

John F. Kennedy International Airport (JFK)

Venue Network Intelligence Report

Rev 1, first issue, 2026-09-15

This baseline reads 12 months of Ookla crowdsourced cellular tiles (95,364 carrier-tile records over 50,923 unique tiles) and 50,663 usage tiles across 134 gate points and 414 mapped venue points in five operating terminals. Inside the terminal footprints T-Mobile leads 5 of 5 ranked terminals on the building-masked basis, while the three carriers tie at the venue gate-area median and 75 of 134 gate points read weak for all three. Boingo Wireless is the Port Authority's neutral-host DAS and Wi-Fi provider at JFK; the next step is Boingo's per-terminal coverage map, with the section 14 building-masked criteria written into the New Terminal One and Terminal 6 designs.

Prepared by the Imagine Wireless Network Intelligence Platform

Data window: 2025-09-01 to 2026-08-31 · Issued: 2026-09-15 · Freshness: 15 days (within the 90-day policy)

Primary sources: Ookla Cell Analytics (per-carrier RF tiles; All Networks usage and density tiles) · OpenStreetMap gates, terminal polygons, and tenant points (pinned 2026-09-15)

Reference sources: Boingo press release of October 14, 2025 (held) · Imagine knowledge-graph record (pinned 2026-09-16) · Port Authority of New York and New Jersey press releases · portauthoritybuilds.com · public press (web-verified 2026-09-15)

CONFIDENTIAL. Prepared for Port Authority of New York and New Jersey stakeholder review



PHOTO. Terminal 4 apron and gates, 2024. Illustrative; the photograph is not a measurement. · Photo: Oleg Yunakov, CC0 (2024-09-15), via Wikimedia Commons

5G at the venue gate-area median	Inside the terminal footprints (building-masked)	Critical 5G gate points (below -110 dBm)	Wi-Fi share of observed data volume
Tie · medians -98.3, -99.3, -100.2 dBm (Verizon, T-Mobile, AT&T); n=134 gate points	T-Mobile leads 5 of 5 ranked terminals (section 4.1)	12 of 402 gate-carrier pairs (Verizon 0, T-Mobile 0, AT&T 12)	56.2% of observed MB (n=50,663 tiles)

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1. Executive readout

Provenance legend: measured values compute from the Ookla exports at build time. Facts marked "cited source" come from public sources this report does not hold as measurements. Facts marked "KG record" come from the pinned Imagine knowledge-graph snapshot and are likewise cited source. Threshold ladder (section 16): 5G reference signal received power (RSRP) healthy at or above -95 dBm, at risk between -95 and -110 dBm, critical below -110 dBm. Two bases recur: the building-masked basis: 5G-reporting tiles inside the OSM terminal polygon, healthy share of those, median; and the gate-area basis: mean of tiles within 80 m of the gate point, which straddles the apron.

John F. Kennedy International Airport is operated by the Port Authority of New York and New Jersey. Boingo Wireless is the Port Authority's neutral-host DAS and Wi-Fi provider at JFK (Boingo press release, October 14, 2025, held; PANYNJ board authorization, June 26, 2025, KG record; Airport DAS Master, July 2026, KG record): the agreement was authorized on June 26, 2025 under the 2024 RFP, announced on October 14, 2025 as a long-term agreement to deliver next-generation cellular and free public Wi-Fi across Port Authority properties including JFK, runs 2026 to 2038, and replaces the 1999 New York Telecom Partners agreement under which Boingo already operated at JFK; Boingo also provides Passpoint Wi-Fi at JFK. The remaining question is Boingo's per-terminal coverage map (section 8, recommendation 1). This report reads the tiles as what the passenger experiences on the Boingo-served venue. It measures 134 gate points across five operating terminals, 414 mapped venue points,

95,364 carrier-tile records over 50,923 unique tiles, and 50,663 usage tiles over the 12-month window ending 2026-08-31.

Terminal leaders (building-masked, the capex lens): Inside the terminal footprints (building-masked basis: 5G-reporting tiles inside the OSM terminal polygon, healthy share of those, median), T-Mobile leads 5 of 5 ranked terminals (Terminal 1, Terminal 4, Terminal 5, Terminal 7, Terminal 8).

