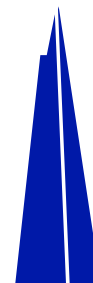
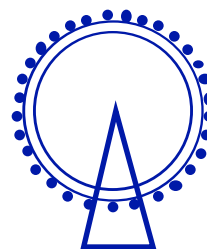




Delivering Better Transport with Data

Lauren Sager Weinstein
Chief Data Officer, Technology & Data
Transport for London



EVERY JOURNEY MATTERS

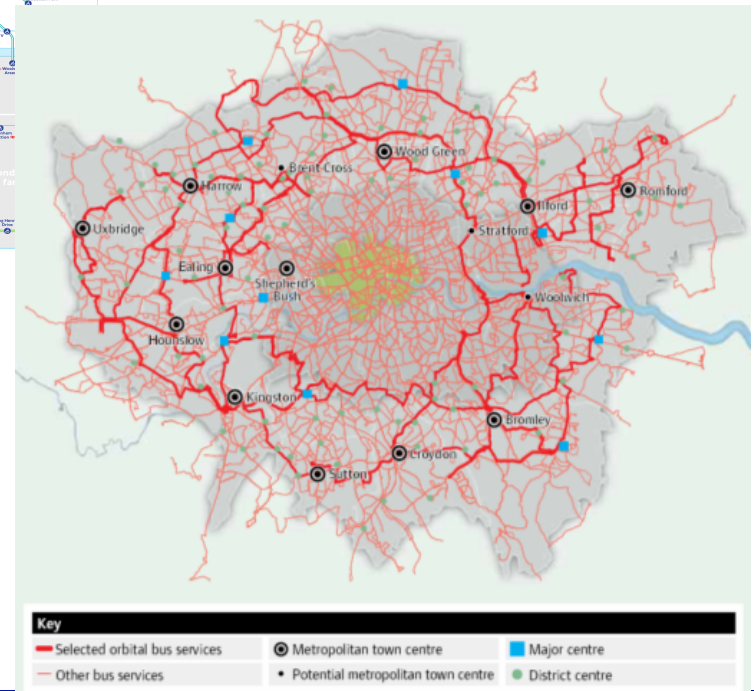
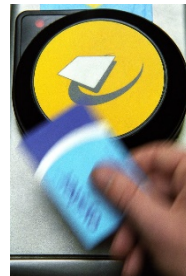
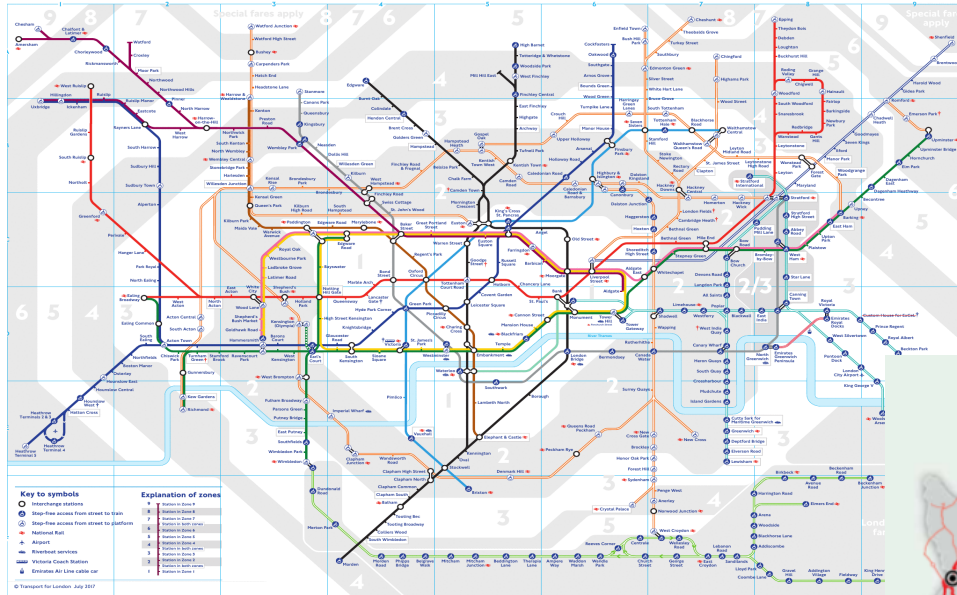
TRANSPORT FOR LONDON

