# Measuring connectivity in London

OECD, Paris
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TfL City Planning

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# Overview

- TfL
- Connectivity measures in TfL
  - PTALs
  - Travel time mapping
  - Catchment analysis
- WebCAT
- Current and future developments



# Transport for London – what we do

- One of the GLA's 'Functional Bodies' and directly accountable to the elected Mayor
- Responsible for strategic planning for transport in London (Mayor's Transport Strategy), and significant implementation and operation - London Underground, Buses, DLR, Tram, Overground
- City Planning is responsible for delivering an integrated, effective and efficient Strategy and Planning function across TfL

**'Keep London working and growing and make life better**


**Meet the rising expectations of our customers and users**

**Plan ahead to meet the challenges of a growing population**

**Unlock economic development and growth**

# Connectivity measures in TfL

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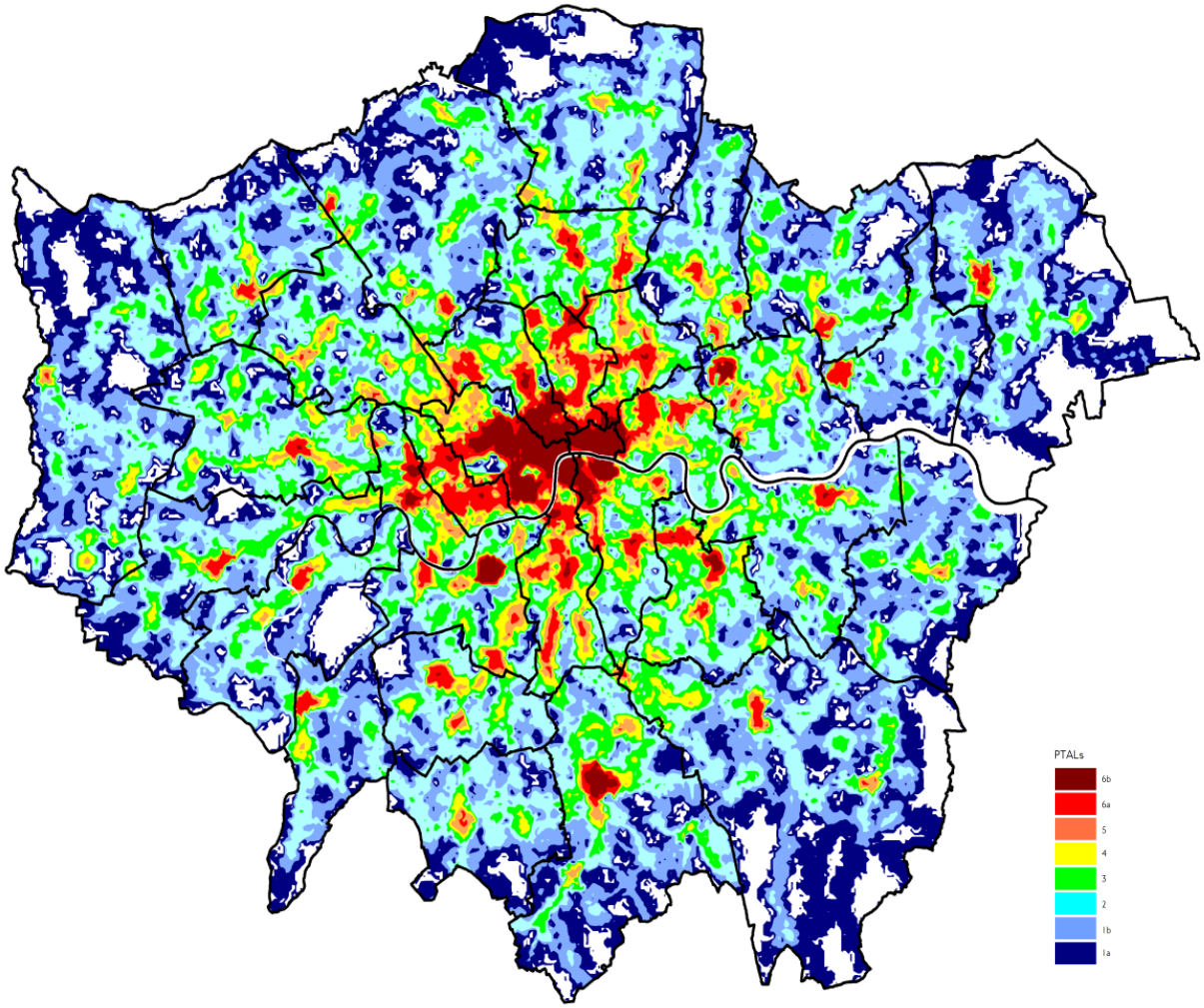
# Public Transport Accessibility Levels (PTALs) are our simplest measure of connectivity

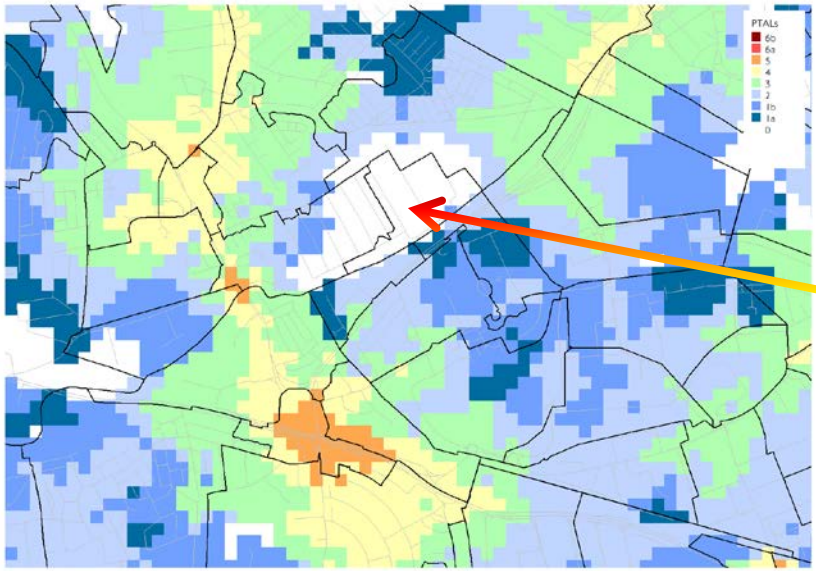



For any location in London PTALs combine walk times and service wait times to give a measure of connectivity to the Public Transport network

They are relatively easy to use and calculate

Mapped output provides a clear and intuitive representation of public transport provision across London – understandable to both transport planners and the general public

# PTALs at the local - site specific level




A new housing development may be planned here but it is beyond the maximum walk time to the transport network – PTAL 0

The simplicity of PTAL means we can calculate them using a grid of points at 100m intervals - 150,000+ across London

Highlights variation in access to the transport network within a development site or at a sub-zonal level

We provide PTAL calculation results for individual locations on our website WebCAT

