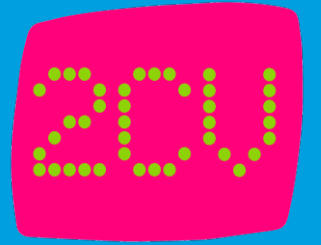


# TfL mobile data and privacy

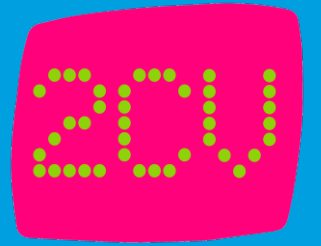
Debrief

February 2016

# Contents

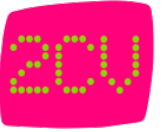


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- 5 Moving forwards



# Introduction

# Research objectives



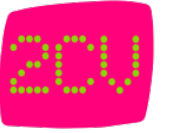
Business question

- 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?

Research questions

- 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

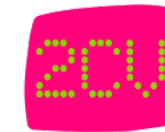


**6 x 1.5hr group discussions**

**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

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



Equal mix of gender in each group

**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

As a vehicle passes one of our beacons, TfL can detect a mobile device (e.g. Smartphone or Tablet) trying to connect.

- Allows TfL to gather real-time information about traffic flow and congestion
- TfL can pass this information on to road users via its website, twitter feed and road-side signs
- This allows people to plan their journeys better and avoid congestion

## Scenario 2: Mobile phone – planning

Mobile devices (e.g. phones or tablets) are continually looking for a connection or phone "signal" as they are carried around London. Network providers could detect this and pass the location information for each device on to TfL without identifying who they belong to.

This data can help TfL better understand demand for travel on different routes, different types of transport, at different times and in different places.

TfL can then ensure that it invests in the transport schemes and plans that make people's journeys easier.

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

Mobile devices (such as phones and tablets) taken onto the Underground will try to connect to the Wi-Fi network, if they are switched on.

The Wi-Fi connection point captures the location of the device and detects its unique identifier code.

By collecting live information about route choices and volumes of people, TfL can provide better information to its customers (including commuters and visitors) about route planning, crowding and predicted journey times.

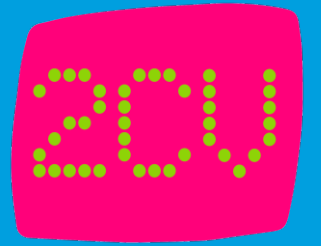
## Scenario 4: Registering a mobile device – analytics

It could be possible for a customer to choose to share location data from their mobile device with TfL. They could then link it to their Oyster, contactless, Santander Cycles or Congestion Charge account.

This could be via an app or the customer's online accounts, for example.

With a better understanding of a customer's travel patterns and favourite journey choices/routes, TfL can help them get the best out of our network with up-to-date information and alerts.

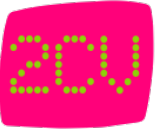
Alert types: Email, Push notification, Text message, Push notification, Email.



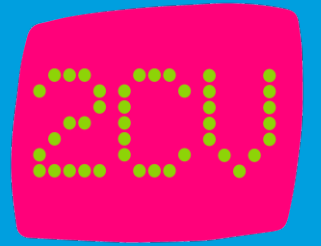
# Research headlines



# Research headlines

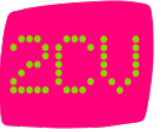


- The **sharing of personal information has become normalised** with consumers doing so in exchange for tangible benefits (ease of access to services; recommendations etc) delivered by organisations they deal with
  - Some concerns relating to privacy (sale of data) and security (fraud) remain but generally 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

# 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 won't 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 benefits (navigation vs social media) vs general identity to access service
- 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

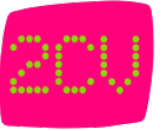


*I deliberately turn it (location) off for anything other than travel apps. I don't want people to know where I am. It feels sinister.*

*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.