Section 4.1 prints the full list once with n, footprint share, healthy share, and median per carrier per terminal; every other section references it. Verizon is best-5G at 16 of 16 Terminal 1 gate points and healthy at 14 of 16 on the gate-area basis (counts, below the 30-gate floor; mean interior share 24%); the two bases describe different parts of Terminal 1 and are both reported.

Venue gate-area median: tie; all three carriers below the healthy line.

The three venue gate-area medians (Verizon -98.3 dBm, T-Mobile -99.3 dBm, AT&T -100.2 dBm) sit within 1.8 dB of each other; the adjacent margins are 1.0 and 0.8 dB and the smaller one (0.8 dB) is under the 1 dB noise floor (section 16), so the venue-level order is a tie. Healthy 5G gate points: Verizon 24 of 134 (18%), T-Mobile 33 of 134 (25%), AT&T 9 of 134 (7%); at risk: Verizon 110, T-Mobile 101, AT&T 113; critical: Verizon 0, T-Mobile 0, AT&T 12. Gate-area values are means of tiles within 80 m of a gate point; on average 28% of those tiles lie inside a terminal footprint and the rest straddle the apron (section 4.3).

Verizon: tied at the venue gate-area median; leads inside 0 of 5 terminal footprints (building-masked); best-5G at the most gate points in Terminal 1, Terminal 4 and Terminal 8 (gate-area counts).

Verizon's venue gate-area median is -98.3 dBm, healthy at 24 of 134 gate points (18%), with a 5G signal-to-interference-plus-noise ratio (SINR) median of +8.5 dB (45 of 134 healthy). It is best-5G at 54 of 110 decided gate points (24 more tied under the 1 dB floor, of 134 comparable) and best-LTE at 9 of 105 decided (29 more tied under the 1 dB floor) (LTE median -93.7 dBm, 78 of 134 healthy). It reports 5G on 59% of its on-airport tiles (panel-sensitive). Inside the footprints its healthy share of 5G-reporting tiles runs 30% to 49% (section 4.1). Its terminal-vs-periphery proxy is +3.0 dB (section 5.2).

T-Mobile: tied at the venue gate-area median; leads inside 5 of 5 terminal footprints (building-masked); best-5G at the most gate points in Terminal 5 and Terminal 7 (gate-area counts).

T-Mobile's venue gate-area median is -99.3 dBm, healthy at 33 of 134 gate points (25%), with a 5G signal-to-interference-plus-noise ratio (SINR) median of +10.6 dB (71 of 134 healthy). It is best-5G at 44 of 110 decided gate points (24 more tied under the 1 dB floor, of 134 comparable) and best-LTE at 5 of 105 decided (29 more tied under the 1 dB floor) (LTE median -97.3 dBm, 35 of 134 healthy). It reports 5G on 78% of its on-airport tiles (panel-sensitive). Inside the footprints its healthy share of 5G-reporting tiles runs 62% to 82% (section 4.1). Its terminal-vs-periphery proxy is +1.0 dB (section 5.2).

AT&T: tied at the venue gate-area median; leads inside 0 of 5 terminal footprints (building-masked); best-5G at the most gate points in no terminal (gate-area counts).

AT&T's venue gate-area median is -100.2 dBm, healthy at 9 of 134 gate points (7%), with a 5G signal-to-interference-plus-noise ratio (SINR) median of +8.0 dB (38 of 134 healthy). It is best-5G at 12 of 110

decided gate points (24 more tied under the 1 dB floor, of 134 comparable) and best-LTE at 91 of 105 decided (29 more tied under the 1 dB floor) (LTE median –90.8 dBm, 102 of 134 healthy). It reports 5G on 45% of its on-airport tiles (panel-sensitive). Inside the footprints its healthy share of 5G-reporting tiles runs 10% to 60% (section 4.1). Its terminal-vs-periphery proxy is +4.0 dB (section 5.2).