## PTALs and the London Plan

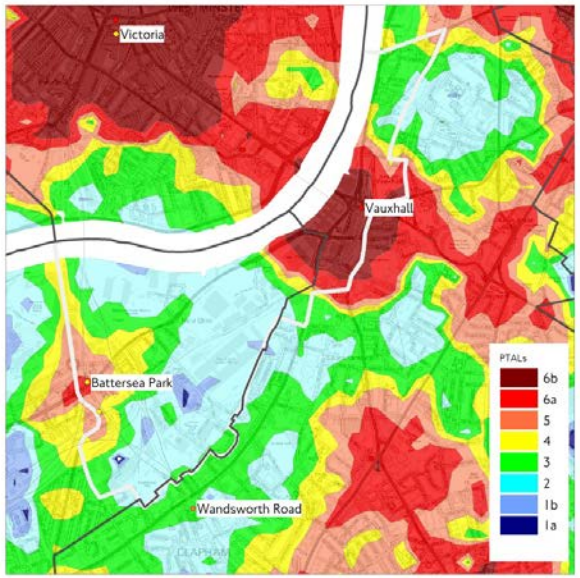
- a key factor to determine housing densities across London
- helps defines parking provision in residential developments
- used to monitor the provision of business and commercial activities in areas of good connectivity – PTAL 5 and above
- the methodology has been adapted and used in other locations: Manchester and Singapore

Table 3.2 Sustainable residential quality (SRQ) density matrix (habitable rooms and dwellings per hectare)

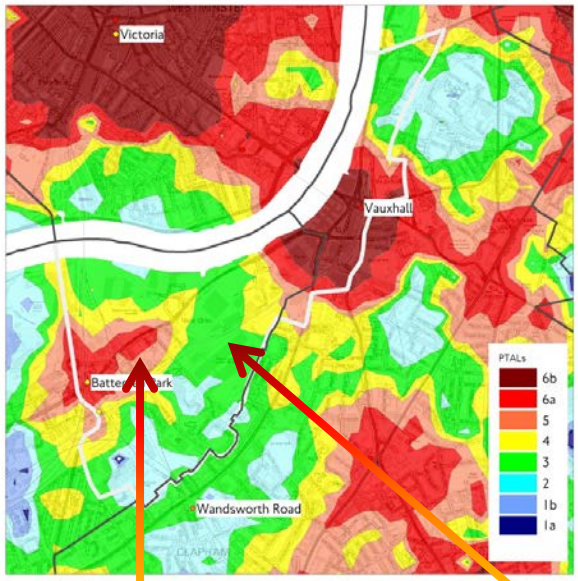
| Setting | Public Transport Accessibility Level (PTAL) | | |
|---|---|---|---|
| | 0 to 1 | 2 to 3 | 4 to 6 |
| Suburban | 150–200 hr/ha | 150–250 hr/ha | 200–350 hr/ha |
| 3.8–4.6 hr/unit | 35–55 u/ha | 35–65 u/ha | 45–90 u/ha |
| 3.1–3.7 hr/unit | 40–65 u/ha | 40–80 u/ha | 55–115 u/ha |
| 2.7–3.0 hr/unit | 50–75 u/ha | 50–95 u/ha | 70–130 u/ha |
| Urban | 150–250 hr/ha | 200–450 hr/ha | 200–700 hr/ha |
| 3.8 –4.6 hr/unit | 35–65 u/ha | 45–120 u/ha | 45–185 u/ha |
| 3.1–3.7 hr/unit | 40–80 u/ha | 55–145 u/ha | 55–225 u/ha |
| 2.7–3.0 hr/unit | 50–95 u/ha | 70–170 u/ha | 70–260 u/ha |
| Central | 150-300 hr/ha | 300–650 hr/ha | 650–1100 hr/ha |
| 3.8–4.6 hr/unit | 35–80 u/ha | 65–170 u/ha | 140–290 u/ha |
| 3.1–3.7 hr/unit | 40–100 u/ha | 80–210 u/ha | 175–355 u/ha |
| 2.7–3.0 hr/unit | 50–110 u/hr | 100–240 u/ha | 215–405 u/ha |

# PTALs can demonstrate how improved walking links and/or new transport provision can improve site connectivity

## Current PTALs



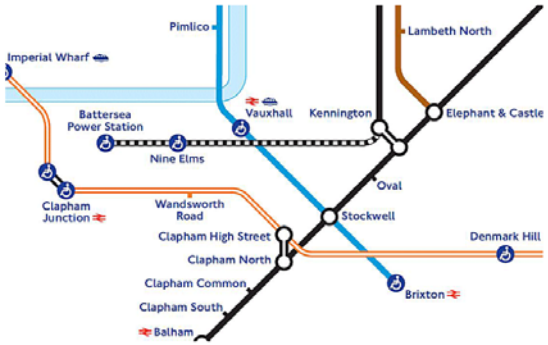

## Future PTALs




This example is for the Vauxhall/Nine Elms/Battersea area

Changes due to the introduction of a new underground station at Battersea and improved walking routes