London

- 1,579km²
- 8.8m residents and growing
- 32m journey stages per day
- 75 per cent of all UK rail journeys start or end in London or south east

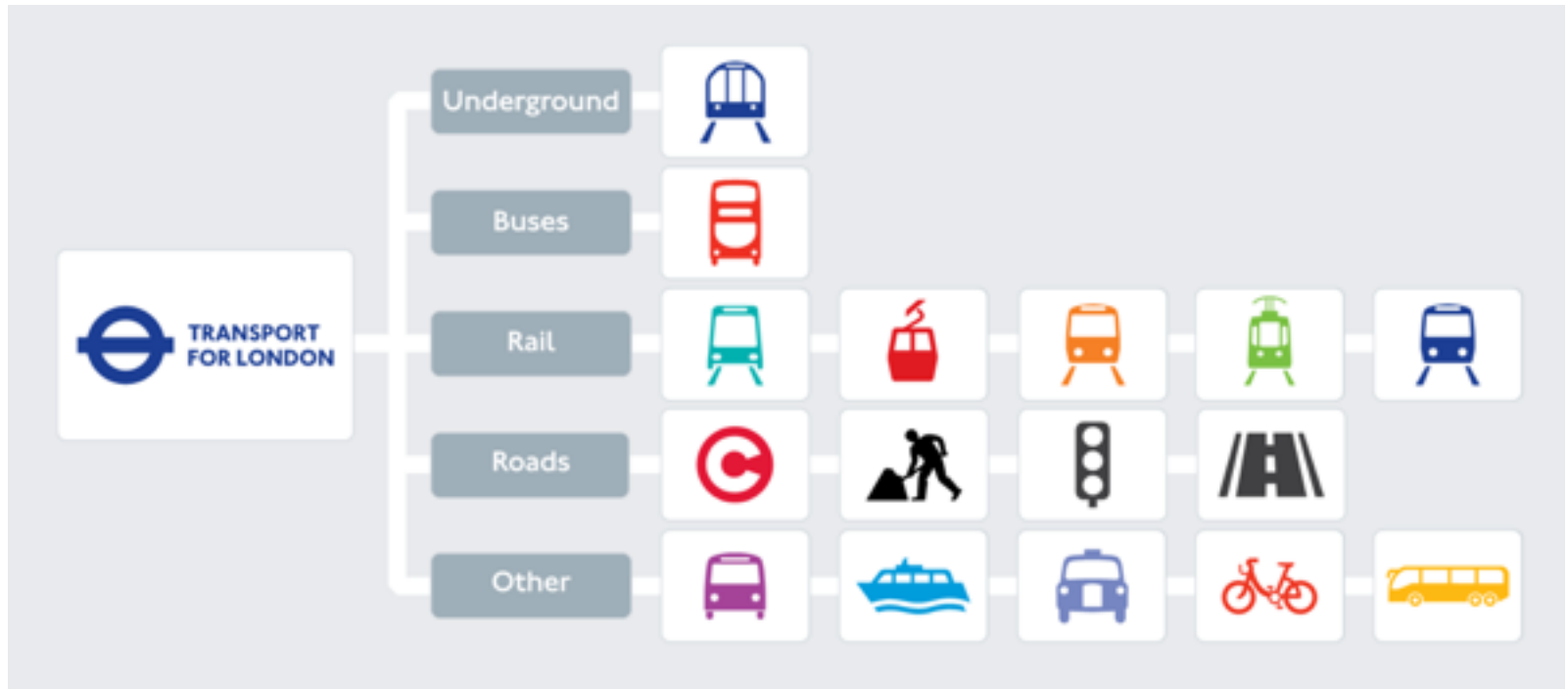


Our public transport network



TRANSPORT FOR LONDON

Our responsibilities

**EVERY JOURNEY MATTERS**



Our Purpose

- To deliver for the Mayor
- Keep London working and growing and make life better
- Every Journey Matters



