Transport for London

Project 6,460 WI-FI Data Insights

Document reference PEP WI-FI Data Insights

Project Execution Plan (PEP)

		Signature	Date
Prepared by	Amie Browes Project Manager		
Reviewed by	Endorsement statement Andrew Duniec Programme Manager		
Reviewed by	Lauren Sager – Weinstein Deputy Sponsor		
Reviewed by	Guy Allen		
Reviewed by	Ryan Sweeney Data Services Manager		
Reviewed by	Dale Campbell Operational Research and Analytics Manager		
Reviewed by	Graeme Fairnie Analyst		
Reviewed by	Joe Scheinkonig Commercial Development Manager		
Reviewed by	Lee McGirr Privacy Adviser		
Reviewed by	Lucy Fish Customer Strategy Manager		
Reviewed by	Duncan Elder		

Reviewed by	Leo Farthing Analytics Operations Manager		
Reviewed by	Chantel Thorpe Knowledge and Engagement Manager		
Reviewed by	Chris Carter Knowledge Team Adviser		
	Nimesh Jobanputra PMO		
Approved by	I confirm that this deliverable meets the requirements of the relevant TfL Pathway Product Description and that all consultation comments have been addressed to the satisfaction of consultees. Graeme Craig Project Sponsor		

Document History

Revision	Date	Summary of changes
A0.1	14/07/2016	First Draft
A0.2	27/07/2016	Amendments following PTP

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1 Project Scope

1.1 Background

The Customer Experience Analytics (CEA) Operational Research (OR) team have undergone a piece of research work to understand the value of WI-FI data to TfL. This analysis highlighted that a number of different factors could be identified that could be different for each individual journey, these being:

- Route Choice
- Interchange
- In station movements
- Train Assignment / Crowding

All of these factors can then be scaled up taking in to account taps within the network and devices seen.

A number of areas within TfL have been identified as having an interest in this data and following a number of stakeholder sessions there are 4 themes that have been identified that will add benefit to TfL.

1. Financial – Increasing revenue from our advertising estate.
2. Customer – Providing customer information for journey planning, congestion avoidance and identifying customers eligible for a refund.
3. Medium and Long Term Planning – Ensuring optimal and evidence based decision making for a range of potential investments i.e. new trains, station upgrades, timetabling and event management.
4. Operational & Safety – Ensuring we manage disruptions and events and we deploy staff to meet our customer's needs.

A number of user cases have been identified to support these themes and they can be found through the link below, in section 1.2.

The project will be delivered in phases based on technical components, with the first phase delivering output from 54 stations which can be seen in Appendix A. The details of this phase can be seen in the project brief document through the link in the table below.

1.2 Core documents

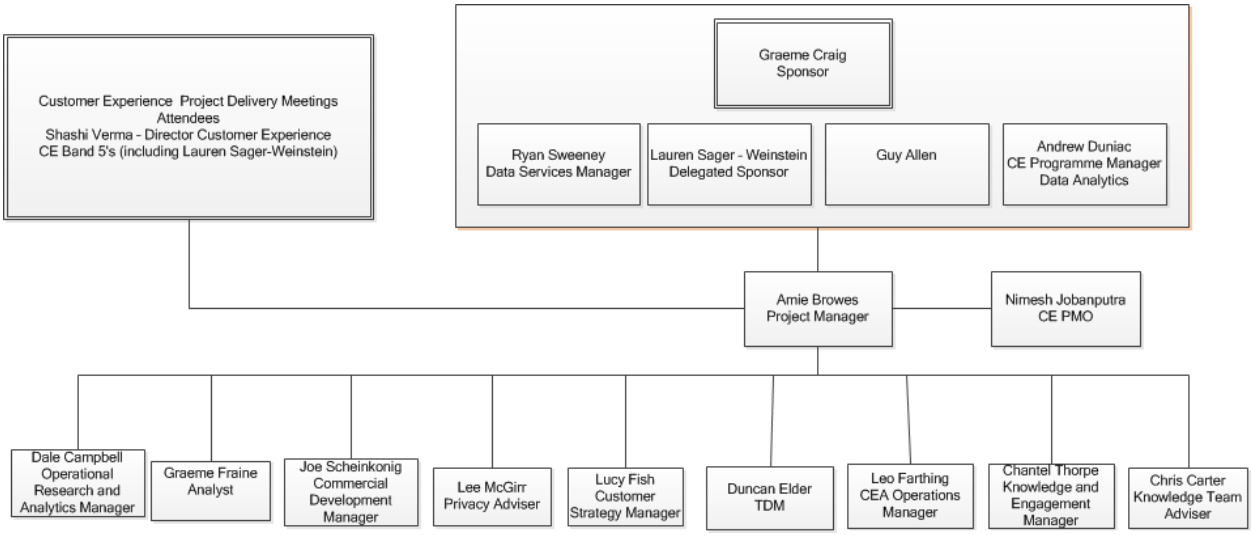
Baseline Item	Document Reference & Link
Project Requirements	
Project Brief	
Project Plan	
Estimate	
Finance Plan	

1.3 Key milestones

Milestone	Date	Comments
PTP	26/07/2016	
PEP Completed	26/07/2016	
Gate 2 Sign Off	18/08/2016	
Phase 1 Pilot Complete	30/10/2016	

2 Project Governance

2.1 Governance



This project will hold weekly Steering Groups during the pilot phase to ensure that work remains on track and key decisions are made timely. A project update report will be issued to the key stakeholders on a monthly basis to align with the Project Delivery Meetings.

The Product Owner within CE Analytics will hold the following meetings for the duration of the project.

- Requirements gathering and refinement workshops to ensure the project delivers what the business needs.
- Sprint Review, at the end of a sprint with the key business representatives to get development sign off to ensure the product delivered meets the requirements set by the business.

2.2 Organisation

Role	Person	Directorate / Organisation	Commitment (hrs/wk)
Sponsor	Graeme Craig	Comm Dev	1
Programme Manager	Andrew Duniec	CE	1
Project Manager	Amie Browes	CE	7
Data Services Manager	Ryan Sweeney	CE	2
	Guy Allen	CEA	5
Operational Reseach and Analytics Manager	Dale Campbell	CEA	2
Analyst	Graeme Fraine	CEA	15
Commercial Development Manager	Joe Scheinkonig	Comm Dev	15
Privacy Adviser	Lee McGirr	Privacy	7
Customer Strategy Manager	Lucy Fish	TDM	2
TDM	Duncan Elder	TDM	2
Analytics Operations Manager	Leo Farthing	CEA	1
Knowledge and Engagement Manager	Chantel Thorpe	CCO	2
Knowledge Team Adviser	Chris Carter	CCO	2
PMO	Nimesh Jobanputra	CE	0.5

2.3 Project Controls

This project will control changes in a number of ways, as the project will be delivered in three phases, following an agile methodology the requirements for each phase will not be fully captured until the development of the requirements is imminent, which will help to mitigate a change in the detailed requirements. The requirements captured will receive business sign off before development commences.

If there is a request for high level requirement changes then the project will use the Customer Experience Portfolio Change Control process, which is available at the following link:

CE Change Control Process

2.4 Cost Control

The cost estimate for the project will be broken down into a budgetary forecast at stage 2.

This forecast will be reviewed every quarter, in line with the CE and Surface financial review cycle. The project will review all costs on a monthly basis with the CE Project Accountant. The project will cross charge the surface budget agreement at the end of each period.

If the forecasted costs increase beyond the budget, the issue will be raised through relevant CE boards. At the same time as this the main contact within surface will be informed through the Project Manager, with finance updates being given during period end financial updates.

3 Project Interfaces

3.1 Key Stakeholders

The stakeholders on this project have been identified at two levels, Strategic and Operational.

Strategic

The strategic stakeholder are the key decision makers within the stakeholder groups and will be the point of escalation should this be necessary. These are also the stakeholders whose agreement will be necessary on key decisions.

The key stakeholders have been identified according to their influence on the project and the impact of the project on their business.

Operational

The operational stakeholders are those involved in identifying and validating the business requirements, assuring the project delivery within their impacted area and supporting any business change activities.

Key stakeholder groups are summarised in the table below.

Stakeholder Name	Known information/ Position	Strategic/ Operational/ External	Interest	Influence	Comms
Shashi Verma Director Customer Experience	Maintain Interest	Strategic	High	High	CE Project Delivery Meeting Periodic Report
Lauren Sager - Weinstein Head of Analytics (Project Sponsor)	Key decision maker – need consent	Strategic	High	High	Project Board CE Project Delivery Meeting Periodic Report
Other members of the leadership team (CE Band 5's)	Keep Informed	Strategic	Medium	High	CE Project Delivery Meeting Periodic Report
Andrew Duniec Programme Manager	Keep Informed	Strategic	Medium	Medium	CE Project Delivery Meeting Periodic Report 1:1
Guy Allen	Key Decsion Maker	Strategic	High	High	CE Project Delivery Meeting Steering Group Periodic Report 1:1

Ryan Sweeney Data Services Manager	Keep Informed	Operational	High	Low	CE Project Delivery Meeting Steering Group Periodic Report
Dale Campbell Operational Research and Analytics Manager	Main Interest	Operational	High	Low	CE Project Delivery Meeting Steering Group Periodic Report
Graeme Fairnie Analyst	Main Interest	Operational	High	Low	Steering Group Periodic Report
Joe Scheinkonig Commercial Development Manager	Main Interest	Strategic	High	High	Steering Group Periodic Report
Lee McGirr Privacy Adviser	Main Interest	Operational	High	High	Steering Group Periodic Report
Lucy Fish Customer Strategy Manager	Main Interest	Operational	High	Medium	Steering Group Periodic Report
Duncan Elder	Main Interest	Operational	Medium	Low	Steering Group Periodic Report
Leo Farthing CEA Operations Manager	Keep Informed	Operational	Medium	Medium	Periodic Report

Chantel Thorpe Knowledge and Engagement Manager	Main Interest	Operational	Medium	Low	Periodic Report
Chris Carter Knowledge Team Adviser	Main Interest	Operational	Medium	Low	Steering Group Periodic Report

3.2 Sharing of information, co-ordination and co-operation arrangement

Strategic engagement with stakeholders occurs through a number of existing channels including:

Periodic CE Project Delivery Reports and Meetings

Ad-hoc risk reviews will be fed into the project risk register

Regular engagement at an operational level occurs in the following ways:

Periodic CE Project Delivery Reports and Meetings

Project meetings with work stream members

Additional ad-hoc engagement occurs as necessary to involve stakeholders in the decision making process as issues arise which have an impact on requirements.