Which carrier is worst depends on the basis, and the report uses each basis for what it measures. On the gate-area basis, AT&T is the weakest carrier at 90 of 134 ranked gate points and holds all 12 critical gate points (Verizon 0, T-Mobile 0, AT&T 12). Inside the footprints on the panel-sensitive present-and-healthy share, Verizon is the weakest carrier in 3 of 5 terminals; on the building-masked conditional share the weakest carrier is AT&T in T1, Verizon in T4, Verizon in T5, Verizon in T7, AT&T in T8. The capex lens is the building-masked conditional view: it is the only lens in the export that reads the buildings rather than the apron, and it is the basis for sections 13 and 14.

How the order holds

The three venue gate-area medians (Verizon –98.3 dBm, T-Mobile –99.3 dBm, AT&T –100.2 dBm) sit within 1.8 dB of each other; the adjacent margins are 1.0 and 0.8 dB and the smaller one (0.8 dB) is under the 1 dB noise floor (section 16), so the venue-level order is a tie. Inside the footprints the margins are decisive where they clear the 5-point share floor: Terminal 1 T-Mobile by 13 points; Terminal 4 T-Mobile by 30 points; Terminal 5 T-Mobile by 10 points; Terminal 7 T-Mobile by 34 points; Terminal 8 T-Mobile by 42 points. Ties under the floor: none. The conditional leader and the present-and-healthy leader agree in every ranked terminal. The order reproduces from the tile export alone.

Why the concordance matters

On the gate-area basis, 75 of 134 gate points are weak for all three carriers, 52 for two, 7 for one, and 0 are healthy for all three. On the building-interior re-cut (a carrier is weak inside a footprint when its healthy share of 5G-reporting tiles is below 50%), the count of weak carriers is T1 2 of 3, T4 2 of 3, T5 1 of 3, T7 2 of 3, T8 2 of 3, and no footprint is weak for all three. The gate-area figure describes the apron-straddling tile sets; the interior re-cut describes the buildings. Section 4.3 gives both.

How to read the order

Every ranking in this report is signal-layer: RSRP and SINR from an Android crowdsource panel. The export contains no throughput or latency, so it measures where signal is. It does not measure whether a call or app fails, and a strong-signal network can still be congested. Gate-area values are tiles within 80 m of a gate point: on average 28% of those tiles lie inside a terminal footprint (by terminal: T1 24%, T4 22%, T5 33%, T7 41%, T8 30%) and the rest are apron and stand. The building-masked view (section 4.1) is the only lens that reads the buildings; nothing in this report is measured indoors and there is no Z-axis.

2. Venue snapshot and asset inventory

Element	Value	Notes
Airport / IATA / ICAO	John F. Kennedy International Airport / JFK / KJFK	62.6 million passengers in 2025, a 1.0 percent decrease from its 2024 record of 63.3 million (Port Authority of New York and New Jersey press release, facility volumes for December and full-year 2025; cited source)
Operating authority	Port Authority of New York and New Jersey	Neutral-host DAS and Wi-Fi provider: Boingo Wireless (Tier B, held press release + KG record). Named contacts in the graph: Beth Rooney (Director, Port); Jacqueline McCarthy (Director, Aviation Redevelopment); Michael Wojnar (Special Counselor to the Executive Director); Sarah McKeon (Director, Aviation) (KG record, cited source)
Terminals analyzed	5	T1 (Air France, Korean Air, Lufthansa, SWISS, Turkish Airlines) · T4 (Delta Air Lines) · T5 (JetBlue Airways) · T7 (Air Canada, Aer Lingus, ANA, Icelandair, Frontier, Norse Atlantic) · T8 (American Airlines). Tier B. Terminal 2 has been demolished and has no footprint in

