improving
public transport
through technology

Cycling and Walking Data for Multi-Modal Journey Planning

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List of contents

Status of this document		3
1	**Introduction**	**4**
1.1	About this document	4
1.2	Background and context	4
1.3	Scope	4
1.4	Limitations and the Future	5
2	**The data landscape**	**6**
3	**Formats and standards**	**8**
3.1	Formats	8
3.2	Network and infrastructure	8
3.3	Shared mobility	9
3.4	Public transport, interchange and journey planning	10
4	**Walking Links**	**12**
4.1	GTFS Pathways	12
4.1.1	Introduction	12
4.1.2	How GTFS Pathways works.	12
4.1.3	Where it is used	13
4.1.4	Good practice for UK publishers	14
4.2	Walking links in NeTEx	15
4.2.1	Background	15
4.2.2	How NeTEx models a station	15
4.2.3	Walking between stops - not just within them	17
4.2.4	Real time	17
4.2.5	European practice	17
4.2.6	How UK publishers should use NeTEx for walking links	18
5	**Case studies and usage**	**19**
5.1	Usage	19
6	**CyclInfra: the European standard in development**	**23**
7	**Good Practice Recommendations**	**24**
7.1	Core Recommendation	24
7.2	Local transport authorities and combined authorities	24
7.3	Shared mobility operators	24
7.4	Public transport operators	25
7.5	Journey planner providers	25
7.6	National bodies (DfT, Active Travel England)	25
8	**Gaps and risks**	**26**
8.1	Summary	26
8.2	Gaps	26
8.3	Risks	26

Appendix 1 Glossary 27

Status of this document

This document is Published.

If there are any comments or feedback arising from the review or use of this document, please contact us at secretariat@rtig.org.uk.

1 Introduction

1.1 About this document

1.1.1 This report has been produced for members of RTIG Inform (RTIG) and those interested in the provision of walking and cycling information to the public. The purpose of the report is to provide advice on the data and formats used. sections of a journey

1.2 Background and context

1.2.1 Almost every public transport journey starts and ends on foot or by bike, yet these are the sections least well described in journey-planning data. In London, residents make 6.2 million walk-only trips a day (2024/25) and there are 1.4 million cycle trips a day (2025) (TfL, Travel in London 2025). UK bike share recorded nearly 25 million hires in the year to September 2023 - about 67,500 a day (CoMoUK via Cycling Industry News).

1.2.2 This report sets out good practice for describing walking, cycling and shared micromobility, so that multi-modal journey planners can route across them reliably. It is written for RTIG members: local transport authorities, operators, journey planner suppliers and data aggregators.

1.2.3 In scope:

- network and infrastructure data (paths, cycle routes and their attributes);
- shared mobility availability (bike share, e-scooters, cargo bikes);
- interchange data (cycle parking, access paths and accessibility at stops); and
- the standards and APIs that bring these together in a journey planner.

1.2.4 Out of scope: traffic counting, ticketing and payment.

1.3 Scope

1.3.1 This report has no statutory or other legal basis and is purely to provide advice to suppliers, local authorities and others who specify, produce or maintain walking and cycling information.

1.4 Limitations and the Future

1.4.1 This report reflects the available technology and those practices which have been found to be effective at the date of publication. However, technology and its applications are evolving, and it is therefore probable that new technologies, new developments of existing technologies, and new ways to adopt them on buses will evolve.

1.4.2 RTIG also understands that technologies and practices which are not on the market at the time of writing this document will emerge, and that such developments should not be excluded from consideration.

1.4.3 Operators, authorities and suppliers are *encouraged* to consider new approaches - bearing in mind the general principles promoted in this document.

2 The data landscape

2.1.1 A multi-modal journey planner needs six layers of data to route walking and cycling well. The UK public transport landscape is strong on public transport data; is less strong on, but has *many* - shared-mobility feeds; and weakest on infrastructure attributes and interchange data.

Layer	What the journey planner needs	Main UK sources	Main formats
1. Walking and cycling network	A routable network with permissions, surface, width, segregation, lighting and gradient	OpenStreetMap; OS MasterMap Highways Network (Roads and Paths); local datasets such as the TfL Cycling Infrastructure Database	OSM PBF/XML; GML or GeoPackage; CEN/TS 17268 (being extended through CyclInfra)
2. Routes and wayfinding	Signed and named routes, including the National Cycle Network	Walk Wheel Cycle Trust (NCN); OSM route relations	OSM relations; GIS files
3. Shared micromobility	Station and vehicle locations, live availability, pricing, operating zones	Operator feeds (Beryl, Donkey Republic, Dott, Lime and others); TfL Unified API for Santander Cycles	GBFS; MDS for regulators; NeTEx and SIRI under EU MMTIS
4. Interchange and parking	Cycle parking at stops and stations (capacity, security), access paths, step-free routes	TfL CID (cycle parking); OSM amenity=bicycle_parking; NaPTAN stop points; station operators	NeTEx and Transmodel (EN 12896); GTFS pathways.txt and levels.txt
5. Public transport	Timetables, real time, rules on carrying bikes	Bus Open Data Service; NaPTAN; rail timetable data	TransXChange; GTFS; NeTEx; SIRI

