**Customer Service and Operational** 

**Performance Panel** 



Date: 12 July 2023

# Item: Digital Wayfinding for Cycling

## This paper will be considered in public.

## 1 Summary

- 1.1 Cycle wayfinding in London can offer safer and more welcoming routes than it currently does. This is the case for both TfL navigational tools and for third-party applications.
- 1.2 Existing cycle navigational algorithms can route cyclists through known collision hotspots, do not always navigate via the TfL Cycleways network or borough cycling infrastructure, and often avoid quieter roads and parks.
- 1.3 We are looking at how we can improve digital wayfinding for cycling so that it is safer and a better experience in TfL Go and third-party apps.
- 1.4 In July 2022, the Open Innovation team held a Digital Wayfinding Summit, which created the initial spur to action for TfL and third-parties.
- 1.5 Since then, we have been working to improve route choice for cycling in TfL Go, as well as working with our third-party travel planning partners apps including Google Maps and Citymapper. Collectively, this will improve cycle route choice for our customers, whichever platform they choose to get their information from.
- 1.6 We are now seeing the first results of that work. In-app cycle wayfinding is improving. The next 12 months should see further progress, with safer and more welcoming routes being returned.

## 2 Recommendation

2.1 The Panel is asked to note the project update.

## 3 Context

- 3.1 TfL, in partnership with the boroughs, has delivered over 340 kilometres of cycle routes in London. Beyond our dedicated Cycleways network, there are great places to cycle, for example, via streets with low traffic or within parks and green spaces, and there are now an estimated 1.2 million trips cycled each day.
- 3.2 There are, however, also undesirable places to cycle; such as collision hotspots, busy roads and complex junctions.
- 3.3 We currently show where our cycleways are on tfl.gov.uk, via an interactive map, but most customers use travel planning apps. These often don't direct cyclists to

use dedicated cycling infrastructure nor quieter roads, and can often direct people to use busier and less safe routes.

- 3.4 As part of the updated <u>Cycling Action Plan 2</u>, we are committed to correcting this both in our own journey planning tools, such as TfL Go, as well as with third-parties via sharing knowledge, expertise, and making the right data open and available for external developers to use.
- 3.5 This is a priority for the Walking and Cycling Commissioner and is identified as a key project in the Cycling Action Plan 2.

## Cycling Action Plan 2, Action 15

#### We will improve digital journey planning and navigation tools by:

- a) Developing routing principles to determine the best route for cycling
- b) Embed these principles in the routing algorithm of our TfL Go journey planning app and share them with third-party developers to improve other journey planning services
- c) Working closely with third-party developers to harness their own insights and datasets, and assist with their research and development
- d) Share, create and maintain the datasets required to improve routing

# 4 Cycle navigation: issues to be addressed

- 4.1 Londoners have lots of options to plan their cycle journey. Customers can use our TfL Go app to plan routes for cycling as well as via other apps such as Google Maps, Apple Maps, Citymapper, BeeLine, Cycle.travel, CycleStreets and Komoot.
- 4.2 TfL's Open Data approach has already enabled third-party apps to develop good quality travel planning products for our customers, but we need to further work together so that the routing results are as safe as possible. Some third-party apps have a significant reach; for example, globally there are more than one billion monthly active users of Google Maps services. An openness to collaborating with others is key to improving the products which most of our customers use.
- 4.3 We have a wide range of insight and expertise as to where you would and would not want to cycle, and will start to translate this into routing principles for both TfL Go and third-parties.
- 4.4 Looking at the following examples of existing navigational tools between Euston and Southwark, taken from early 2022 when the project was mobilising, customers are presented with excellent platforms to use but are not always presented with the cycle route choice that will make them feel the most comfortable.





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#### Example 1 TfL Go

Route: Euston Station to Southwark Station.

TfL Go's route choice (noted in blue) does not utilise Cycleway 6 or quiet roads in LB Camden (noted in purple dashed line).

Furthermore, it navigates via known collision hotspots, identified for improvements on TfL's Safety Junction investment programme (red cross).

#### Example 2 Google Maps

Preview >>>

Route: Euston Station to Southwark Station.

Google's route choice (noted in blue) does utilise some of Cycleway 6 (noted where the purple dashed line intersects the blue line).

It does, however, navigate via the Holborn gyratory, which is actively being worked on to urgently improve safety at this junction (red circle).

#### Example 3 City Mapper

Route: Euston Station to Southwark Station.

Citymapper's route choice (noted in blue) utilises some of Cycleway 6 (noted where the purple dashed line intersects the blue line) as well as several quiet roads in LB Camden.

It does, however, navigate along High Holborn, which is a known busy route (red rectangle).

- 4.5 Current tools do not always return what we think are the best routes for cycling.
- 4.6 We know from our extensive design experience what it takes to build a good cycleway. High quality routes are either segregated or prioritise streets where the traffic volumes, speeds and HGV numbers are low. Routing algorithms should prioritise these principles too.

4.7 Combining TfL's knowledge and expertise with our Open Data is enabling us to both improve our own TfL Go app as well as fostering fruitful collaboration with third-party routing providers. By sharing any outcomes or new datasets we may use as part of our exploratory work to make cycle routes safer in TfL Go, we can improve the lives of Londoners by influencing other developers to upgrade the safety standards of their own apps.