		OpenStreetMap; New Terminal One (NTO) is not open in the measurement window; the first phase is now expected in early 2027 (cited source).
Gate points analyzed	134	137 OpenStreetMap gate nodes pinned 2026-09-15; same-ref nodes within 30 m merged (T4 A6 from 3 nodes; T4 A7 from 2 nodes) · T1: 16 · T4: 47 · T5: 29 · T7: 10 · T8: 32; one gate carries no ref
Mapped venue points	414	128 food · 91 transport_admin · 89 retail · 61 services · 23 other · 16 lounge · 5 admin · 1 lodging. Terminal attribution: T1 55, T4 85, T5 59, T7 19, T8 58, outside terminals 138. Google Places (New) + OpenStreetMap, 345 + 70 points, pinned 2026-09-15 (Tier B); 1 pseudo-point dropped, 1 flagged (section 16)
Carriers measured	3	Verizon · T-Mobile · AT&T (95,364 carrier-tile records over 50,923 unique tiles; 50,663 All Networks usage tiles)
In-building cellular	Boingo Wireless neutral-host DAS and Wi-Fi (provider of record, Tier B)	Boingo Wireless is the Port Authority's neutral-host DAS and Wi-Fi provider at JFK (Boingo press release, October 14, 2025, held; PANYNJ board authorization, June 26, 2025, KG record; Airport DAS Master, July 2026, KG record); the agreement was authorized on June 26, 2025 under the 2024 RFP, announced on October 14, 2025 as a long-term agreement to deliver next-generation cellular and free public Wi-Fi across Port Authority properties including JFK, runs 2026 to 2038, and replaces the 1999 New York Telecom Partners agreement under which Boingo already operated at JFK; Boingo also provides Passpoint Wi-Fi at JFK. DAS: yes · self-owned: no · neutral host: yes · operator Boingo · equipment OEM unknown (Airport DAS Master, reconciled July 28, 2026) (KG record). Open item: Boingo's per-terminal coverage map (section 8, recommendation 1)
Construction program	New Terminal One and Terminal 6	New Terminal One: \$9.5 billion, 23 gates, on the Terminal 1 site and the former Terminals 2 and 3 site; not open in the measurement window; the first phase is now expected in early 2027 (The Points Guy, September 15, 2026; portauthoritybuilds.com JFK Terminal 1 page). Terminal 6: \$4.2 billion, 10 gates, first gates expected in late 2026, replacing the former Terminal 6 and eventually Terminal 7 (truenorthvip.com JFK 2026 construction guide; Simple Flying). Program total about \$19 billion (truenorthvip.com). All cited source
Knowledge-graph coverage	Record held (pinned 2026-09-16)	large hub; 30,792,806 calendar-year enplanements (year as recorded in the graph); Boingo neutral-host DAS and Passpoint rows; four leadership rows; the contracts query and the artifact search failed at the pull; per-terminal DAS scope and carrier participation are not in the graph (KG record, cited source)
Export extent	Aerodrome east strip unexported	the export rectangle stops at longitude -73.7618, so the aerodrome's eastern

strip (the runway 4L/22R end and the east cargo area) carries no tiles; no terminal sits in that strip



PHOTO. Terminal 8 exterior with the American Airlines and British Airways signage, June 2024. Illustrative; the photograph is not a measurement. · Photo: 颐园居, CC BY 4.0 (2024-06-02), via Wikimedia Commons

How to read the measurement

Every cellular number in this report is an aggregate of crowdsourced background scans from consumer Android devices (about 3% of handsets; iOS devices are not sampled), binned by Ookla to map tiles of about 8 m by 11 m, then joined to gate and tenant points. The numbers describe where devices were over a 12-month window. They are not drive-test measurements. Every n counts tiles, and every table carries its n so thin cells are visible.

JFK venue map: aerodrome, OSM buildings, 134 gate points, 95,364 carrier-tile records over 50,923 unique tiles