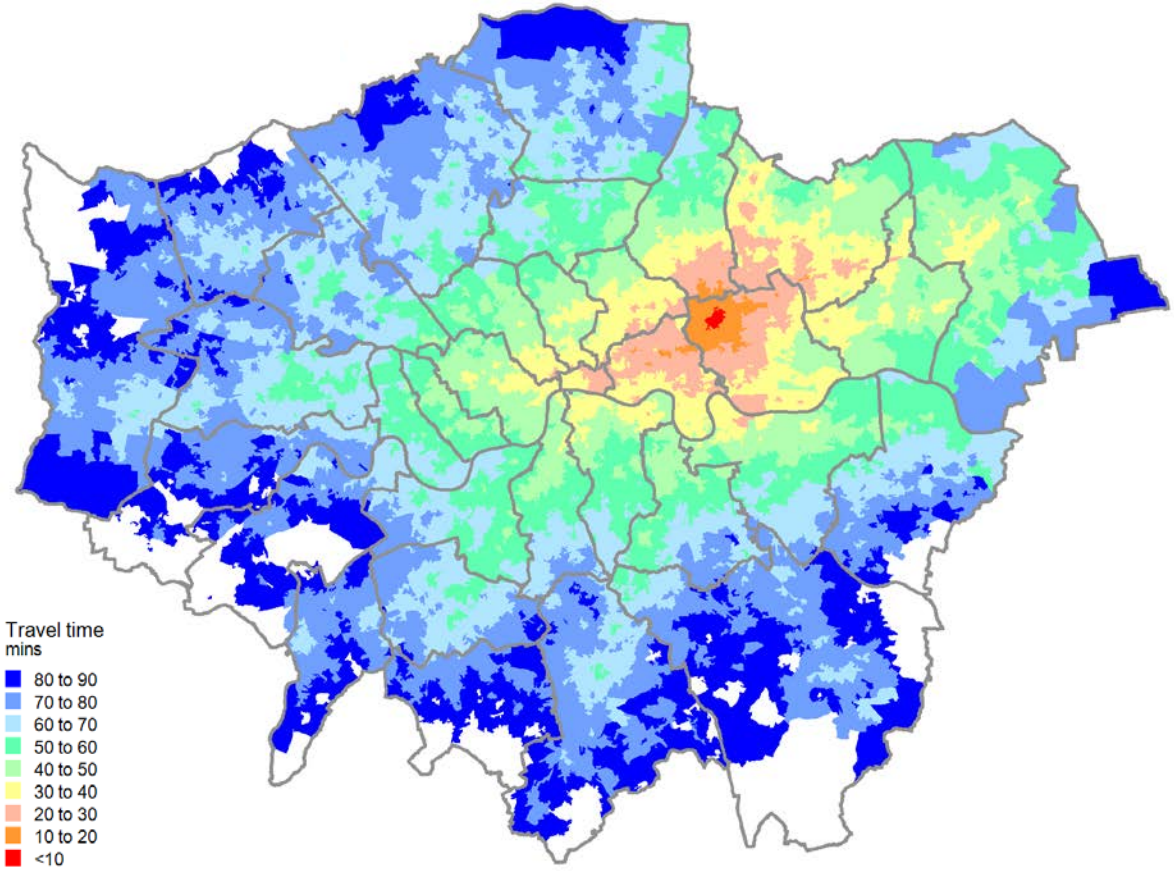
Tube map of proposed extension




New station to be built here

Residential developments with improved walking links across the area

# Travel time mapping measures connectivity in terms of how far you can get through the network for any combination of locations



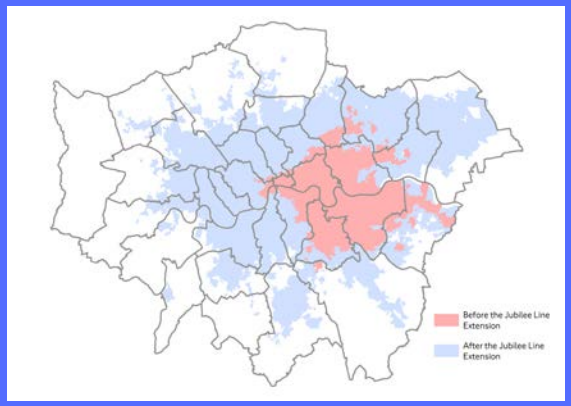

**This example shows travel times to Stratford using Census Output Areas in London**

**The network used includes:**

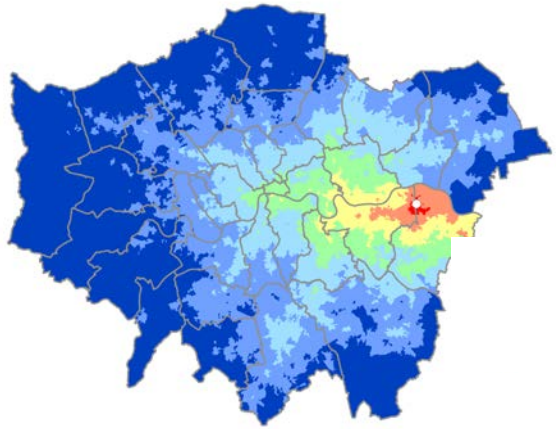
- **Year**: existing network
- **Mode**: all PT modes (bus, rail, DLR, LU etc)
- **Time period:** AM Peak
- **Direction**: to the location

# Travel time mapping – some more examples

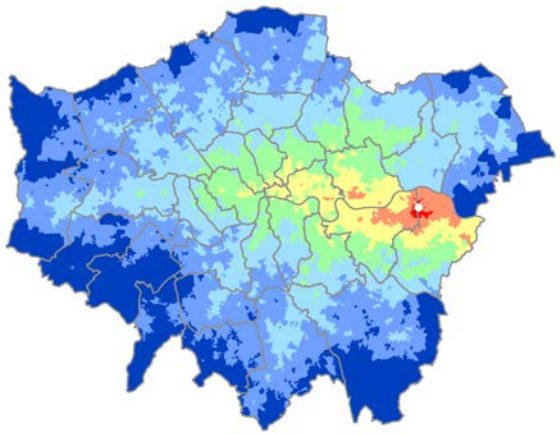
Comparing travel times (60 minute catchments) to North Greenwich with/without the Jubilee Line



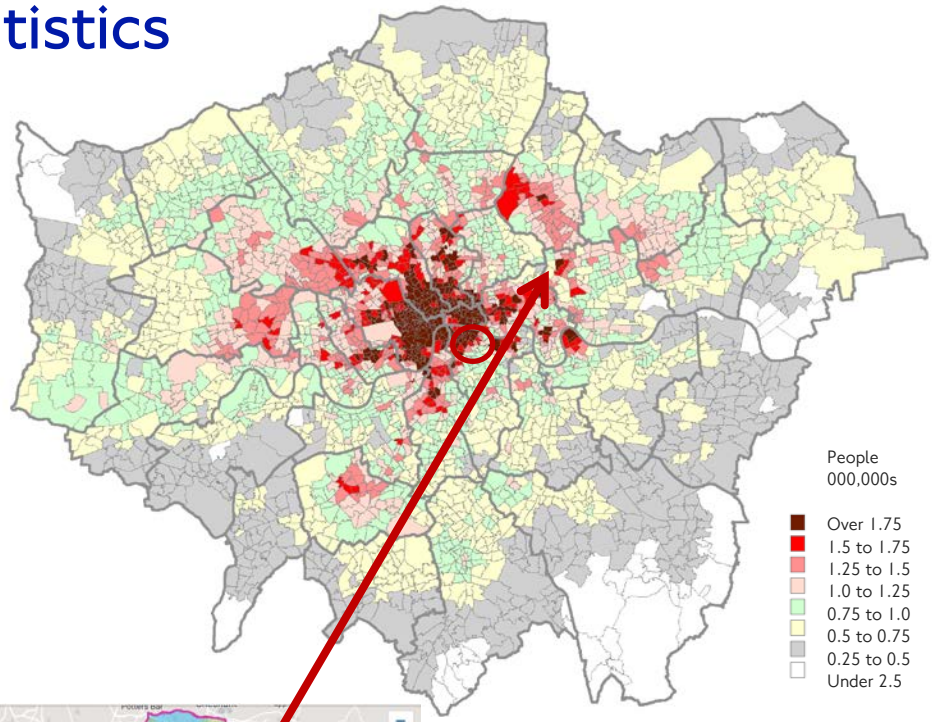

Combined 45 minute travel time Catchments to the nearest large town centre



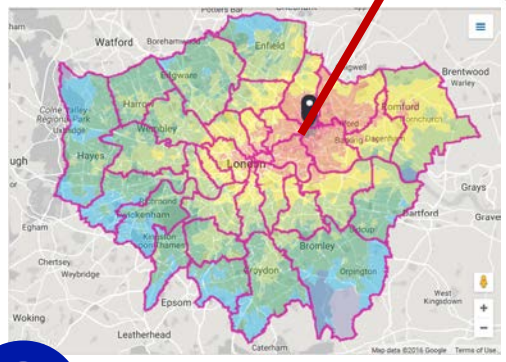
Travel times from Abbey Wood – with and without Crossrail