6. Routing and APIs	Door-to-door plans combining layers 1–5	OpenTripPlanner; Traveline; commercial planners	OTP APIs; OJP (CEN/TS 17118); TRIAS

2.1.2 Layers 1 and 4 are where CyclInfra will have most impact. Layer 3 is the most mature, and GBFS is the de facto standard.

3 Formats and standards

3.1 Formats

3.1.1 No single format covers walking and cycling end to end. Good practice in the UK and Europe combines four formats:

- OpenStreetMap for the network.
- GBFS for shared mobility.
- Transmodel, NeTEx and SIRI for public transport and interchange.
- an open routing API (OpenTripPlanner or OJP) to bring them together.

3.1.2 A European project - CyclInfra, is the first attempt to give cycling infrastructure a formal European standard.

3.2 Network and infrastructure

Format	What it covers	Governance and status	UK and European use
OpenStreetMap (OSM)	Global, community-maintained map: paths, cycleways, access rights, surface, cycle parking, route relations	OpenStreetMap Foundation; ODbL licence; tags are a convention, not a formal standard	Default routing source for CycleStreets, OpenTripPlanner, Digitransit, Entur and most UK cycle planners. OpenTripPlanner maps UK tags such as highway=bridleway to walk and cycle permissions
OS MasterMap Highways Network – Paths	GB link-and-node path network with highway authority and maintenance responsibility; monthly updates	Ordnance Survey; GML 3.2.1, GeoPackage, vector tiles; free to Public Sector Geospatial Agreement (PSGA) members	Authoritative public-sector base, used alongside OSM. OS Detailed Path Network (National Parks only) reached end of life on 30 Sept 2026; users move to the OS NGD Transport theme

CyclInfra (CEN/TR, in development)	Guidelines to standardise cycling infrastructure data: at minimum type, surface and width; also cycle parking for trip planning	CEN/TC 278 WG7 with WG3; EU-funded (EISMEA); Jan 2026 – about early 2028	Will extend CEN/TS 17268 (ITS spatial data), Transmodel and NeTEx. OSM-first design. See the case study
France national cycle infrastructure schema (BNAC)	National schema harmonising cycle infrastructure data for reuse by route planners; excludes cycle parking; optional OSM ID per feature	Etalab / transport.data.gouv.fr; open licence (Licence Ouverte 2.0)	Published by French authorities, e.g. Eurométropole de Strasbourg; named in CyclInfra's gap analysis
TfL Cycling Infrastructure Database	240,000+ surveyed assets across London	TfL; GeoJSON and Unified API; Open Government Licence variant	UK's most detailed local dataset (see case study)

3.3 Shared mobility

Format	What it covers	Governance and status	UK and European use
GBFS (General Bikeshare Feed Specification)	Real-time public feed for docked and dockless bikes, e-bikes, e-scooters, cargo bikes, mopeds and car share. Version 3.0 has 12 JSON files, including station_status, vehicle_status,	MobilityData (formally transferred in 2022); open, community-governed	Over 1,500 systems worldwide. Of the 1,277 in MobilityData's public catalogue, 833 are in EU countries. 52 UK systems are listed (see case study). Google

	geofencing_zones and system_pricing_plans		publishes a guide to integrating GBFS into Google Maps
MDS (Mobility Data Specification)	Operator-to-city data for regulating and permitting micromobility; not a public journey-planning feed	Open Mobility Foundation; MDS 2.0	Mainly North America; some European city regulators
TOMP-API	Booking and trip execution between transport operators and Mobility-as-a-Service apps	TOMP Working Group; Apache 2.0	Dutch origin; complements GBFS, which is discovery only