The CE Project Delivery meetings will serve as the key forum for identifying any conflicts with other projects.

Project documentation can be found on the project's SharePoint pages in the Data Analytics section of the Customer Experience SharePoint site.

6,460 WI-FI Data Insights Sharepoint Site

Due to the nature of the data that is being collected we are working closely with the Privacy team and have briefed the Information Commission Office (ICO). The paper that was shared with the ICO can be found on the project sharepoint site.

Colleagues within the Privacy team are completing the Privacy Impact Assessment (PIA) and are also leading on publishing information on TfL's Privacy pages. Once these pages have been published a link will be added within this document.

3.3 Dependencies

There are a number of dependences that have been identified for this project these can be found in the dependency register:

Dependency Register

These are being managed through the Project's Steering Group.

3.4 Key assumptions

Key assumptions made in the development of this PEP are;

- Project Authority will be approved at the Project Delivery Meeting
- Analytics have the correct resource skills available to deliver the Project to the agreed timescale
- There are no legal constraints in bringing in the WI-FI data.

4 Project Change Impact

4.1 Infrastructure Impact

	Primary	Secondary
Highway	☐	☐
IM / Information Communication Technology (ICT) see note	☑	☐
Track	☐	☐
Civils	☐	☐
Premises	☐	☐
Fire	☐	☐
E&M	☐	☐
Power	☐	☐
Lifts & Escalators	☐	☐
Rolling Stock	☐	☐
Signalling	☐	☐

Communications & IT	☐	☑
Systems Integration	☐	☐
Human Factors	☐	☐
EMC	☐	☐
Station Planning	☐	☑
Operations	☐	☐
Maintenance	☐	☐
Other assets as required	☐	☑

4.2 People Change Impact

There will be minimal change to people's day to day role within TfL during the project and after implementation. For those roles that are customer facing and likely to be affected by this project a number of communications are being written to provide the relevant information. The impact on staff will be monitored and support will be provided as necessary.

4.3 Risks

The project will comply with the Corporate Risk The project Risk and Issue Register will be maintained on SharePoint throughout the life of the project.

Risk & Issues

Key risks will be highlighted as part of the Periodic Reporting.

4.4 Verification of Change

Ensure the deliverables which will be launched onto a live network, are fit for purpose through:

Ensure Analytics deliverables are fit for purpose through continuous technical assurance by the project team

Sprint Review sessions with key stakeholders to sign off User Stories as the new functionality is being developed.

The verification of the above will be carried out and signed of by the Steering Group to ensure the deliverables are fit for purpose.

5 Project Delivery Approach

5.1 Approach Description

This project is being delivered by Internal TfL Staff, the work has come about following some research work that was carried out by our Operational Research Team. The project will rely on a number of areas in TfL working together and meeting the challenging deadlines. .

5.2 Approach Reason

The project will be delivered in line with Pathway project management methodology. Relevant lessons learnt from other projects will be reviewed to avoid any unnecessary delays and escalation costs.

5.3 Procurement

The project does not include any procurement activity.

5.4 Site Access

Whilst this project will require signage to be put up in the stations that are being used as part of the pilot, this will use the site access plan that marketing currently have for these contractors.

5.5 Operational Readiness

The Operational Readiness plan will be produced during the latter stages of the project. This will be added to sharepoint when it becomes available.

5.6 Maintenance Readiness

The Maintenance Readiness plan will be produced during the development stage of the project when options analysis and decisions are formalised. This will be added to the project SharePoint site when it becomes available

5.7 Consents Management

No planning consents are required for this project.

5.8 Health, Safety, Environmental and Sustainability Management

There are no Health Safety and Environment issues on this project and the project will comply with TfL HSE.

5.9 Technical/ Engineering Management

There is no Technical / Engineering Management on this project.

5.10 Construction Management

There is no construction management on this project.

Please ensure that this document does not exceed 2 pages and is checked for spelling and grammar

Customer Experience Gate 0 Submission

This form should be completed for work that are expected to be run as a formal project or BAU items that requires a separate budget and therefore needs to be reported on

Initiative Number and Title	Name of submitter	Project Sponsor	Delegated Sponsor	Band 5 representative at SMM
Wi-Fi data insights	Ryan Sweeney	Graeme Craig	*Lauren Sager Weinstein*	*Lauren Sager Weinstein*

Scope Overview/Key Objectives

CEA Operational Research analysed a day's sample of Wi-Fi data to understand its value to TfL. Analysis demonstrated that, route choice and interchange (line and stations) can be identified, in station movements volumes and durations quantified, train assignment/left behind and crowding measured and this can be scaled to network totals based on representation of devices. Having shared the analysis, a number of internal stakeholders, including Commercial Development, Travel Demand Management and Transport Planning support and will fund developing this further as a productionised information source as it offers considerable benefits. Stakeholder sessions have identified 32 use cases with 4 themes;

*1) **Financial** – increasing revenue from our advertising assets and reducing spend through more efficient working practices.*
*2) **Customer** – providing customer information for journey planning, congestion avoidance and identifying customers eligible for a refund.*
*3) **Medium and Long Term Planning** – Ensuring optimal and evidence based decision making for a range of potential investments ranging from the number of new trains, station upgrades, timetabling and event management, superseding current survey based methods.*
*4) **Operational &Safety** – Ensuring we manage disruptions and events, deploy staff to best meet customer needs and ensure a safe environment for all who use the rail network.*

This objectives of this project would be to deliver
-A productionised real time feed of all Wi-Fi device pings and traps into the CEA Data Warehouse Platform;
-Scalable algorithms and data transformations that identify route choice and interchange between origin-destination pairs, in station movements volumes, duration and platform crowding, at a minute by minute level for every day for the whole TfL rail network covered by Wi-Fi. This will be 1 day in arrears.
-Front end visualisation and developments to make this output information accessible and query-able to business users

The project would be delivered in phases based on technical components. The information outputs would be designed to ensure compatibility with ODX (our public transport matrix that includes bus inference) and Customer Segmentation analysis to provide us with a rich and complete data source.

Financial Benefits	Non-Financial Benefits
Advertising Partnership *Enabling TfL to achieve £322m revenue generation over the next 8 years by being able to quantify asset value based on the number of eyeballs/impressions and dynamically trade advertising space.* ***Optimal financial & operational decision making*** *Supporting significant financial decisions (e.g. correct number of trains to meet demand/ station upgrades) and replace surveys (c.£150k p/a)*	***Customer*** *-Providing platform, train and crowding information to staff and customer to enable customers to make decisions to avoid congestion.* *-Identifying and providing refunds where a customer can be associated to a disrupted route or held outside a station*

Any Additional Information

Next Steps – please choose one of the options below	
Commence Project to: **Gate 1&2 (combined), key activities include** If there are no options in the way the project is delivered, you may work directly towards Gate 2. At this gate the scope, costs and schedule must be baselined.	

We will work with Information Governance to inform customers that we are collecting and using Wi-Fi data.

Seed Funding *amount required to progress to next steps indicated above*	
Amount required (£) [redacted] to support an initial sprint to scope this project and refine Estimated cost below	**Commercial Development**

Project Estimated Final Costs (EFC) *Please indicate how much you think the project is likely to cost if known*	
Capital ([redacted] (to be revised after initial sprint) to deliver end product	**Opex [redacted]**
Comments/Source of Funding: Initial estimates forecast a [redacted] spend to deliver a full solution * 3x Operational Analysts for 3 months to develop the algorithms required [redacted] * 1x sprint team (architect, ETL, developers, Product Owner, Analyst) for 3 months [redacted] * [redacted] for customer information and station signage * [redacted] for IM data feed, storage and architecture It was agreed on the 1st July that Commercial Development would fund this project	

Key Dates		
Milestone	**Date**	**Explanation**
Advertising Partnership Increased Revenue from data	April 2017	Forecasts have been made based on this data being available and usable
Launch of Crossrail	May 2017	Requirement to understand impact this is having on the network and customer behaviours
Ceasing RODS surveys	Nov 2017	Annual surveys take place with associated infrastructure

Outcome					
	Decision	Approved	Approved Submitted to Actions		Rejected
	Status	Project	Programme	Small Works	BAU – SMM have decided this work does not require a PM, but needs reporting on
	Category	Must Have	Should Have		Could Have
	Category Reasoning				

Privacy Impact Assessment Checklist

Objective

Any new initiative, project or proposal that involves personal information or privacy intrusive technologies is likely to give rise to various privacy concerns.

Including a Privacy Impact Assessment (PIA) within a project will ensure that the privacy concerns are identified early on. It should then continue throughout the project lifecycle. The PIA model has been endorsed by the Information Commissioner's Office (the privacy regulator) as a crucial element in the concept of 'privacy by design,' whereby privacy measures are built in or embedded into a system design from the very outset.

Examples of when a PIA should be considered include (but are not limited to):

- Whenever new information about individuals will be captured
- When existing data is to be used for new purposes
- Proposals to outsource processing of personal data to a third party
- Proposals to process personal data off shore (includes remote access)
- Proposals to use any new technology for a particular purpose
- New or significant data sharing initiatives with third parties

This Screening Questions Checklist is designed to examine a new project/initiative at an early stage. It will result in an initial assessment of privacy risk and determine which level of further assessment is necessary. Please note that the requirement to undertake a PIA applies to projects involving customer data as well as those involving employee/ex-employee/pension scheme member data.

Project Information	
Organisation:	Transport for London
Business Area(s)/Directorate(s) involved:	Information Management (IM) Marketing & Communications
Name and position of individual(s) completing checklist	Matthew Griffin, Head of Business Relationship Management, IM Lucy Fish, Customer Channel Manager, Marketing & Comms
Email address(es)	[redacted]

Description of the project being assessed	Proof of Concept for capture of real time crowding information using WiFi location data.
Is this a new or existing project	New project.
Purpose of the project	To use the information available from WiFi access points to improve the operation and customer information provided on the TfL network. See summary of business case below.
Provide brief details of any earlier PIA or other personal data assessment done on this project in whole or in part	None, as this is a new project.