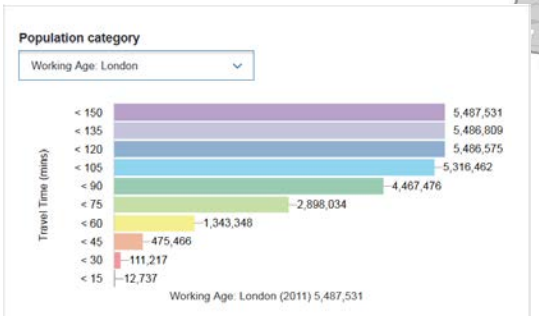


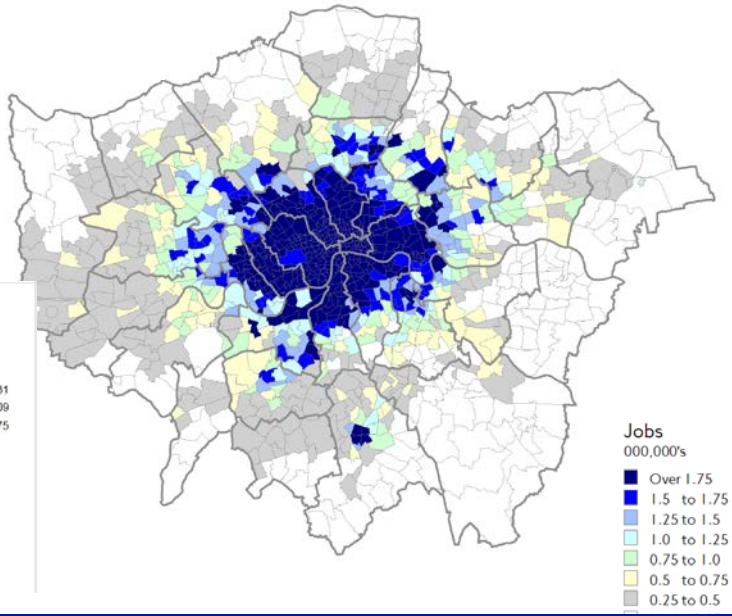
# London-wide catchment analysis – aggregates the catchment results for each zone in London and maps the calculated statistics




These examples show the population (left) and jobs (below) within 45 minutes travel time of each zone in London

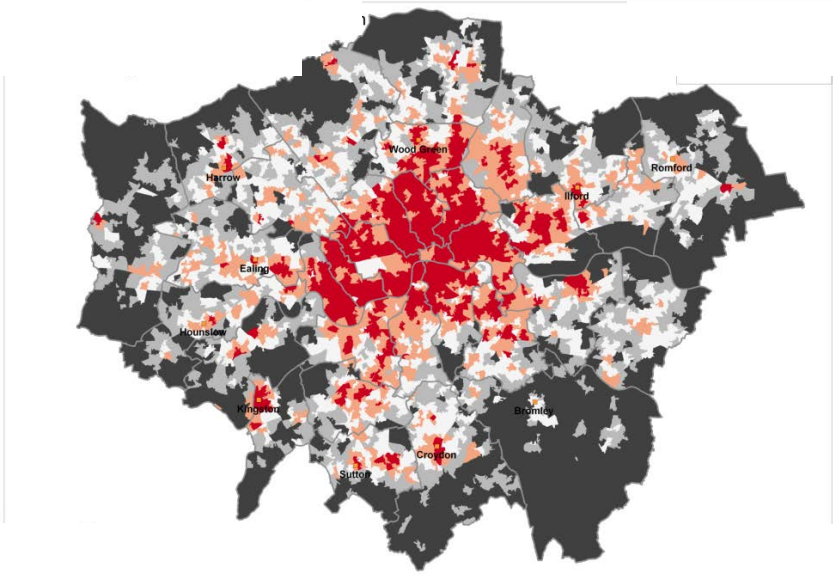


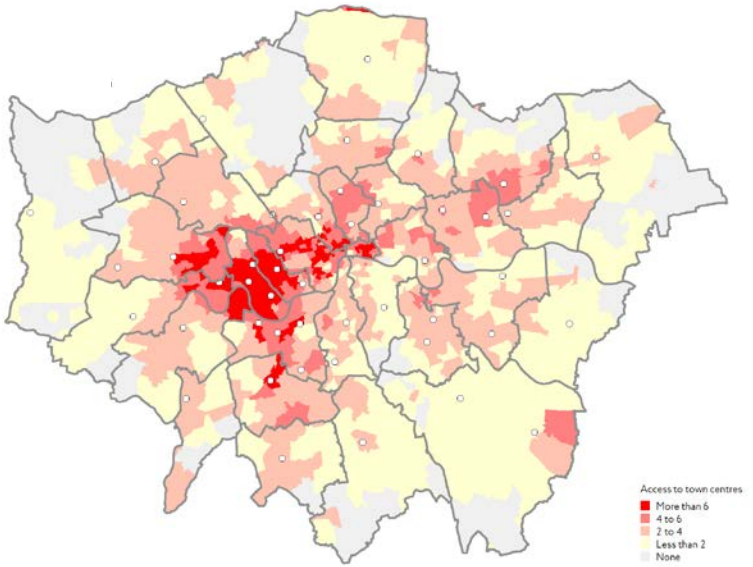



# ATOS – measuring access to opportunities and services

- ATOS developed as a measure to quantity access to a basket of essential services including – schools, GP surgeries, food shopping etc.
- There are issues associated with defining these services: capacity, quality, service provision, public/private
- This map show the ATOS composite score map - combing data for all service types.




- As a proxy for a basket of services we often measure access to town centres
- Assuming that all centres would offer the same basic services we can quantity the number of centres within say 45 minutes of a location
- This map calculates access to metropolitan and major centres in London