3.4 Public transport, interchange and journey planning

Format	What it covers	Governance and status	UK and European use
Transmodel (EN 12896), NeTEx (CEN/TS 16614), SIRI (CEN/TS 15531)	Reference model, exchange format for network, stops and fares, and real time. NeTEx can describe stop places, access paths and parking	CEN/TC 278 WG3; named reference standards under EU MMTIS (Delegated Regulation 2024/490), which now covers bike-sharing and e-scooter sharing	National base for Entur, Norway and Skånetrafiken, Sweden (Nordic NeTEx profile). In the UK, NeTEx is used for bus fares in BODS; CyclInfra proposes extensions for cycle parking
GTFS and GTFS Realtime	Timetables and real time; pathways.txt and levels.txt for walking routes inside stations; bikes_allowed per trip	MobilityData	BODS publishes GTFS for all of England; the input format for Google Maps and OpenTripPlanner
DATEX II (CEN/TS 16157)	Road traffic and parking data, including dynamic parking availability	CEN/TC 278; named in MMTIS	Strategic roads and car parks; limited cycling use to date

TransXChange and NaPTAN	UK bus timetables and the national register of public transport access points	DfT	NaPTAN does not hold cycle parking or entrance-path data, which is a UK gap
OJP – Open API for Distributed Journey Planning (CEN/TS 17118)	Journey-planning API that links planners across borders. Trip requests can cover walking, cycling and shared bikes, e-scooters and cars	CEN; binding under MMTIS	Switzerland's national OJP service, built on TRIAS. Free use up to 50 requests a minute or 20,000 a day
OpenTripPlanner (open source)	Multi-modal router that reads OSM, GTFS, NeTEx, SIRI and GBFS	Open-source community	National planners in Norway and Finland. Regional planners in Sweden, France, Italy, Germany, Spain and Poland. In the UK, used by the independent Aubin planner and the ONS Data Science Campus

4 Walking Links

4.1 GTFS Pathways

4.1.1 Introduction

4.1.1.1 GTFS Pathways is a widely consumed format for walking routes inside stations. It describes each step from entrance to platform: walkways, stairs, lifts, escalators and fare gates - with lengths, times, widths and slopes. It is now part of core GTFS. It has been published, for example, in Paris, Sydney and Boston, but there is currently no known UK publisher.

4.1.2 How GTFS Pathways works.

4.1.2.1 A station is modelled as a graph. The nodes are locations in stops.txt, identified by location_type:

0 = platform or stop

1 = station

2 = entrance or exit

3 = generic node

4 = boarding area

4.1.2.2 The edges are rows in pathways.txt, and levels.txt gives each floor. Pathways must describe the whole station: every platform must connect to at least one entrance, with no dangling locations (GTFS reference).

Feature	Fields	What it enables
Pathway connections	pathway_id, from_stop_id, to_stop_id, is_bidirectional, pathway_mode: 1 walkway, 2 stairs, 3 travelator, 4 escalator, 5 lift, 6 fare gate, 7 exit gate	Step-by-step routes from entrance to platform. Fare and exit gates let planners avoid sending people through paid areas. Exit gates must be one-way
Pathway details	length (metres), stair_count (positive up, negative down; about 15 per floor if estimated), max_slope (e.g. 0.083 = 8.3%), min_width	Step-free and wheelchair routing: avoiding stairs, steep ramps and narrow passages
In-station traversal time	traversal_time (seconds), recommended for travelators, escalators and lifts	Realistic interchange times, rather than a fixed transfer allowance
Levels	levels.txt: level_id, level_index (0 = ground, negative = below ground),	Instructions such as "take the lift to Platform level"

	level_name; stops.level_id. Required when lifts are described	
Pathway signs	signposted_as, reversed_signposted_as	Directions that match the station's own signs
Accessibility	stops.wheelchair_boarding for platforms and entrances	Whether an accessible path exists to each platform and from each entrance

4.1.3 Where it is used

Example	What is published	Scale and use
Île-de-France Mobilités, Paris region	pathways.txt for walking links between stops within stations, in the regional GTFS of ten files	Updated three times a day, covering the next 30 days. A standalone GTFS-Pathways dataset (2019) preceded it
Transport for NSW, Sydney	pathways.txt and levels.txt for selected train stations, in the complete GTFS	Generated daily; version 1.0 released May 2023. Intended for step-by-step guidance between entrances and platforms, including traversal times, signs and accessibility. No real-time updates
MBTA, Boston	Entrances for all rapid-transit stations, platform levels, and simple pathways for about 75% of subway stations	Collected in a physical survey of all subway stations that took more than two months. Google Maps displays some of the fields
San Francisco Bay Area (MTC)	Pathways for 35 regional transit hubs, created with a commercial station editor	Viewable in Transitland's free Pathways Explorer

4.1.3.1 Interline reports that Google Maps and the Transit app display GTFS-Pathways data. MobilityData's GTFS feature adoption tracker shows how far support goes:

- **OpenTripPlanner** supports all five pathway features, including levels.

- **Google Maps** supports connections, traversal times and signs, but ignores levels and max_slope.
- **The Transit app** supports connections, details, traversal times and signs, but not levels.