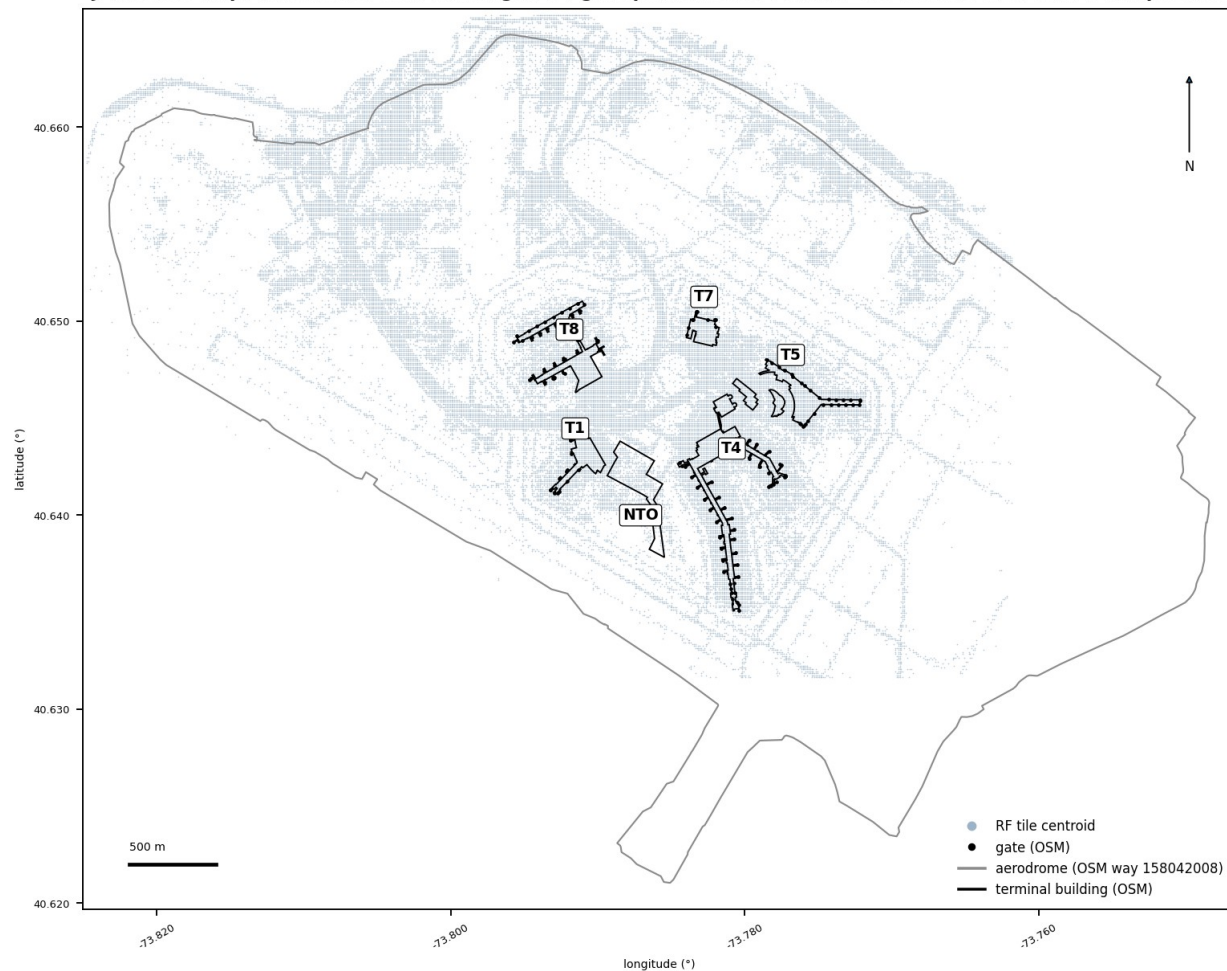


FIG. 1. Venue map: aerodrome outline, OSM terminal buildings, 134 gate points, and the 50,923 unique on-airport RF tile centroids (95,364 carrier-tile records). NTO is New Terminal One, under construction. North up; scale bar in meters. The east strip beyond the export rectangle carries no tiles. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

