

Your response

About Ookla and this response

Ookla provides connectivity intelligence through Speedtest®, Speedtest Intelligence®, Dwnndetector®, RootMetrics®, Ekahau® and related network measurement products. Speedtest data is generated by consumers testing real devices on real networks, indoors and outdoors, at all hours, in every part of the UK. It is complemented by RootMetrics controlled drive, walk and indoor venue testing and by background signal scan data that records device radio state, including no-service conditions. Because Speedtest measurements are initiated by users rather than collected in the background, they capture iPhone users at full scale alongside Android users. That matters in the UK, where iPhones account for roughly half of smartphones in use, among the highest shares of any major market. This response draws only on areas where Ookla has direct measurement evidence.

Ookla welcomes this discussion paper. The shift it represents, from reporting predicted coverage to assessing the reliability of delivered experience, matches how consumers actually judge mobile networks. The choice of a crowdsourced measurement basis is, in our view, correct, provided the data represents the devices and places people actually use. Ookla responded to DSIT's Mobile Market Review call for evidence in May 2026. This response is complementary and focuses on measurement design, benchmark calibration and the evidence base for Ofcom's four priority areas.

To test the proposals directly, we applied Ofcom's good performance thresholds to Speedtest Intelligence data across 43 countries, and within the UK down to nation, local authority, city centre, station and rail corridor level. Four headline findings run through this response.

- In Q2 2026, 78.1% of UK Speedtest measurements met the 5 Mbit/s download and 1.5 Mbit/s upload thresholds, placing the UK 40th of the 43 countries we scored, down from 34th in 2022. Six countries already exceed 90% (Türkiye, Denmark, Sweden, Czechia, the Netherlands and Bulgaria), so the benchmark is demonstrably attainable. No UK local authority, and no UK city centre we measured, currently reaches it.
- The single largest failure mode in the UK is the uplink. 18.3% of UK measurements miss the 1.5 Mbit/s upload threshold, double or more the failure rates we measure in Denmark, the Netherlands and Sweden, versus 9.2% missing the download threshold. The UK's median mobile upload (8.6 Mbit/s in Q2 2026) is the lowest among the European countries we track.
- The UK's pass rate has improved by only around 2.4 percentage points since 2022, against gains of 7.7 and 7.6 points in Spain and Poland respectively. The benchmark is reachable, but not on the current trajectory.
- Indoor environments are the largest blind spot in current reporting. Applying a new Ookla methodology that measures indoor readiness building by building, under half of London's measured indoor floor space cleared a basic radio quality gate in Q1 2026, and a quarter of the floor space measured throughout the year never passed in any quarter. Section 5 sets out this evidence in detail.

We would welcome the opportunity to provide Ofcom with supporting data, replication detail for any figure in this response, and recurring baselines for the interventions the paper discusses (the VodafoneThree network commitment, Project Reach, mmWave deployment in high density areas, and the LEO on-train Wi-Fi programme). Where this response cites city centre, station, rail corridor or indoor results, the underlying tables can be supplied as attachments in the format Ofcom prefers.

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Section 2: The quality of mobile connectivity we want to see	Confidential? No Views on the Map Your Mobile good performance metric and how it should evolve

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- What are your views on the use of the Map Your Mobile good performance metric and how should the measure evolve over time? What are your views on the usefulness of: - the 90% figure as a benchmark applicable across geographies and based on crowdsourced data?, and - Whether the 90% benchmark is realistic and sufficiently ambitious?	Ookla supports the metric. Anchoring good performance to the applications people routinely use, measuring it with crowdsourced data rather than predictions, and expressing it as the share of measurements that succeed are sound design choices. Three properties are worth protecting as the measure evolves. It is simple to communicate. It is testable by third parties. And it reflects experience where people actually are, including indoors, rather than where models predict signal to be. The inclusion of an upload threshold is particularly important. Applying the two speed legs to UK measurements in Q2 2026, 9.2% failed the 5 Mbit/s download leg while 18.3% failed the 1.5 Mbit/s upload leg. The upload leg is the binding constraint on the UK's score, and the failure rate is double or more what we measure in Denmark (7.7%), the Netherlands (8.7%) and Sweden (6.9%). The UK's median mobile upload of 8.6 Mbit/s is the lowest among European countries we track. Uplink capacity is what video calls, content sharing and a growing set of interactive and AI-mediated applications depend on. Any future revision should retain, and over time consider strengthening, the uplink leg. On the latency leg, we would encourage Ofcom to specify the measurement path precisely as the metric matures. Latency is far more sensitive than throughput to where test endpoints sit relative to the user. Scored against Speedtest's multi-server latency, a deliberately demanding measure that samples several endpoints rather than the nearest, 62% of measurements in England would pass a 50 ms gate, but only 32% in Scotland and 12% in Northern Ireland (median multi-server latency is 44.5 ms in England, 56.0 ms in Scotland and 63.1 ms in Northern Ireland). Much of that gap reflects where serving and interconnection infrastructure physically sits, not radio quality. A national latency benchmark that does not fix the measurement endpoint, or normalise for topology, risks penalising the periphery for geography rather than performance. We recommend the methodology state exactly how the latency leg is measured (endpoint location, idle versus loaded, aggregation), and that nation-level pass rate differentials be monitored for topology effects. On how the measure should evolve over time, we would suggest five directions, in rough priority order. 1. Report the distribution, not only the average. A single national score conceals the geography this paper is about. We suggest publishing the share of postcode districts or local authorities meeting the benchmark, alongside lower-percentile results (for example 10th percentile speeds), which capture the intermittent failures that drive consumer dissatisfaction.