4.1.3.2 NeTEx and Transmodel model the same things in more detail: stop place entrances, levels, path links and junctions, and accessibility assessments. They are the EU MMTIS reference. GTFS Pathways is simpler to produce and reaches more consumer apps today. However, neither can show a lift that is out of service; that needs a separate real-time feed.

4.1.3.3 We found no published UK GTFS feed with pathways data, though we understand there is some data from a pilot in an authority that has not yet been published.

4.1.3.4 BODS' GTFS is converted from bus timetables in TransXChange, which does not describe paths inside stations. NaPTAN records stops and some station entrances, but not the routes between them.

4.1.4 Good practice for UK publishers

4.1.4.1 Start with the busiest interchanges and step-free stations. Survey once, then maintain the data in a station editor rather than in spreadsheets.

4.1.4.2 Fill traversal_time and signposted_as first: these are the fields consumers support most widely.

4.1.4.3 Add stair_count, max_slope and min_width for step-free routing, even though not every app uses them yet.

4.1.4.4 Use NaPTAN codes for platforms and entrances, so pathways link to the national stop register.

4.1.4.5 Check every release with MobilityData's canonical GTFS validator. It flags unreachable platforms (pathway_unreachable_location), lifts without levels (missing_level_id) and two-way exit gates (bidirectional_exit_gate).

4.1.4.6 Publish lift and escalator outages in real time alongside the static pathways.

4.2 Walking links in NeTEx

4.2.1 Background

4.2.1.1 With the use of Transmodel based formats for public transport in the UK, NeTEx should form the master record for walking links in and between stations - with GTFS Pathways generated *from* it for consumer apps in the same way as GTFS and GTFS-RT is produced from TransXChange in BODS.

4.2.1.2 NeTEx can describe everything GTFS Pathways does, and in addition, it adds walking times for different kinds of traveller; detailed accessibility; ready-made step-by-step routes; and a link to real-time lift status. One survey can then feed both formats.

4.2.2 How NeTEx models a station

4.2.2.1 The stop model comes from IFOPT (Identification of Fixed Objects in Public Transport), which is now part of NeTEx Part 1:

4.2.2.2 A StopPlace contains Quays (platforms and stances), BoardingPositions, AccessSpaces (concourses, halls and passages), StopPlaceEntrances and Levels.

4.2.2.3 A SitePathLink joins any two of these, or a PathJunction.

4.2.2.4 A NavigationPath strings path links together into a complete route, for example, "entrance A to platform 3, step-free", with an instruction for each step.

4.2.2.5 Element names are taken from the NeTEx v2.0 schema (path links, navigation paths, stop places).

GTFS Pathways	NeTEx equivalent	What NeTEx adds
stops.txt station (1), platform (0), boarding area (4), entrance (2), generic node (3)	StopPlace, Quay, BoardingPosition, StopPlaceEntrance, PathJunction; AccessSpace for concourses	Named areas inside the station, not just points
levels.txt	Level, referenced from each component by LevelRef	Accessibility assessment per level
pathways.txt row	SitePathLink (From and To)	MaximumFlowPerMinute (capacity of the link)

pathway_mode	AccessFeatureType on the link, plus equipment records: StaircaseEquipment, LiftEquipment, EscalatorEquipment, TravelatorEquipment, RampEquipment	Equipment details, and an OutOfService flag on equipment
is_bidirectional	AllowedUse (one way or two way)	—
Length	Distance	—
traversal_time (one value)	TransferDuration: DefaultDuration, FrequentTravellerDuration, OccasionalTravellerDuration, MobilityRestrictedTravellerDuration	Different walking times for regular users, visitors and people with reduced mobility
stair_count	NumberOfSteps, with Transition (up, down, level, up and down, down and up)	Direction of travel shown explicitly
max_slope (a ratio, e.g. 0.083)	Gradient (in degrees) and GradientType; TiltAngle	Cross-slope. Note that the units differ, so conversion is needed
min_width	MinimumWidth, MinimumHeight	Headroom
signposted_as, reversed_signposted_as	Towards, Back (direction headings), Label; SignEquipment	The signs themselves as objects
wheelchair_boarding	AccessibilityAssessment with MobilityImpairedAccess and limitations: WheelchairAccess, StepFreeAccess, StairFreeAccess, EscalatorFreeAccess, LiftFreeAccess, RampFreeAccess, LevelAccessIntoVehicle, AudibleSignalsAvailable, VisualSignsAvailable, TactileGuidanceAvailable, GuideDogAccess	Needs beyond wheelchair use: blind and partially sighted passengers, people who cannot use escalators, guide dogs