We are data rich



19 million
smartcard ticketing
transactions a day
from **12 million**
active cards

12 million ANPR
registration plates
from the **1600**
cameras across our
road network

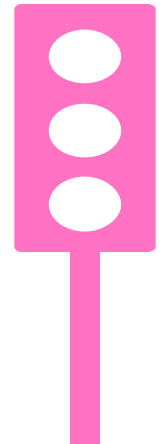


4.5 million ibus geo-
located events



650,000
tfl.gov.uk
website
visits

15,000 SCOOT
detectors creating
5.2bn records



500,000 rows of
train diagnostic
data on the
Central Line alone



250,000 daily train location and
event data from NETMIS



DATA ITSELF IS NOT ENOUGH

We must make it useful

- Transforming data into intelligence to drive improvement



- Putting our customers at the heart of what we do
- Improving our operations & safety
- Supporting new capacity & growth

And data privacy is fundamental

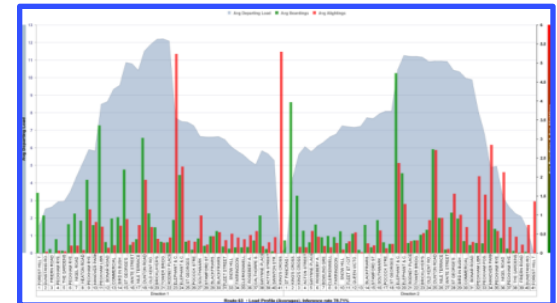
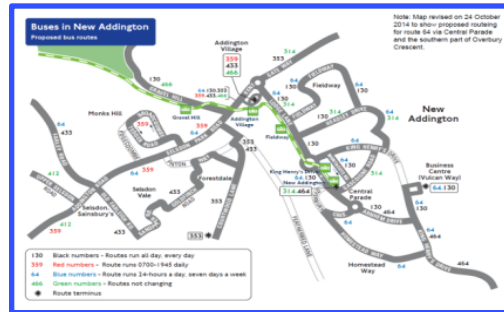




Origin Destination Interchange Tool (ODX)

Capacity Planning

Business Intelligence



Pattern recognition and business logic

Bus boarding
entry taps



Other modal
taps



Bus location
data

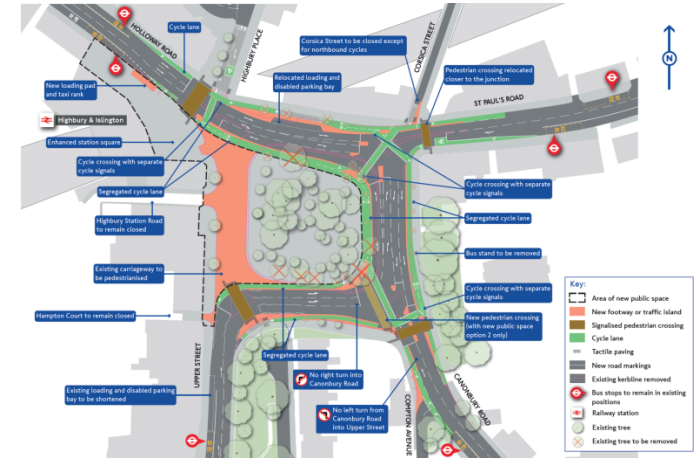


Matrix to infer our public transport journeys



ODX to Improve our Network

- Roads Modernisation Programme
 - making London's busiest junctions safer and more attractive for vulnerable road users
- ODX used to understand customers' interchange movements
 - Highbury and Islington
 - Archway
 - Old Street
 - To identify whether and where to relocate bus stops



14 Exploring new opportunities for data



By transforming pseudonymised WiFi connection data into movements could this help us

- Provide better information to customers for journey planning and avoiding congestion?
- **Operate and manage** our stations better?
- **Plan** timetables, upgrades etc. more efficiently?
- By measuring footfall, could we generate additional **income to reinvest** in our services?