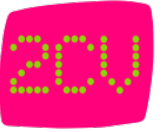


*That's way more stalker-ish. They don't tell you they're doing it.*

*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.*

# Acceptability of mobile data 'tracking' affected by key factors



- 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

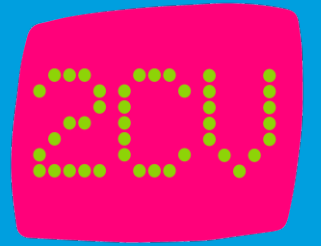
- Benefit is purely for organisation (commercial / monetised)
- Purpose of data collection appears opaque / open to interpretation
- Data collected feels more individual / identifiable (demographic detail)
- Cannot control opt in or out to collection

*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



# 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** to 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.*

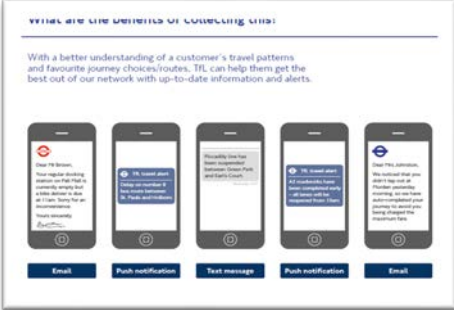


# Overall response to TfL's use of mobile data collection: four scenarios



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

Tangible benefit for customer



**Scenario 4:**  
Registration on a mobile device



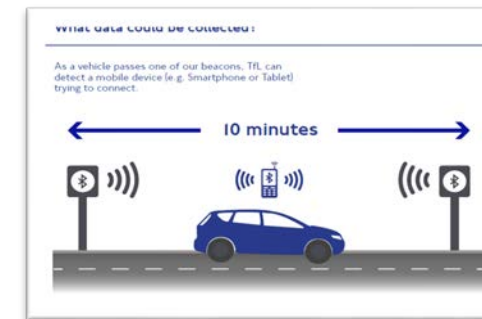
**Scenario 3:**  
Wi-Fi connection on Tube – TDM

Transparent purpose

Purpose less obvious



**Scenario 2:**  
Mobile phone – planning



**Scenario 1:**  
Road beacons – Bluetooth

Less clear customer benefit

# 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

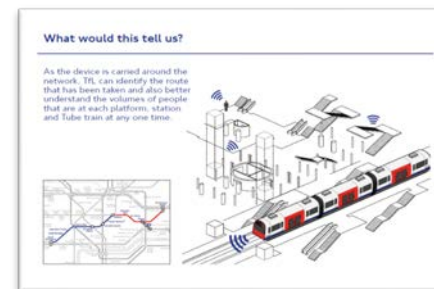
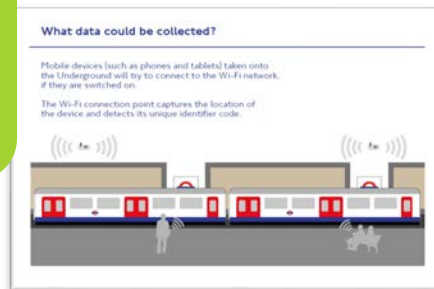
### Watch outs:

- 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

*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?*

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



# 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

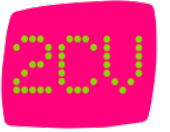


*That would be really useful! I could just drive to a different station in the morning if I knew my central line was down..*

*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.*

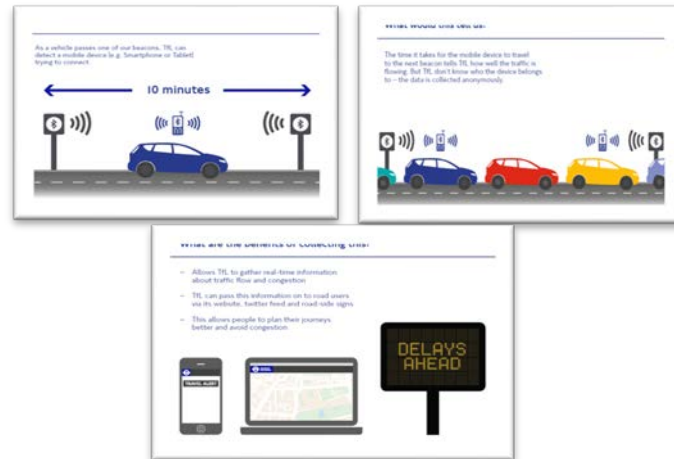
# Scenario 1: Road beacons – Bluetooth (Surface)



