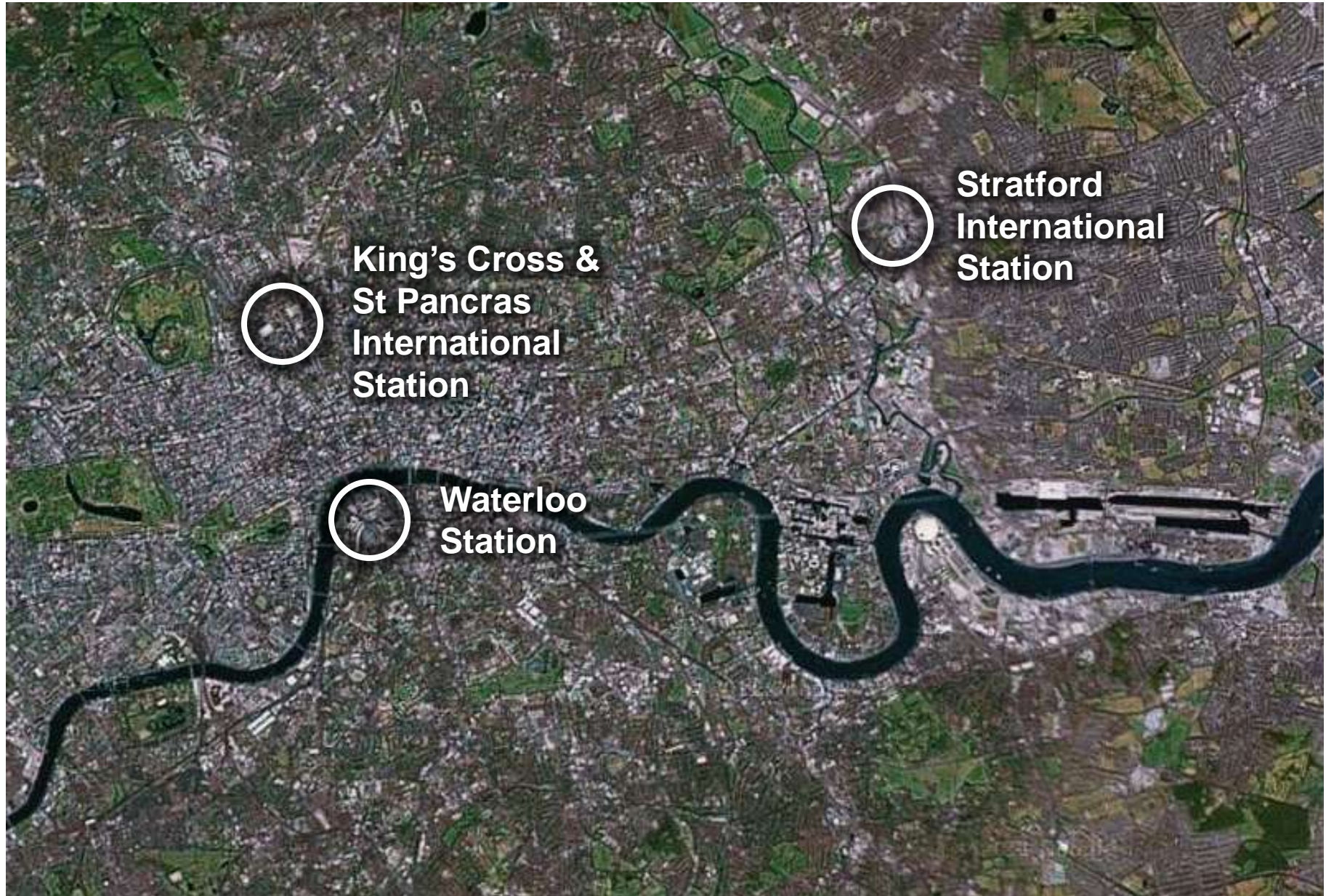
Stratford City, London London Olympics 2012 Masterplan



UK High Speed 1



London



Kings Cross and St Pancras Stations, London



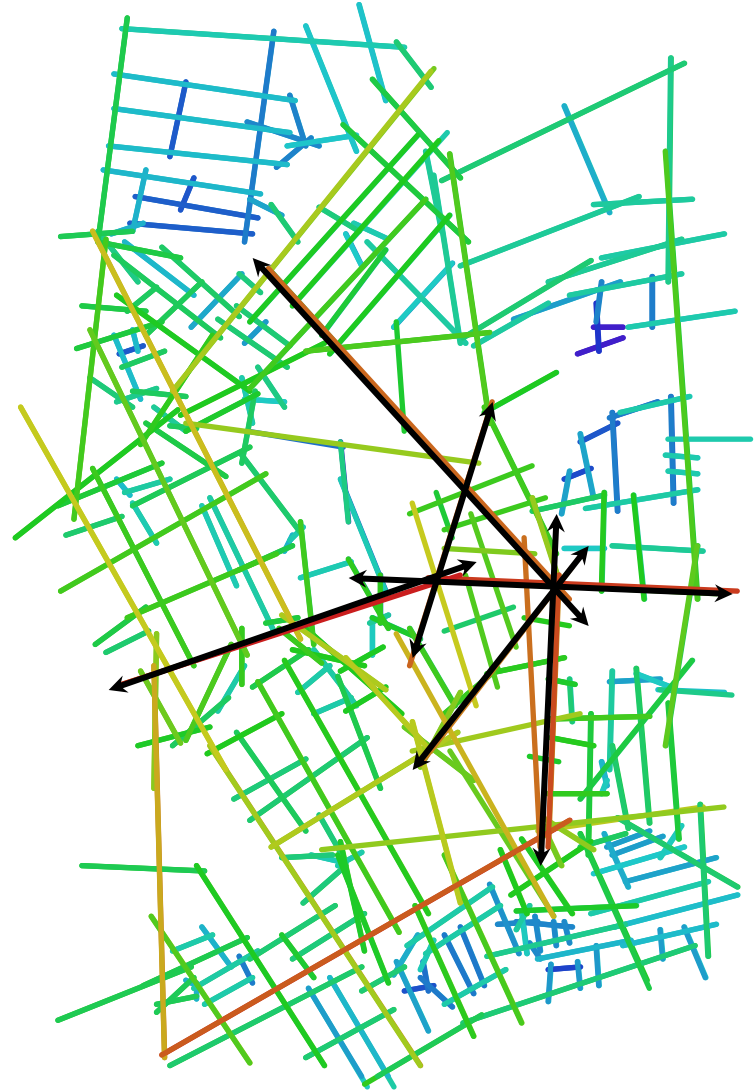
Spatial masterplanning **Rapid design development & testing**