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	2. Add a time dimension. UK median download speeds fall from roughly 96 Mbit/s off-peak to 56 Mbit/s in the evening peak, and the 10th percentile falls by about 65% to around 5 Mbit/s, which is the download threshold itself. A network can pass a 24-hour average while failing users at the hours they most rely on it. Peak-hour pass rates should become part of the reporting. We publish peak period congestion analysis across mobile markets (noted at footnote 68 of the paper) and would gladly support this extension. 3. Add responsiveness under load. Idle latency increasingly understates experienced delay. Loaded latency (latency during active transfer) rises materially in the UK at peak times, and international standards work points the same way (IETF IPPM responsiveness under working conditions and ITU-T Y.1567). Jitter and packet loss matter for real-time applications and could follow later, added gradually and with restated back-series to preserve trend interpretability. 4. Complement performance measurements with no-service evidence. As the paper notes (footnote 39), crowdsourced performance data reflects experience only where a connection attempt can be made. Background signal scan data, which records radio state including no-service conditions at scale, can close this blind spot, distinguishing no signal from poor performance and locating lived not-spots more faithfully than predictions. Ookla holds such data for the UK and would welcome discussing how it could complement the published measure. 5. Change thresholds rarely and transparently. Thresholds should be reviewed against evolving application demand, but changed with restated back-series so trends remain interpretable, and threshold changes should not coincide with benchmark-level changes. The 90% figure as a benchmark applicable across geographies, based on crowdsourced data Crowdsourced data is the right basis. It reflects delivered experience on real devices, includes indoor use, covers all hours, and scales to statistically meaningful volumes in small geographies. Scored against Speedtest Intelligence data, 78.1% of UK measurements met both speed thresholds in Q2 2026. By nation, England scored 78.8%, Scotland 78.8%, Northern Ireland 79.7% and Wales 71.9%, making Wales clearly the weakest nation. One design consideration deserves particular attention. A benchmark that describes how often people get good performance should draw on the devices people actually use. Datasets that rely on background collection are heavily

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	constrained on iOS by operating system restrictions, so they under-represent iPhone users. iPhones account for roughly half of the smartphones in use in the UK. Speedtest measurements are consumer-initiated, so they capture iOS and Android users at full scale. We would encourage Ofcom to define the metric precisely enough that any qualified dataset can score it, to set published minimum standards for the data behind it (sample thresholds per area and per operator, device coverage across operating systems, and a methodology change log), and to keep device representativeness under review as the benchmark becomes more consequential. There is regulatory precedent for grounding public reporting in Speedtest data. Arcep integrates it into its Mon Réseau Mobile platform in France, with a published code of conduct and open data publication. Applying the benchmark across geographies is where it will do the most work, and where care is needed. Using H1 2026 data, among 357 UK local authorities with sufficient samples, none reaches 90% on the speed thresholds. The range runs from around 60% (Isle of Anglesey, Wyre Forest, Pembrokeshire) to just under 90% (Sandwell, 89.8%), and only around four in ten local authorities exceed even 80%. The benchmark is therefore not a marginal stretch target. In most of the country it describes a different level of service. That is an argument for it, provided progress is reported as a distribution, so the tail is visible, and the benchmark operates as a direction of travel for every area rather than a national average that can be met while the tail is left behind. We agree with the paper's framing that the benchmark should be a share of measurements rather than of landmass, assessed per operator and per area. Is the 90% benchmark realistic and sufficiently ambitious? Both, on the evidence, but only with a change in trajectory, which is precisely why publishing it matters. The benchmark is realistic. Six of the 43 countries we scored already exceed 90% on the speed thresholds (Türkiye 91.8%, Denmark 91.2%, Sweden 90.9%, Czechia 90.5%, the Netherlands 90.3%, Bulgaria 90.1%). City centre evidence points the same way. Applying the thresholds to measurements within 1.5 km of city centre points in H1 2026, Stockholm passes 98.5% of the time, Oslo 94.5%, Prague 94.3% and Copenhagen 94.0%, while no UK city centre we measured exceeds 87%. The benchmark describes a level of service comparable European networks deliver today, including in the dense environments this paper is most concerned about.		
	Measurements meeting 5/1.5 Mbit/s	Pass rate	Rank of 43

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	speed thresholds, Q2 2026		
	Türkiye	91.8%	1
	Denmark	91.2%	2
	Sweden	90.9%	3
	Czechia	90.5%	4
	Netherlands	90.3%	5
	Bulgaria	90.1%	6
	France	79.3%	39
	United Kingdom	78.1%	40
	Ookla Speedtest Intelligence, Q2 2026. Share of mobile measurements meeting both speed components of Ofcom's good performance standard (at least 5 Mbit/s download and at least 1.5 Mbit/s upload). Latency is reported separately in the text. The benchmark is also ambitious. The UK's pass rate improved from 75.7% in 2022 to 78.1% in Q2 2026, roughly 0.6 percentage points a year. At that pace, 90% is around two decades away. Over the same window Spain improved by 7.7 points and Poland by 7.6, and the UK slipped from 34th to 40th in our ranking. The benchmark is therefore not achievable by trend continuation. It implies a step change in mid-band deployment depth, uplink provisioning and busy-hour capacity. We would encourage Ofcom to pair the 90% end state with published interim trajectories, national and distributional, so that progress, or its absence, is visible well before the end of the decade. Two design suggestions follow. First, keep the 90% attainment level stable even as metric components evolve, restating history whenever the metric changes. Second, resist pressure to relax either the thresholds or the attainment level to flatter progress. The value of this benchmark is precisely that it is uncomfortable. Finally, we note the paper's useful distinction between reliability (how often performance is good) and resilience (service continuity under failure conditions). Ookla measures both, and does so in a way no single dataset can. By bringing together Speedtest measurements, background signal scans and Dwn detector outage reports, we can observe how networks degrade, fail over and recover during major incidents, from the user's side. Our published analyses of Storm Éowyn in the UK and Ireland and of the April 2025 power outage across Spain and Portugal took exactly this		