# Bringing TfL's connectivity work together

## WebCAT

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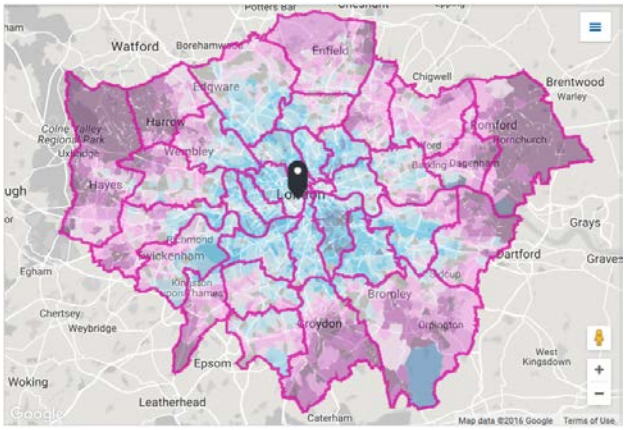
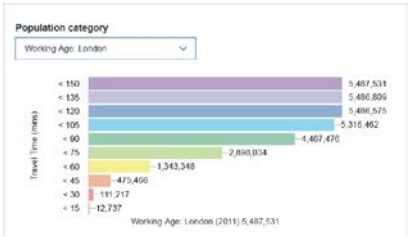
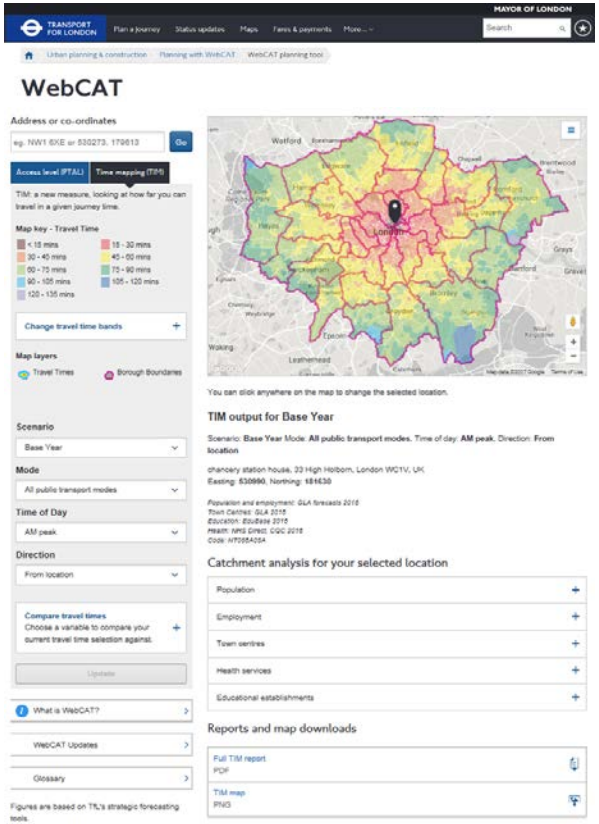
# WebCAT brings together our connectivity measures into one intuitive web-based application

- Available on TfL's public website
- Select a location on the interactive map to view site specific connectivity data:
  - PTALs
  - Travel time mapping
  - Catchment  statistics
  - Comparison tool
- Flexibility to accommodate for user requirements









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# WebCAT data sources: TfL's strategic models

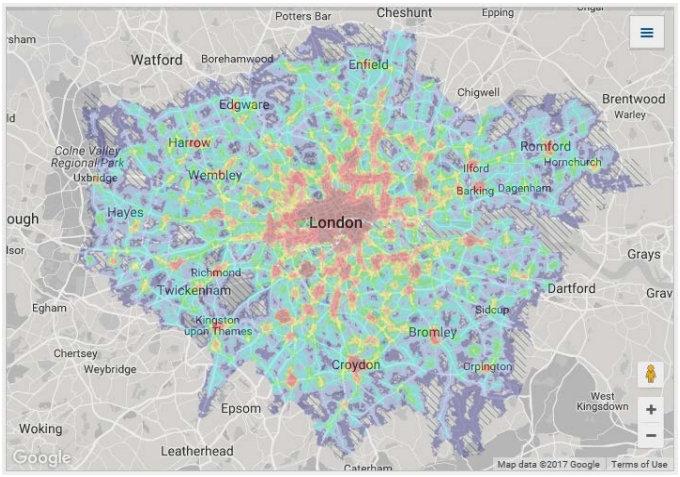
PTALs

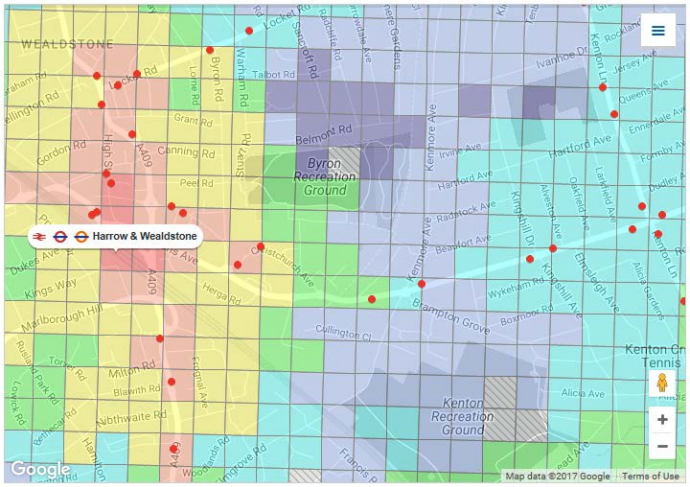
- Public transport model (Railplan) provides service definitions for current and future PTAL calculations

Travel time analysis

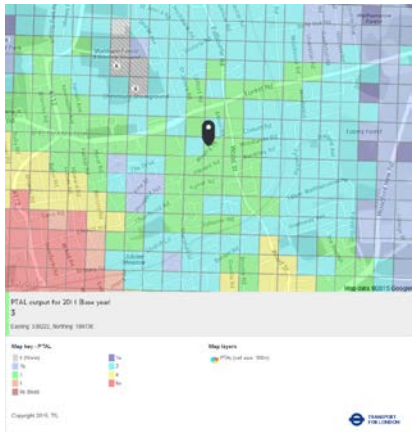
- Journey time matrices: public transport (Railplan) and cycle (Cynemon)
- Population and employment forecasts for catchment analysis
- Zoning systems

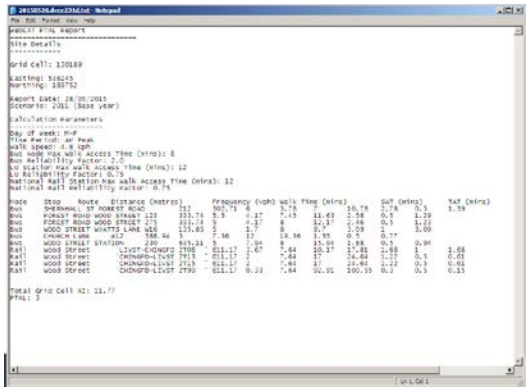
# WebCAT and PTALs




- View PTALs at a strategic or local level: WebCAT calculates PTAL for a grid of points at 100m intervals across London
- See PTALs in context
- Highlights variation in access to the transport network within a small local area
- Current and Future PTALs avail;able
- Reports and downloads