# 5 Action taken: Digital Wayfinding Summit

- 5.1 In July 2022, TfL's Open Innovation team held the Digital Wayfinding for Cycling summit to explore how we could collectively, across all platforms, improve digital wayfinding for cycling. We brought together over 50 people, which included a wide range of stakeholders from across TfL and the external developer community, as well as representatives from our cycling community, to reflect the lived experience of using navigational tools in practice.
- 5.2 We had presentations from Apple, Citymapper, CycleStreets and Cycle.travel on what has been achieved to date with existing navigational tools and TfL Digital shared customer research informing our strategy for improving cycling in TfL Go.
- 5.3 We also held a workshop to see how navigational tools can incorporate core safety routing principles and complementary user preferences. With data being the key mechanism for this, the workshop focused on identifying data owners and possible gaps, along with any challenges in sourcing relevant data sets.
- 5.4 Since the summit, we have continued our engagement with developers to explore how we can progress potential opportunities for improving cycle routing algorithms in third-party tools.
- 5.5 At the summit we heard of how important it is to keep our data up to date and we aim to update our <u>Cycleways map</u> and open dataset for use by third-parties as frequently as possible.
- 5.6 TfL's Cycling Infrastructure Database (an audit carried out in 2017 of all of London's cycle infrastructure, including lines and signs) has been uploaded to OpenStreetMap (OSM), making it more accessible to the developer community. A key benefit of doing so means the wider OSM contributor community can take ownership of continuing to update this information to reflect current day conditions.

# 6 Action taken: Improvements already achieved with third-party apps

- 6.1 Since we engaged with our digital partners in early 2022, we have already started to see third-parties make changes because of this work.
- 6.2 When we reached out to Citymapper to discuss routing, we queried their use of High Holborn on their 'Quiet' user profile. Updates to this specific route now show the predominant use of our Cycleways Network (where blue and purple lines intercept in figure 1).



Figure 1. Citymapper routing changes after engagement

- 6.3 Over the past year we have been continuing to share our knowledge and expertise with Google to improve the experience on Google Maps for those travelling in and around London. These include:
  - (a) using the latest TfL cycleways open data, so routing results for cycling use fresher data;
  - (b) rolling out <u>glanceable directions</u> so cyclists can quickly and safely see trip progress right from their lock screen or route overview; and
  - (c) launching more detailed cycling route information, showing cyclists the percentage of cycle lanes on a specific route see below
- 6.4 Our relationship with Google has developed into a fruitful partnership and we continue to actively share our knowledge and expertise to improve the experience on Google Maps. This includes research and development on routing enhancements.



Figure 2. Google's more detailed cycle route information

# 7 Looking ahead

## Switching to OpenStreetMap for TfL journey planning

- 7.1 The map base for TfL Go and TfL Journey Planner is currently based on a database that primarily serves vehicular movement, rather than for people walking or cycling. There is minimal detail with regards to pedestrian and cycle crossings and it has a very simplified model of the street layout.
- 7.2 TfL's Digital team is currently updating our journey planning tools to utilise OpenStreetMap (OSM) as the new map base. OSM is a community developed online map service that has significantly more detail than our current mapping base. Not only does OSM denote features for walking, cycling and vehicular movements, it details assets and features of the street, for example, cycle parking and speed limits. Our journey planner having access to the static cycling datasets found in OSM sets will be improved, which is in turn expected to return better routes for cycling in London.
- 7.3 The switch is expected to be complete by the end of the 2023/24 financial year.

## Proof of Concept to improve digital wayfinding for cycling in TfL Go

- 7.4 TfL's Open Innovation team are looking at the impact on cycle routing by trialling the inclusion of new datasets for journey planning. The proof of concept (POC) uses TfL Go as a testbed where we will utilise the new OSM base map platform.
- 7.5 The test will initially focus on the inclusion of known and readily available datasets. Examples of data to be tested include, TfL's Cycleways network, speed restrictions and traffic counts. We will further examine the weighting given to routes with these attributes through an iterative testing process.

- 7.6 In parallel, we are exploring innovative datasets that we may wish to acquire for inclusion in our journey planning tools. We know that the busyness of a street is a key determinant for if a route is suitable for cycling; and thus securing this insight in a digestible format for routing may improve cycle routing when tested in the POC.
- 7.7 Results from the initial POC are expected by Autumn 2023. The successes could then be utilised by TfL Go and TfL Journey Planner.
- 7.8 Once we have fully tested the changes to our cycle routing algorithm, we will surface these in our digital channels and publish the improved cycle routing API as open data, promoting it to the developer community and digital partners so they can update their apps. We will establish data owners and ensure that there is a process to maintain and support the data, so these relevant datasets are also made available for use by third parties. This will ensure that cyclists in London will have access to high quality route options whichever app they use.

## Working with digital partners

- 7.9 Open Innovation will leverage existing app developer relationships and continue to influence third party apps to improve cycle routing and promote safer routes in their apps by demonstrating concrete improvements that can be made to their cycle routing algorithms.
- 7.10 For any new datasets that we conclude from the POC to be valuable in improving digital wayfinding for cycling, we will work with partners to ensure their relevance and format are accepted for use in third party apps. This includes relating all the outcomes back to attendees of the summit, demonstrating how we have responded to the challenges presented in July 2022.
- 7.11 We will also continue to work directly with the Google Maps team working on cycling and navigation, to provide feedback on the enhancements they are making to their product. This is a strong and productive relationship, and the Google Maps team's future plans continue to actively and directly respond to last year's Digital Wayfinding Summit and more generally the Mayor's Transport Strategy.

## 8 Summary

8.1 We have made good progress to date and are confident that, in the next year and building on what has already been achieved, the Cycling Wayfinding project will have resolved many of the concerns about digital cycle routing raised at the Digital Wayfinding Summit in Summer 2022. We will provide a further update on progress next year.

#### List of Appendices to this report:

None

#### List of Background Papers:

None

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