Privacy approach

Scenario 3: Wi-Fi connection on Tube – TDM

Clear and transparent purpose and benefit for data collection

What's working:

- Positively received and anticipated use, customers suggested this as an application of technology before they saw the example
- Provides a concrete benefit for customers: contextual information will help ease pain point of overcrowding, and allow them to make decisions
- Provides a clear and transparent purpose for data collection, and is anonymised, allaying privacy concerns some customers have

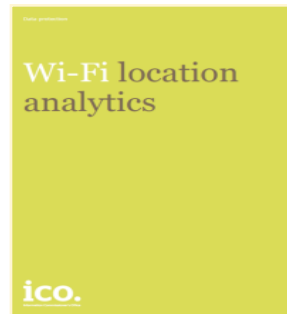
Watch out:

- Potential risk of this highlighting TfL's challenges and frustrating customers (particularly during busy periods where it may provide less value to customers). May require carefully tailored comms

City Mapper helps you which is the least busy part of the train – it's handy

I like that one I would just need for the next train I take the crowded train

What's that going to tell me at 8:00 at Bank station, it's really crowded?



Communications

Transport for London

WiFi trial to help give customers better journeys

17 November 2016

Four week trial collecting de-personalised WiFi connection data will help TfL better understand how passengers move through stations and interchange between lines

• If trial is successful, data could be used to improve services, provide better travel information and help prioritise investment across the Tube network

"This short trial will help us understand whether WiFi connection data could help us plan and operate our transport network more effectively for customers"

Shashi Verma
Chief Technology Officer, Transport for London

Media releases

- 2017
- 2016
- January
- February

The Telegraph

Technology

Commuters to be tracked on the Tube through free WiFi

UNDERGROUND

Transport for London

WiFi data collection

We are collecting WiFi data at this station to tell how it can be used to improve our services, provide better travel information and help prioritise investment.

We will not identify individuals or monitor browsing activity.

We will collect data between Monday 20 November and Monday 19 December.

For more information visit: tfl.gov.uk/wifi

Tube bosses to track commuters using wifi

SAPPHIRE SMITH | Friday 10 November 2016 | 214 comments

Click to follow The Evening Standard

Transport for London @TfL

21h

We're running a WiFi data trial to help us better understand Tube passengers' movements through stations. Blog blog.tfl.gov.uk/2016/11/23/wif...