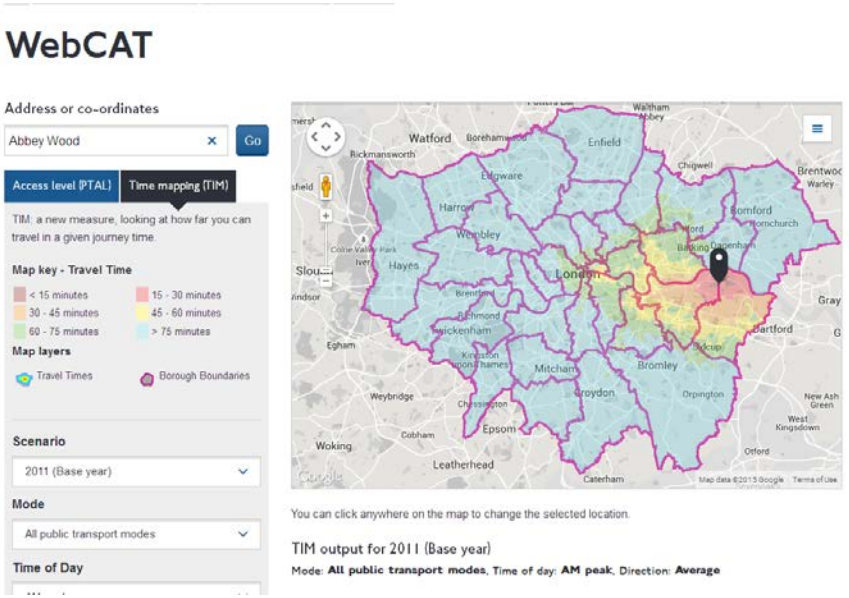
# WebCAT and travel time analysis

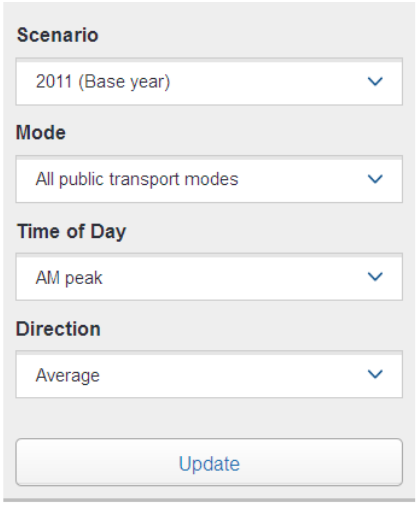
Users can select different travel time datasets based on the following criterion:

- Year: 2011, 2021, 2031
- Mode: All PT, Bus, Step-free
- Time of Day: AM Peak, Inter-peak, PM Peak
- Direction: To, From, Average

You can also:

- generate catchment bar charts for each location
- Compare and plot different travel time variables
- Alter the travel time bands to suite your analysis

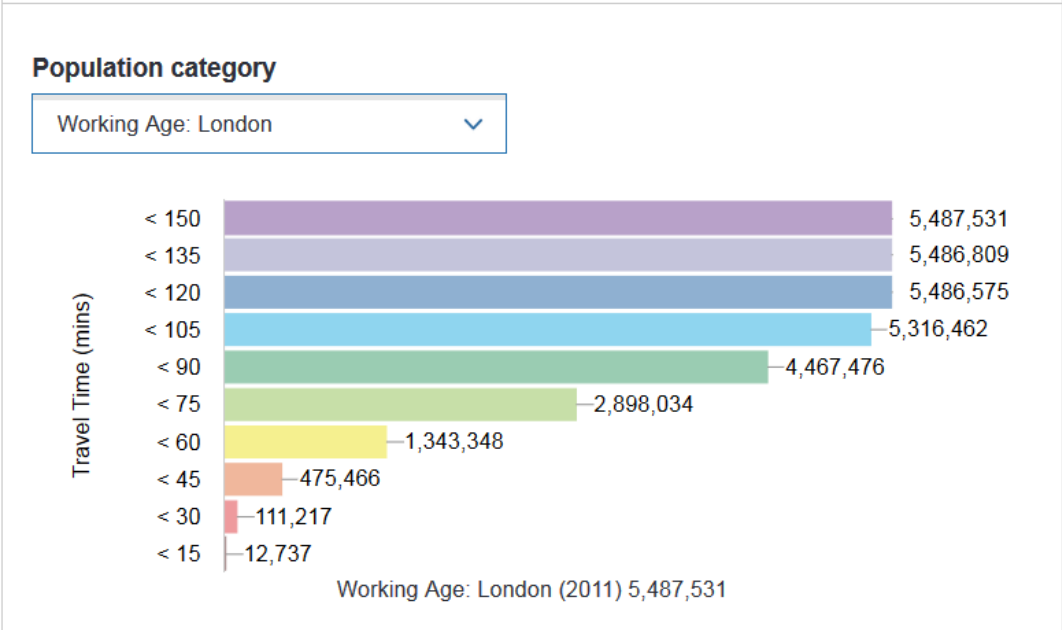


# WebCAT and catchment analysis

Using cumulative bar charts:

- See how many people or jobs are there within each mapped travel time band
- View the impact of a new scheme
- Population and jobs data based on the GLA forecasts for: 2011, 2021 and 2031
- Data included for locations in and outside London




Data sets available:

Population – in London or London & SE
Total
Households
Working age
Economically active
Pensioners

Jobs – in London or London & SE

Town Centres
Metropolitan
Metropolitan + Major
Metropolitan + Major + District

Health services
A&E departments
GP surgeries
Pharmacies

Educational establishments
Primary schools
Secondary schools
Further educations

# Current and future developments

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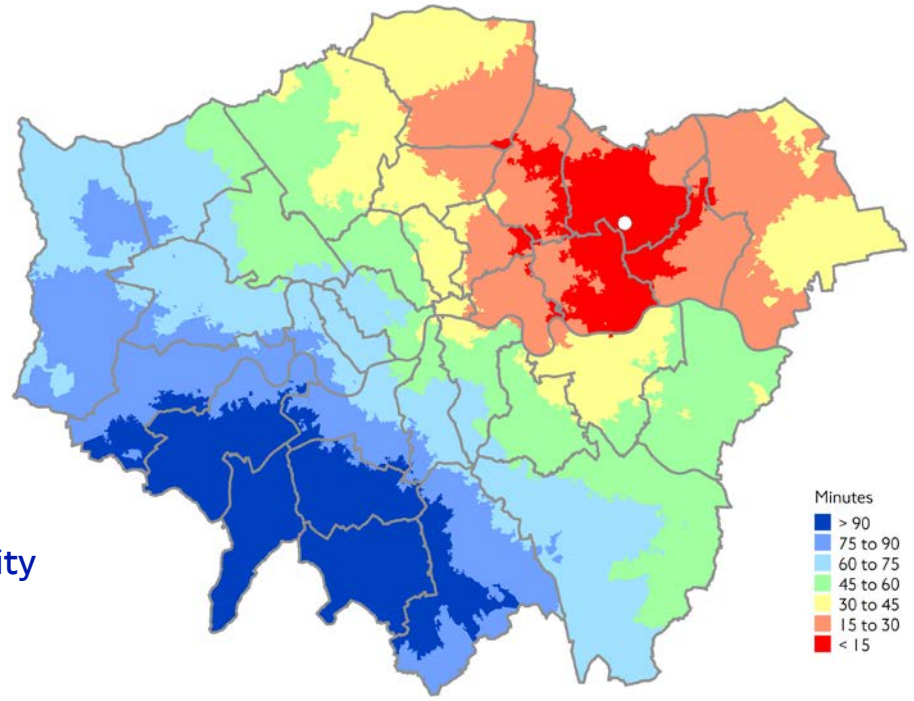
# Connectivity analysis and the 2017 Mayor's Transport Strategy