PIA checklist - date of completion	**25/10/14**

Summary of business case - Real time crowding information Proof of Concept

Levels of crowding on the TfL network at some locations and times contribute to a poor customer experience as travellers experience delays and uncomfortable journeys (at times they can also present a safety risk). Customer research suggests that improved real time crowding information (RTCI) and tools for customers to interpret this information will allow travellers to make better decisions about their journey resulting in improved customer experience. In addition, the provision of RTCI to operational teams will allow for improved short term planning (where crowding is predicted to occur) and will therefore benefit both the business and operational teams and the customer resulting from an improved operational response.

Operational benefits

- Provide real time crowding information to **operational teams** to allow for better tactical decisions by management and operational staff that will in turn improve customer experience; and provide information to operational teams to allow them to support customers in advance of increased crowding.

Customer benefits

- Provide **customers** with real time view of the state of the transport network through channels that are already used regularly will allow them to make the best decision about their travel; and,
- Forms the basis for travel behaviour change on the transport network thereby improving the operation of the network and overall customer experience.
- Encourages particular customer groups to change their travel behaviour to avoid crowding on the network and opting for travelling at less crowded times and on less crowded routes which will result in improved experience for them and other customers using the crowded services; and,
- Provide customers with an updated estimate of how long their planned journey is likely to take as a result of crowding on the network.
- Provide future personalisation of travel information (subject to customers explicitly opting-in to such services).

Full-Scale Privacy Impact Assessment Criteria

Criteria	Response Yes/No/Maybe	Detail / Rationale - include as much detail as possible
Does the project apply new or additional information technologies that have substantial potential for privacy intrusion?	Yes	The information available from the wifi access points adjacent to LU platforms and ticket halls, includes the MAC address of each mobile device which tries to connect to the Virgin Media wifi service. This data could be used to track the movement of individuals and in theory, could also be combined with other data relating to those same individuals captured by our CCTV cameras or electronic ticketing system. NB A MAC ('Media Access Control') address is a unique identifier assigned to network interfaces for communications on the physical network segment.
Does the project involve new identifiers, re-use of existing identifiers, or intrusive identification, identity authentication or identity management processes?	Yes	MAC addresses will need to be anonymised (ie hashed) but further techniques will also be required to manage this data appropriately
Might the project have the effect of denying anonymity and pseudonymity, or converting transactions that could previously be conducted anonymously or pseudonymously into identified transactions?	Yes	The data will potentially allow the identification of individuals, especially when combined with other sources such as CCTV data or Oyster data or other sources.
Does the project involve multiple organisations, whether they are government agencies (e.g. in 'joined-up government' initiatives) or private sector organisations (e.g. as outsourced service providers or as 'business partners')?	No	This data is only contained within TfL at present, although it may eventually involve the addition of other location based information, for example from the mobile operators.

Does the project involve new or significantly changed handling of personal data that is of particular concern to individuals?	Yes	MAC address information identifies a specific device and coupled with the location data of said device, this is a personal data concern.
Does the project involve new or significantly changed handling of a considerable amount of personal data about each individual in the database?	Yes	We currently do not track individual journeys to this granularity.
Does the project involve new or significantly changed handling of personal data about a large number of individuals?	Yes	The aim will be to gather data and store historical records of all journeys available to be tracked, this will be many millions of journeys.
Does the project involve new or significantly changed consolidation, inter-linking, cross-referencing or matching of personal data from multiple sources?	Initially no, but may be extended	Initially only standalone WiFi data will be used, the project may be extended to include other data sets owned by TfL, eg gateline and customer account data).
Does the project relate to data processing which is in any way exempt from legislative privacy protections?	No	
Does the project's justification include significant contributions to public security measures?	No	
Does the project involve systematic disclosure of personal data to, or access by, third parties that are not subject to comparable privacy regulation?	No	

PIA Screening Questions: Conclusions

The project needs to carefully manage the data it intends to collect. As part of the storage process the MAC addresses must be encoded using a cryptographic hash function. A cryptographic hash function is a kind of algorithm that can be run on a piece of data, often an individual file, producing a value called a checksum. Two files can be assured to be identical only if the checksums generated from each file, using the same cryptographic hash function, are identical. Thus this will allow comparison of MAC addresses without allowing the MAC address to be revealed or reconstructed, even if the hash function is known.

A principle of data protection in Big Data environments is that in all cases only the minimum data set necessary for the application should be used. To achieve this we will build an environment with specific data services that provide specific information based on the analysis of the underlying raw data.

For example if the application of the data requires journey times then the application will calculate journey times from the underlying data and provide just that information, rather than the underlying individual WiFi data.

Each application will have to provide a separate justification for access to the information. The information services will be built up over time based on the business needs.

TfL mobile data and privacy

Debrief

February 2016

Transport for London

Contents

Transport for London

Introduction

Transport for London

Research objectives

- To what extent does the possibility of using WiFi / mobile network connection data (captured on LU/ London Rail networks and the TLRN) raise data privacy concerns for customers? In what ways could using this data directly benefit customers and what are the implications for personalisation?

- To explore customers attitudes and perceptions around the use of WiFi / mobile connection data in general - making a distinction between the types of connection data where necessary (Bluetooth, cellular, Wi-Fi, GPS etc)
- To understand how customers feel about this data being used for improving journeys for them personally and the system as a whole, and to guide *how* this could be communicated to TfL's customers
- To understand customer's current assumptions around how TfL use their data (and what data)
- To provide a clear understanding of the terms in which WiFi /mobile data could be used by TfL, with a specific focus on the acceptability of different scenarios (eg TDM, personalised travel information, transport planning, system running more efficiently)
- To explore the likely impact on TfL reputation and customer satisfaction

Methodology

A group methodology was used to explore customer perceptions and attitudes

6 x 1.5hr group discussions

To understand customer response to mobile data collection and TfL concepts

4 x scenarios were shown via storyboards

Sample overview

Group	Age	Location
1	<30 (pre family)	Inner
2	<30 (pre family)	Outer
3	30 – 45	Inner
4	30 – 45	Outer
5	45 +	Inner
6	45 +	Outer

All had:
Internet access at home/or on mobile
Smartphone (iPhone, Android etc) and/or tablet
Internet access and use the internet on their mobile

Equal mix of gender in each group

All were BC1C2, this SEG band is also reflective of mobile internet usage and smartphone ownership

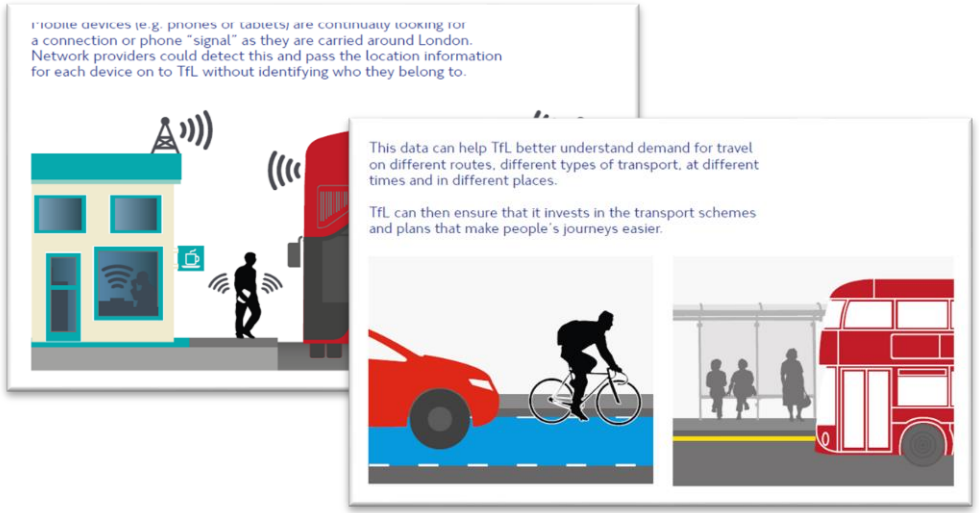
A mix of transport users in all groups with:
Mix of main mode: 2 x car users, 2 x Tube, 2 x rail users

Range of other transport used: Car, bus, cycling/cycle hire, trams, taxi, minicab, walking
Mix of journey types; leisure, commute