## 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.*

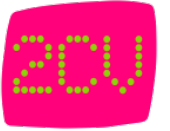
### Watch outs: 👎

- 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.*

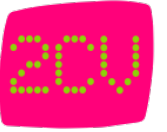
*That's important. They have to keep thinking about the future.*

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.*



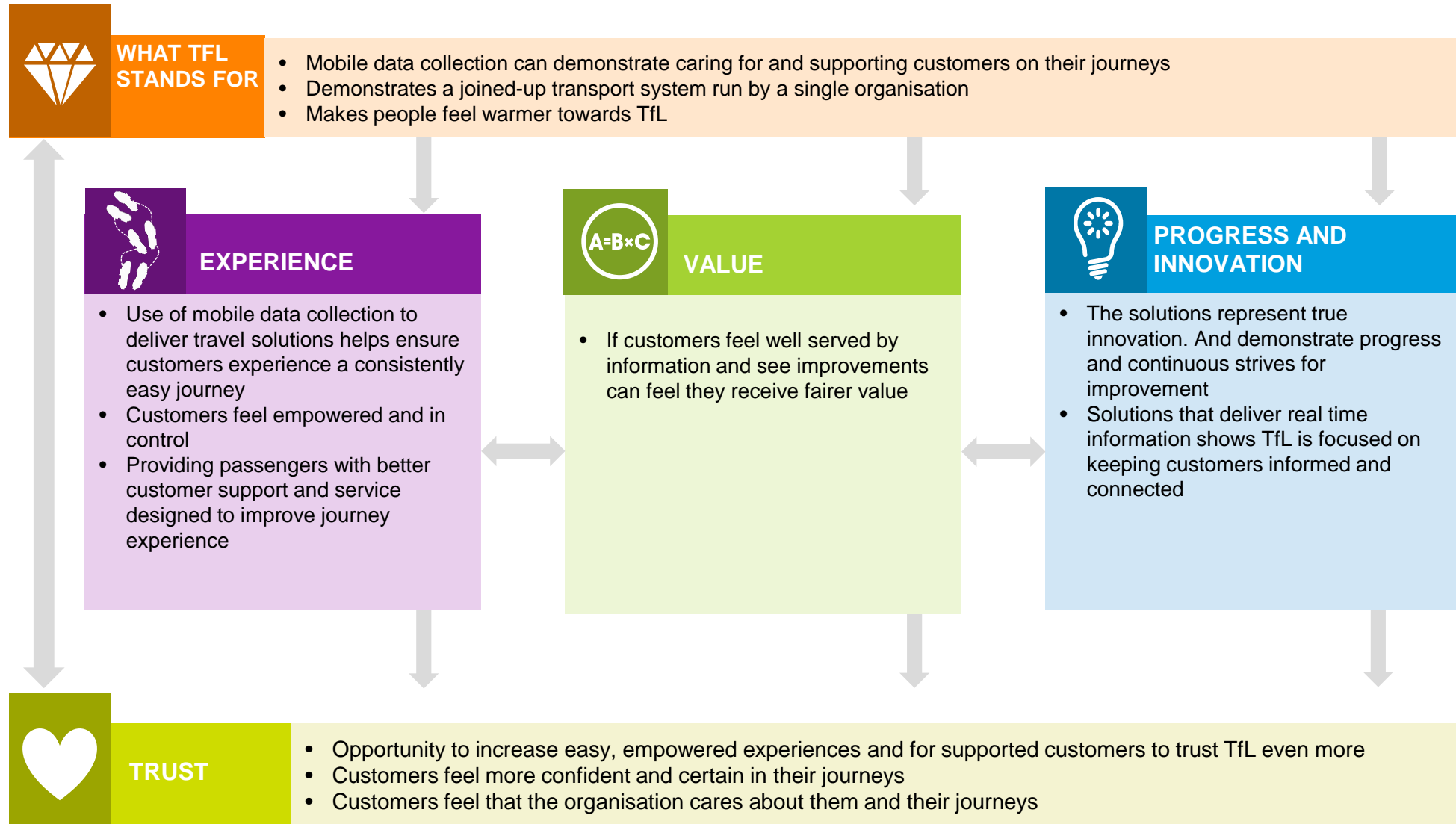
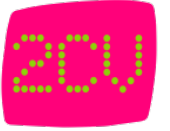
# Acceptance of TfL data use for commercial purposes depends on customers being in control