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Spatial layout as infrastructure

An aerial night photograph of a city, likely Washington D.C., showing a dense, illuminated grid of streets. The lights create a complex pattern of yellow and white lines against the dark background of the city and surrounding areas. The grid is most prominent in the center and right side of the image, while the left side shows more irregular, less illuminated areas.

It costs money to provide.

It has a functional impact.

The cost of access **Fast highways not “Main Streets”**



Main street mixing global
& local movement.

**Enhanced movement
economy.**



Fast highways, separating
global & local movement.

**Suppressed movement
economy.**

Why is any of this important?

Climate change & resource depletion

Cost & scarcity of energy & materials

Economic regeneration

Personal, community & institutional wealth

Social wellbeing

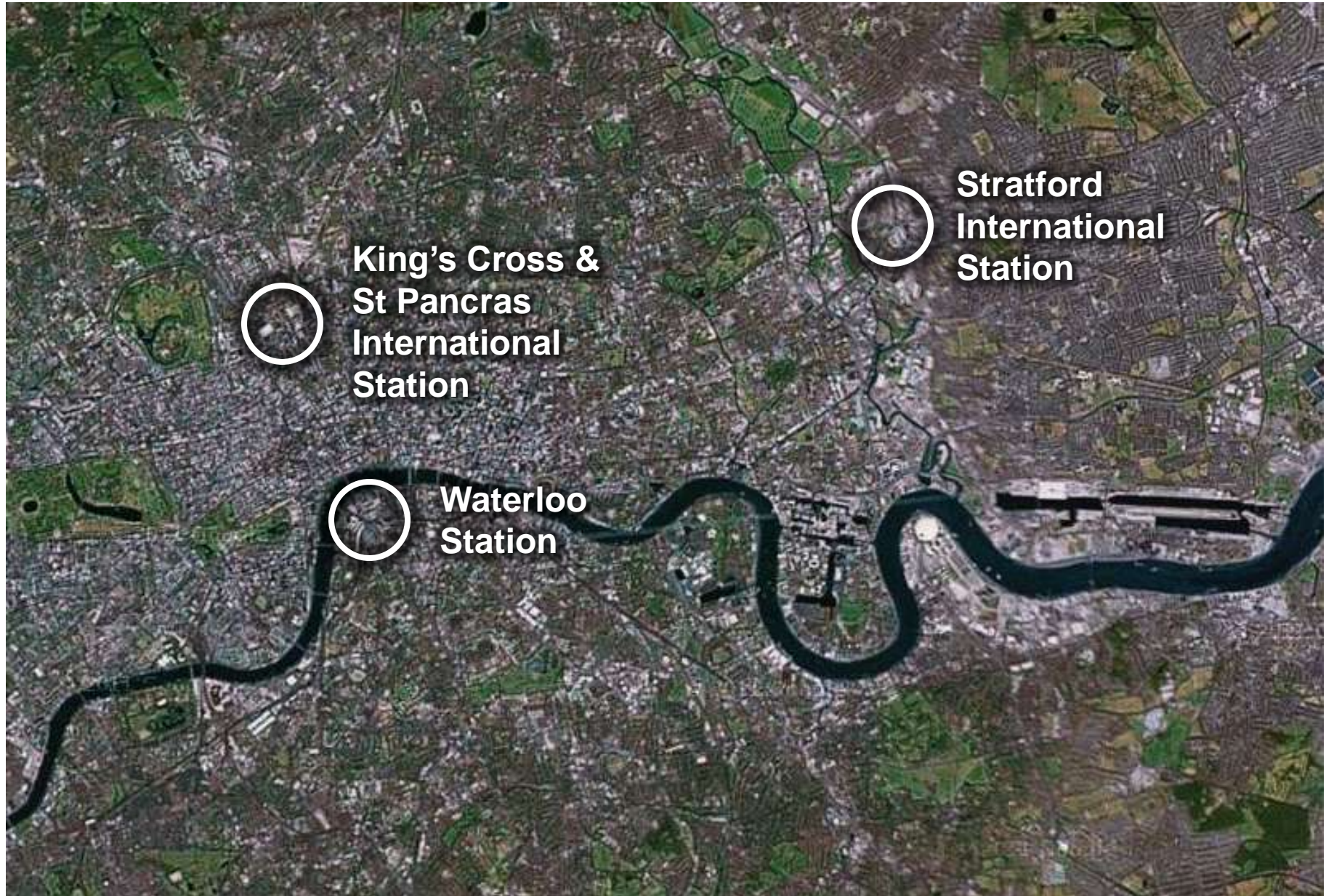
Real & perceived safety; health

Cultural continuity

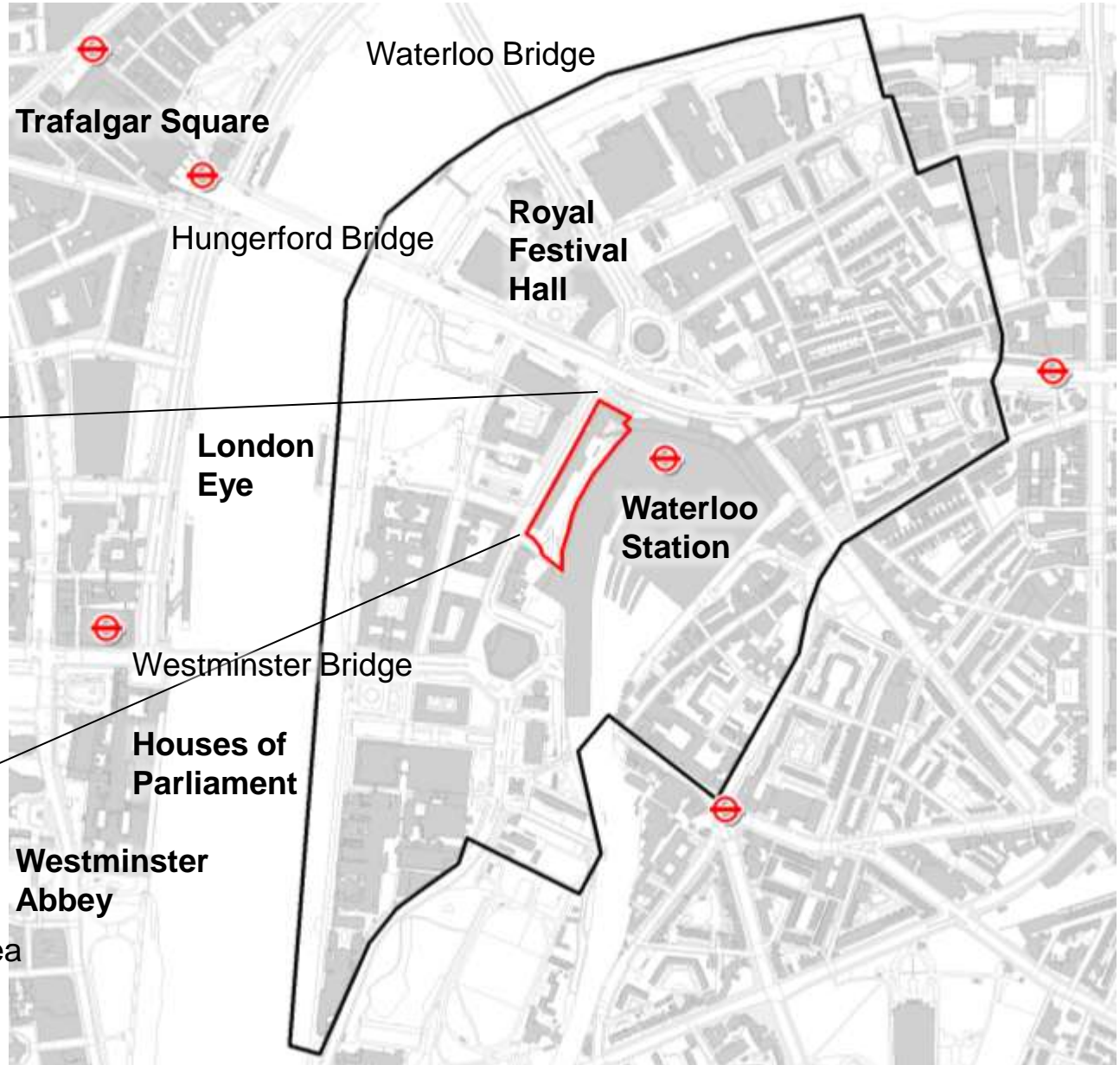
The risk **Failed urbanism**



London



Waterloo, London



Underground Station