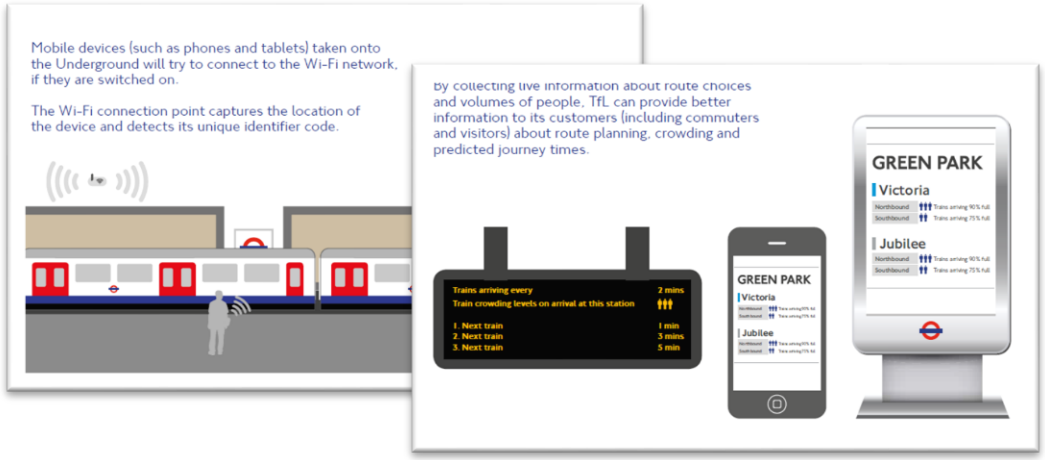
Scenarios tested

Scenario 1: **Road beacons – Bluetooth**

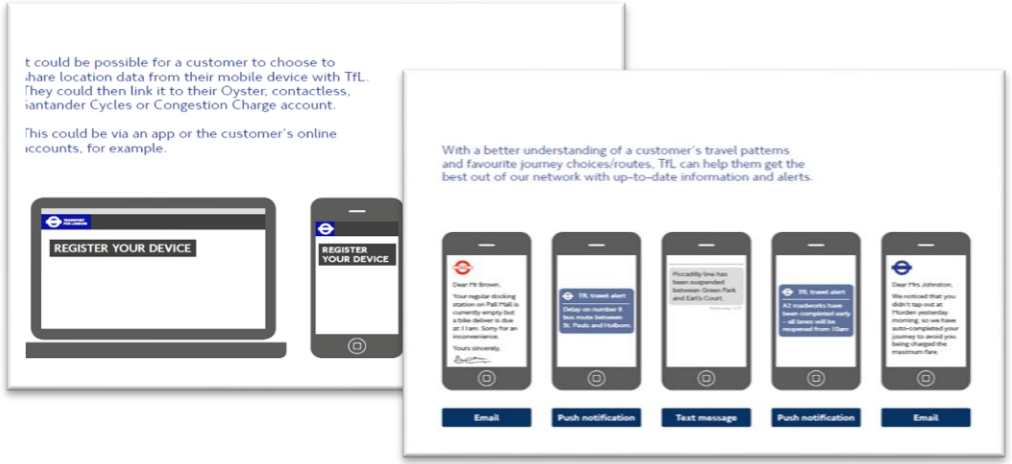
Scenario 2: **Mobile phone – planning**



Scenario 3: **Wi-Fi connection on Tube – TDM**



Scenario 4: **Registering a mobile device – analytics**



Research headlines

Transport for London

Research headlines

- The **sharing of personal information has become normalised** with consumers doing so in exchange for tangible benefits (ease of access to services; recommendations etc) delivered by organisations they deal with
    - Some concerns relating to privacy (sale of data) and security (fraud) remain but generally customers feel they can manage any risk by making informed choices regarding the organisations they choose to share information with

- **Sharing of location is viewed differently** as this communicates *where you are* in real time which can feel more personal than *who you are*

- The idea of **mobile data tracking is a new concept** and the application of this technology is widely unknown. Many are initially apprehensive of how it will be used and organisations' motivations for using it
    - It is clear that communicating the technology and raising awareness of its use will be critical in driving acceptance of TfL using it

- **Customers quickly realise the potential benefits** of utilising tracking data. TfL delivering solutions regarded as improving travel experiences can have positive impacts on reputation

- It will be critical that TfL is: **transparent** and overt in its use of data; **communicates the tangible benefits** they will deliver; **reassures** customers regarding the security of their data

Attitudes toward data sharing & collection

Transport for London

Customers want to control personal information given as well as level of interaction

When it comes down to sharing of information to access / use a service, customers feel it is important they are….

In charge of **how much detail** they give to organisations

Able (where feasible) **to manage the level of interaction** with the organisations they've shared information with

I draw a line when I can't see why they're asking for certain information. If I don't think it necessary, I wont continue. It feels really invasive.

I'd feel a lot better if they told me what they needed some of this stuff for. Do Netflix really need to know how old I am?

I like to limit the amount of stuff I get back from them. I don't mind recommendations but I want them to be relevant or be able to turn them off.

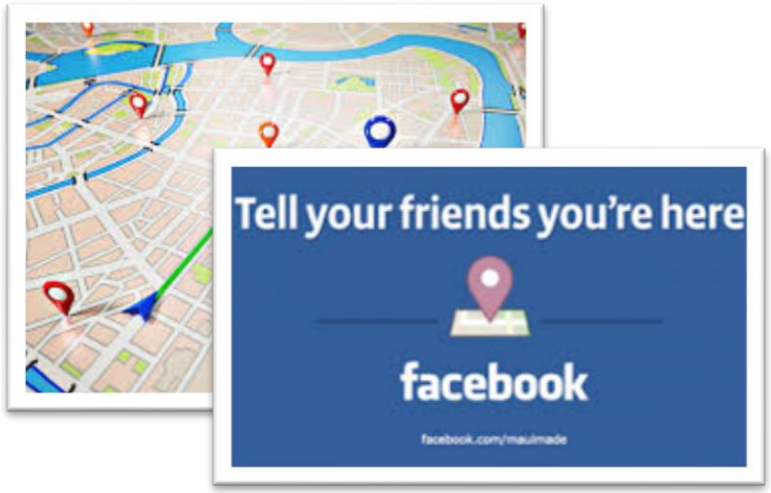
Having this level of control can help consumers feel empowered

Sharing location data is perceived differently

- Location data is viewed differently than other personal information because it is used for **very specific purposes** that benefit (navigation vs social media)

- Some customers (across both age ranges) choose to regulate and control access to this type of information more than other data because it communicates **where you are in real time** which can feel more personal

- In addition, some clearly do **not view what they are doing when using location data as 'sharing'** it with a service, and privacy / security risks not a consideration



I deliberately turn it (location) off for anything other than travel apps. I don't want people to know where I am. If feels sinister.

I don't feel that I'm sharing my information with Google or CityMapper when I turn my location data on. It's where I am but not who I am.

Abstract idea of mobile data ‘tracking’ does prompt concerns

- Customers are unaware that mobile devices are always looking to connect (even if WiFi not on) and that individual unique identifier can be picked up doing so
  - They are also **unaware that this technology is currently being used to identify** and track devices

- There is some **unease regarding this technology** and how it might be used, Concerns focus around
  - Privacy (being followed, tracked)
  - Motivations of organisation utilising data (‘Big Brother’)

- For many, unease with mobile data usage in this context stems from the fact this is **relatively new and unknown** technology with uncertain applications

- But this concern sits alongside **a resignation about how this tech will be adopted** as well as some acceptance that this may offer them some benefits as consumers/service users.

That’s way more stalker-ish. They don’t’ tell you they’re doing it.

If you can target stuff - information or offers I want to me, then that’s fine.

This is just the way of the world I guess. It’s sort of inevitable.

Education and awareness raising will be a key element in driving acceptance

Acceptability of mobile data ‘tracking’ affected by key factors

Less wary

More concerned

- **When overt end benefit for consumer**
- **Clear and transparent purpose for data collection at point of using service**
- **Data collected is anonymised/aggregated (more ‘arms length’ and tech feels ‘safer’)**
- **A measure of control related to how much information you pass on**

- **Benefit is purely for organisation (commercial / monetised)**
- **Purpose of data collection appears opaque / open to interpretation**
- **Data collected feels more individual / identifiable (demographic detail)**
- **Cannot control opt in or out to collection**

If I can opt out by turning my phone to airplane mode and they give me that choice then that’s fine.

I need to know upfront that they’re doing it and what for.

I think airports will do more with this. Not just manage queues. Follow terrorist suspects.

Gender and age? That means they know way more than they’re saying. I don’t like that.

Responses to TfL mobile data scenarios

Transport for London

Customers are broadly positive of TfL using mobile data to improve their travel experience

- Customers understand that TfL will use the mobile data to provide them with a better travel experience and are broadly accepting of the trade off
    - And the **core benefits t**o them are seen as the ability to make better and more informed travel decisions based on information provided by TfL

- There is some understanding (or expectation) amongst customers that **TfL already use customer data** (Oyster) to inform service delivery and planning so this is a logical extension of that

- While there is acceptance of TfL's use of this technology, customers would be **more positive and accepting** if TfL were upfront and transparent about this…
    - Obtaining permission (e.g. allowing customers to opt in) is ideal, but informing customers is likely to be enough (*smile you're on CCTV*)
    - Explaining rationale behind why the data is collected and the benefits it can deliver
    - Explaining the data is collated by and owned by mobile providers

- Overall customers tended to gravitate towards scenarios **they understand and believe deliver a clear, tangible benefit**

We need to give TfL something in order for TfL to do something to us.

It's already happening with Oyster, if it's going to make our travel better then I don't see any problems.

I'm fine with it, but they need to tell us about this.

Overall response to TfL's use of mobile data collection: four scenarios

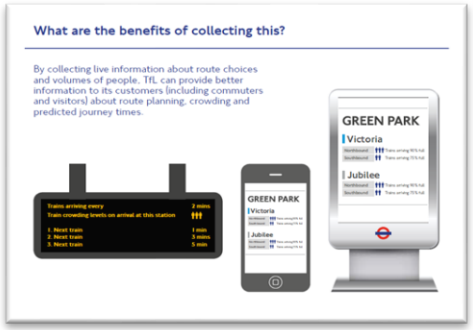
- *Well received*
- *Has potential but would benefit from repositioning/clarification*

Tangible benefit for customer

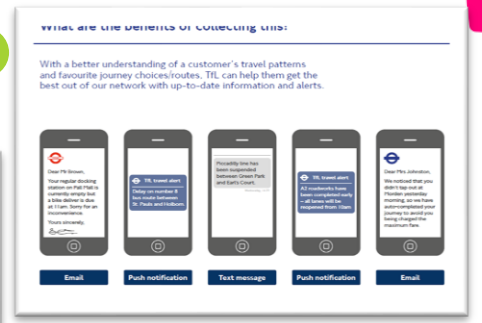
Purpose less obvious

Transparent purpose

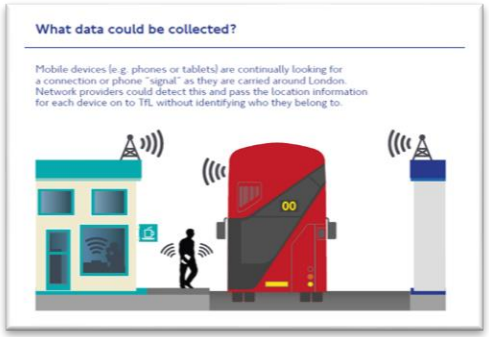
Less clear customer benefit



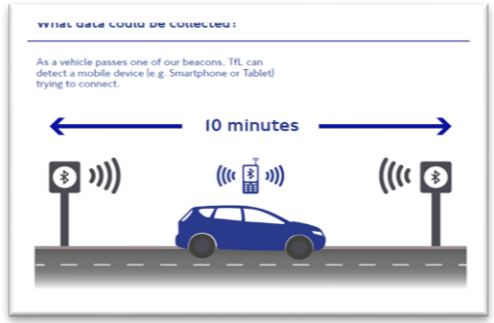
Scenario 3:
Wi-Fi connection on Tube – TDM



Scenario 4:
Registration on a mobile device



Scenario 2:
Mobile phone – planning



Scenario 1:
Road beacons – Bluetooth

Scenario 3: Wi-Fi connection on Tube (TDM)

Clear and transparent purpose and benefit for data collection

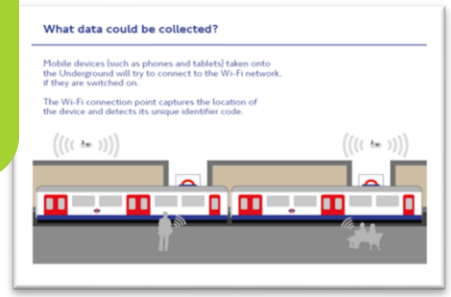
What's working:

- 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

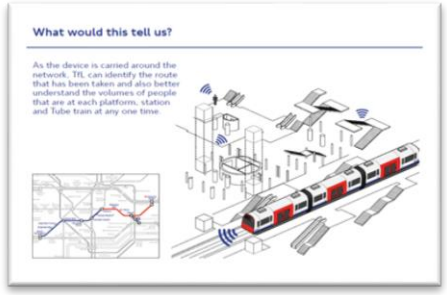
Watch outs:

- 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 tells you which is the least busy part of the train – it's handy.