Sharing results

Review of the TfL WiFi pilot

Our findings

Transport for London

content.tfl.gov.uk/review-tfl-wifi-pilot.pdf



Data was depersonalised and analysed

More than

**509
million**

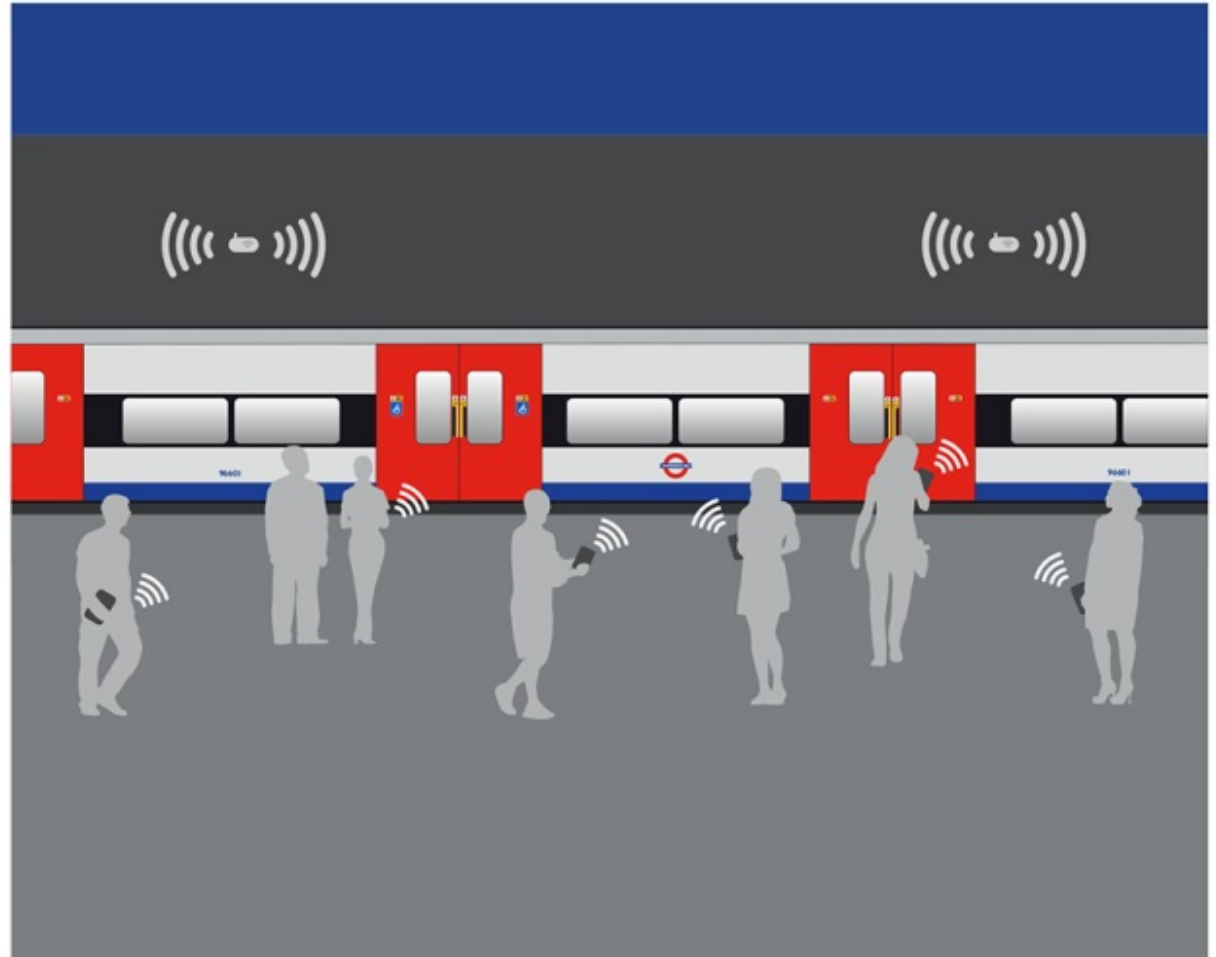