- 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!*

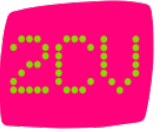
*That's just good, tactical advertising!*

# Mobile data connection could benefit TfL's reputation



It will be critical that customers feel TfL has been candid regarding *how* data is collected and used and communicates benefits to customers

# 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

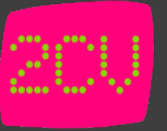
- Assure customers regarding the anonymity of data where relevant
- Explain they can opt or manage the access to this data
- Communicate mobile operators & TfL work under strict data protection rules
- Avoid use of any language that provokes privacy concerns
- Avoid over complicated and technical detail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

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

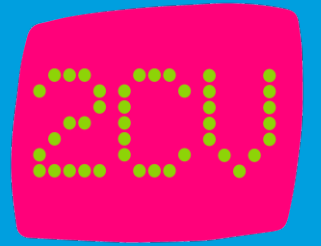
- Essential customers feel their improved experiences is driving the application on this technology
- Critical to position the benefits to feel tangible and relevant so they don't feel abstract and 'distant'



# Moving forward

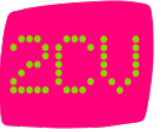


- As seen in previous research there is an expectation that TfL will provide more and better customer solutions and using mobile location data provides the organisation one clear opportunity on how to deliver these
- This said, this technology feels new and unfamiliar and so customer awareness and understanding 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 3<sup>rd</sup> parties; any unsolicited communications from TfL or it's partners



# Appendix

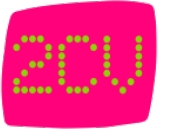
# Customers rarely interrogate different technologies used to connect



- Customers have a broad understanding of the technologies used to connect mobile devices but not too much thought given regarding the specific technical differences
- Customers understanding of each technology is based around the specific need it delivers against
  - GPS for navigation (Google Maps; Travel Apps)
  - (free) WiFi to save using their own mobile data
  - Bluetooth to pair devices (phone and speakers)
  - Cellular for connectivity via a specific network provider (calls, SMS, online)
- People tend to utilise each tech as needed and rarely (if ever) think about how they work or *how they are differ*



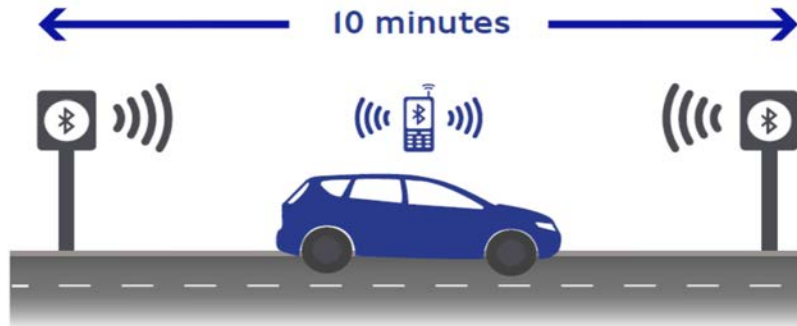
# Scenario 1: Road beacons – Bluetooth



1

## What data could be collected?

As a vehicle passes one of our beacons, TfL can detect a mobile device (e.g. Smartphone or Tablet) trying to connect.



2

## What would this tell us?

The time it takes for the mobile device to travel to the next beacon tells TfL how well the traffic is flowing. But TfL don't know who the device belongs to – the data is collected anonymously.