I like that one. I would just wait for the next train, I hate the crowded trains.



What's that going to tell me at 9:00 at Bank station, all trains are crowded?

Scenario 4: Registering with a mobile device (Analytics)

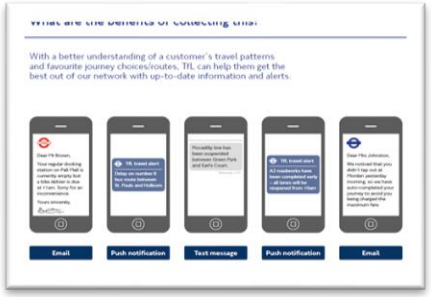
Well received and customers felt there was a clear benefit

What's working:

- This scenario clearly communicates a strong benefit for customers, offering them personalised real-time information that would allow them to make crucial journey decisions
- Customers appreciated the level of control they have in this scenario, with the ability to opt-in for registration

Watch outs:

- For a small but vocal minority, the data collected feels too personal (individual / identifiable) and plays on their privacy concerns; this group are unlikely to opt in
- Customers would like to be in control of when information is received



That would be really useful! I could just drive to a different station in the morning if I knew my central line was down..

You're in control there, I like that. They're letting us decide and I would register because you're getting something good back.

Sorry, that's just too much for me. They're already watching me on my Oyster card, why do they need exactly where I live and where I work.

Scenario 1: Road beacons – Bluetooth (Surface)

Clearer explanation needed to demonstrate value and relevance

What's working:

- Customers appreciated that data collection is anonymised
- Customers liked that the data collection has a clear and tangible purpose

It's like the airport one, it's just registering your device, not who you are so I don't mind it.

Watch outs:

- There was a perception amongst customers that this scenario was not delivering anything above what already exists – with many accessing live trafficking information from a range of sources (GPS, *Twitter*, apps, etc.)
- Combined with the perception that this would include infrastructural cost (installing beacons), left some feeling it was a poor use of resource
- Currently benefit is seen as very focused on drivers, linking use of technology to buses as a mode will also increase appeal – there is appetite for live travel information on this mode

My satnav already does that and I have a few driving apps that give me live traffic information.

Don't they already do that? With road cameras. It seems a bit unnecessary to me.

Scenario 2: Mobile phone (Planning)

Lacks an immediate tangible benefit and clear purpose

What's working:

- The idea of long-term planning resonated with many customers

That's TfL gathering stats, I know they need to do that to improve things so I don't see a problem.

That's important. They have to keep thinking about the future.

Watch outs:

- Lacks an immediate, tangible benefit and therefore failed to engage with many customers
- Clearer explanation needed on to how data is collected what TfL can do with it – customers were unsure of how this general information could benefit TfL (eg distinguishing between modes)
- Without a clear purpose and tangible benefit, customers were less comfortable

I don't understand how that's going to be useful for TfL, how can they even tell if someone is using public transport.

I'm not sure about that one. They're just tracking us all across London, but they're not clear about what they plan to do with the information.

Acceptance of TfL data use for commercial purposes depends on customers being in control

- While some customers are hesitant about TfL being involved with commercial enterprise, the **majority think this is inevitable and were open to it**

- However customers want **TfL to be open and transparent** about use of mobile data collection for commercial purposes

- Response to use of mobile data collection for commercial purposes depends on use
    - **Registering mobile to receive customer notifications (Personalisation):** customers comfortable with this as long as they are in control of what notifications they receive or have ability to opt out (notification centre vs push messages)
    - **Use of aggregated and anonymised location data to make advertising more effective:** customers felt this was less invasive as they were not using personal data

I don't want a pop-up message every hour, maybe if there's an offer section on the app I can look there. Mind you if it's a good offer I wouldn't mind it popping up!

That's just good, tactical advertising!

Principles to help drive engagement and acceptance of use of mobile data

1. TfL needs to demonstrate transparency

- TfL to be overt about the mobile tracking data tech and strategy and *how* it is used
- Explain the technology simply *and* that operators collate and pass on data to TfL
- Transparency help reinforce an open, honest relationship with customers

2. TfL needs to reassure customers regarding use of their data

- Assure customers regarding the anonymity of data where relevant
- Explain they can opt out or manage the access to this data
- Communicate mobile operators & TfL work under strict data protection rules
- Avoid use of any language that provokes privacy concerns
- Avoid over complicated and technical detail of *how* the tech works

3. TfL needs to communicate that data usage will benefit customer

- Essential customers feel their improved experiences is driving the application on this technology
- Critical to position the benefits to feel tangible and relevant so they don't feel abstract and 'distant'

Moving forward

- As seen in previous research there is an expectation that TfL will provide more and better customer solutions and using mobile location data provides the organisation one clear opportunity on how to deliver these

- This said, this technology feels new and unfamiliar and so customer awareness and understanding of this technology and its application is low.

- TfL can play a role in informing and driving awareness and educating customers of the benefits (and informing customers will help ensure engagement, acceptance and take up)

- The principles for engagement outlined above can help counter customer concerns regarding: privacy; the sale of data to 3rd parties; any unsolicited communications from TfL or it's partners

Integrated communications plan
Customers, communications and technology

WiFi Network data collection pilot

October 2016

Sponsor: Graeme Craig
Delegated Sponsor: Lauren Sager - Weinstein

(NB: TO BE DISTRIBUTED AS BELOW NO LATER THAN 7 CALENDAR DAYS PRIOR TO ACTIVITY STARTING)

Marketing distribution	CC&T distribution	Integrated team distribution (please complete)	Employee engagement distribution	Other stakeholders (please complete)
Chris Macleod Miranda Leedham Julie Dixon Phil Young Alison Naylor Alison Henderson	Stuart Lee (for onward distribution to Leadership Team, CC&T Leadership Team) Sarah Gasson Lauren Sager – Weinstein Lucy Fish	Ryan Sweeney Amie Browes Thomas Canning Sarah Cohen Ali Mahmood Charlotte Cox Shimisa Santhirasenan	Mary Strydom Nadine Pangilinan Alison Giroux David Carr	Graeme Craig Guy Allen Lee McGirr Joe Scheinkonig Geoff Hobbs

05.08.2016
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CONTEXT/BACKGROUND

- Activate an innovative 4 week pilot starting 10 October 2016 whereby WiFi connectivity data will be collected at 54 selected London Underground stations to better understand journey patterns and improve our services

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- The pilot will be testing whether WiFi connectivity data can offer benefits in four key areas:
    - **Financial** –increasing revenue from our advertising assets, reducing spend through more efficient working practices and reduced surveys;
    - **Customer** – providing better customer information for journey planning, congestion avoidance and identifying customers eligible for a refund;
    - **Medium and Long Term Planning** – Ensuring optimal and evidence based decision making for a range of potential investments ranging from the number of new trains procured, station upgrades, timetabling and event management, superseding current survey based methods (e.g. RODS);
    - **Operational & Safety** – Ensuring we manage disruptions and events, deploy staff to best meet customer needs and ensure a safe environment for all who use our network
- Collected data is not used to identify individuals and all Media Access Control (MAC) addresses will be encrypted and stored in a secure database within a secure data warehouse. Access to the encrypted data will be controlled to a limited number of analysts and usage monitored
- This pilot will comply legally with privacy and data protection guidelines and Customer Experience Analytics are working closely with Information Governance and the Information Commissioners Office
- Once the pilot is complete, TfL will share its findings with regulatory and governing bodies and decide whether:
    - To commence full network data collection to enable continuous analysis of WiFi
    - To undertake an additional or extended pilot to allow more analysis or feedback
    - To cease collecting and processing WiFi data altogether

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KEY OBJECTIVES

Business objectives

- Inform customers who use our network that a 4 week pilot will run between 10 October and 7 November inclusive, where WiFi connection data will be collected

Main customer & user objective

- Improve the reliability of transport services, including travel demand management
- Use data to improve both the operation of the London Underground network and provide better customer information
- Train and equip our staff to deliver what customers and users want; and
- Provide personalised, real-time, integrated information

Note that the pilot will not itself achieve these objectives but will determine whether we can implement and deliver this as a project if the pilot is successful

KEY MESSAGES

- TfL collects WiFi connectivity data to better understand journey patterns and improve our services
- Collected data is not used to identify individuals
- For more information visit tfl.go.uk/privacy (the website will give further details on the pilot and include FAQs to help customers better understand how we carefully managed collected data)
- The pilot is for four weeks and only at a limited number (54) of LU Stations
  (Key messages are legally compliant and have been approved by privacy and data protection experts in Information Governance)

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TARGET AUDIENCE(S)

- All users of the underground, registered customers, All TfL Staff, Media, Special Interest Groups including the ICO
- Key staff engagement – CCO, Social Media, Station Staff

