Journey time and connectivity measures for London

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RGS/IBG

Journey times for policy-making, delivery and evaluation

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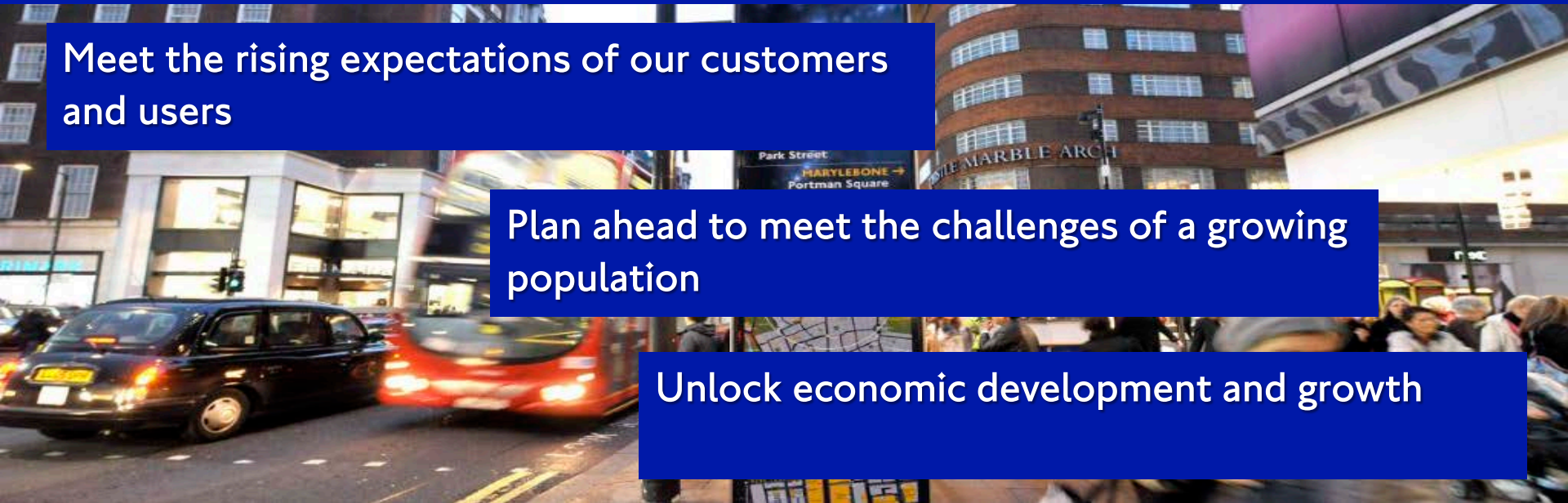
Overview

- TfL
- TfL journey time datasets
- Travel time analysis
- WebCAT
- 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



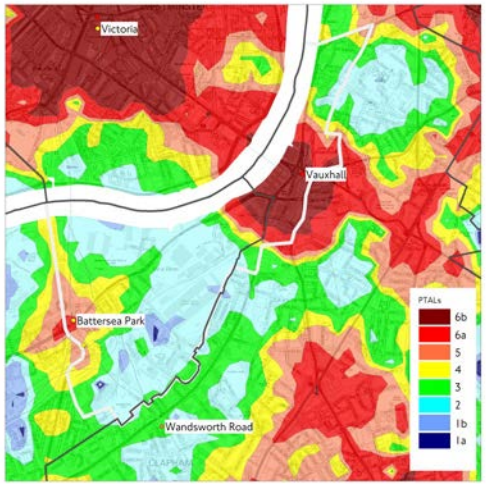
Meet the rising expectations of our customers and users

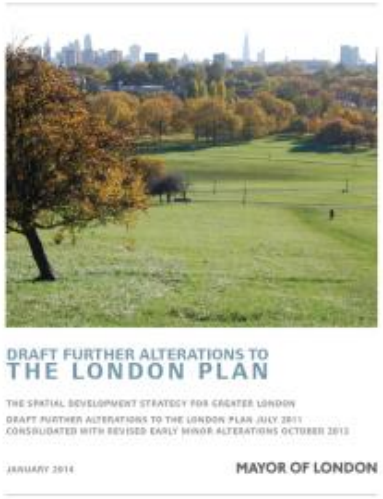
Plan ahead to meet the challenges of a growing population