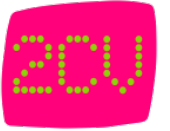
3

## What are the benefits of collecting this?

- Allows TfL to gather real-time information about traffic flow and congestion
- TfL can pass this information on to road users via its website, twitter feed and road-side signs
- This allows people to plan their journeys better and avoid congestion



# Scenario 2: Mobile phone – Planning



## 1 What data could be collected?

Mobile devices (e.g. phones or tablets) are continually looking for a connection or phone “signal” as they are carried around London. Network providers could detect this and pass the location information for each device on to TfL without identifying who they belong to.



## 2 What would this tell us?

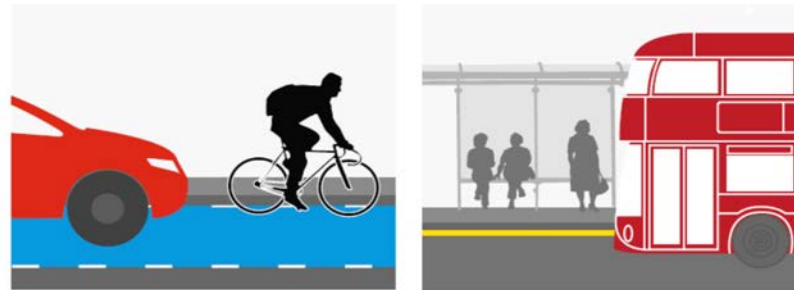
TfL could use this data to better understand the volumes and different ways that people travel between different areas of London.



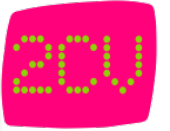
## 3 What are the benefits of collecting this?

This data can help TfL better understand demand for travel on different routes, different types of transport, at different times and in different places.

TfL can then ensure that it invests in the transport schemes and plans that make people’s journeys easier.



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

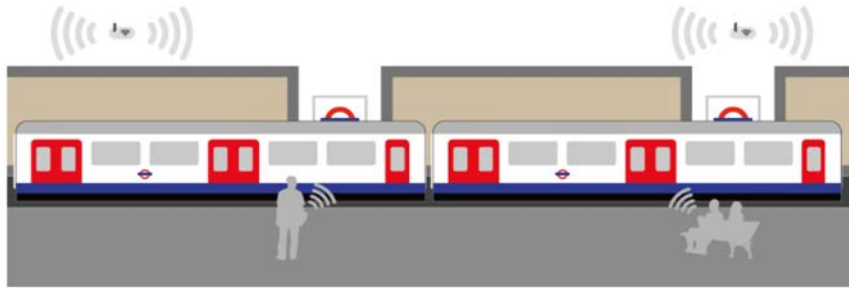


1

## What data could be collected?

Mobile devices (such as phones and tablets) taken onto the Underground will try to connect to the Wi-Fi network, if they are switched on.

The Wi-Fi connection point captures the location of the device and detects its unique identifier code.



2

## What would this tell us?

As the device is carried around the network, TfL can identify the route that has been taken and also better understand the volumes of people that are at each platform, station and Tube train at any one time.



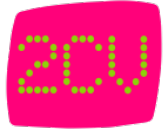
3

## What are the benefits of collecting this?

By collecting live information about route choices and volumes of people, TfL can provide better information to its customers (including commuters and visitors) about route planning, crowding and predicted journey times.



# Scenario 4: Registration on a mobile device - Analytics



1

## What data could be collected?

It could be possible for a customer to choose to share location data from their mobile device with TfL. They could then link it to their Oyster, contactless, Santander Cycles or Congestion Charge account.

This could be via an app or the customer's online accounts, for example.



2

## What would this tell us?

If a customer has chosen to share location data from their device, TfL will be able to collect data about their travel patterns across all of our services and better understand people's journey choices across London.



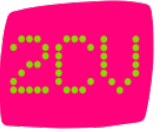
3

## What are the benefits of collecting this?

With a better understanding of a customer's travel patterns and favourite journey choices/routes, TfL can help them get the best out of our network with up-to-date information and alerts.