RISKS

- Reputational damage to TfL as some customers may be uncomfortable with data being collected and all data will automatically be collected from any device within range of a WiFi access point. To opt out customers will either have to switch off WiFi connectivity on their device or set the device to airplane mode and not subsequently enable WiFi connectivity
- To combat this risk as recent research indicated TfL needs to ensure that customers feel*:
    - We are being transparent
    - Assure customers that individuals will not be idnetified
    - Highlight the benefits to the customer (for instance improvements to their travel experiences if TfL understands journey patterns better)
    - They understand the purpose and can understand more at our dedicated WiFi privacy wbepage

OUTCOMES

- Customers informed that this pilot is taking place, reminding them TfL communicates honestly and transparently
- The pilot forms part of TfL's continuing work to ensure that all revenue is reinvested in delivering a modern and affordable transport network. Depending on the outcome of the pilot, the data could also be used to help improve wayfinding within stations in the future to ensure

Please see appendices for more detail

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customers understand the quickest and most accessible routes, as well as help TfL make best use of current and future commercial assets within its stations and help generate revenue to be reinvested in London's transport network

* Findings were from the Mobile data and privacy report (2016)

BUDGET

- Total budget for the pilot is £40k, of which £2k is allocated to integrated communication support

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Integrated communications activity plan

Channel	Start date	Audience detail	Description of activity	Key messages
Press	w/c 26 September	Media	• Press release announcing the pilot • Broadcast media interviews with Lauren Sager Weinstein and Stuart Reid or Gareth Powell at Warren Street • A Metro article would look to run w/c 26 September in advance of the pilot beginning reiterating the key messages from the press release • A robust Q&A to explain where the pilot will take place, what is involved, any concerns around the pilot and how we plan to use this data	• Explain why we are collecting WiFi data, what we plan to do with it and key customer benefits • Collected data will not be used to identify individuals • Communicate the tangible benefits to customers so they better understand why we are collecting data

Please see appendices for more detail

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Channel	Start date	Audience detail	Description of activity	Key messages
Social media	w/c 26 September	Twitter/ Facebook/ Tech blog	• Social Media posted by Press Office to highlight trial, explain benefits and address any concerns around the trial • Blog posts during trial to inform digital community what we are doing and provide a feedback forum	• Explain why we are collecting WiFi data, what we plan to do with it and key customer benefits
TfL.gov.uk	w/c 26 September	Customers	• New dedicated wifi privacy website page	- Summary of the trial and stations involved - About the data being collection - How to opt out - 20+ FAQs - How and where we store the data - Explaining how the data will remain secure and private

Please see appendices for more detail

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Channel	Start date	Audience detail	Description of activity	Key messages
Marcomms	w/c 10 October	Customers	• Informing customers at participating stations through posters in ticket halls and platforms that WiFi connectivity data is being collected • Using a combination of customer information boards and DR circuit posters depending on where the message is most appropriate	• TfL collects WiFi connectivity data to better understand journey patterns and improve our services • Collected data is not used to identify individuals • For more information visit tfl.go.uk/privacy
Staff engagement	w/c 26 September	All Staff	• Source article, LU intranet article, Yammer • Station briefings via line general managers to cascade to staff at stations	• What we are doing, why and website link to FAQs • Help staff with who to contact if further assistance is required
Contact centre briefings	w/c 26 September	All CCO staff	• Briefings, FAQ information Support on the day of media release from project team	• Help the contact centre understand the trial in more detail and who to contact in the project team if further assistance is required

Please see appendices for more detail

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Channel	Start date	Audience detail	Description of activity	Key messages
Stakeholder engagement	w/c 26 September	AMs, MPs, transport watchdogs, travel watch tech and business community, safety and accessibility groups	• Targeted emails to stakeholders and advance notice to selected trusted contacts to obtain supportive comments and statements	• TfL collects WiFi connectivity data to better understand journey patterns and improve our services • Collected data is not used to identify individuals • For more information visit tfl.go.uk/privacy

(Overview of above proposed activity will be shared for review and endorsement with Customer Group and Technology & Data Group)

CREATIVE WORK

Will be included once finalised

ADDITIONAL INFORMATION

- Project Leads – Ryan Sweeney and Amie Browes (reporting to Shashi Verma and Lauren Sager – Weinstein)
- Press and Media – Thomas Canning
- Marketing operations – Ali Mahmood

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- Information Governance – Lee McGirr

APPENDIX 1

1.1 Customer Experience Analytics Operational Research (CEA OR) analysed a day's sample of WiFi data to understand its value to TfL. This demonstrated that:

1. Individual route choice and interchange (line and stations) can be identified;
2. In station movements routes can be measured in terms of volumes and durations;
3. Train assignment or left behind can be calculated and crowding inferred;
4. All the above can be scaled to network totals based on representation of devices.

1.2 A Gate 0 paper was submitted to Customer Experience SMT and approved on the 14 July to formalise this as a project. This project will deliver:

1. A productionised real time feed of all WiFi device location data into the CEA Data Warehouse Platform for use by many across TfL;
2. Methods that identify route choice and interchange between origin-destination pairs, in station movements volumes, duration and platform crowding, at a minute by minute level for every day for the whole TfL rail network covered by WiFi. This will be 1 day in arrears. (s)
3. A user friendly front end interface to make the derived intelligence accessible and query-able to all business users

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1.3 The project would be delivered in phases based on technical components. The information outputs would be designed to ensure compatibility with ODX (our public transport matrix that includes bus inference) and Customer Segmentation analysis to provide us with a rich and complete data source.

2 CEA have worked with Information Governance to develop a pilot. For this we have selected 54 stations to enable TfL to collect the variety of data required to test the use cases whilst minimising the amount of data collected during the pilot. The justification for selecting this as the data collection areas are

1. **Understanding route choice**. We want to understand the various routes (lines and stations) taken by customers between their entry station and exit station (which we may already know from ticketing data). This data will enable us to better plan the network and could deliver a superior, larger, more frequent and cheaper data set than Rolling Origin Destination Survey (RODS) data.

2. **Understanding crowding and train assignment**. We want to understand if we can use a combination of WiFi and train scheduling and telemetry data to measure train crowding and to help us understand how customers interact with crowded trains. This will assist communications with customers about the specific levels of crowding they may experience on their journeys and allow them to make informed choices about the type of journeys they make

3. **Understanding in station movements**. TfL has a variety of stations on its network from small stations served by one line to major termini with multiple lines and many possible walking routes within stations to reach platforms. To understand in station movements we have selected some of the largest and most complex stations where a variety of movements are possible and small stations where station movements should be straightforward.

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4. **Scaling seen devices to network totals**. WiFi data will only be a sample. Some customers will not carry a WiFi capable device, others will have WiFi turned off, and some may not be within range of the WiFi access points. We are also likely to double or treble survey some customers who carry multiple WiFi enabled devices. By selecting the proposed area we will be able to understand how we scale the devices seen to network totals and remove any bias within the data.

5. **Understanding the impact of mobile network connectivity on WiFi.** Only 45 per cent of the London Underground network is in tunnels and therefore has limited data connectivity. For the remaining 55% it may be possible to connect to a radio network (GPRS, EDGE, 3G or 4G) through a mobile network provider for data connectivity. We wish to understand how the availability of radio networks impact the number of customers connecting to station WiFi.

Insights from Wi-Fi data

Proposed Pilot

EVERY JOURNEY MATTERS

Contents

Background

In 2014, TfL approached the Information Commissioners Office (ICO) to discuss using data generated from the TfL in-station Wi-Fi access points. The aim of using this data was to improve both the operation of the London Underground network and provide better customer information. TfL conducted a Privacy Impact Assessment as part of this to identify and reduce any risks or privacy concerns this could have generated. Whilst Wi-Fi data was considered initially, the proof of concept, which assessed passenger crowding on the Victoria Line was delivered using train telemetry data, Rolling Origin Destination Survey (RODS) data and Oyster smartcard ticketing data instead of Wi-Fi data.

The purpose of this document is for TfL to engage the ICO as we are now planning to run a pilot using Wi-Fi data on a subset of the London Underground network. We propose collecting, hashing and analysing the media access control (MAC) address [hereafter referred to as 'Wi-Fi data'] of customers connecting to selected Wi-Fi access points to determine the value of this data against specified use cases. A new privacy impact assessment will be completed as part of this.

Use Cases and benefits of analysing Wi-Fi data

Wi-Fi data has the potential to provide TfL with a far greater understanding of customer behaviour on the London Underground network enabling TfL to improve the operation, planning and information provision on London Underground. Four key use cases have been identified where the collection, processing and analysis of Wi-Fi data could benefit both TfL and our customers:

1. **Customer Information**: TfL could provide historical and near real time information to customers informing them of on-train, platform and station crowding and advise customers of the best route and travel options. Where disruptions and delays occur, patterns of travel from Wi-Fi data could be used to identify customers with similar patterns in our ticketing data enabling us to deliver more efficient and effective refunds to customers impacted.

2. **Medium and long term transport network planning**: Currently TfL carries out the Rolling Origin Destination Survey (RODS) to understand passenger journeys, route choices and movements. The survey underpins organisation wide planning decisions ranging from timetables, to train assets, and the priority and design of station upgrades. RODS incurs the same constraints and bias inherent in any self-completion survey; it is only carried out with a small sample of customers, at a small sample of stations and in a short time period limiting its usefulness in capturing the variability and dynamic nature of the network and customers movements within in it. By using Wi-Fi data, merged with aggregated Oyster and Contactless ticketing data we would have a far richer data source to ensure optimal and evidence based decision making for a wide range of planning decisions. This would also enable financial savings through reduced survey, processing and modelling costs.

3. **Operations and Safety Information**: Understanding our customer's behaviour is vital for day-to-day, event and disruption management of the Underground network. Through collecting and processing Wi-Fi data we would be better able to operate our network and to deploy staff more effectively to best meet customer needs; ensuring a safe environment for all who use the network.

4. **Financial**: TfL is under increasing financial pressure. The Department of Transport grant we receive (£591m in 2015/16) will be removed from 2018. In addition, fares are to be frozen over the current mayoral term (2016 to 2020). To ensure we continue to provide a world

class transport network we will need to spend less and generate more. One area for generating more is the commercial advertising partnership for in-station advertising assets. By understanding customer behaviour in relation to these assets we will be able to significantly increase the revenue we generate.