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	approach, and that body of work has supported engagement with the OECD and with national regulators on telecoms resilience. We would welcome supporting Ofcom's resilience workstream with the same combined evidence base.
Section 3: Market-led improvements in mobile network quality • What information do customers need about network quality to choose the best network for their needs, and where are the main gaps in current provision of that information? • How well does Map Your Mobile currently meet customer and stakeholder needs, and what specific improvements would make it more useful?	Confidential? No What information customers need, and the main gaps Customers choosing a network need the answer to one question. How often will this network work well in the places, and at the times, I will actually use it? Answering it requires information that is per operator, local, experience-based rather than predicted, and honest about variation across time of day, indoors versus outdoors, and journeys. It also requires information drawn from the devices people actually use. Roughly half of UK smartphones are iPhones, among the highest shares of any major market. Information built on background data collection under-represents those users, because operating system restrictions limit background measurement on iOS. Speedtest data is consumer-initiated and captures iPhone and Android users at full scale. We would encourage Ofcom to treat device representativeness as a first-order requirement for any consumer-facing quality information. Against that standard, the main gaps in current provision are as follows. • Time of day. No consumer-facing UK source shows how networks perform at the hours people depend on them. Nationally, the UK's evening-peak median download (around 56 Mbit/s) sits around 40% below its off-peak level, the 10th percentile falls to about 5 Mbit/s, and degradation differs sharply by operator and place. Across the 14 UK cities we analyse, evening declines range from negligible (Manchester) to more than a third (London among them). A customer comparing networks on a full-day average can pick the wrong network for their actual usage hours. • Indoor experience. Most mobile time is spent indoors, but indoor performance is largely invisible in consumer information, and predicted indoor coverage still rests on a simplified average building entry loss. Section 5 sets out new evidence on how large this blind spot is. • Journeys. Rail and road corridor performance is absent from consumer-facing tools. Ofcom's train research shows why that matters. • Trend. Consumers can see a snapshot but not whether an operator is improving. That is the information that would most

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	sharpen operator incentives during the current investment cycle, and that would let customers reward improvement. • Comparability. Operator marketing claims (population coverage, or 5G labels spanning very different underlying services) are not comparable across networks. Independent, consistently measured metrics are the corrective. We also note the paper's intention (footnote 57) to track how customer demand responds to quality differences. Measured quality differentials between operators, at local level and over time, are the natural explanatory dataset for that work, and we would be glad to assist. How well Map Your Mobile meets needs, and specific improvements Map Your Mobile is a substantial improvement, in our view the most consumer-honest tool Ofcom has published. Raising the prediction thresholds, moving to 50 m pixels, and above all attaching a crowdsourced performance layer changed it from a coverage checker into an early experience checker, and its first-year reach (around a million visits, plus syndication to comparison services) shows the demand exists. Specific improvements we would prioritise are set out below. 1. Publish the benchmark through it. As the 90% benchmark is adopted, the per-operator, per-postcode-district pass rate, and its trend, should be visible in Map Your Mobile itself. That single change would convert the benchmark from a policy instrument into a retail-level competitive incentive, which is the paper's stated theory of market-led improvement. 2. Add temporal and indoor context. Peak versus off-peak indicators, and an indoor versus outdoor split of the performance layer where sample volumes allow. 3. Publish methodology versioning and sample sufficiency. Show users and analysts when data was last refreshed, what changed methodologically and when, and where results rest on thin samples. This protects the tool's credibility as it becomes more consequential. 4. Release underlying aggregates as open data, as Arcep does in France. Third parties (comparison services, local authorities, researchers) will multiply the tool's reach and scrutiny. 5. Ground the tool in representative, multi-method measurement. The performance layer should reflect the full device population, including iPhone users, and would benefit from pairing crowdsourced measurement with controlled testing. Ookla operates both at scale in the UK, spanning consumer-initiated Speedtest measurements across iOS and Android, RootMetrics controlled drive, walk and indoor venue