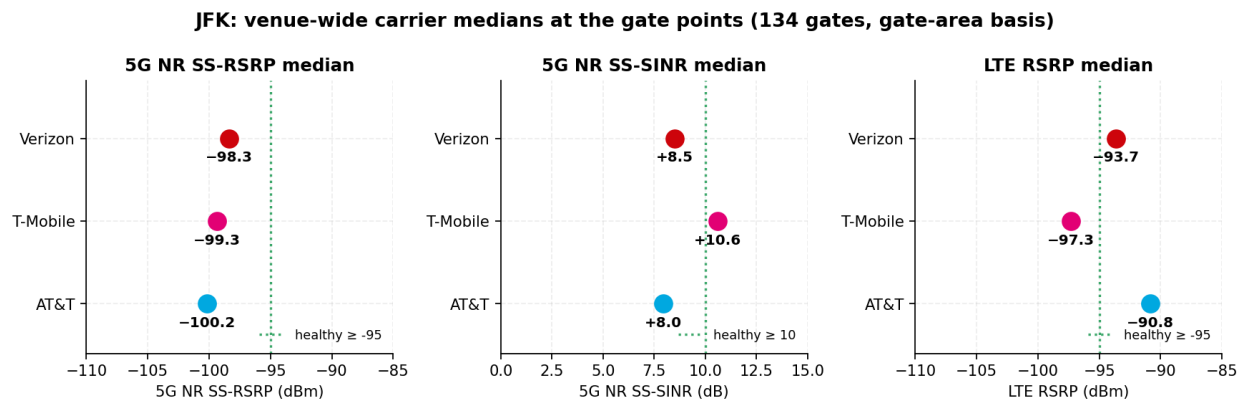


FIG. 2. Venue medians across 134 gate points on a -110 to -85 dBm axis (SINR on 0 to 15 dB), against the locked threshold ladder (section 16). · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

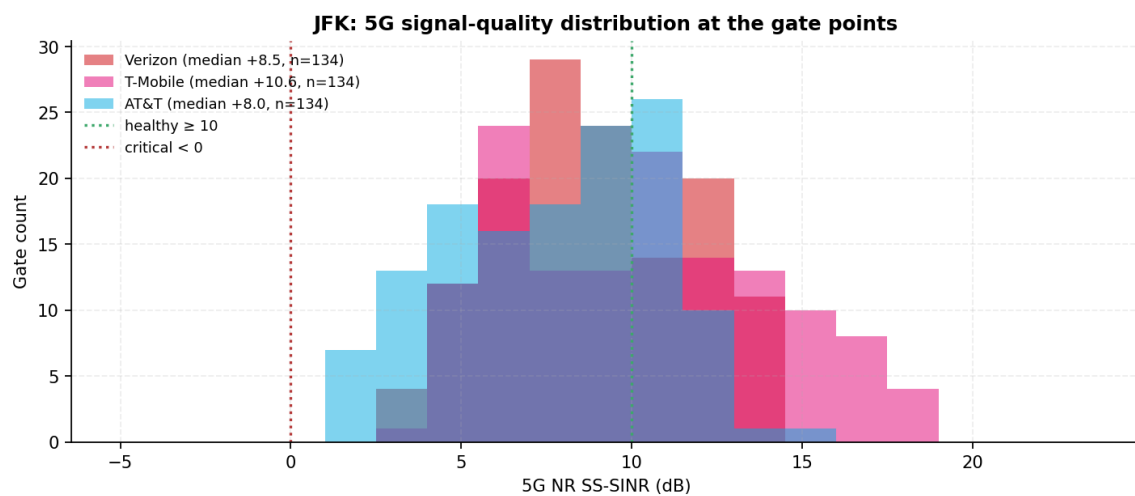


FIG. 3. SINR distribution per carrier at the gate points. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