No equivalent	NavigationPath with PathLinkInSequence (Heading left, right or forward; Instruction)	Pre-built, checked step-by-step routes, such as an official step-free route
No equivalent	TactileWarningStrip, TactileGuidingStrip, FlooringType, LeftSideBorder, RightSideBorder	Detail for visually impaired navigation

4.2.3 Walking between stops - not just within them

4.2.3.1 NeTEx transfer elements (Connection, SiteConnection, DefaultConnection) describe walking links between stop places or quays, for example, from a rail station to a nearby bus stop. They use the same four-part TransferDuration. GTFS transfers.txt has a single minimum transfer time. This matters for UK interchanges, where the walk between rail and bus is often the weakest part of a journey plan.

4.2.4 Real time

4.2.4.1 Static data can flag equipment as OutOfService. Live lift and escalator status belongs in SIRI Facility Monitoring (CEN/TS 15531-4), which carries the impact of each outage for different groups of disabled travellers.

4.2.5 European practice

Example	What it does
EPIAP, CEN/TS 16614-6:2024	The European Passenger Information Accessibility Profile, NeTEx Part 6, released in NeTEx v1.3.1 (May 2024). It is the European profile for station accessibility and walking data. France requires rail accessibility inventories under the EU rules for passengers with reduced mobility (TSI PRM) to use it
France: Profil NeTEx accessibilité v2.4	Mandatory for publishing accessibility data under an order of 28 May 2024, which builds on the 2019 mobility law (LOM). Version 2.4 was published on 6 March 2026 and is being aligned with EPIAP. It has three levels: basic, intermediate (services) and complete (navigation paths and equipment). Distance is mandatory on path links, and MinimumWidth is mandatory for lifts and footways. Lift status is published through SIRI

Norway: National Stop Register	Entur's national register of stop place infrastructure, including wheelchair accessibility. It is exported daily as NeTEx under an open licence (NLOD) and feeds the national OpenTripPlanner journey planner

4.2.6 How UK publishers should use NeTEx for walking links

4.2.6.1 Survey once, publish twice. Hold station walking data in NeTEx, following EPIAP, and generate GTFS Pathways from it for Google Maps and other consumer apps. This avoids two surveys drifting apart.

4.2.6.2 Key everything to NaPTAN. Use NaPTAN codes as the identifiers for StopPlace, Quay and StopPlaceEntrance, so walking links join the national stop register and BODS timetables.

4.2.6.3 Fill the four transfer durations. Start with DefaultDuration and MobilityRestrictedTravellerDuration. These give step-free travellers realistic connection times, not an optimistic average.

4.2.6.4 Record accessibility limitations on every link and level - not just the station. Derive the overall MobilityImpairedAccess value from them, as the French profile does: true if all are true, partial if some are.

4.2.6.5 Publish named step-free routes as NavigationPaths, so journey planners can show the station's own recommended route.

4.2.6.6 Cover walks between stations and nearby stops with SiteConnections, starting with major rail-bus interchanges.

4.2.6.7 Convert units carefully. GTFS max_slope is a ratio and NeTEx Gradient is in degrees.

4.2.6.8 Add SIRI Facility Monitoring for lifts and escalators, so planners can reroute when step-free access is lost.

4.2.6.9 Agree a UK profile. A UK walking and accessibility profile aligned with EPIAP and the French profile would stop each authority inventing its own.

5 Case studies and usage

5.1 Usage

5.1.1 The formats that work at scale are open, have a clear owner and are fed by operators as a condition of operating. GBFS for shared bikes and NeTEx, SIRI and OSM in the Nordic national planners show this most clearly.