Unlock economic development and growth

Journey time/connectivity analysis is central to TfL City Planning's work

- Mayor's Transport Strategy
- London Plan
- Build the case for new transport schemes
- Regeneration schemes
- Encouraging modal shift





Journey time data is derived from our strategic transportation model outputs

- Journey time matrices available for all modes:
    - Public transport (Railplan) Rail, Tube, Bus, DLR, Tram
    - Cycling (Cynemon)
    - Highway LOHAM

- Current and Future networks – Crossrail - new schemes and projects
- Time periods – Peak, Inter-peak, Evening
- Congestion and crowding
- Population and employment forecasts for catchment analysis
- Zoning systems

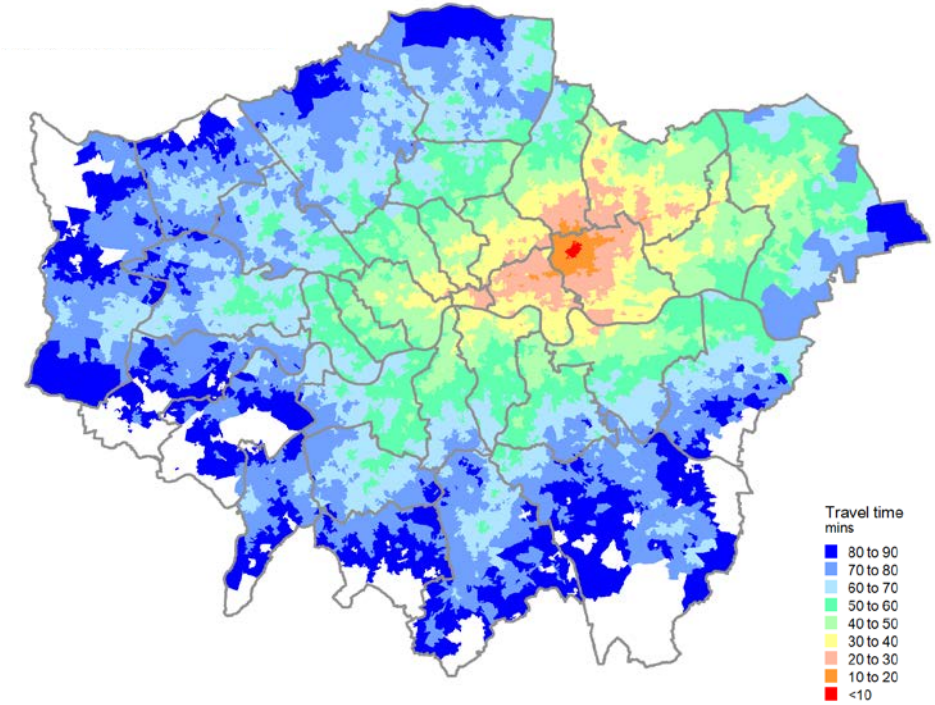
Data issues:

- Our strategic transport networks represent a snap shot of the network at a particular date, Temporary diversions and other incidents are not usually taken into account
- Future year networks include new schemes and projects such as Cross rail 1and 2, Bakerloo Line extension, line upgrades etc.
- Current and future networks can be compared on a consistent basis: highlighting the differences a new scheme will have on journey times.
- Providing consistent historic/time series datasets though can be more problematic
- The emphasis has been on the Morning Peak and the Journey to Work – but other time periods are significant – Weekends, Night time etc.
- Journey time data usually represents the shortest time between Origin & Destination. We assume customers use "perfect routing knowledge". But this may involve additional interchange that the customer may not want to use.
- Zoning systems – 3,300 zones in London – strategic vs local level

Journey time measures in TfL

EVERY JOURNEY MATTERS

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



Travel times to Stratford

Network:

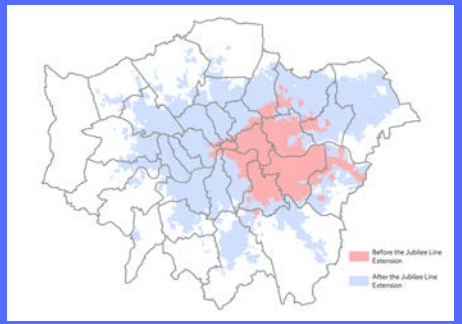
- **Year**: Current/Base
- **Mode**: All PT modes
- **Time period:** AM Peak
- **Direction**: to the location
- **Zones**: COAs

Journey time:

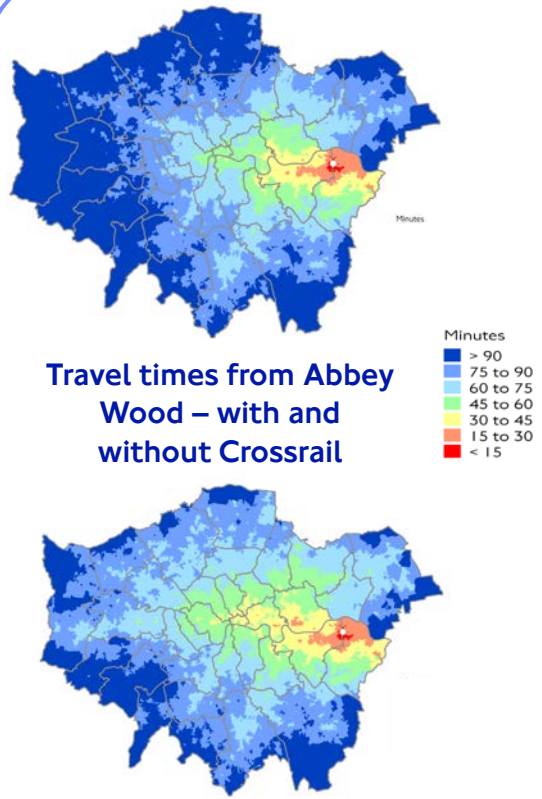
- Walk time
- Wait time
- In-vehicle time
- Interchange time

Journey 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

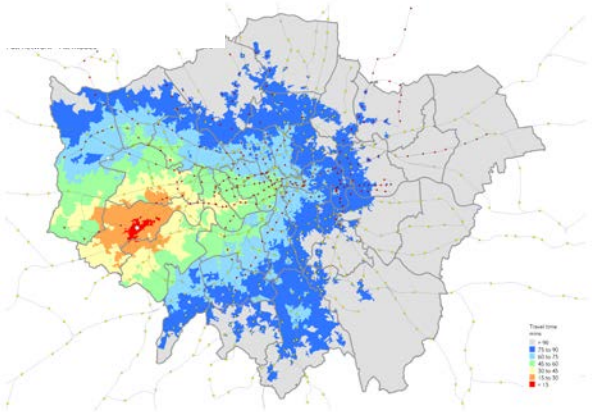


Travel times from Abbey Wood – with and without Crossrail

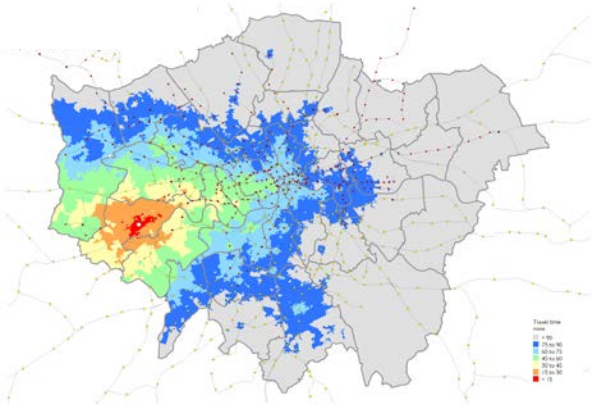
Travel time mapping - step-free analysis

For many public transport users the network is not fully accessible: steps and other barriers exist.

We have developed a series of transport networks that take step-free access into account, removing those station walk links that are not considered accessible/step-free.