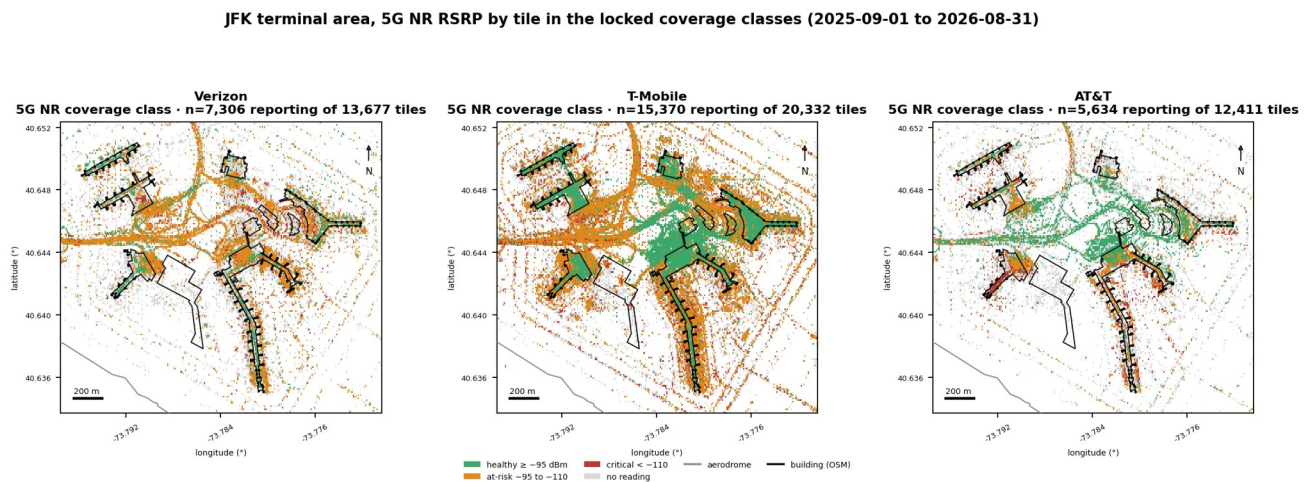


FIG. 4. Terminal-area map of 5G NR RSRP by tile and carrier, colored by the locked coverage class. Grey tiles carry no 5G reading. Each tile is about 8 m by 11 m; n is the tile count per panel. Gate labels are off for legibility; Appendix C names every gate. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

3.1 Verizon results

Verizon's venue gate-area median is -98.3 dBm (first of three in presentation order; a tie under the noise floor), healthy at 24 of 134 gate points (18%), at risk at 110, critical at 0. SINR is +8.5 dB at the median (45 of 134 healthy). It is best-5G at 54 of 110 decided gate points (24 more tied under the 1 dB floor) and best-LTE at 9 of 105 decided; its LTE median is -93.7 dBm (78 of 134 healthy). It reports 5G on 59% of its on-airport tiles (17,066 of 28,746; panel-sensitive).

Inside the footprints (building-masked, section 4.1), Verizon's healthy share of 5G-reporting tiles is T1 49% (n=192 reporting of 306 inside, footprint 63%), T4 36% (n=558 reporting of 880 inside, footprint 63%), T5 34% (n=385 reporting of 610 inside, footprint 63%), T7 30% (n=92 reporting of 198 inside, footprint 46%), T8 40% (n=311 reporting of 505 inside, footprint 62%). It leads inside 0 of 5 footprints on that basis (no terminal). On the gate-area basis it is best-5G at the most gate points in Terminal 1, Terminal 4 and Terminal 8 (counts: T1 16 of 16, T4 24 of 47 with 8 tied, T5 0 of 29 with 9 tied, T7 0 of 10 with 2 tied, T8 14 of 32 with 5 tied), and its gate-area medians by terminal are T1 -93.3 dBm (14 of 16 healthy), T4 -100.6 dBm (0 of 47 healthy), T5 -97.7 dBm (0 of 29 healthy), T7 -98.7 dBm (0 of 10 healthy), T8 -96.7 dBm (10 of 32 healthy). Its terminal-vs-periphery proxy is +3.0 dB (section 5.2); a periphery-stronger reading is consistent with macro spillover, and the export cannot resolve it without carrier attestation (recommendation 2).

Verizon framed finding

Tied at the venue gate-area median; leads inside 0 of 5 ranked footprints; 5G footprint 59% (panel-sensitive). The section 14 criteria hold it to a healthy share of 5G-reporting tiles at or above 90% inside every footprint.

3.2 T-Mobile results

T-Mobile's venue gate-area median is -99.3 dBm (second of three in presentation order; a tie under the noise floor), healthy at 33 of 134 gate points (25%), at risk at 101, critical at 0. SINR is +10.6 dB at the median (71 of 134 healthy). It is best-5G at 44 of 110 decided gate points (24 more tied under the 1 dB floor) and best-LTE at 5 of 105 decided; its LTE median is -97.3 dBm (35 of 134 healthy). It reports 5G on 78% of its on-airport tiles (33,821 of 43,109; panel-sensitive).