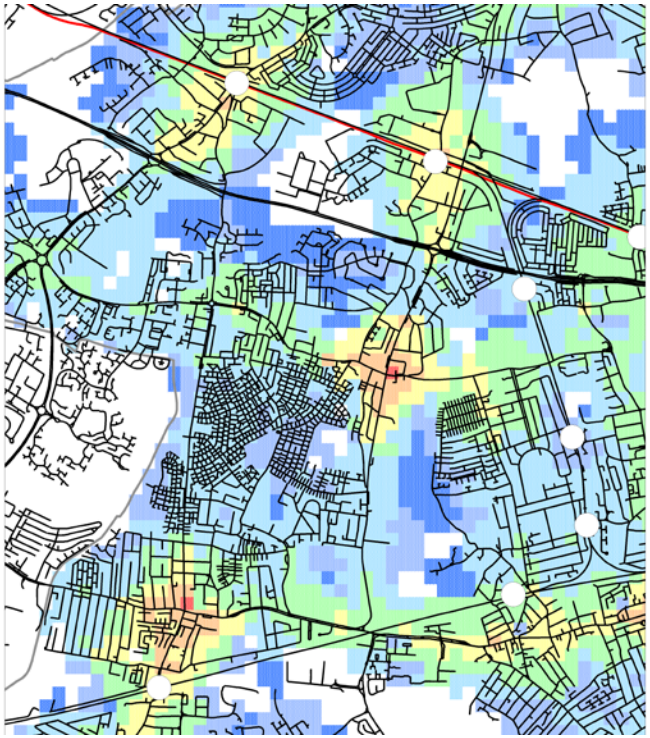
- By 2041 London will have a population of 10.5m, accompanied by 6.8 million jobs
- For London to grow and thrive, it is essential "that London's residents, workers and visitors walk, cycle and use public transport more to improve their health and the environment, to make streets work more efficiently and keep London moving"
- By 2041, 80 per cent of all Londoners' trips (currently 64%) will be made on foot, by cycle or by public transport
- Our connectivity measures will reflect these aims and include all modes in our analysis

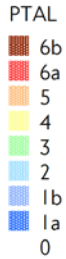
# WebCAT – future developments

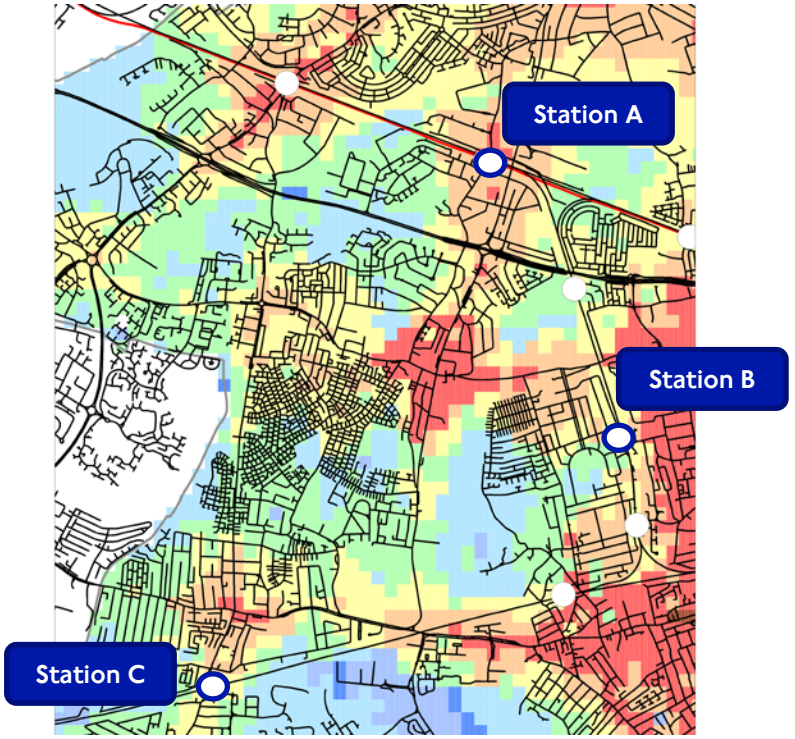
- Including additional travel time datasets
  - Highway travel times
  - Walking analysis
- Including additional catchment datasets
  - Employment  sectors
  - White/Blue collar
  - Service locations
- Improved mapping and reporting functionality



# PTALs + cycling: extending the access distance to rail stations means new areas have potential for residential development





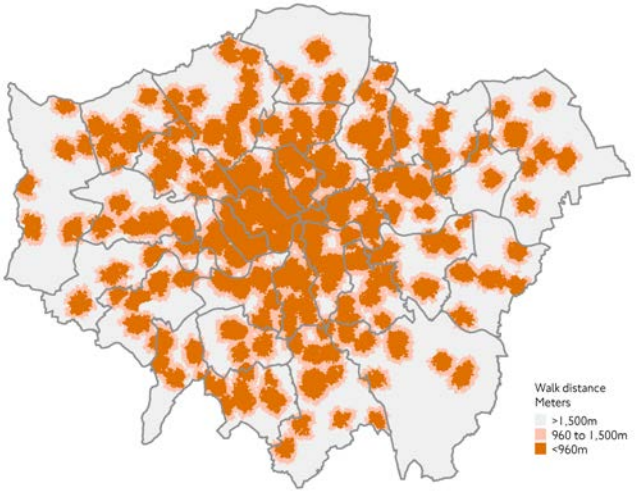



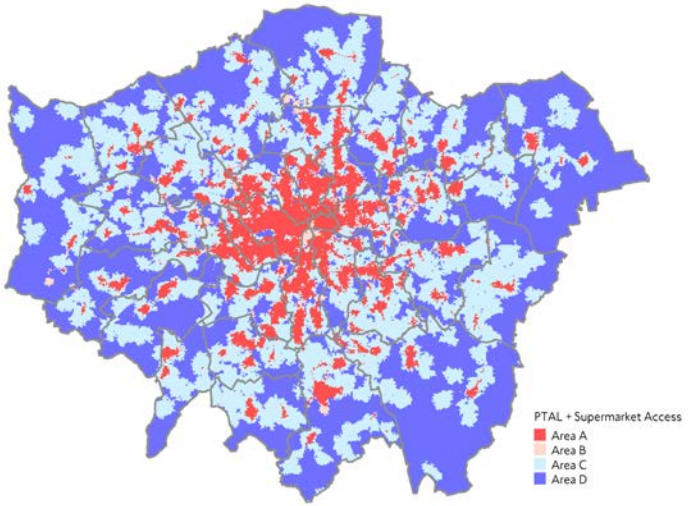

- Suburban area - PTAL 1b or 2
- Beyond the maximum walk distance to rail services using standard PTAL parameters