Pilot Proposal

Informing Customers

We will communicate to our customers and the public that we are collecting and processing Wi-Fi data on a subset of our network. The proposed channels detailed below are methods we will consider using to inform as many customers as practicably possible.

1. In station signage and notices,
2. In station announcements,
3. Press release(s),
4. Newspaper articles or advertisements,
5. Dedicated TfL website page,
6. Emailing registered TfL customers.

Customers will be advised that they can opt out by turning off the Wi-Fi capability of their device.

Informing Employees

Currently station staff frequently use Wi-Fi on mobile work devices (phones and tablets). This enables TfL to provide staff with the latest information and easy to use tools to help them deliver excellent customer service. We will work with our Employee Communications team to provide staff with the information on how this may affect them. Communication channels are likely to include:

1. Team Meetings and briefings,
2. Staff magazines and bulletins (electronic and hard copy),
3. Emails,
4. TfL Yammer Network.

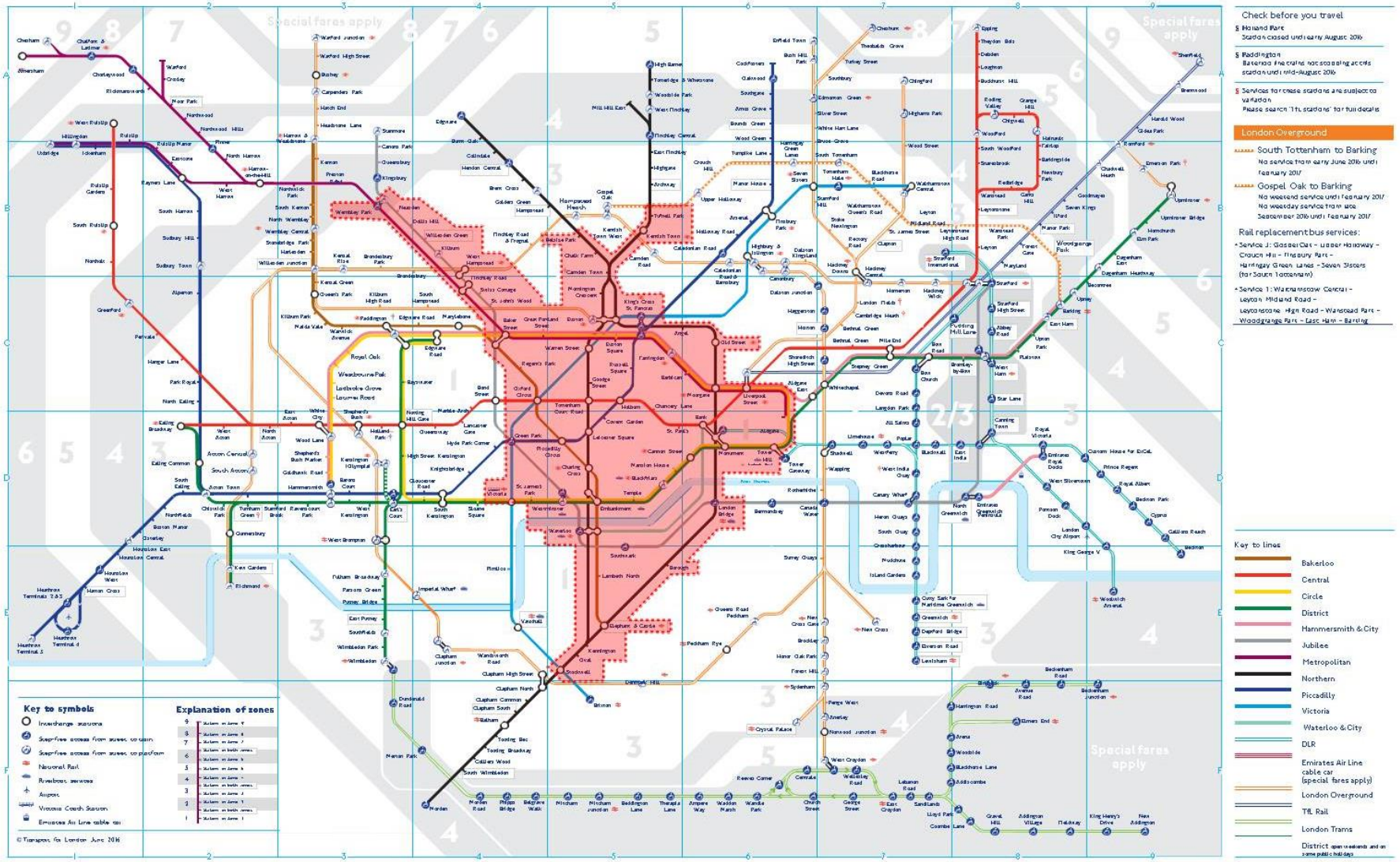
Pilot Period

We plan to run this pilot for four weeks commencing on Monday 5 September 2016. We will communicate to customers the intentions of the pilot both before the pilot begins and during the pilot through our available communication channels.

Data Collection Area

TfL proposes collecting and processing data from only those stations in Figure 1. This is a total of 54 stations (Appendix 1).

Figure 1: Proposed Area where data will be collected, hashed and anonymised and analysed.



*Tottenham Court Road has no Wi-Fi provision. Based on information http://content.tfl.gov.uk/wifi-underground-overground-map-october-2015.pdf

Rationale for Data Collection Area

This area has been carefully selected to enable TfL to collect the variety of data required to test the use cases whilst minimising the amount of data collected during the pilot. The justification for selecting this as the data collection area are:

1. ***Understanding route choice***. We want to understand the various routes (lines and stations) taken by customers between their entry station and exit station (which we may already know from ticketing data). This data will enable us to better plan the network. Rolling Origin Destination Survey (RODS) currently provides this information based on a sample of customers but this is deliberately carried out on days without disruption or events. We believe Wi-Fi data has the potential to replace RODS and deliver a superior, larger, more frequent and cheaper data set. It would provide us with a continuous data set and we could understand seasonal changes and trends and monitor the impact of a range of factors. We have selected part of Zone 1 as it has a dense number of stations, offers a high number of interchange options, has multiple routes between two stations, and customers are likely to show a far greater propensity to interchange compared to outer zones which are served by fewer routes and options. Further to this we also need an area where we can monitor entries and exits. The perimeter effect of the circle line will enable this. We have selected the Metropolitan Line and Jubilee Stations between Finchley Road and Wembley Park to understand what line and train a customer takes when there are two options where one is faster than the other (5 minutes on the Metropolitan Line versus 12 minutes on the Jubilee Line).

2. ***Understanding crowding and train assignment.*** We want to understand if we can use a combination of Wi-Fi and train scheduling and telemetry data to measure on train crowding and to help us understand how customers interact with crowded trains. This will assist communications with customers about the specific levels of crowding they may experience on their journeys and allow them to make informed choices about the type of journeys they make. To fully understand this we have chosen some Zone 1 stations where demand and crowding are most prominent. Furthermore, we have selected branch lines to enable us to assess where customers may choose to remain on the platform as they wait for a train to their destination and not because the train is crowded and prevented them from boarding. To understand the impact of branch lines we have selected part of the Northern Line that includes the City and Bank branch and the Edgware and High Barnet branches. We have not

selected the whole of the Northern Line but two stations after the branch which we think is the minimum required in order to test and validate our outputs.

3. ***Understanding in station movements.*** TfL has a variety of stations on its network from small stations served by one line to major termini with multiple lines and many possible walking routes within stations to reach platforms. To understand in station movements we have selected some of the largest and most complex stations where a variety of movements are possible including large termini (Kings Cross St. Pancras, Euston, Waterloo, Liverpool Street, Victoria), large interchange stations (Green Park, Bank, Monument, Westminster, Baker Street, Embankment) with up to 10 platforms, and small stations where station movements should be straightforward (St. James's Park, Barbican, Temple, Euston Sq.).

4. ***Scaling seen devices to network totals.*** Wi-Fi data will only be a sample of the population. Some customers will not carry a Wi-Fi capable device, others will have Wi-Fi turned off, and some may not be within range of the Wi-Fi access points. We are also likely to double or treble survey some customers who carry and connect to the network with multiple Wi-Fi enabled devices. By selecting the proposed area we will be able to understand how we scale the devices seen to network totals and remove any bias within the data.

5. ***Understanding the impact of mobile network connectivity on Wi-Fi.*** Only 45 per cent of the London Underground network is in tunnels and therefore has limited data connectivity. For the remaining 55% it may be possible to connect to a radio network (GPRS, EDGE, 3G or 4G) through a mobile network provider for data connectivity. We wish to understand how the availability of radio networks impact the number of customers connecting to station Wi-Fi. To facilitate this we have selected the stations between Finchley Road to Wembley Park on the Metropolitan and Jubilee line. Here the trains run outside of tunnels and customers should be able to choose between Wi-Fi and mobile radio network.

Pilot data access and security

Data will be stored in an on-estate secure data warehouse and will be hashed and anonymised to prevent the identification of an original MAC address. A limited number of analysts will have access to the data during the pilot. These analysts are required to complete annual tests on Privacy and Data Protection, and Information Security. Analysts accessing this data are familiar dealing with personal and sensitive data through their access and management of the Oyster and Contactless Payment Card data.

Pilot Review and Next Steps

During the four week pilot we will collect, process and start analysing the data. We will only process and analyse data collected during the four week pilot. It is likely that we will continue to process and analyse data collected during the pilot after the pilot has ended to continue testing the use cases. Once we have completed the analysis of data against the use cases we will review the pilot. We will ask for questions to determine the success of the pilot:

1. Did the collection, processing and analytics of data deliver envisaged benefits and value against the use cases stated earlier in (Use Cases and benefits of analysing Wi-Fi data)'

2. What, if any was the response from our customers and the public to TfL undertaking this pilot?

3. What, if any was the response from organisations that govern and regulate TfL?

4. What, if any was the response from specialist interest groups?

Following this review, TfL will share its findings with regulatory and governing bodies and decide whether:

1. To cease collecting and processing Wi-Fi data,

2. To undertake an additional or extended pilot to allow more analysis or feedback,

3. To commence full network data collection to enable continuous analysis of Wi-Fi, creating transactional and aggregated data.