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	testing, and background signal scans. Speedtest data already underpins the performance layer of Arcep’s comparable platform in France, and our UK dataset is dense enough to score every postcode district on Ofcom’s exact thresholds. We would be pleased to support the tool’s evolution. 6. Label new coverage layers honestly. As satellite direct-to-device services arrive, the tool should distinguish what a service supports today (messaging, low-rate data) from what terrestrial good performance means under the benchmark.																																
Section 4: Connectivity in busy areas • What do you think are the biggest barriers to achieving better mobile performance in town and city centres and why? • What do you think should be Ofcom’s main priorities for our future work in this area? • What information would stakeholders, especially local authorities / planning authorities find useful for Ofcom to provide further insights on and why?	Confidential? No The biggest barriers in town and city centres Our data suggests the busy-area problem is better described as an all-day capacity deficit than an evening congestion problem, with densification economics as the root cause. First, no UK city centre we measured reaches the proposed benchmark even on the speed thresholds alone. Within 1.5 km of the centres of 14 major UK cities in H1 2026, the all-operator pass rate ranges from 72.8% (Edinburgh) to 86.8% (Cardiff), with central London at 81.8% to 84.2% depending on the centre point used. On the identical definition, ten of sixteen international city centres we scored exceed 90%. Stockholm passes 98.5% of measurements, Oslo 94.5%, Prague 94.3%, Copenhagen 94.0% and Seoul 92.2%, with Brussels, Amsterdam, Vienna, Lisbon and New York at or above 90.5%. Not all dense capitals manage it (Paris 79.4%, Rome 78.4%). At operator level, only six of the sixty UK city-centre and operator combinations we scored exceed 90% on the speed thresholds (with a seventh at exactly 90%), and none in London, Manchester, Birmingham, Leeds, Liverpool, Newcastle or Edinburgh. Adding the latency leg would lower these figures further. <table><tr><th>City centre (1.5 km radius), H1 2026</th><th>Speed-thresholds pass rate</th><th>Median download</th><th>Median upload</th></tr><tr><td>Stockholm</td><td>98.5%</td><td>416 Mbit/s</td><td>57.5 Mbit/s</td></tr><tr><td>Oslo</td><td>94.5%</td><td>236 Mbit/s</td><td>38.1 Mbit/s</td></tr><tr><td>Prague</td><td>94.3%</td><td>155 Mbit/s</td><td>35.5 Mbit/s</td></tr><tr><td>Copenhagen</td><td>94.0%</td><td>262 Mbit/s</td><td>30.0 Mbit/s</td></tr><tr><td>Amsterdam</td><td>90.8%</td><td>207 Mbit/s</td><td>26.5 Mbit/s</td></tr><tr><td>Cardiff (best UK)</td><td>86.8%</td><td>137 Mbit/s</td><td>18.0 Mbit/s</td></tr><tr><td>London (City)</td><td>84.2%</td><td>98 Mbit/s</td><td>14.6 Mbit/s</td></tr></table>	City centre (1.5 km radius), H1 2026	Speed-thresholds pass rate	Median download	Median upload	Stockholm	98.5%	416 Mbit/s	57.5 Mbit/s	Oslo	94.5%	236 Mbit/s	38.1 Mbit/s	Prague	94.3%	155 Mbit/s	35.5 Mbit/s	Copenhagen	94.0%	262 Mbit/s	30.0 Mbit/s	Amsterdam	90.8%	207 Mbit/s	26.5 Mbit/s	Cardiff (best UK)	86.8%	137 Mbit/s	18.0 Mbit/s	London (City)	84.2%	98 Mbit/s	14.6 Mbit/s
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	London (West End)	81.8%	93 Mbit/s	11.5 Mbit/s
	Manchester	81.7%	100 Mbit/s	11.7 Mbit/s
	Paris	79.4%	133 Mbit/s	10.6 Mbit/s
	Edinburgh (worst UK)	72.8%	47 Mbit/s	5.7 Mbit/s
	Ookla Speedtest Intelligence, H1 2026, GPS-located measurements within 1.5 km of recognised city centre points. Share meeting at least 5 Mbit/s download and at least 1.5 Mbit/s upload. Selected rows shown, full table available to Ofcom. Second, the deficit is present at every hour. At the quietest hours of the day, when congestion is irrelevant, UK networks deliver a median of around 100 Mbit/s nationally, against roughly 180 Mbit/s in the Netherlands and 204 Mbit/s in Denmark at the same hours. That is evidence of too little active spectrum radiating from too few sites, rather than demand outstripping a well-dimensioned network. Evening degradation then compounds it. Median download within 500 m of London Waterloo, for example, falls to about 37 Mbit/s in the evening peak. Third, the uplink is the sharpest failure in exactly these places. Uplink failure shares in UK city centres run at 10 to 24% of measurements, and median city-centre uploads (roughly 6 to 18 Mbit/s across UK cities) compare with roughly 21 to 58 Mbit/s in the ten international centres that meet the benchmark. Stockholm's median city-centre upload is roughly four times London's. Busy places are where people upload, share and stream out. The uplink is where their experience most visibly breaks. The barriers behind this, in our assessment, are site-acquisition economics and planning friction for dense urban grids (the paper's analysis of prior-approval refusal rates makes this case), the gap between licensed and activated mid-band spectrum in city cores, under-provisioned uplink in carrier configurations, and backhaul economics for small cells. The mmWave licences awarded in October 2025 for 68 high density areas address the right problem, but device support and deployment timelines make them a late-decade solution. The near-term lever is mid-band depth and site density. Ofcom's main priorities in busy areas 1. Make city-centre reliability a recurring, published measurement. Extend the paper's one-off Q1 2026 city-centre analysis into a standing series (per operator, per city, including			

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	peak-hour cuts), so improvement is visible and attributable. We publish city-level analyses of this kind routinely and would gladly support a consistent series, including international city-centre context. 2. Track deployment against the awarded capacity pipeline. mmWave activation in the 68 high density areas, upper 6 GHz when awarded, and mid-band carrier additions in city cores. A pre-deployment baseline now exists, in the paper and in our data, and publishing progress against it will show whether spectrum awards convert into delivered capacity. 3. Keep publishing the planning evidence. Publishing local planning authority approval statistics alongside measured performance would let authorities see the connectivity consequences of their processes, and let residents see them too. 4. Keep venue-scale performance in scope. Stadiums, arenas and transport hubs concentrate exactly the demand this section is about. Around the twelve stations named in Project Reach, our H1 2026 measurements show speed-threshold pass rates from about 70% (Edinburgh Waverley) to 89% (Liverpool Lime Street), a ready-made baseline for the committed station investments. Information useful to local and planning authorities The paper notes several authorities have already commissioned their own measurement, which is evidence of unmet demand for local data. What authorities need is granular, current, independent evidence tied to their own geography. That means postcode-district or LSOA-level pass rates against the national benchmark (with peak-hour cuts), trend since a fixed baseline, and comparison with peer authorities. Our H1 2026 local authority table, spanning roughly 60% to 90% pass rates on the speed thresholds, is exactly the kind of evidence that turns a national debate into a local delivery conversation. Before and after evaluation of specific interventions (new sites, small-cell programmes, venue systems) would help authorities justify enabling decisions. Such effects are visible in measurement data, and we would support structured evaluations with Ofcom, DSIT or individual authorities.
Section 5: Connectivity in indoor, shared public places What do you think are the biggest barriers to achieving	Confidential? No The biggest barriers indoors Four compounding factors, in our assessment. 1. Physics and building standards. Mid-band 5G penetrates modern construction poorly, and the trend in building fabric is