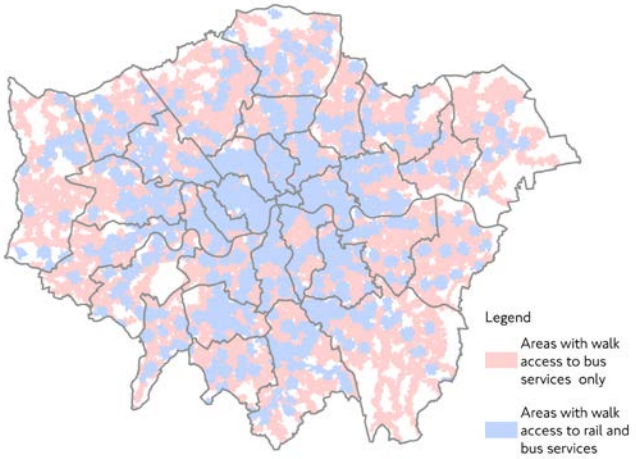
- Cycling extends access to local rail services - raising PTAL to 3 or above
- Unlocks additional areas to housing development with appropriate infra-structure

# Walking connectivity

- Access to opportunities and services by walking only – sustainable neighbourhoods
- Walk catchments and network density
- PTALs as a walking model – access to public transport services
- Combing PTAL and service access data to highlight different categories e.g. poor PT connectivity but good local service provision.

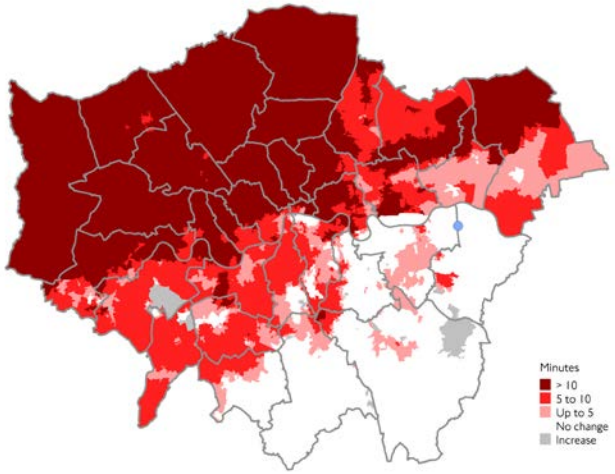


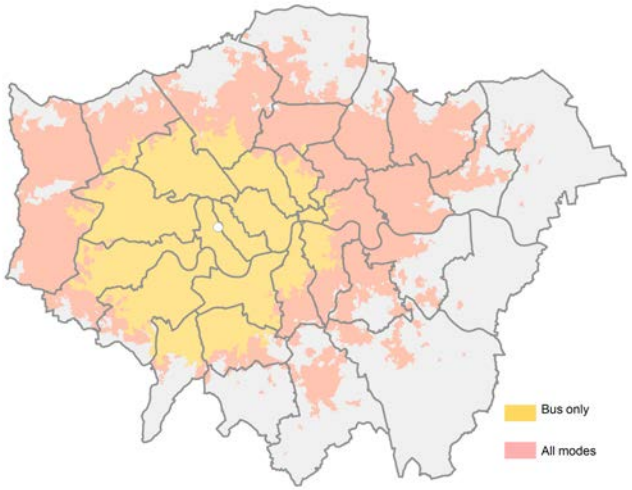



# Some final thoughts

- What is the right balance between providing technical detail and complex measures vs ease of interpretation? Which are the key audiences for these types of measures?
- Is there a benefit to using more real time data to base our connectivity analysis on? What could these datasets be and do the benefits outweigh the cost?
- How important is inclusion of highway measures? How can we mitigate concerns around comparability of public and private modes? How useful are highway measures in promoting us of sustainable transport?
- How useful are measures that build in non-journey time attributes? Which user cases would this be required for? What are the associated challenges?
- Are formalised connectivity indicators required for all circumstances? Should we develop more flexible tools tha allow users to undertake their own analysis within a agreed parameters?



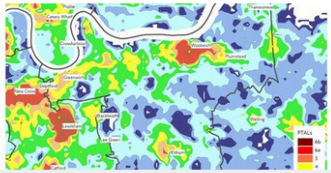



# Further information

## Planning with WebCAT

Share

We use WebCAT to provide information on London's transport system to the professional planning community. This connectivity assessment toolkit allows planners to measure public transport access levels (PTAL) and to produce travel time reports.



**WebCAT**

Go to the toolkit to check PTAL values and create travel time maps


**WebCAT updates**

Find out what connectivity data is being added to the toolkit

### What is WebCAT?

WebCAT is a toolkit to help the work of professional planners in London. WebCAT stands for Web-based Connectivity Assessment Toolkit. The toolkit currently contains two main tools: PTAL and Time Mapping (TIM).

WebCAT allows users to create their own PTAL maps and view PTAL for future scenarios. PTAL values are now pre-calculated using a grid of points at 100m intervals across the Greater London area.

WebCAT replaces the TfL Planning Information Database website at www.webptals.org.uk. This site will close after WebCAT is launched.

### Connectivity assessment guide

Our complete guide to connectivity assessment will help WebCAT users become familiar with the techniques we use to assess levels of connectivity in London.

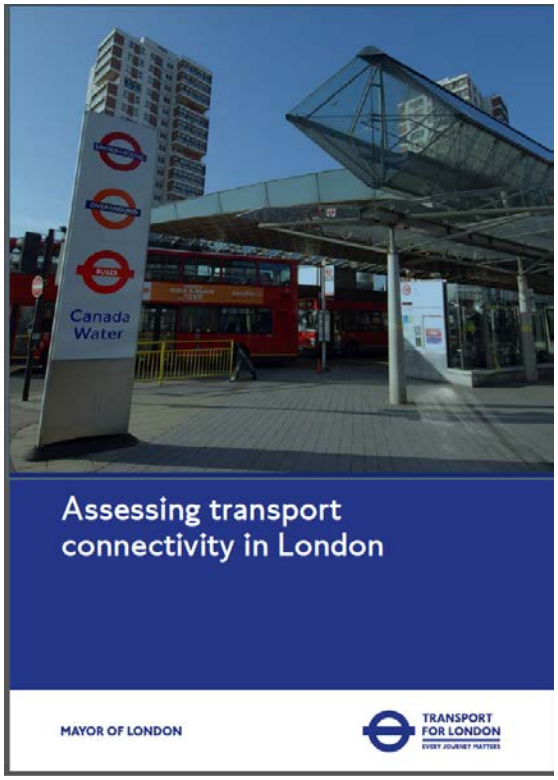
**URBAN PLANNING & CONSTRUCTION**

- Planning applications
- Transport assessment guidance
- Travel plans
- Conveyancing searches
- Highway licences
- Transport & healthcare
- Roadworks & street faults
- Urban design

**PLANNING WITH WEBCAT**

- WebCAT
- Glossary
- WebCAT updates
- Interchange
- Contacts

SUMMER: AVAILABLE FOR




**Visit us at: www.tfl.gov.uk/WebCAT**

**Contact us at: WebCAT@TfL.gov.uk**