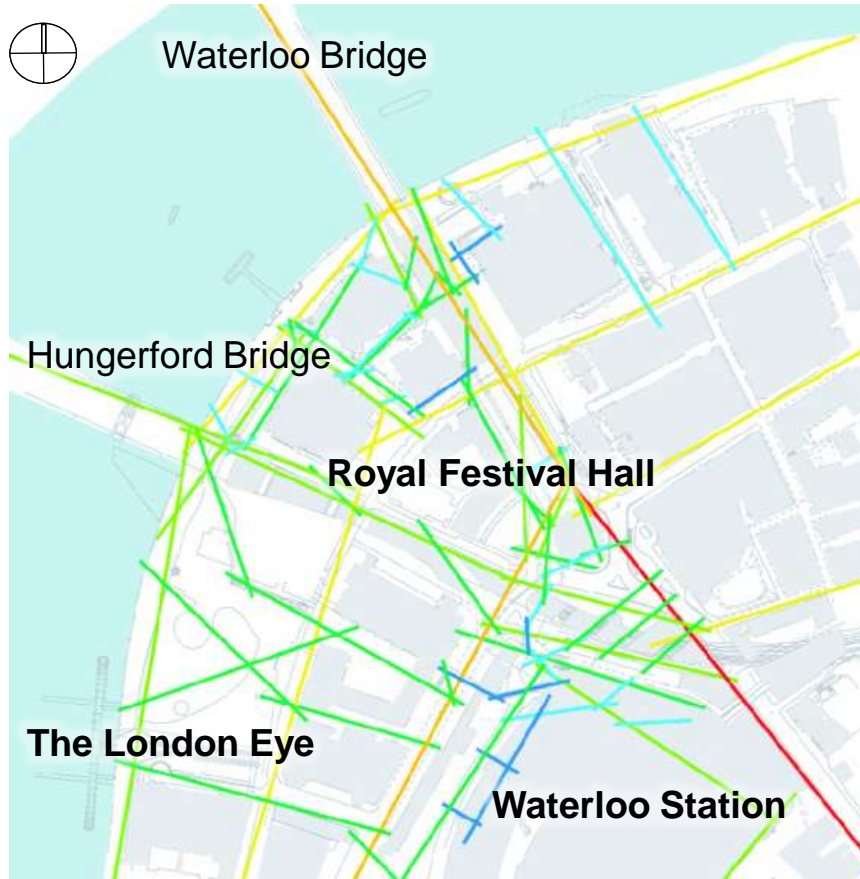


Waterloo Opportunity Area

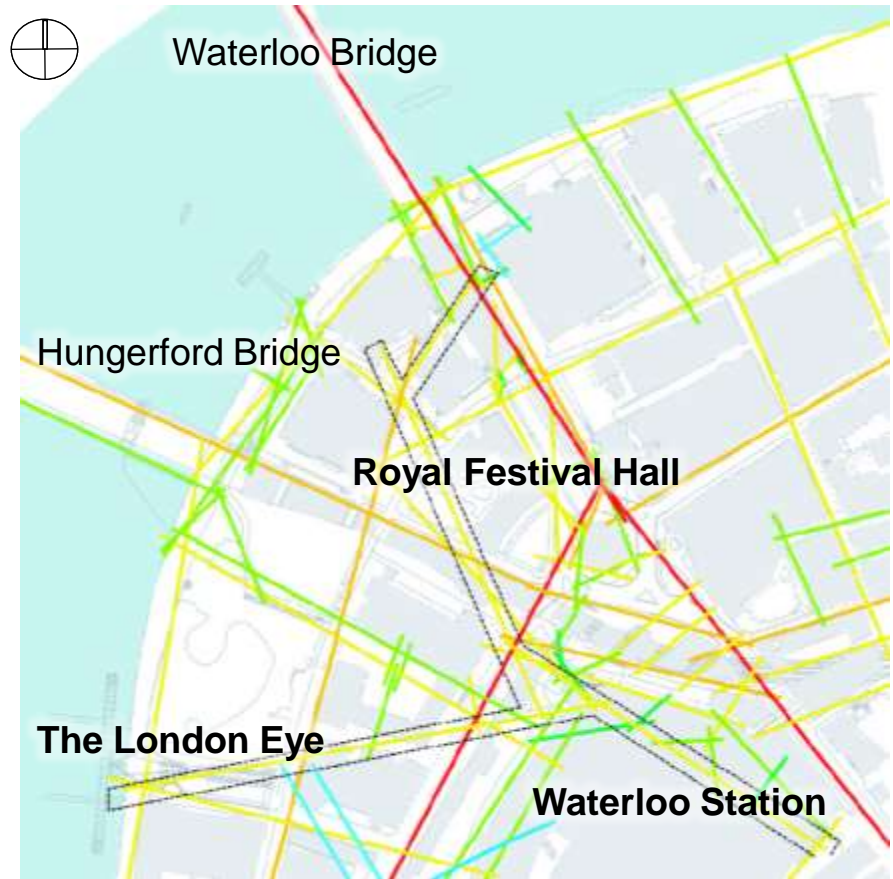


Site Boundary

Waterloo, London Spatial Integration

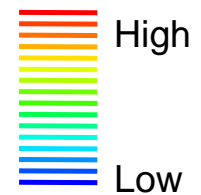


Existing



Proposed

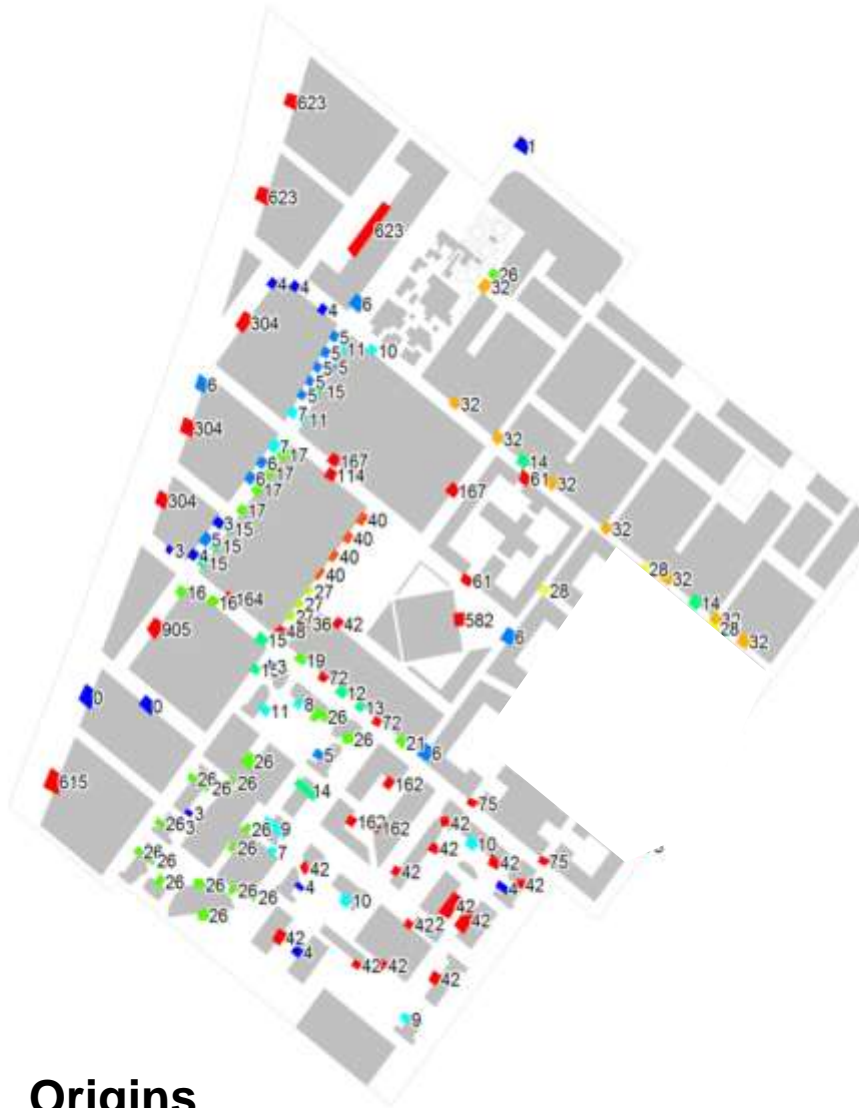
Spatial Integration



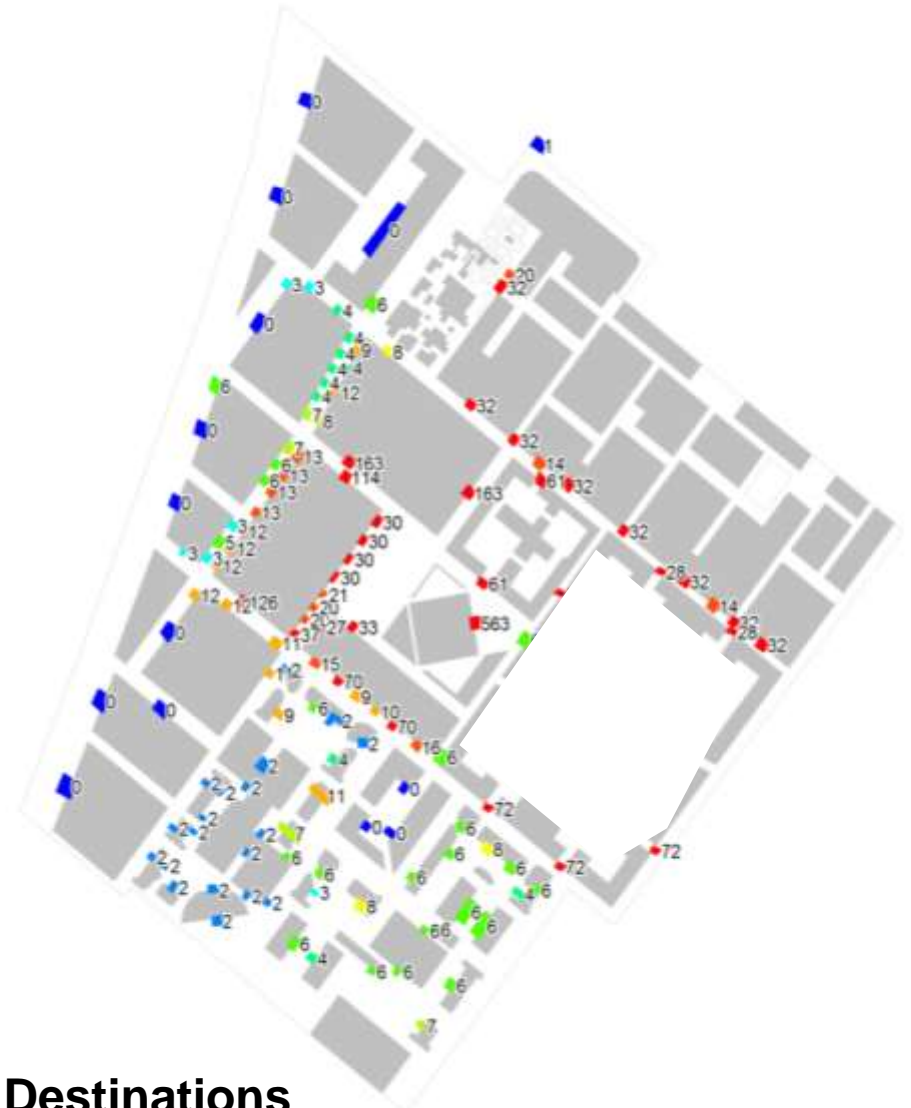
Waterloo, London High density, mixed-use regeneration