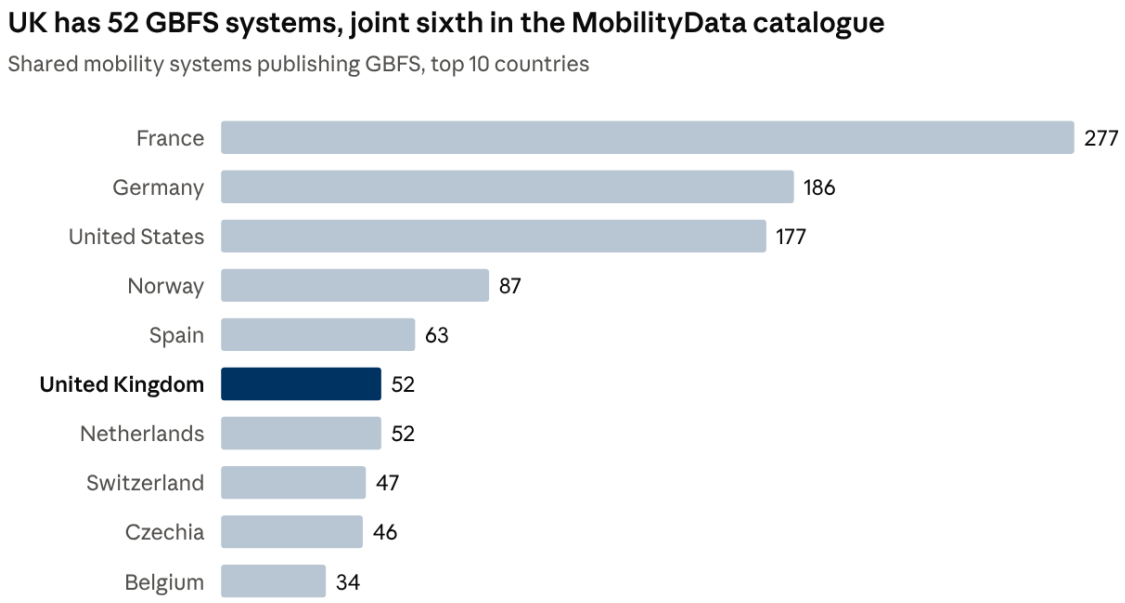


Figure 1 UK has 52 GBFS systems, joint sixth in the MobilityData catalogue

5.1.2 The UK's 52 catalogued GBFS systems come from eight publishers: Beryl (23 schemes), Donkey Republic (15), Dott (6), Zeus (4), and one each from Bolt, nextbike, Swansea University and WESTcargo. London's Santander Cycles, the UK's largest scheme, does not appear in the GBFS catalogue. Its availability is published through TfL's own Unified API.

Example	Formats used	Usage statistics	Commentary
Santander Cycles, London	TfL Unified API (live availability); open hire data on the London Datastore	8.77 million hires in 2024, up from 8.54 million in 2023. About 12,000 cycles, including 2,000 e-bikes, at 800+ docking stations. E-bikes rose from 7% of hires in 2023 to 18% in January–September 2025	A large scheme with an open API reaches every major journey planner. A GBFS feed alongside the API would assist data consumers.
UK bike share, national	Mostly GBFS (Beryl, Donkey Republic, Dott, Lime and others)	Nearly 25 million hires in the year to September 2023, 67,565 a day (up 24%), in 48 locations. 59% of hires were on e-bikes. An estimated 245 million car miles replaced	Growth is in dockless and e-bike schemes, where live vehicle data (vehicle_status) and operating zones (geofencing_zones) matter most.
TfL Cycling Infrastructure Database	GeoJSON and Unified API; OSM import attempted	Over 240,000 assets, including 146,000 cycle parking spaces, 2,000 km of cycle routes and 58,000 signs, surveyed in 2017–18. TfL Journey Planner uses it to show the nearest cycle parking	A one-off survey goes stale. The OSM merge was abandoned incomplete in January 2023, so plan maintenance and OSM alignment from the start

Entur, Norway	NeTEx (Nordic profile), SIRI, OSM, GBFS; OpenTripPlanner 2	National planner since November 2017, handling peaks above 20 requests a second. Its national registry holds data from 60 operators and 21,000 daily departures. Entur maintains the open-source Lamassu GBFS aggregator; Norway has 87 catalogued GBFS systems.	A single national body that aggregates public transport and shared mobility data gives every app the same complete base.
Digitransit, Finland	OpenTripPlanner, OSM, city-bike data	Used by "hundreds of thousands of people every day" (HSL, Fintraffic, Waltti).	Shared open-source planning code lowers the cost for regions.
MobiData BW, Baden-Württemberg	GBFS aggregation; open licences	The state platform republishes e-scooter, bike, cargo-bike, moped and car-sharing data as GBFS, among 146 datasets from 27 organisations.	A regional authority can aggregate operator feeds into one GBFS endpoint per mode, a potential model for UK combined authorities.
Switzerland OJP	OJP (CEN/TS 17118), TRIAS, OSM for walking and cycling	Free: up to 20,000 requests a day. Users include BLS Mobil and FAIRTIQ. Trip requests cover walking, cycling and shared bikes, e-scooters and cars.	A national journey-planning API lets small operators offer door-to-door plans without building a router.

France, BNAC and transport.data.gouv.fr	National cycle infrastructure schema; GBFS via the national access point	France has 277 catalogued GBFS systems, the most of any country. Local authorities publish cycle infrastructure in the common schema.	A national schema with an OSM link field makes local data reusable; it is a direct input to CyclInfra.
ONS Data Science Campus and Welsh Government	OpenTripPlanner; OSM; TransXChange and CIF converted to GTFS	Analytical tool for travel-time scenarios; no user statistics published.	Open tools can model access by walking, cycling and public transport for planning, not only for live journey planning.