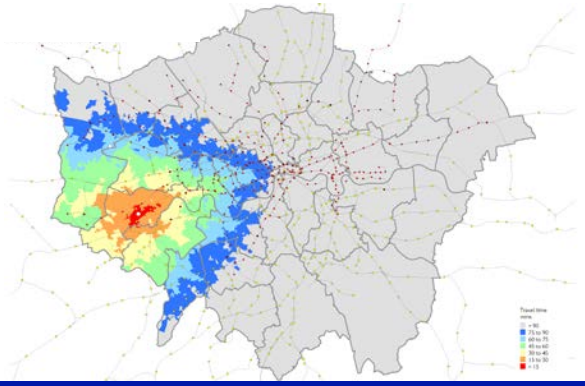


Full network – standard base network using all modes (Rail, LU, DLR, Tram, Bus).



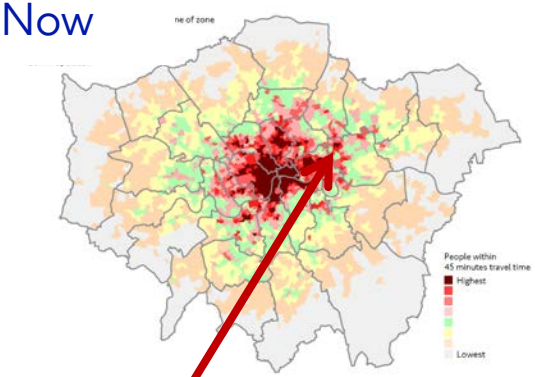
Step-free network –walk links removed that are not considered step-free .

Bus only network – times derived from the full network but using bus mode only

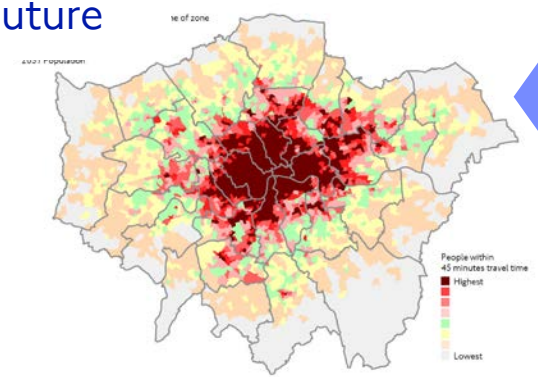


London-wide catchment analysis – aggregates the catchment attribute for each zone in London and maps the results

Now

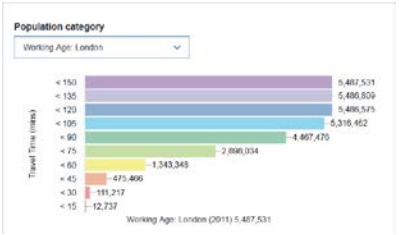


Future

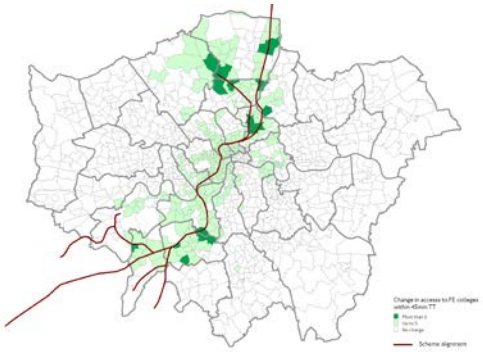


These examples show the number of people within 45 minutes travel time of each zone in 2011 (left) and 2031 (right)