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better mobile performance indoors and why? • What do you think should be Ofcom's main priorities for our future work in this area? • What information would you find useful for Ofcom to provide further insights on in relation to connectivity indoors and why?	adverse. The ITU's building entry loss model puts the median loss through a traditional building at roughly 14 to 16 dB across cellular bands, and through a modern thermally efficient building at around 31 dB. Energy-efficient glazing alone can attenuate signal by 25 to 40 dB, and Norway's regulator has noted that a single modern external wall can cut a mobile signal by up to 70 dB. Official indoor coverage statistics, by contrast, are derived by subtracting a 10 dB average allowance from predicted outdoor signal. The UK is, rightly, making buildings more thermally efficient. Without countervailing measures it is also making them more radio-opaque, and current reporting cannot see it happening. 2. Split incentives. The party controlling a building is usually neither the party whose customers suffer nor the party consumers blame. Dedicated in-building systems are expensive and there is no consistent commercial template for who pays. The Greater Manchester findings illustrate both the solution and its fragility. A venue-wide shared system served participating operators well at peak, while a non-participating operator underperformed severely. Shared infrastructure works, but only for operators who join. 3. Measurement invisibility. Indoors is where most mobile time is spent and where the least published evidence exists. What is not measured will not be managed. This is the gap Ookla has now begun to close, and the early UK evidence is set out below. 4. Capacity behind the wall. Deep-indoor coverage often falls back to low-band layers with limited capacity, so covered indoors can mean single-digit Mbit/s. We note the Greater Manchester finding that some 80% of indoor good-performance failures were download failures. Indoors, unlike outdoors in city centres, the binding constraint is download capacity that survives the building, which points to mid-band depth, small cells and in-building systems rather than coverage-layer fixes. New evidence. Measuring indoor readiness building by building Ookla has developed what is, to our knowledge, the first city-scale measurement of indoor cellular performance that is resolved to individual buildings and weighted by floor area. It uses background signal scans from smartphones, classified as indoor using Ookla's patented in-building sample recognition capability and joined to individual building footprints, with floor counts and floor areas estimated from building records. A building's floor space counts as coverage-ready only when median signal strength reaches at least -105 dBm, the level Ofcom itself uses to define basic outdoor 4G service, and signal

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	quality clears a minimum bar. Results are aggregated by floor area and describe measured buildings only. The first three-city study covers London, Berlin and New York quarterly from Q2 2025 to Q1 2026, and the London findings bear directly on this section. • In Q1 2026, only 47% of London's measured indoor floor space was coverage-ready, against 68% in Berlin and 69% in New York. London's gap of 69.4 million square metres of not-ready floor space is around four times Berlin's 17.2 million. • The gap is chronic rather than episodic. Among London buildings measured in every quarter of the year, 25% of floor space never passed the quality gate in any quarter, roughly three times the chronic rate of Berlin (8%) and New York (7%). • London underperforms at every building height. Its 20 to 29 floor buildings, where postwar tower blocks and recent residential high-rises cluster, fail on 76% of measured floor space, the weakest segment measured anywhere in the study. • The commercial core is the epicentre. The City of London fails the quality gate across 56% of its measured floor space, nearly three times the rate of Lower Manhattan (20%) and well above Midtown Manhattan (26%) and Berlin's Mitte (32%). The five London boroughs with the largest measured gaps host 2.8 million jobs between them. • Prediction and measurement answer different questions, and the difference is large. On the modelled view, 99% of London premises have indoor 4G coverage from all four operators. On our measured view, 45% of London's indoor floor space cleared the radio quality gate across the same four-quarter window. The divergence is not an indictment of any single model. It is the size of the blind spot that prediction-only reporting leaves behind. • The gap is concentrated and mostly winnable. Five boroughs hold 43% of London's not-ready floor space. Around 43% of London's failing floor space is genuinely signal-starved and needs outdoor reach first, which in dense cities means rooftop sites. The remainder mostly fails on signal quality rather than reach, and around two thirds of the signal-starved floor space sits within 5 dB of the quality gate, close enough for densification and in-building systems to flip. • Building fabric measurably shapes the outcome. In New York, where measured buildings can be matched to energy audit filings, buildings flagged for envelope work such as windows, insulation or air sealing measure 34% not ready against 26% where no such work is flagged, a difference that survives controls for height, use, borough and age. Stock built since 2000 measures worse than pre-war masonry. Energy