Masdar, UAE Multi origin – multi destination modelling



Origins



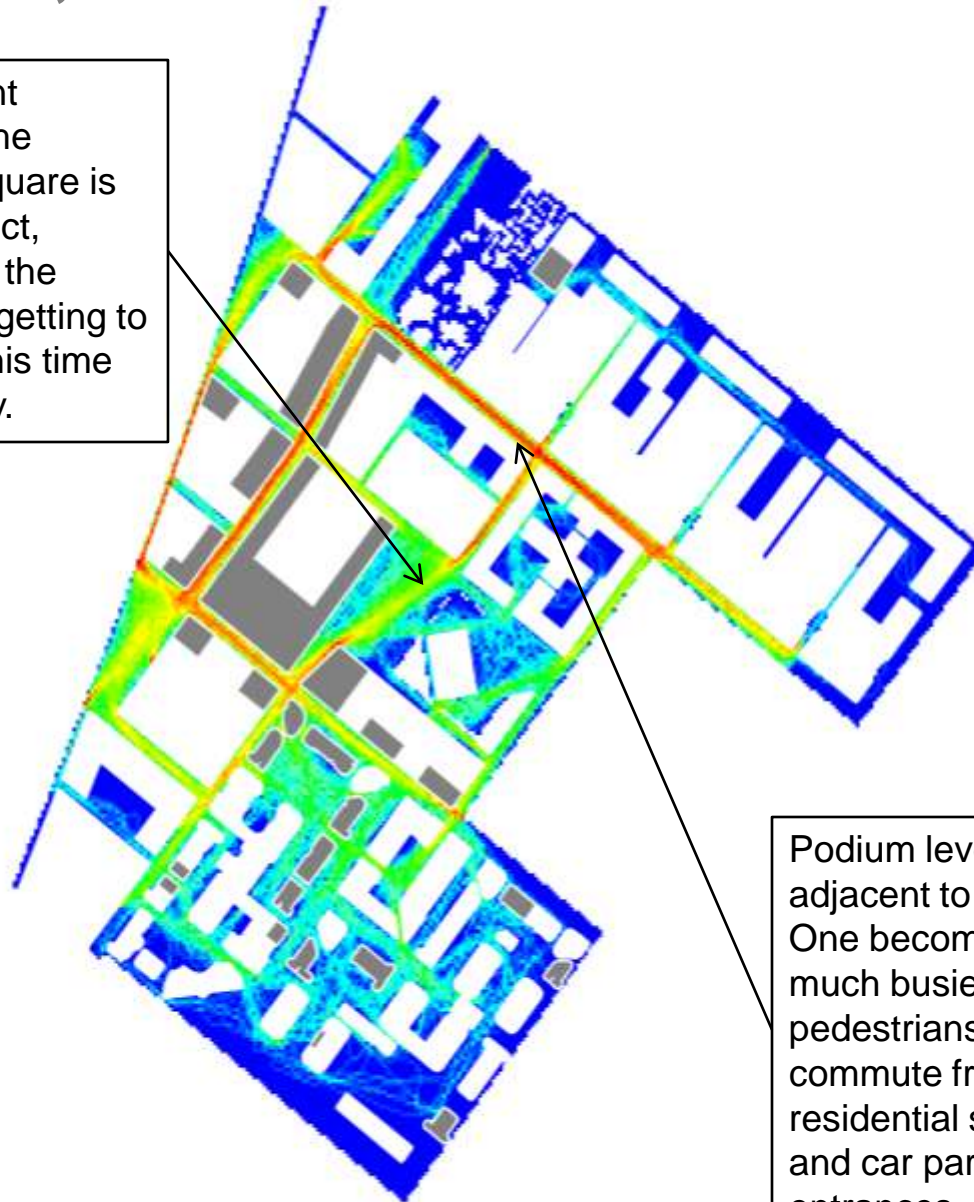
Destinations

Masdar, UAE Agent paths between origins & destinations



Masdar, UAE Pedestrian movement forecast 9am

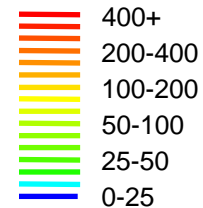
Movement through the central square is more direct, reflecting the focus on getting to work at this time of the day.



 Building outline

 Shading

Pedestrian movement
People per hour



Masdar, UAE Pedestrian movement forecast 2pm

As exposure to sunlight becomes greater on the shopping street, pedestrians move to the side of the street where shading is provided.

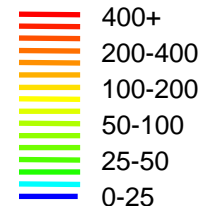
Pedestrians stay close to the shade provided by buildings rather than moving to the centre of the central square.

The University area picks up more movement as pedestrians prefer the shaded routes through to offices.