Changes are due to population growth and/or improvements in connectivity by 2031

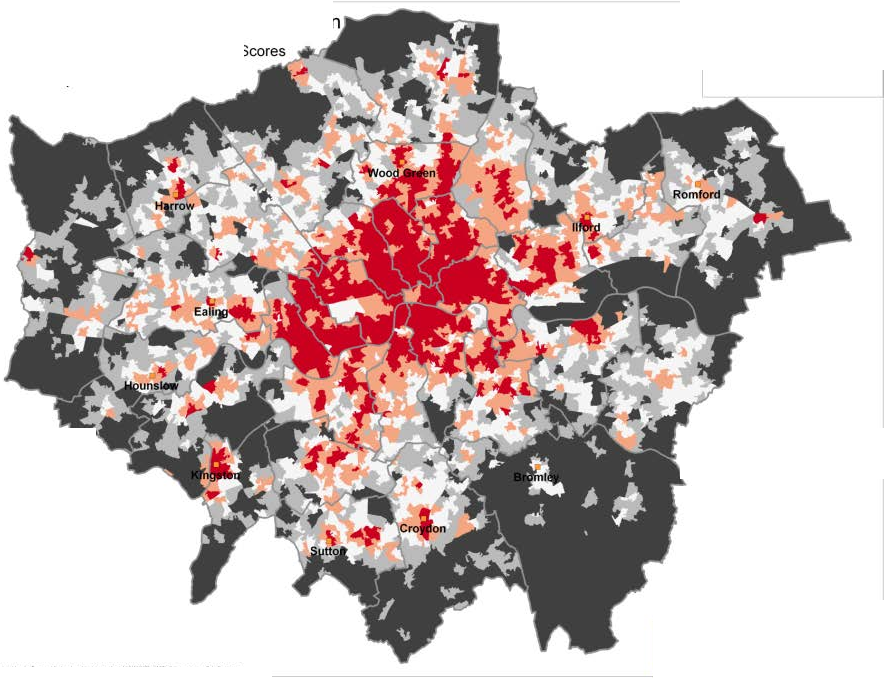


This example compares travel times from all zones to FE colleges within 45 minutes travel time using the current network and a future network including Crossrail 2



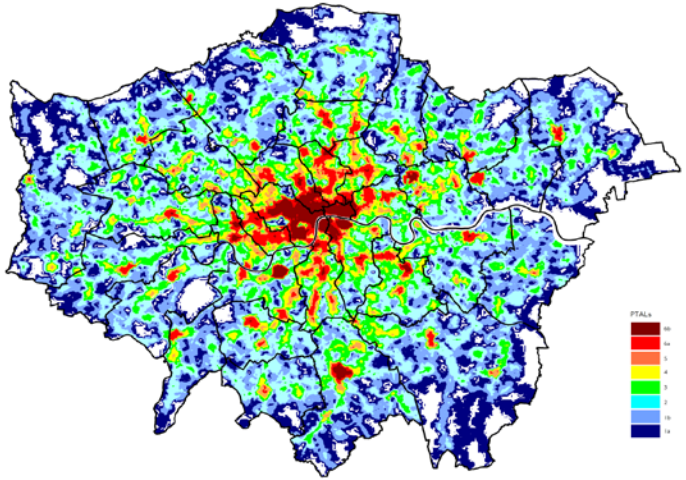
ATOS – measuring access to opportunities and services

- A response to the DfT's work: ATOS was developed as a measure to quantify access to a basket of essential services including – schools, GP surgeries, food shopping etc. by public transport and/or walking.
- The map above shows ATOS composite scores - combing data for all service types
- Issues associated with defining essential services: capacity, quality, service provision, public/private, personal choice
- High service provision in London means that many locations can be reached by walking, cycling or local bus services alone
- This method is more useful for assessing access by walking and cycling where proximity to services is more significant



Public Transport Accessibility Levels (PTALs)

- PTALs do not consider travel time through the network but proximity (walk distance/walk time) to the public transport network.
- They are relevant to London where (in most cases) a dense and integrated transport network means that a range of opportunities can be reached within a reasonable amount of time
- Access to essential service research showed that there is a strong correlation between PTALs and the time taken to reach key services – i.e high PTAL areas generally have good access to services and low PTAL areas have poor access to services

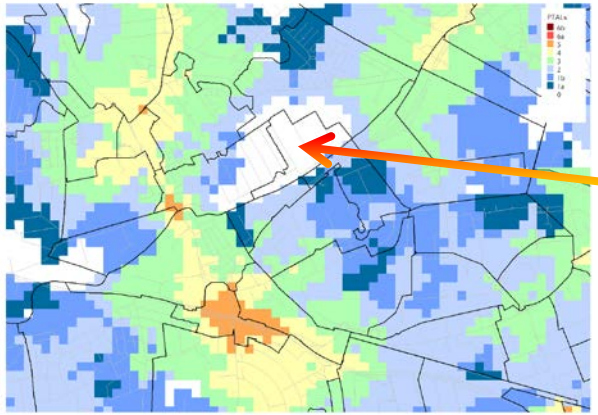


For any location in London PTALs combine walk times (to stations/bus stops) and service wait times (at those stops) to give a measure of connectivity to the Public Transport network