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	retrofit programmes are rewriting the radio properties of the building stock at scale. • The gap tracks social vulnerability. Pooling districts across the three cities by within-city vulnerability percentiles, the not-ready share of floor space climbs from 30% in the least vulnerable fifth to 47% in the most vulnerable fifth. The gap lands on the populations least able to fall back on home broadband. Priorities for Ofcom's future work indoors • Measure first. Establish a recurring indoor evidence base, separating indoor from outdoor experience and prioritising the shared public places the paper identifies. The building-resolved methodology above is portable to any UK city and complements venue-level controlled testing (RootMetrics tests hundreds of UK indoor venues per six-month cycle) and in-building Wi-Fi diagnostics (Ekahau). We would welcome working with Ofcom on an indoor measurement framework for the UK. • Convene the building side. Bring developers, landlords and building-standards bodies into connectivity policy, including examining how building regulations and retrofit programmes account for radio transparency (for example treated glazing options), so energy efficiency and connectivity stop being traded off silently. International practice shows what is possible. South Korea now devotes half of its national 5G quality evaluation sites to indoor venues, Singapore enforces a per-building indoor coverage standard, and Hong Kong requires new buildings to reserve equipment space for operators. No European regulator yet measures indoor mobile performance, which is an opportunity for Ofcom to lead. • Address rooftop site economics. Nearly half of London's failing indoor floor space is signal-starved, and outdoor reach in dense cities depends on rooftop sites. Site access disputes and notices to quit on urban rooftops therefore bear directly on this section's outcomes, and the measured indoor gap gives that debate an evidence base it has lacked. • Support shared in-building infrastructure. Neutral-host models, Shared Access licensing (including 26 GHz indoors), and clear expectations of all-operator participation in major-venue systems, so the pattern observed at large venues (good for integrated operators, poor for the absent one) becomes the exception. • Keep Wi-Fi in the frame. Indoor experience is a cellular-plus-Wi-Fi outcome, and Ofcom's 6 GHz decisions help. But public-venue Wi-Fi quality is highly uneven, and consumers rarely know in advance whether venue Wi-Fi will rescue poor

Question	Your response
	cellular. In our three-city indoor study, the correlation between districts' Wi-Fi usage and their indoor cellular gap is close to zero, so heavy Wi-Fi use is not evidence that the cellular gap has been worked around. Venue-level reporting would discipline both layers. Information that would be useful indoors A public, recurring indoor readiness series for major UK cities, of the kind described above, which we would be pleased to support. Venue-category benchmarks showing how UK stations, arenas and shopping centres compare with each other and with international equivalents. Indoor versus outdoor performance splits by area. Building-era and building-type analyses linking construction characteristics to measured readiness. And published case-study evaluations of in-building deployments (DAS and neutral host installations) quantifying before and after user experience, to build the commercial evidence base that landlords currently lack.
Section 6: Connectivity on trains • What do you think are the biggest barriers, technical and commercial, to achieving better mobile performance on trains? Which are most significant and why? • Do you agree with our proposal to work with government to support improvements in train connectivity? • What information would you find useful for Ofcom to provide further insights on in relation to connectivity on trains and why?	Confidential? No The biggest barriers, technical and commercial, and which matter most The commercial and structural barriers dominate, in our view. Technically, good on-train connectivity is a solved problem, internationally and even within the UK. Ofcom's own commissioned research found one track-to-train deployment passing the performance standard 83% of the time, and our corridor data shows the Midland Main Line delivering a median of 92 Mbit/s to passengers while the East Coast Main Line delivers 29 Mbit/s. That variation is not physics. It is investment and accountability. On the commercial side, rail corridors are linear infrastructure with low revenue density, so unaided operator economics stop well short of continuous coverage. Responsibility is fragmented between Network Rail, train operators, MNOs and Wi-Fi backhaul contractors, with no single party accountable for the passenger's connection. And on-board Wi-Fi has been procured to a cost floor rather than an experience standard. The technical barriers (carriage penetration loss, which rolling-stock choices and treated windows can address, tunnels and deep cuttings, handover at speed, and constrained trackside backhaul) are real but secondary. Our measurements quantify the outcome at journey scale, complementing the line-segment study published alongside the paper. Pooling two years of in-motion measurements (tests taken at 80 km/h or above), the UK's median download of 58 Mbit/s compares with around 100 Mbit/s in France, 160 Mbit/s