5.1.3 Usage statistics are not published for most UK journey planners or for most GBFS consumers – thereby making it impossible to make service usage comparisons.

6 CyclInfra: the European standard in development

6.1.1 CyclInfra ("European specifications for Cycling infrastructure data") is run by CEN/TC 278 and funded by the European Commission through EISMEA. It started on 28 January 2026 for 24 months. Its main output will be a CEN Technical Report: Guidelines for the standardisation of cycling infrastructure data, covering:

- infrastructure type, surface and width as a minimum;
- a gap analysis of GDF, INSPIRE, NeTEx, DATEX II, OSM and the French schema;
- extensions to CEN/TS 17268, Transmodel and NeTEx for cycle parking; and
- conversion to and from OSM

6.1.2 The team has built a European baseline from OSM cycling tags and presented it at State of the Map 2026.

7 Good Practice Recommendations

7.1 Core Recommendation

7.1.1 The core recommendation is to use OSM for the network; GBFS for shared mobility; and TransXChange, NeTEx or GTFS for public transport. Link the three through stop codes, and publish everything openly with a named owner and an update cycle.

7.2 Local transport authorities and combined authorities

7.2.1 Make a live GBFS feed (version 3.0) a condition of every bike, e-bike, cargo-bike and e-scooter permit or contract. The feed should include vehicle_status, geofencing_zones and system_pricing_plans, and be registered in the MobilityData catalogue.

7.2.2 Treat OpenStreetMap as the shared base network. Fund corrections to cycleway type, surface, width and cycle parking in OSM rather than building a separate dataset that goes stale.

7.2.3 Where a local survey exists, publish it openly with OSM identifiers and a maintenance plan. TfL's database shows the cost of not planning this: the OSM alignment was abandoned incomplete.

7.2.4 Record cycle parking at stops, stations and mobility hubs, including capacity, cover and security. Link it to NaPTAN stop codes so journey planners can offer bike-and-ride.

7.2.5 Consider one aggregated GBFS endpoint per mode for the region - following MobiData BW in Baden-Württemberg.

7.2.6 Map local infrastructure attributes to type, surface and width now. These are CyclInfra's minimum attributes, so local data will be ready for the European guidance.

7.3 Shared mobility operators

7.3.1 Publish GBFS 3.0 with accurate vehicle_types: pedal or electric, cargo, and range for e-bikes and e-scooters.

7.3.2 Keep feeds live, with realistic refresh times. Use system_alerts for closures, and provide rental links so planners can pass users straight to booking.

7.3.3 Give regulators MDS data, or the data they ask for, separately from the public GBFS feed, so the public feed stays simple.

7.4 Public transport operators

7.4.1 Publish rules on carrying bikes in timetable data: bikes_allowed in GTFS, or the NeTEx equivalent.

7.4.2 Describe station access paths, lifts and step-free routes with GTFS pathways.txt or NeTEx, so walking sections inside interchanges are realistic.

7.5 Journey planner providers

7.5.1 Ingest GBFS and OSM directly and show cycle parking at interchanges alongside bike-share availability.

7.5.2 Offer routing profiles (quiet, fast, step-free) driven by OSM attributes. Show where data is missing rather than assuming a path is suitable.

7.5.3 Build on open engines (OpenTripPlanner) or national APIs (OJP), as in Norway, Finland and Switzerland - rather than separate local routers.

7.5.4 Publish basic usage statistics: journeys planned by mode, and requests to each feed. Data owners can then show the value of making their data open.

7.6 National bodies (DfT, Active Travel England)

7.6.1 Consider a national GBFS index or aggregator for Great Britain, alongside the Bus Open Data Service, similar to Entur and transport.data.gouv.fr.

7.6.2 Add cycle parking and the walking routes inside stations to NaPTAN, or publish them as linked datasets (for example GTFS Pathways keyed to NaPTAN codes).

8 Gaps and risks

8.1 Summary

8.1.1 The UK's biggest gaps are interchange data (cycle parking and access at stops) and the lack of usage evidence. The biggest risk is feeds disappearing as schemes come and go.

8.2 Gaps

8.2.1 No UK standard exists for cycle infrastructure attributes; local datasets use their own structures. CyclInfra's Technical Report, due around early 2028, will be guidance rather than a mandatory standard.

8.2.2 **Interchange data.** NaPTAN does not hold cycle parking or the walking routes inside stations, and no UK feed publishes GTFS Pathways. Journey planners therefore cannot reliably offer bike-and-ride or step-free interchange routes.