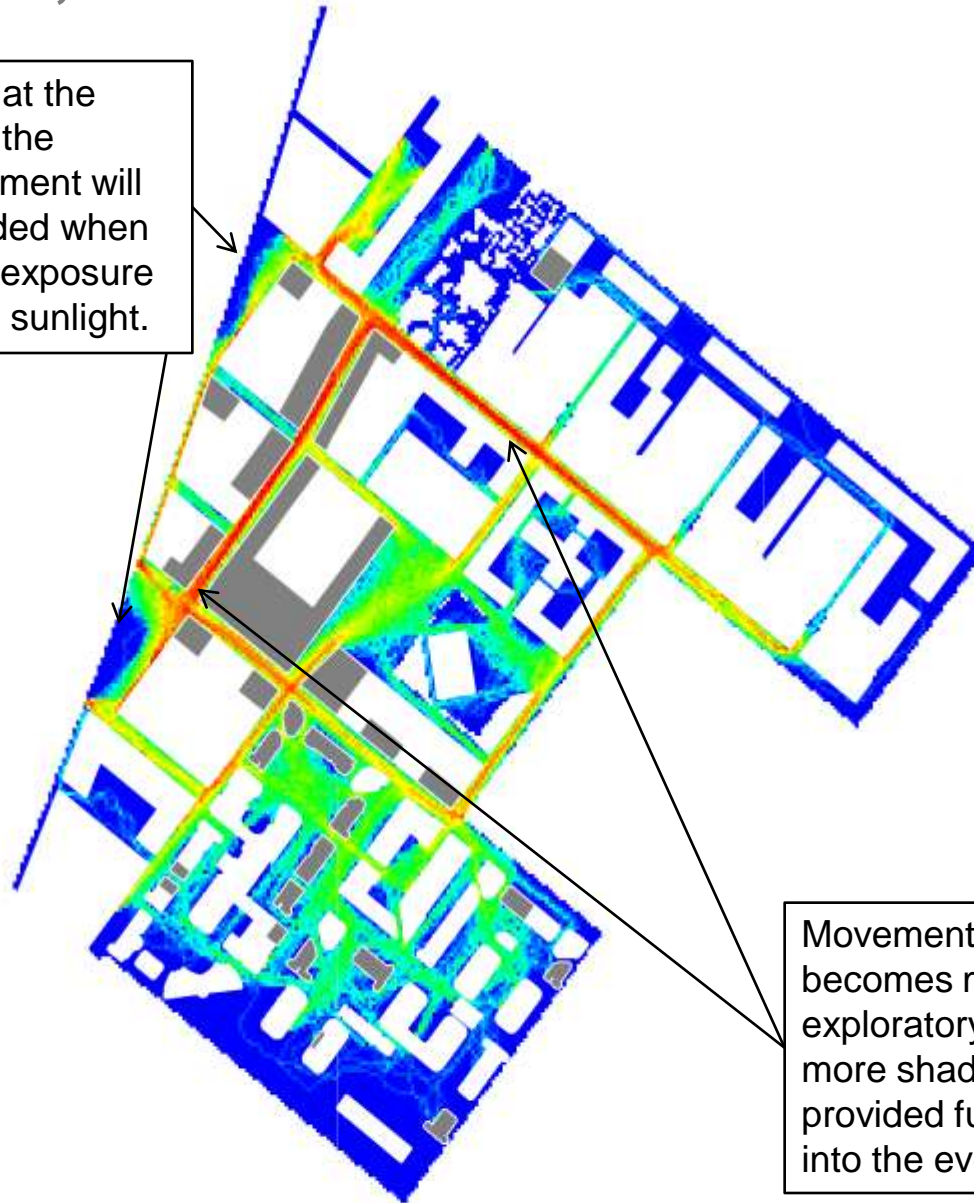
Building outline
Shading

Pedestrian movement
People per hour



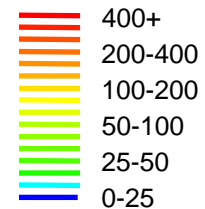
Masdar, UAE Pedestrian movement forecast 6pm

Spaces at the edge of the development will be avoided when there is exposure to direct sunlight.



Building outline
Shading

Pedestrian movement
People per hour



Masdar, UAE **Place profiling**



Some of the narrower streets of the masterplan will still receive reasonable flow levels. One of the busiest streets in the masterplan is the link between the central public square and the retail street. This connection would also be suitable for small scale retail provision.

450 People Per Hour



The busiest part of Phase 1 will have up to 700 people per hour passing through the area. This figure will rise further at specific times of the day and will ensure that small scale retail will be able to survive on the back of passing trade.

700 People Per Hour

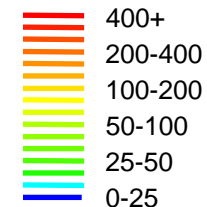


The central public space works well as a local focal space for the development. The square is a convenient short-cut between many destinations and as such will benefit for pedestrians passing through the centre of the square as well as static activity at the edges of the space.