They are relatively easy to use and calculate for single locations or an area

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

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

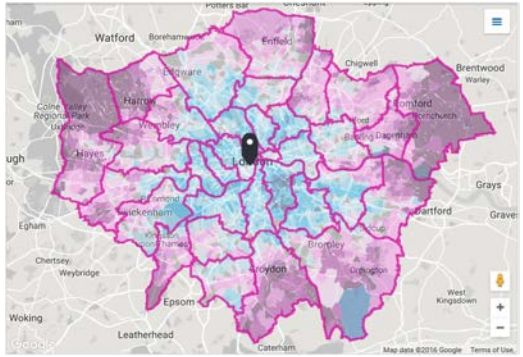
Bringing TfL's connectivity work together

WebCAT

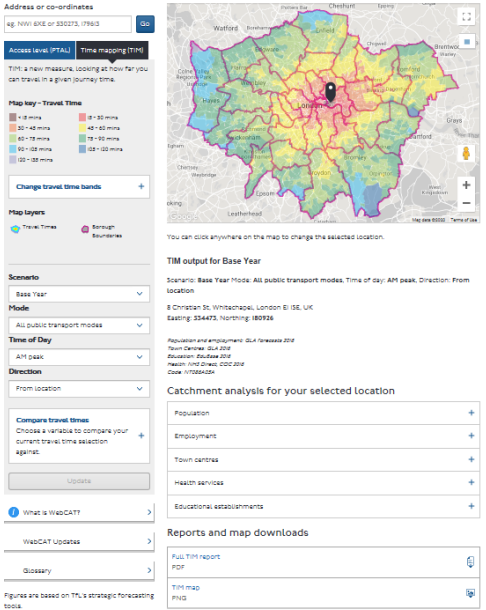
EVERY JOURNEY MATTERS

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

- Available on TfL's public website - making our travel time/connectivity datasets available to a wider audience
- Select any location in London on the interactive map to view site specific data:
  - Travel time mapping
  - Catchment statistics
  - PTALs
  - Journey time comparison tool



WebCAT



EVERY JOURNEY MATTERS

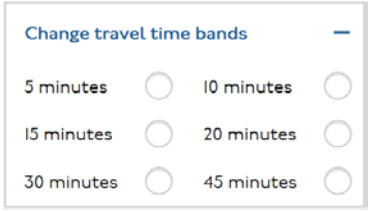
WebCAT and journey time analysis

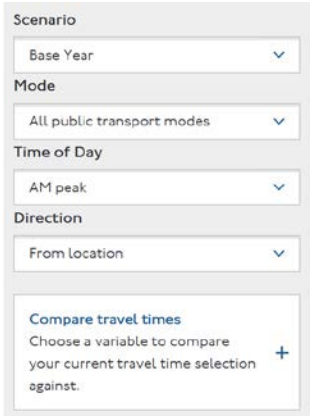
Users can select different travel time datasets based on the following criterion:

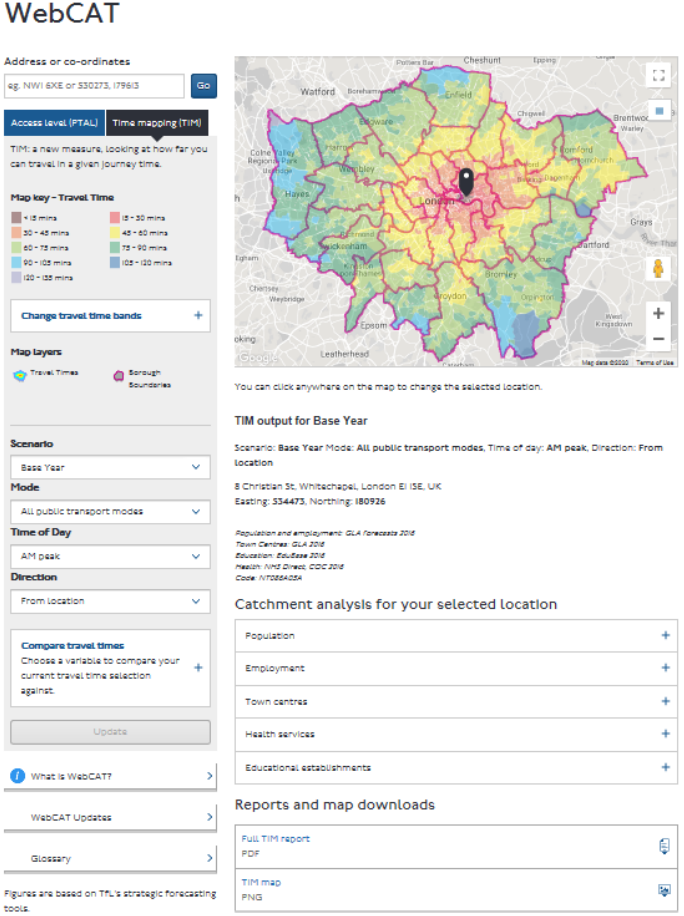
- Year: 2011, 2021, 2031
- Mode: All PT, Bus, Step-free
- Time of Day: AM Peak, Inter-peak, PM Peak
- Direction: To, From, Average

Further analysis:

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





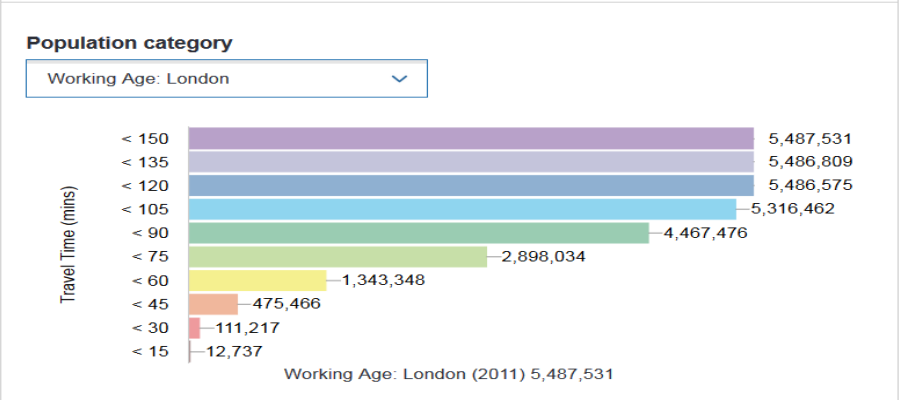


EVERY JOURNEY MATTERS

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



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

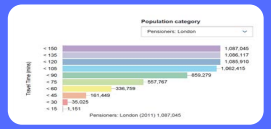
Town Centres:
- Metropolitan
- Metropolitan + Major
- Metropolitan + Major + District

Health services:
- A&E departments
- GP surgeries
- Pharmacies

Educational establishments:
- Primary schools
- Secondary schools
- Further educations

WebCAT and health service analysis

Travel time plots to health service locations



Catchment statistics – total population, age groups etc. within 30, 45, 60 minutes of a site