8.2.3 **Bike carriage rules.** Some services cannot be described properly in UK data standards. TfL's Cycle Shuttle, which passengers can only use with a bike, is one example: it does not show correctly in journey planners.

8.2.4 **Uneven GBFS coverage.** London's Santander Cycles is not in the GBFS catalogue, and only eight UK publishers are listed.

8.2.5 **Usage statistics.** Few UK journey planners or feed publishers report how often data is used.

8.2.6 **Path data.** OS Detailed Path Network ended on 30 September 2026. OSM quality for surface and width varies by area.

8.3 Risks

8.3.1 **Scheme churn.** Edinburgh's Just Eat Cycles closed in September 2021, TIER left York in May 2024, and Zipcar left the UK at the end of 2025. Planners must handle feeds that stop.

8.3.2 **Closed aggregation.** If shared mobility data reaches users only through a few commercial apps, authorities lose sight of coverage and quality.

8.3.3 **Duplicated effort.** Parallel local cycle datasets that are not aligned with OSM or CyclInfra will need costly conversion later.

Appendix 1 Glossary

API	Application Programming Interface
BNAC	Base Nationale des Aménagements Cyclables, France's national cycle infrastructure data schema
BODS	Bus Open Data Service (DfT): timetables, fares and vehicle locations for buses in England
BSI	British Standards Institution, the UK national standards body
CEN	European Committee for Standardization (Comité Européen de Normalisation)
CEN/TC 278	European standards committee for intelligent transport systems; BSI mirror committee EPL/278
CEN/TR	CEN Technical Report
CEN/TS	CEN Technical Specification
CID	Cycling Infrastructure Database (TfL)
CIF	Common Interface File, the GB rail timetable format
CoMoUK	Collaborative Mobility UK, the national charity for shared transport
CyclInfra	CEN project on European specifications for cycling infrastructure data, 2026–28
DATEX II	European standard for road traffic and travel data exchange (CEN/TS 16157)
DfT	Department for Transport
EISMEA	European Innovation Council and SMEs Executive Agency
EN	European Standard (Europäische Norm)
EPIAP	European Passenger Information Accessibility Profile (NeTEx Part 6, CEN/TS 16614-6)
GBFS	General Bikeshare Feed Specification, the public real-time shared mobility feed, maintained by MobilityData
GDF	Geographic Data Files, the ISO standard for road network data (ISO 14825)

GeoJSON	JSON-based format for encoding geographic data
GIS	Geographic Information System
GML	Geography Markup Language
GTFS	General Transit Feed Specification, the widely used format for public transport timetables
GTFS Pathways	The pathways.txt and levels.txt files of GTFS, which describe walking routes, stairs, lifts and gates inside stations
GTFS-RT	GTFS Realtime, the real-time extension of GTFS
HSL	Helsinki Region Transport (Helsingin seudun liikenne)
ID	Identifier
IFOPT	Identification of Fixed Objects in Public Transport, the stop model now part of NeTEx Part 1
INSPIRE	Infrastructure for Spatial Information in the European Community (EU Directive 2007/2/EC)
ITS	Intelligent Transport Systems
JSON	JavaScript Object Notation
LOM	Loi d'orientation des mobilités, France's 2019 mobility law
MBTA	Massachusetts Bay Transportation Authority
MDS	Mobility Data Specification, for operator-to-city data, maintained by the Open Mobility Foundation
MMTIS	EU Delegated Regulation 2017/1926 on multimodal travel information services, amended by 2024/490
MTC	Metropolitan Transportation Commission, San Francisco Bay Area
NaPTAN	National Public Transport Access Nodes,
NCN	National Cycle Network
NeTEx / SIRI / Transmodel	CEN standards for public transport network and fares data, real-time data and the underlying data model

NGD	National Geographic Database (Ordnance Survey)
NLOD	Norwegian Licence for Open Government Data
NSW	New South Wales
ODbL	Open Database Licence
OJP	Open API for Distributed Journey Planning (CEN/TS 17118)
ONS	Office for National Statistics
OS	Ordnance Survey
OSM	OpenStreetMap
OTP	OpenTripPlanner
PBF	Protocolbuffer Binary Format, a compressed OSM data format
PRM	Persons with Reduced Mobility
PSGA	Public Sector Geospatial Agreement
RTIG	Real Time Information Group
TfL	Transport for London
TOMP-API	Transport Operator to Mobility-as-a-Service Provider API
TRIAS	Traveller Realtime Information and Advisory Standard (VDV 431), the German journey planning interface
TSI	Technical Specification for Interoperability (EU rail)
WG	Working Group (of a CEN technical committee)
XML	Extensible Markup Language