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	in the Netherlands and 196 Mbit/s in the United States, though notably better than Japan, so the UK is not uniquely poor in motion. Restricting to GB main-line rail corridors in H1 2026, median download along main lines is 57 Mbit/s, falling to 40 Mbit/s for measurements at 100 km/h or above (almost certainly on trains), with 16% of on-train-speed measurements below 5 Mbit/s and a 72% pass rate on the speed thresholds. Loaded latency along the worst corridors approaches a second, so responsiveness fails on trains even when headline speed survives. <table><tr><th>GB rail corridor, H1 2026</th><th>Median download</th><th>Share of measurements <5 Mbit/s</th><th>Speed-thresholds pass rate</th></tr><tr><td>East Coast Main Line</td><td>29 Mbit/s</td><td>23%</td><td>66%</td></tr><tr><td>Great Western Main Line</td><td>47 Mbit/s</td><td>14%</td><td>77%</td></tr><tr><td>West Coast Main Line</td><td>49 Mbit/s</td><td>15%</td><td>71%</td></tr><tr><td>Brighton Main Line</td><td>69 Mbit/s</td><td>10%</td><td>80%</td></tr><tr><td>South Western Main Line</td><td>72 Mbit/s</td><td>9%</td><td>83%</td></tr><tr><td>Midland Main Line</td><td>92 Mbit/s</td><td>11%</td><td>81%</td></tr><tr><td>All main lines (60 km/h or above)</td><td>57 Mbit/s</td><td>11%</td><td>78%</td></tr><tr><td>All main lines (100 km/h or above)</td><td>40 Mbit/s</td><td>16%</td><td>72%</td></tr></table> Ookla Speedtest Intelligence, H1 2026. GPS-located measurements within 150 m of main-line railway geometry at 60 km/h or above (100 km/h or above for the on-train row). Pass rate against at least 5 Mbit/s download and at least 1.5 Mbit/s upload. Selected major corridors shown, full table available to Ofcom. On-board Wi-Fi deserves its own line. In a European comparison we published in October 2025, the median download over UK on-train Wi-Fi was 1.09 Mbit/s, against 64.6 Mbit/s in Sweden, 29.8 Mbit/s in Switzerland and 26.3 Mbit/s in Ireland, with Wi-Fi 4 still common on UK rolling stock and a substantial minority of it confined to 2.4 GHz. The causes sit in backhaul contracts, throttling and on-board equipment rather than user demand.	GB rail corridor, H1 2026	Median download	Share of measurements <5 Mbit/s	Speed-thresholds pass rate	East Coast Main Line	29 Mbit/s	23%	66%	Great Western Main Line	47 Mbit/s	14%	77%	West Coast Main Line	49 Mbit/s	15%	71%	Brighton Main Line	69 Mbit/s	10%	80%	South Western Main Line	72 Mbit/s	9%	83%	Midland Main Line	92 Mbit/s	11%	81%	All main lines (60 km/h or above)	57 Mbit/s	11%	78%	All main lines (100 km/h or above)	40 Mbit/s	16%	72%
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Question	Your response
	Do we agree Ofcom should work with government on train connectivity? Yes. The committed programmes, Project Reach (trackside fibre, 57 tunnels, twelve stations, first installations from 2026) and the £57m LEO satellite Wi-Fi rollout, will land over 2026 to 2028. Whether they translate into passenger-experienced improvement should be established by independent measurement against pre-intervention baselines, not by build milestones. Those baselines now exist, in the line-segment study published alongside the paper, in our corridor and station-area measurements above, and in continuous crowdsourced data going forward. On the question the paper raises about how train connectivity should be reported on an ongoing basis, we would suggest three design principles. First, define the outcome metric as journey-weighted passenger experience (the share of journey time with connectivity meeting the good performance standard), which passengers feel, rather than route-kilometre coverage, which they do not. Second, pair periodic controlled campaigns, which isolate line, rolling-stock and train factors, with continuous crowdsourced measurement, which provides always-on trend coverage at journey scale and international comparability. Ookla is unusual in operating both models. Third, report per corridor and per operator, so accountability attaches somewhere. We would be pleased to contribute the crowdsourced layer and international rail benchmarking to that framework, and to support Ofcom's consideration of whether additional spectrum should be made available for track-to-train use. Information that would be useful on trains A recurring line-level reliability series, so progress on each corridor is visible through the Project Reach build. Tunnel and deep-cutting blackspot mapping. On-board Wi-Fi versus cellular comparison per route operator. Station-area performance (our H1 2026 baseline across the twelve Project Reach stations spans roughly 70% to 89% pass rates on the speed thresholds). And international comparison against markets that have engineered continuous rail coverage, such as the Gotthard Base Tunnel and the Channel Tunnel, with the London Underground build-out soon offering a domestic reference point.
Section 7: Connectivity in rural areas What do you think are the biggest barriers to achieving	Confidential? No The biggest barriers in rural locations The UK's rural mobile gap is no longer primarily a coverage-signal gap. It is a delivered-capacity gap. The Shared

Question	Your response
better mobile performance in rural locations and why? • What do you think should be Ofcom's main priorities for our future work in rural locations and what outcomes should we aim to achieve? • What solutions (technical, commercial, policy or delivery) could improve rural mobile performance? • What information would you find useful for Ofcom to provide further insights on in relation to rural connectivity and why?	Rural Network achieved its 95% landmass objective early, and 4G geographic coverage continues to edge up. But coverage obligations were set at levels that describe presence, not usefulness, and the experience data shows the difference. On a like-for-like degree-of-urbanisation basis (the European Commission's global settlement grid, which removes definitional differences between national rural statistics), UK rural areas record a median download of 39 Mbit/s, the lowest of the 16 European countries we analysed, against 83 Mbit/s in rural France and 134 Mbit/s in rural Denmark. Using the ONS 2021 rural-urban classification for England and Wales, median downloads fall from 88 Mbit/s in the most urban class to the mid-20s to 30s Mbit/s in smaller rural settlements, and pass rates against the good performance standard fall in step. At local authority level, the lowest pass rates in the country are all rural or semi-rural. Isle of Anglesey (60.3%), Pembrokeshire (61.4%), Gwynedd (63.7%), Somerset (63.5%), Cornwall (64.7%) and the Devon districts sit at the bottom of our table. Rural Wales and the South West are, on our evidence, the epicentre of the UK's reliability gap. Behind this sit four barriers. Rural site economics beyond the SRN baseline (capacity investment carries no obligation). Spectrum depth, because rural 5G often rides thin low-band or shared carriers, so a 5G indicator does not deliver 5G-class capacity. Backhaul. And land access and planning in exactly the landscapes where sites are hardest to build. There is also a structural blind spot worth naming. Because deprivation in Britain concentrates in dense urban cores where mid-band is deployed first, measured performance in England runs backwards against affluence. The most deprived tenth of neighbourhoods receives 66% faster median downloads than the least deprived tenth (102 versus 61 Mbit/s), a gradient that survives urban-only controls. Sparse, low-rise and rural Britain, much of it prosperous, is the systematically underserved geography. Rural policy should be understood as the acute end of a general low-density problem, not a niche. Priorities and outcomes for Ofcom's rural work • Reframe the objective from coverage to a rural experience floor. Track rural areas' progression toward the same 90% benchmark, and publish rural pass rates and lower-percentile performance alongside coverage statistics. The outcome to aim for is convergence, narrowing the gap between UK rural performance and both UK urban performance and European rural norms. We recognise, as the paper does, that the full benchmark may not be realistic in places few people frequent. The populated rural areas where people live, work and visit are where the benchmark should bind.