probing requests
were collected at

54

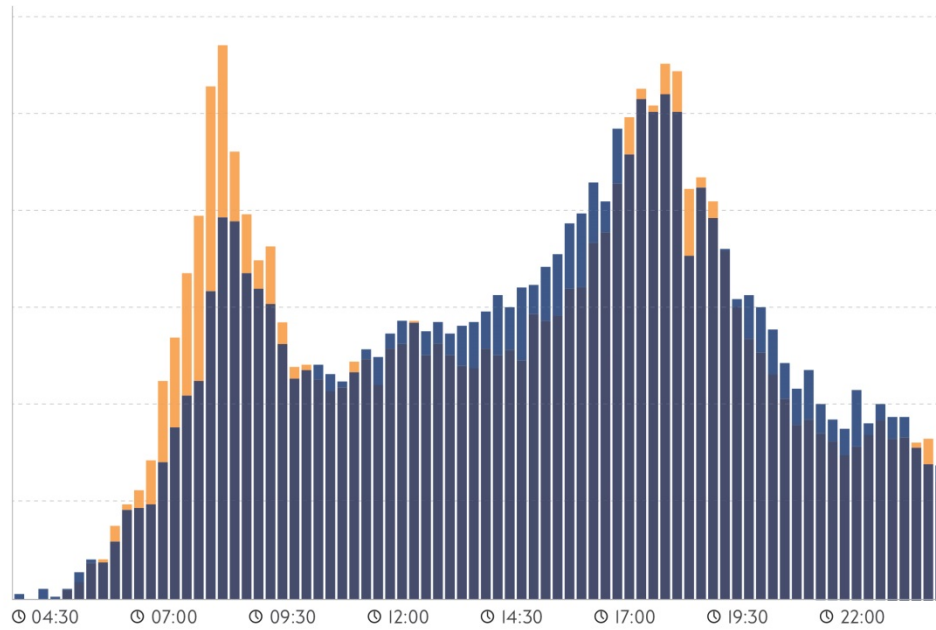
stations from

**5.6
million**

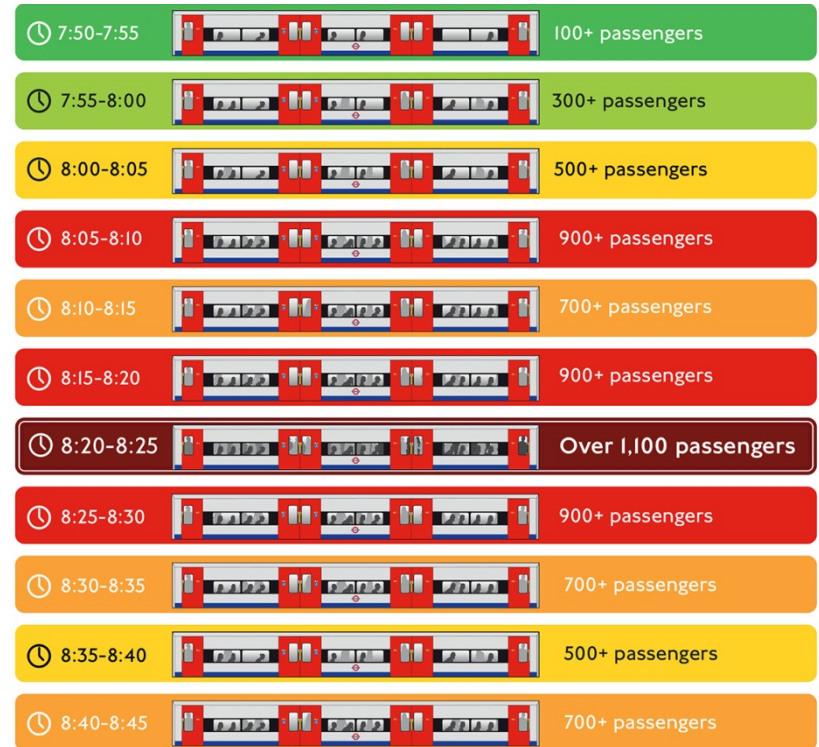
devices



To identify busy stations and trains



WiFi (%)
Oyster (%)