150 People Per Hour

Pedestrian movement
People per hour



Masdar, UAE **Place profiling**



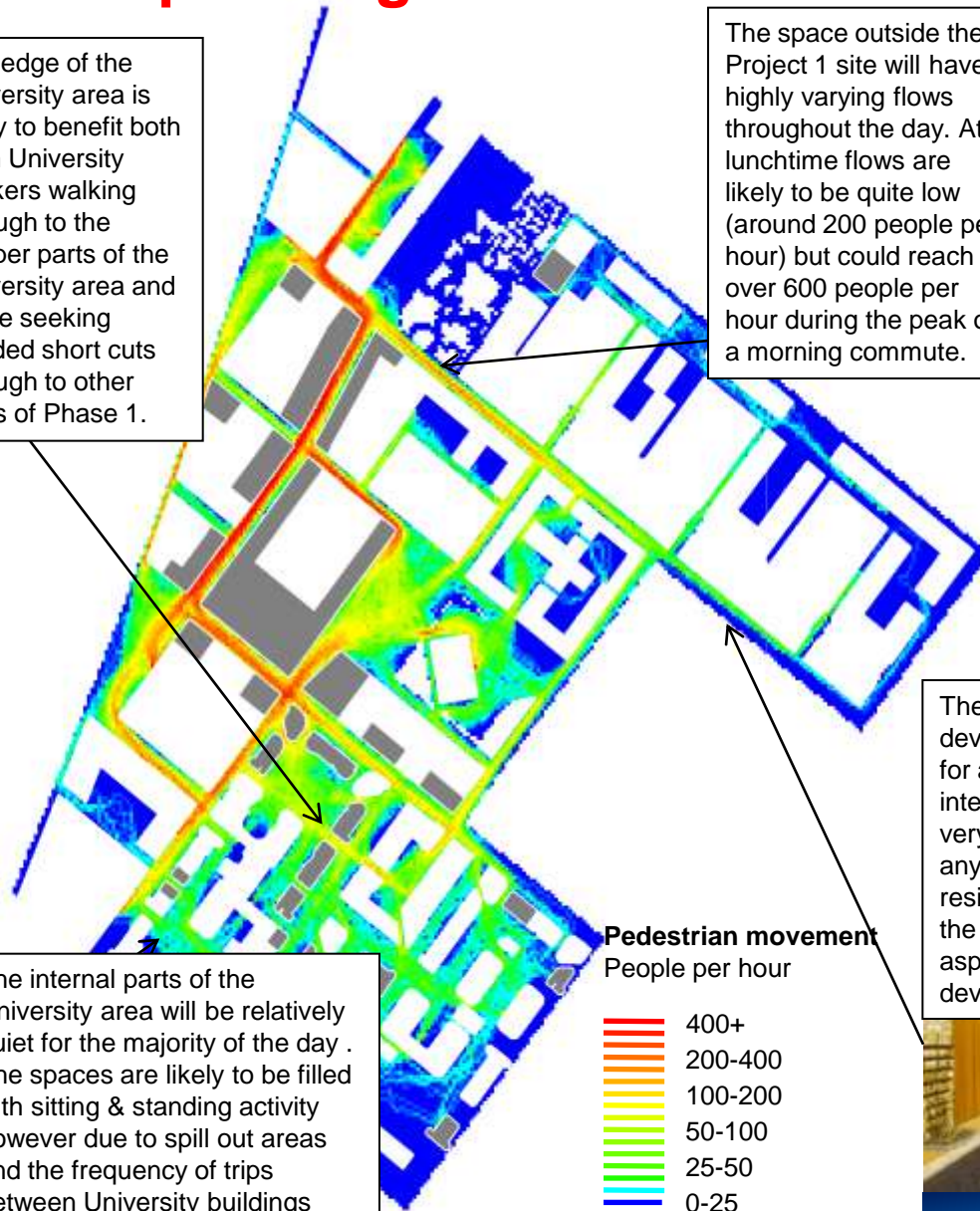
180 People Per Hour

The edge of the University area is likely to benefit both from University workers walking through to the deeper parts of the University area and those seeking shaded short cuts through to other parts of Phase 1.



30 People Per Hour

The internal parts of the University area will be relatively quiet for the majority of the day. The spaces are likely to be filled with sitting & standing activity however due to spill out areas and the frequency of trips between University buildings



The space outside the Project 1 site will have highly varying flows throughout the day. At lunchtime flows are likely to be quite low (around 200 people per hour) but could reach over 600 people per hour during the peak of a morning commute.



240 People Per Hour

The majority of the Project One development will be very quiet for almost all of the day. The internal landscaping spaces are very unlikely to be used by anyone other than immediate residents which may fit well with the intentions for the residential aspect of the Phase 1 development



10 People Per Hour

Ebbsfleet, Kent Poor connectivity



Ebbsfleet, Kent Poor connectivity



Source: Land Securities

Spatial layout efficiency **Global integration**



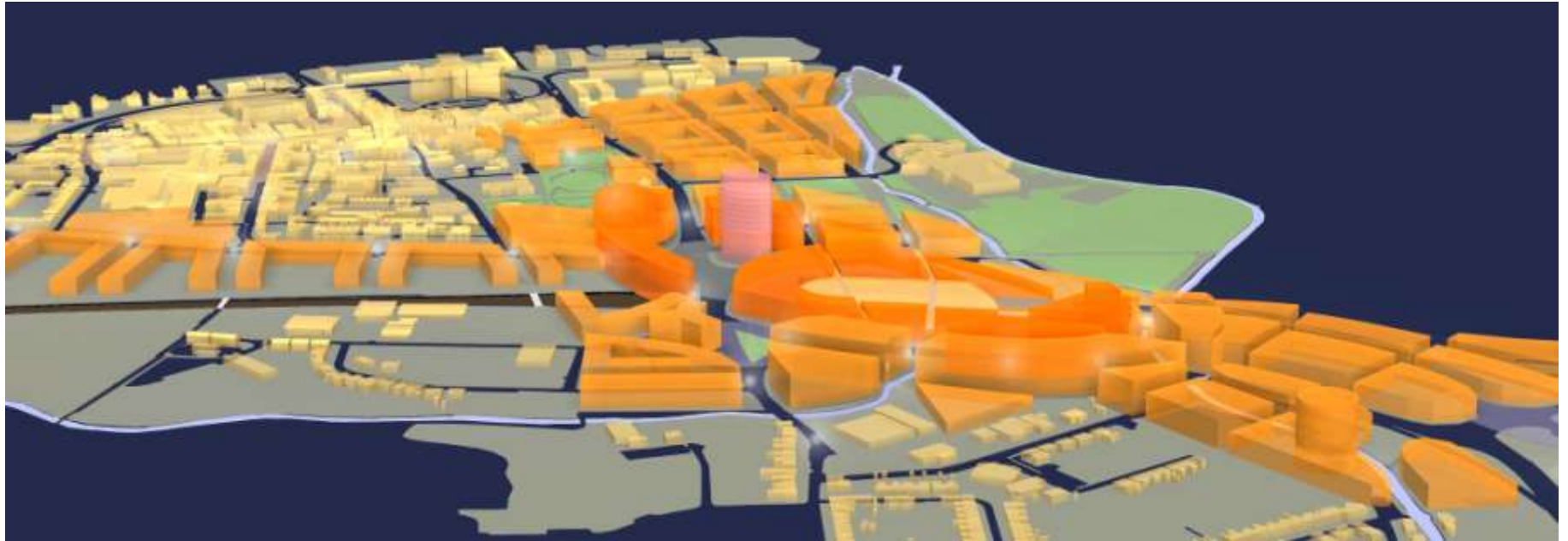
Spatial layout efficiency **Local integration**



Ashford, Kent Urban Severance



Ashford, Kent Regeneration masterplan



Designed to strengthen connections across the railway tracks.

Creates a “connective tissue”.



Ashford, Kent Public realm transformation



Source: hamilton-bailie associates

Ashford, Kent Spatial Integration analysis



Benefits of an evidence-based design approach

Revealing unseen opportunities & creating better ideas

Generating the key spatial layout & land use features of development projects.

Diagnosing existing contexts & identifying opportunities.

Benefits of an evidence-based design approach

Measuring & improving the likelihood of success

Providing reassurance.

Alerting clients to the risks of functional failure.

Finding alternative strategies to mitigate risk.

Benefits of an evidence-based design approach

Facilitating communication between teams/stakeholders

Speaking a common, spatial language.

Building bridges between consultants & communities.

UK HS2 London – Birmingham / Manchester / Leeds



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