Based on the option selected, appropriate communications will take place with stakeholders, customers and staff.

Appendices

Appendix 1 – List of Stations for proposed pilot

Aldgate
Angel
Baker Street
Bank
Belsize Park
Blackfriars
Borough
Camden Town
Cannon Street
Chalk Farm
Chancery Lane
Charing Cross
Covent Garden
Dollis Hill
Elephant & Castle
Embankment
Euston
Finchley Road
Green Park
Holborn
Kennington
Kentish Town
Kilburn
Kings Cross St. Pancras
Lambeth North
Leicester Square
Liverpool Street
London Bridge
Mansion House
Monument
Moorgate
Mornington Crescent
Neasden
Old Street
Oval
Oxford Circus
Piccadilly Circus
Regent's Park
Russell Square
St. James's Park
St. Paul's
St. John's Wood
Stockwell
Swiss Cottage
Temple
Tower Hill
Tufnell Park
Victoria
Warren Street
Waterloo
Wembley Park
West Hampstead
Westminster
Willesden Green

Contact Information

For further information please contact **Lee McGirr** or **Ryan Sweeney**.

Lee McGirr, Privacy Advisor
Email: [redacted]
Phone: [redacted]

Ryan Sweeney, Data Services Manager
Email: [redacted]
Phone: [redacted]

Transport for London

WiFi connection data collection

From Monday 10 October to Monday 7 November

We are collecting WiFi connection data at this station to better understand journey patterns and improve our services.

This data is not used to identify individuals.

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

Transport for London

Privacy and Data Protection Complaints Handling Procedure

Description: Procedure for the investigation and resolution of complaints submitted to TfL or its operating subsidiaries, in connection with alleged non-compliance with the following polices and legislation:

- TfL Privacy and Data Protection Policy
- Data Protection Act 1998
- Privacy and Electronic Communications Regulations 2003

Author: Privacy and Data Protection Team

Approved: 12 March 2013

1. Purpose

This Procedure is intended to outline the mechanism through which complaints about the processing (ie collection, storage, use or disposal) of personal information are to be investigated and resolved. It also applies where an incident of non-compliance (with a statutory or TfL policy related requirement) has been identified internally, in the absence of a complaint by an affected individual.

2. Definitions

Information Commissioner	The regulator appointed by Parliament who enforces the provisions of the Data Protection Act 1998 and the Privacy and Electronic Communications Regulations 2003
Privacy and Data Protection Team	The business unit within Information Governance, responsible for TfL's compliance with information governance legislation (including the Data Protection Act 1998 and the Privacy and Electronic Communications Regulations 2003)
Subject Access Request	A request to access personal information (from the individual to whom the information relates) covered by the provisions of the Data Protection Act 1998

TfL	Transport for London and its wholly owned subsidiaries

3. Organisational scope

Compliance with this procedure is a requirement for all business areas of TfL. Failure to comply with this procedure or to implement any consequential changes to TfL policy or procedure, may result in TfL (or individual employees), operating in breach of the law and being made the subject of financial or other serious penalties imposed by the Information Commissioner or civil courts.

4. Context

This Procedure is not intended to provide a substitute for, or undermine, an individual's right to complain directly to the Information Commissioner's Office (ICO) about the way in which TfL has processed (or is processing) personal information. However, TfL has chosen to adopt this Procedure in accordance with best practice outlined by the ICO.

5. Procedure

5.1 Individuals may submit a complaint which falls within the scope of this Procedure if, for example:

- they believe that their personal information has been processed for a purpose other than that for which it was originally collected;
- they believe that their personal information has been misused or compromised whilst being processed by TfL;
- they believe that their personal information has been disclosed unlawfully in response to a request from a third party;
- their Subject Access request was not dealt with within the statutory 40 calendar days; they did not receive all of the personal information to which they believe they were entitled; or they feel that exemptions to disclosure have been wrongly applied.

It is important to note that the complaints handling process is an opportunity to consider a Subject Access request completely afresh. The review process may also be a trigger for the involvement of the Privacy and Data Protection Team, Internal Audit or the Commissioner's Office, for the first time.

5.2 Any specific or implicit complaint expressing concern or dissatisfaction with (i) the way in which personal information has been processed by TfL; or (ii) TfL's response to a 'business as usual' or 'complex' Subject Access request, must immediately be forwarded to the Privacy and Data Protection Team using the following contact details:

Privacy and Data Protection Team
Transport for London
PO Box 72273
London
SW1P 9JQ

Email: privacy@tfl.gov.uk

5.3 What happens once a complaint has been received by Information Governance?

5.3.1 In all cases, complaints will be acknowledged and the complainant informed of TfL's target date for providing a response to their complaint.

5.3.2 If it becomes apparent that the provision of a response will take longer than the target date (for example because of the complexity of the particular case), the Privacy and Data Protection Team will inform the applicant and explain the reason for the delay.

5.4 Timescales for the investigation and resolution of complaints

5.4.1 Complaints covered by this Procedure must be completed within a reasonable timescale. In accordance with best practice TfL has adopted the following targets for the conduct of an internal review and the provision of a final response to the complainant:

- Written acknowledgment of a complaint should be sent within 5 working days of receipt and include a target date for its resolution;
- Routine complaints will normally be dealt with (and a final response sent to the complainant) within 40 calendar days of receipt;
- Complex complaints (for example involving the collation and analysis of a large amount of supporting information) can take longer than 40 calendar days to resolve, in which case an extension to this deadline may be required.

5.4.2 If it becomes clear at any stage of the investigation of a complaint that TfL will have to extend the deadline set in the original acknowledgment, the Privacy and Data Protection Team will communicate this to the complainant and set a revised deadline by which TfL will respond. Every effort must then be made by TfL to ensure that this deadline is met.

5.5 Who will conduct the investigation and resolve the complaint?

5.5.1 Complaints will be investigated and resolved by a member of the Privacy and Data Protection Team within Information Governance.

5.5.2 Where appropriate (eg the escalation of a related issue to a Director or Chief Officer) additional input will be provided by the Privacy and Data Protection Manager and/or the Head of Information Governance.

5.6 How is an investigation conducted?

5.6.1 The process of investigation of a complaint is not intended to be overly bureaucratic and will be conducted in a fair and impartial manner.

5.6.2 In the case of a general complaint about the way in which TfL has processed personal information, the Privacy and Data Protection Team will investigate the surrounding circumstances and request copies of any material (documents, emails, etc) connected with the subject matter of the complaint. If necessary, the Privacy and Data Protection Team will contact individual employees responsible for associated activities or business processes, to establish the facts surrounding the subject matter of the complaint.

5.6.3 In the case of a Subject Access request, the Privacy and Data Protection Team will request copies of all material (documents, emails, etc) connected with the processing of the request. They will also request copies of any information held by TfL which relates to the original request, whether or not it was disclosed to the complainant. If necessary, the Privacy and Data Protection Team will contact individual employees involved in the processing of the request, to seek clarification on the facts surrounding the handling of the request and any decisions made in relation to the way it was handled by the business.

5.6.4 All TfL employees are expected to cooperate fully with Information Governance's investigation of a complaint under this Procedure and to provide full access to all relevant information.

5.6.5 Once all of the relevant background information has been collected, the Privacy and Data Protection Team will prepare a chronology and a written summary of the facts surrounding the complaint.

5.6.6 In the case of a Subject Access request, the Privacy and Data Protection Team will also attach a copy of the original request(s) to this summary.

5.6.7 An accurate record of the investigation process will be maintained. This is essential given the possibility of a subsequent investigation by the Information Commissioner.

5.7 Possible outcomes of an investigation

5.7.1 Once the investigation is complete, the Privacy and Data Protection Team will discuss the conclusions with any affected business area(s) and ensure that any internal processes which may need to be modified are updated accordingly. the Privacy and Data Protection Team will also work with

managers within the business to address any training needs identified during the investigation.

5.7.2 In the case of a Subject Access request, where the original response is found to have been inadequate, the applicant must be informed, and told when they can expect the additional information originally requested to be provided to them. Where the response is found to have been adequate, the requester must be notified of this decision and reminded of their right to complain direct to the Information Commissioner's Office.

5.8 Monitoring complaints and investigations

5.8.1 Records are kept of the outcome of all investigations carried out under this Procedure. The Privacy and Data Protection Team monitors the volume and nature of complaints regarding TfL's processing of personal information and where necessary, will conduct detailed assessments of local business processes to enable it to make recommendations for improvements and address patterns of non-compliance with relevant policies or legislation.

5.8.2 In circumstances where patterns of non-compliance with procedures, policies or legislation are identified, Internal Audit may also be asked to evaluate the conduct and performance of individual TfL business units.

5.9 External investigation of complaints against TfL

5.9.1 Any complaint about TfL's handling of personal information may be escalated to the Information Commissioner. In such circumstances the Privacy and Data Protection Team is responsible for liaising with the Information Commissioner's Office (ICO), collating any supporting evidence and preparing TfL's formal response.

5.9.2 If TfL receives a written communication (including one transmitted electronically) from the ICO referring to a complaint about TfL's processing of personal information, it must immediately be forwarded to the Privacy and Data Protection Team using the contact details provided in section 10 of this Procedure.

5.9.3 TfL is legally obliged to co-operate with an investigation carried out by the ICO and all TfL employees are expected to co-operate fully with any request from the Privacy and Data Protection Team to assist in the preparation of a response; and to provide full access to all relevant information.

6. Local procedures/supplementary guidance

Any advice or guidance produced by individual business areas within TfL (or by TfL's subsidiary companies), on the application of this Procedure within their area of operations, must be approved by the Privacy and Data Protection Manager prior to publication.

7. Approval

This procedure was approved by the Head of Information Governance on 12 March 2013 and updated on 7 February 2014.

8. Review

This procedure will be subject to review as deemed appropriate by the Head of Information Governance.

9. Procedure owner

The Privacy and Data Protection Manager is the designated owner of this procedure.

10. Contact details

For advice and guidance on the contents and application of this Procedure, please contact*:* privacy@tfl.gov.uk.