Question	Your response
	• Hold committed programmes to measurable rural outcomes. That includes the VodafoneThree network commitment (whose early integration effects are already visible in measured data as material speed uplifts for Three customers), remaining SRN Total Not-Spot builds, and EAS site commercialisation. Independent measurement can verify claimed not-spot elimination, meaning the appearance of new, usable service where none existed, rather than relying on predicted coverage updates. This would also strengthen Ofcom's planned rural case studies, and we would welcome contributing measured baselines to the locations Ofcom selects. • Address the latency periphery. As noted under Section 2, Scotland and Northern Ireland face structural latency disadvantages rooted in infrastructure topology. Encouraging serving infrastructure, interconnection and content caching closer to the devolved nations would improve responsiveness in ways radio investment alone cannot. Solutions (technical, commercial, policy, delivery) Terrestrial first. The durable fix is mid-band activation and capacity investment on rural grids, which is an economics problem. International precedent suggests obligations and incentives work when tied to delivered quality rather than predicted signal. France's New Deal Mobile traded fee relief for enforceable coverage-quality obligations, and Germany's 2025 licence extensions attached 50 Mbit/s obligations. Infrastructure sharing and neutral-host models extend the economics, and Ofcom's exploration of spectrum sharing for hard-to-serve areas is worth pursuing. Satellite direct-to-device is a genuinely useful complement, and the UK is now one of the world's foremost D2D testbeds. Within weeks of the first commercial service launching in February 2026, the UK became the third-largest market globally by detected D2D users in our data (March 2026). But usage is broad and shallow, at about 0.3% of the mobile base with low engagement per user, and current services support messaging and low-rate data rather than benchmark-level performance. We recommend Ofcom report D2D adoption and capability separately from terrestrial coverage, with clear labelling of what each service supports, and treat it as a resilience and reach layer rather than a substitute for terrestrial investment. We publish recurring D2D adoption analysis and would gladly share UK trends as further services launch, including the trials expected this summer. Fixed wireless access and improved in-premise Wi-Fi address the indoor share of rural demand. The mobile benchmark

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	should nonetheless be met by mobile networks outdoors in populated rural areas. Information that would be useful on rural connectivity A like-for-like rural performance series (UK rural versus European rural on consistent definitions, tracked over time). Not-spot experience mapping using measured no-service and sub-threshold evidence rather than predictions alone, which addresses the crowdsourcing blind spot the paper notes at footnote 96. Seasonal analysis for visitor-heavy rural economies, where populations and network load swing sharply. D2D adoption and capability tracking. And site-level before and after evaluation for SRN and EAS activations. All are analyses we already run or could stand up quickly, and we would welcome supporting Ofcom's rural case studies with them.

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Annex. Data and methodology notes

- Speedtest Intelligence data reflects consumer-initiated tests on real devices across iOS and Android. National and international market aggregates follow Ookla's published methodology (per-device aggregation before market medians). Benchmark pass rates and the city centre, station and corridor figures are computed at measurement level, consistent with the share-of-measurements basis of the proposed benchmark. Periods are as stated. Q2 2026 for the 43-country benchmark analysis and H1 2026 (January to June) for UK geospatial analysis, with GPS-located measurements used for city centre, station, rail corridor, rural and deprivation analyses.
- Benchmark implementation. The two speed legs (at least 5 Mbit/s download and at least 1.5 Mbit/s upload) are applied exactly as defined in the paper and scored as the share of measurements passing. Latency results use Speedtest's multi-server latency, a deliberately stricter measure than single-endpoint latency, and are therefore reported separately rather than folded into a headline pass rate.
- City centres are defined as 1.5 km radii around recognised central points, applied identically across countries. Station areas are 500 m radii using a higher location-accuracy subset. Rail corridors comprise measurements

within 150 m of main-line railway geometry at 60 km/h or above (100 km/h or above for on-train confidence). The table in Section 6 shows selected major corridors, with the full set available to Ofcom.

- Indoor readiness figures draw on Ookla background signal scan data classified as indoor using Ookla's patented in-building sample recognition capability, joined to individual building footprints and weighted by floor area. A building's floor space counts as coverage-ready when median signal strength is at least -105 dBm and signal quality clears a minimum bar. Results describe measured buildings and floor space only, for the quarters Q2 2025 to Q1 2026.
- Rural classifications use the ONS 2021 Rural-Urban Classification (England and Wales) and the European Commission GHS-SMOD degree-of-urbanisation grid (for like-for-like international comparison). Deprivation analysis joins measurements to 2021 Lower-layer Super Output Areas and the English Indices of Deprivation 2025.
- External data referenced includes Ofcom Connected Nations 2025 and the Spring 2026 update, Ofcom Map Your Mobile threshold methodology (2025), the studies published alongside this discussion paper, ITU-R P.2109 building entry loss, and public regulator materials for the international practice cited.
- Ookla can provide replication detail for any figure in this response, together with underlying tables as attachments, subject to appropriate treatment of commercially sensitive information. [REDACTED]
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