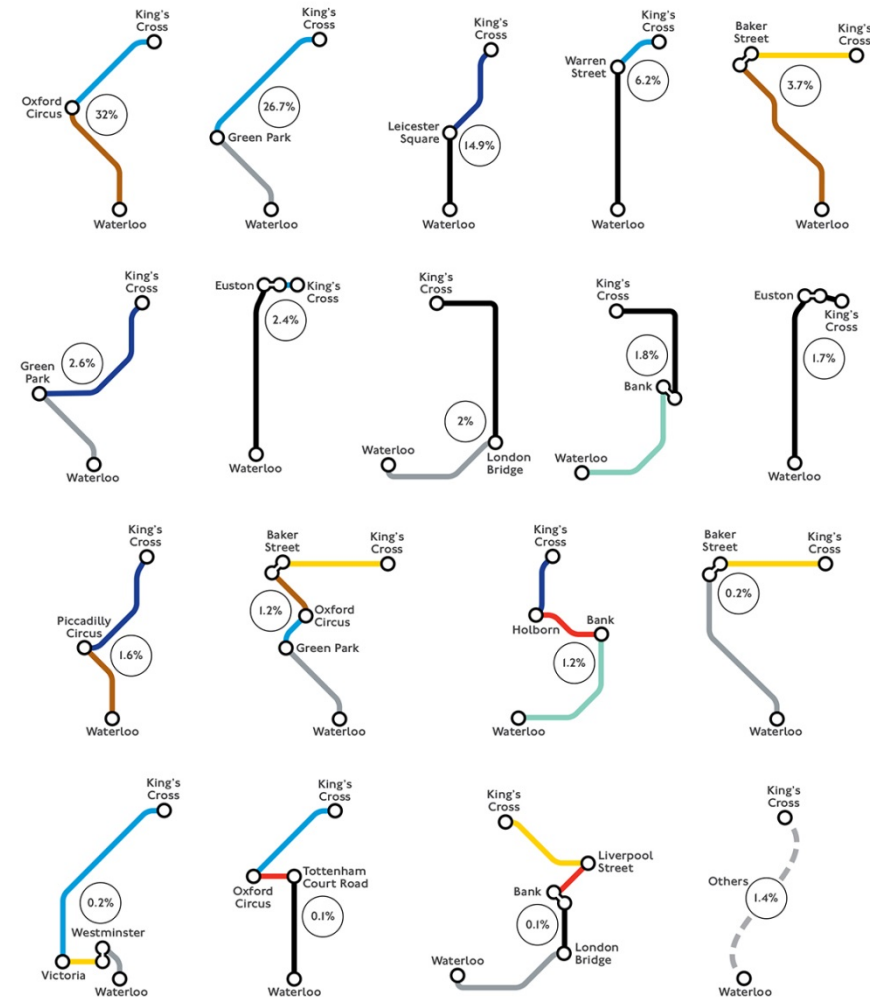
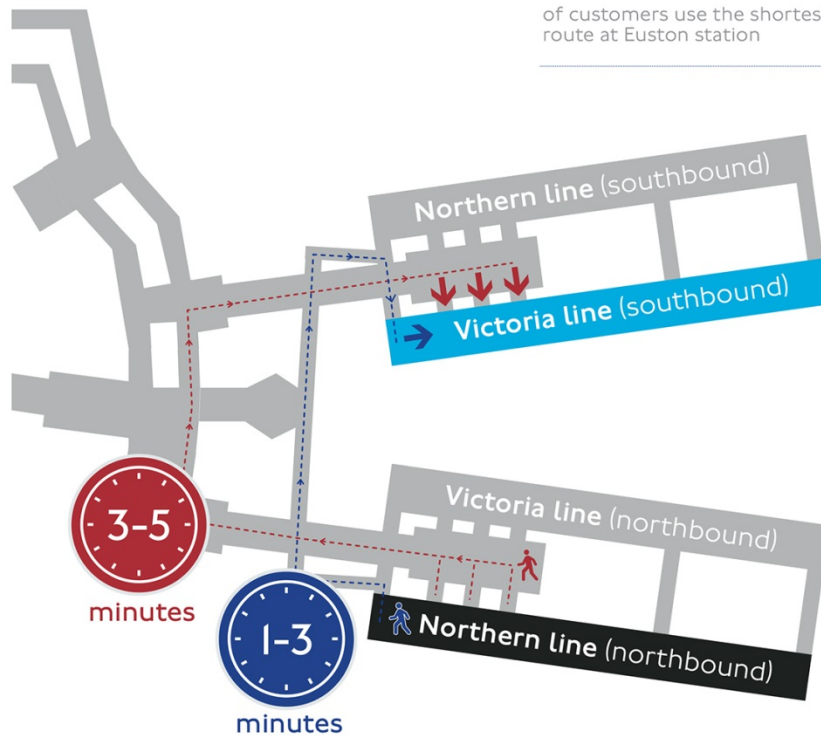