Compare the full network vs the step-free network

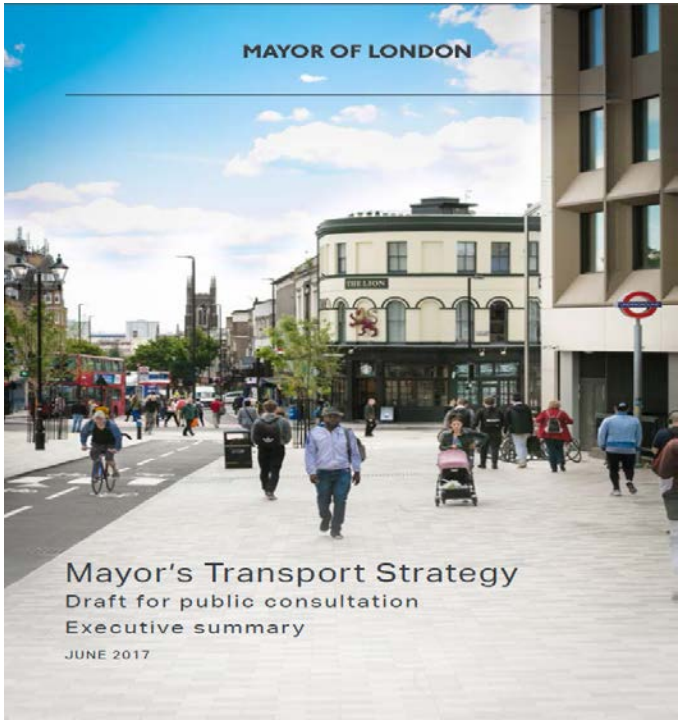
Local connectivity by bus or bicycle – health benefits

PTAL maps – prioritising health service locations with good transport links

Current developments – walking as a mode

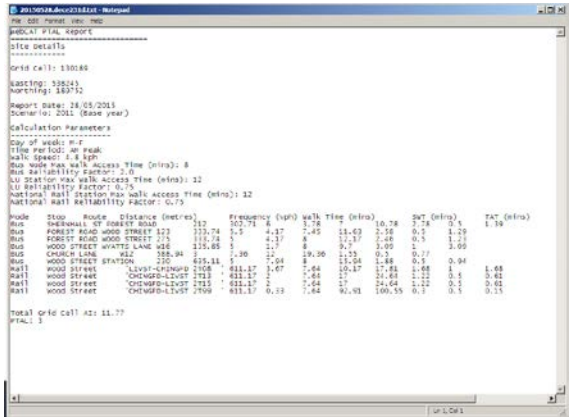
Connectivity analysis and the 2017 Mayor's Transport Strategy

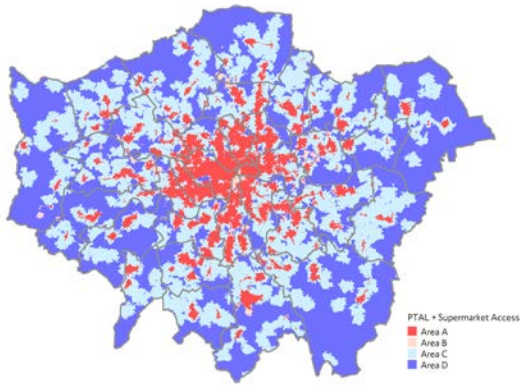
- By 2041 London will have a population of 10.5m, accompanied by 6.8 million jobs
- For London to grow and thrive, it is essential "that London's residents, workers and visitors walk, cycle and use public transport more to improve their health and the environment, to make streets work more efficiently 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



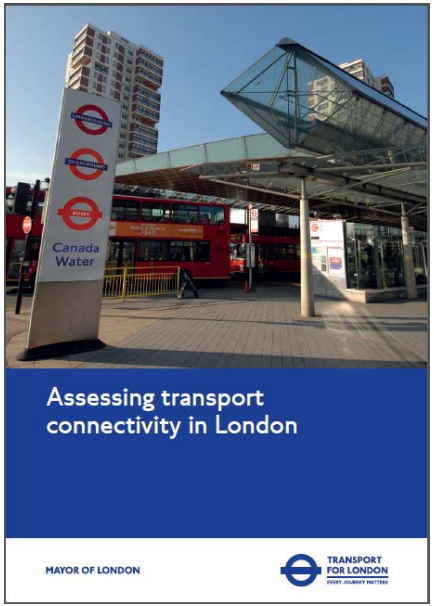
Walking journey time analysis

- PTALs as a walking model – walk access to public transport services
- Access to opportunities and services by walking only – sustainable neighbourhoods
- Combing PTAL and service access data to highlight different categories e.g. poor PT connectivity but good local service provision.
- Combine new indicators into the PTAL calculation sheet
    - Walking time to nearest town centres
    - Local schools and GPs
    - Walk catchment employment





Further information



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

Contact us at: WebCAT@TfL.gov.uk

Transport connectivity assessment guide
PDF 6.19MB