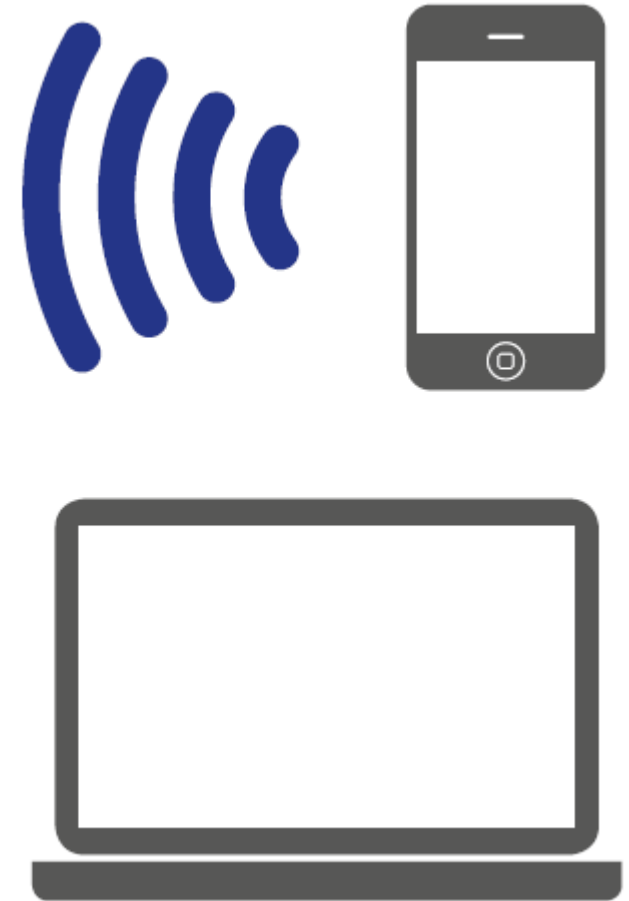


# Introduction



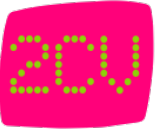
**Mobile devices such as Smartphones and Tablets continually give off different signals that can be detected**

- **These include:**
  - **2G, 3G and 4G phone signals (if connected to a network such as O2)**
  - **Wireless internet signals (in order to connect to WiFi)**
  - **Bluetooth signals (in order to connect to a Bluetooth device)**
  - **GPS ('Global Positioning System' to help you navigate on maps etc.)**