Not crowded Extremely busy



EVERY JOURNEY MATTERS

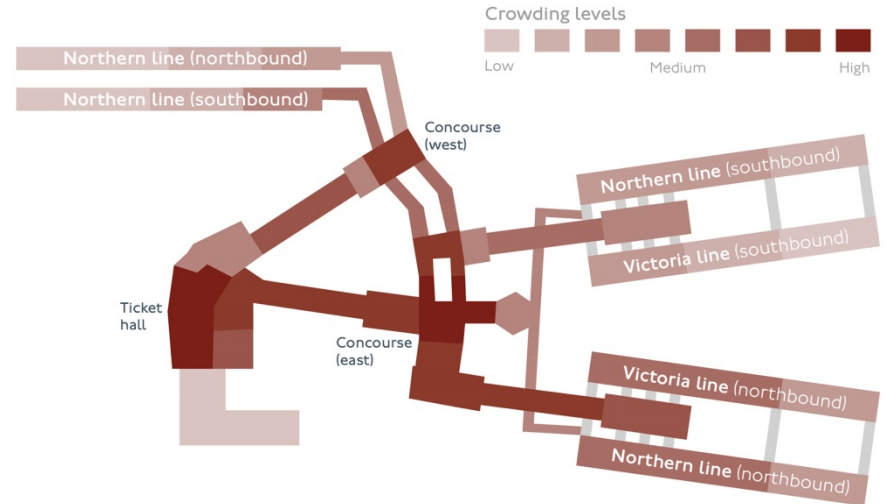
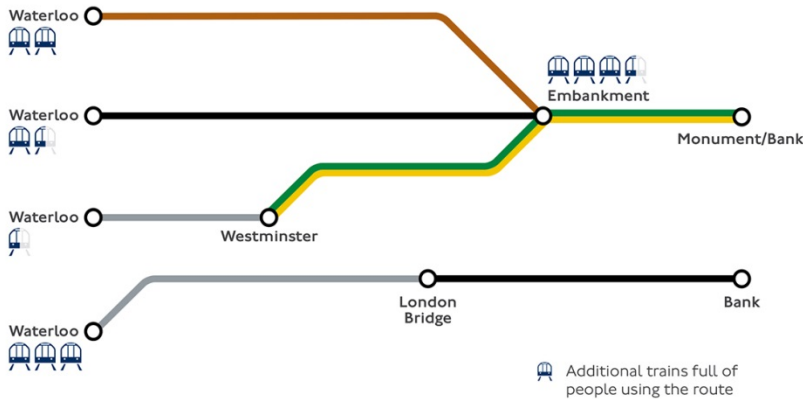
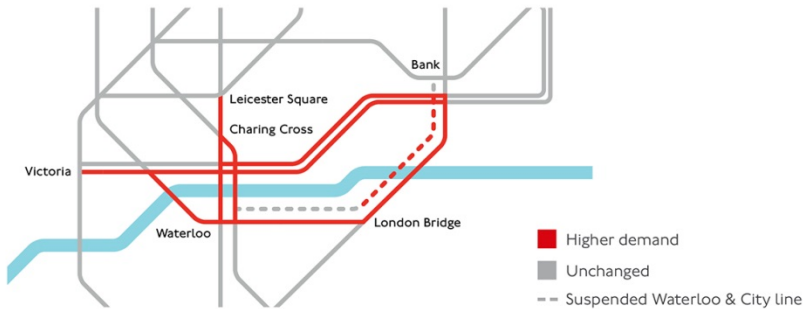
of customers use the shortest route at Euston station



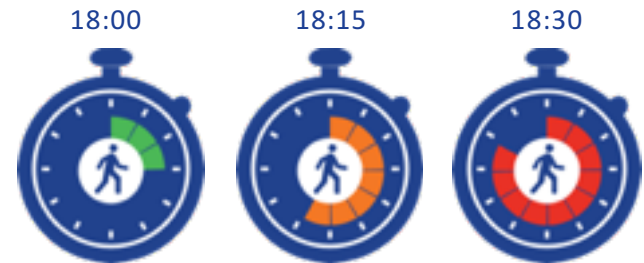
And measure responses to disruption that can help our operations

08:00-09:00

Waterloo & City line suspended, which led to customers making a number of different travel choices to get to Bank station



wait times increased from
three minutes at 18:00 to more
than 10 minutes at 18:30
because of congestion



My Big Data Principles

- Programme of work targeted to our purpose and priorities
- Focus on the right questions and the problems you face. Interesting is not enough and don't start with the data.

As a [my job title]

I need [big data insights]

So that I can [make a decision my job expects me to]





Thank you

Lauren Sager Weinstein

ChiefDataOfficer@tfl.gov.uk



EVERY JOURNEY MATTERS