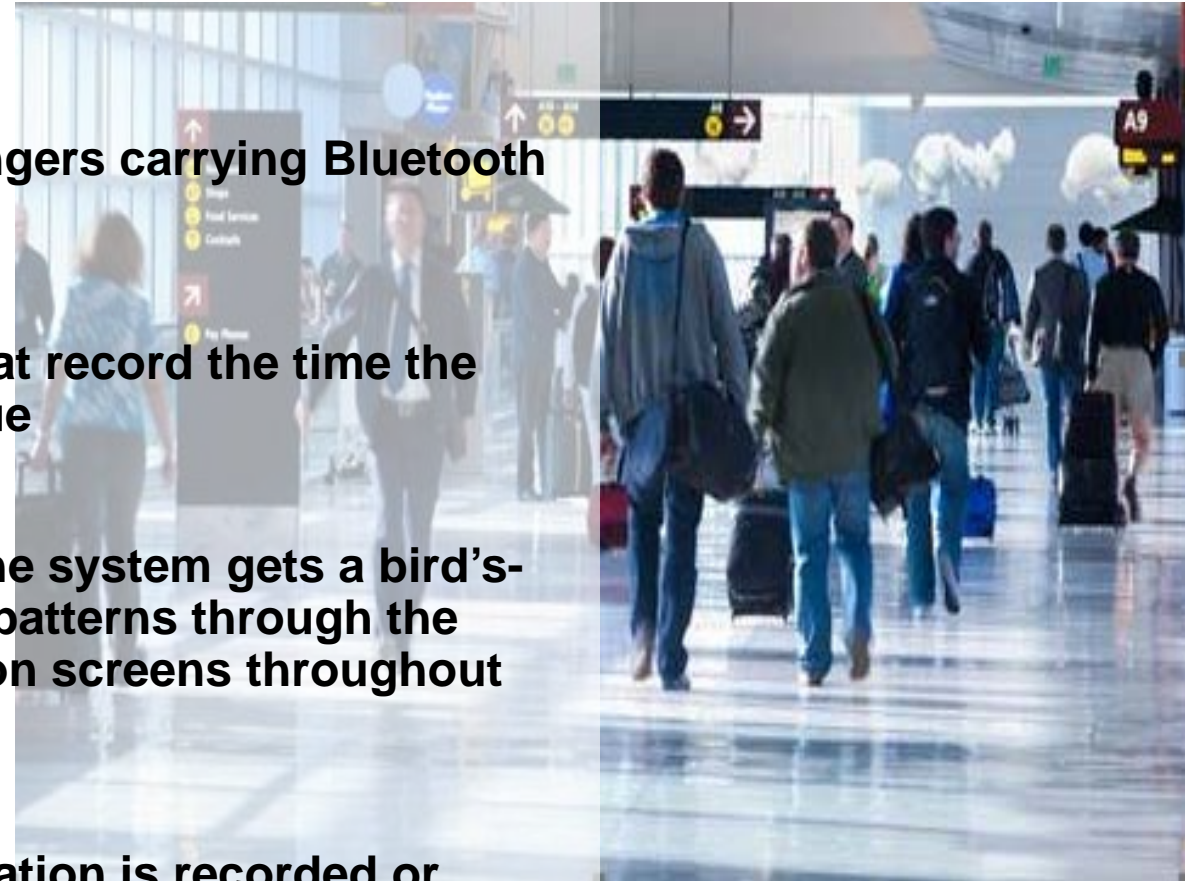




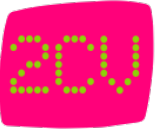
# Airports



- Dublin & JFK international airports both use an “automated technology” system to ensure passengers spend no longer than half an hour in the queue for security checks.
- This technology tracks the length of time that passengers carrying Bluetooth or WiFi-enabled devices spend in the queue
- Sensors are placed in the roof of the security area that record the time the device and the passenger enters and leaves the queue
- By triangulating the data on smartphone locations, the system gets a bird’s-eye view of travel times, dwell times, and movement patterns through the airport. The new, improved wait times are displayed on screens throughout the terminal
- The data is fully anonymised and no personal information is recorded or stored.



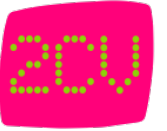
# Hyde Park



- Visitors to Hyde Park were tracked via their mobile phone signals in a trial undertaken by the Royal Parks to analyse footfall last year (2015)
- If a zone of the park contained more than 50 people at once, it was possible to “drill down” to the aggregated demographic data (gender, age) of visitors to that area too, creating a detailed picture of how different people used the park in previous months
- The visitor data Park officials saw as part of this project was several months old and was simply dots on a screen which showed the flow of visitors
- Knowing how visitors use the park can help with the provision of activities and amenities, and to protect park wildlife

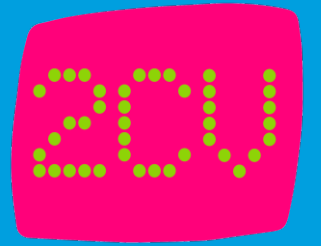


# Shopping centres



- **At least a dozen UK shopping centres have installed Wi-Fi systems which collect mobile signals**
- **Visitors to centres who have their phone's Wi-Fi turned on are picked by the system which logs the unique ID of the phone**
- **The system enables centres to see whether a shopper's phone has visited before, how long it stays, and how far into the centre it goes**
- **If visitors register to use the centres' free Wi-Fi and voluntarily pass over contact information this information can then be used to target bespoke emails relating to specific genders or age groups and communicate real-time offers at specific retail outlets that will appeal to specific audiences**





# Thank you

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