Inside the footprints (building-masked, section 4.1), T-Mobile's healthy share of 5G-reporting tiles is T1 62% (n=330 reporting of 338 inside, footprint 98%), T4 69% (n=885 reporting of 926 inside, footprint 96%), T5 70% (n=618 reporting of 647 inside, footprint 96%), T7 77% (n=200 reporting of 214 inside, footprint 93%), T8 82% (n=521 reporting of 555 inside, footprint 94%). It leads inside 5 of 5 footprints on that basis (Terminal 1, Terminal 4, Terminal 5, Terminal 7 and Terminal 8). On the gate-area basis it is best-5G at the most gate points in Terminal 5 and Terminal 7 (counts: T1 0 of 16, T4 6 of 47 with 8 tied, T5 18 of 29 with 9 tied, T7 7 of 10 with 2 tied, T8 13 of 32 with 5 tied), and its gate-area medians by terminal are T1 -102.3 dBm (0 of 16 healthy), T4 -102.0 dBm (2 of 47 healthy), T5 -95.2 dBm (13 of 29 healthy), T7 -95.0 dBm (5 of 10 healthy), T8 -97.0 dBm (13 of 32 healthy). Its terminal-vs-periphery proxy is +1.0 dB (section 5.2); a flat reading is ambiguous between close-in macro coverage and an in-building source, and the export cannot resolve it without carrier attestation (recommendation 2).



PHOTO. JetBlue aircraft at a JFK gate, August 2023. Illustrative; the photograph is not a measurement. · Photo: Tim, CC0 (2023-08-08), via Wikimedia Commons

T-Mobile framed finding

Tied at the venue gate-area median; leads inside 5 of 5 ranked footprints; 5G footprint 78% (panel-sensitive). Its LTE layer is the weakest of the three. The section 14 criteria hold it to a healthy share of 5G-reporting tiles at or above 90% inside every footprint.

3.3 AT&T results

AT&T's venue gate-area median is -100.2 dBm (third of three in presentation order; a tie under the noise floor), healthy at 9 of 134 gate points (7%), at risk at 113, critical at 12. SINR is $+8.0$ dB at the median (38 of 134 healthy). It is best-5G at 12 of 110 decided gate points (24 more tied under the 1 dB floor) and best-LTE at 91 of 105 decided; its LTE median is -90.8 dBm (102 of 134 healthy). It reports 5G on 45% of its on-airport tiles (10,650 of 23,509; panel-sensitive).

Inside the footprints (building-masked, section 4.1), AT&T's healthy share of 5G-reporting tiles is T1 10% (n=226 reporting of 321 inside, footprint 70%), T4 39% (n=530 reporting of 790 inside, footprint 67%), T5 60% (n=334 reporting of 530 inside, footprint 63%), T7 43% (n=75 reporting of 191 inside, footprint 39%), T8 35% (n=311 reporting of 517 inside, footprint 60%). It leads inside 0 of 5 footprints on that basis (no terminal). On the gate-area basis it is best-5G at the most gate points in no terminal (counts: T1 0 of 16, T4 9 of 47 with 8 tied, T5 2 of 29 with 9 tied, T7 1 of 10 with 2 tied, T8 0 of 32 with 5 tied), and its gate-area medians by terminal are T1 -113.0 dBm (0 of 16 healthy), T4 -105.5 dBm (4 of 47 healthy), T5 -97.4 dBm (4 of 29 healthy), T7 -99.6 dBm (1 of 10 healthy), T8 -99.1 dBm (0 of 32 healthy). Its terminal-vs-periphery proxy is $+4.0$ dB (section 5.2); a periphery-stronger reading is

consistent with macro spillover, and the export cannot resolve it without carrier attestation (recommendation 2).

AT&T framed finding

Tied at the venue gate-area median; leads inside 0 of 5 ranked footprints; 5G footprint 45% (panel-sensitive). Its LTE layer is the venue LTE network of record. The section 14 criteria hold it to a healthy share of 5G-reporting tiles at or above 90% inside every footprint.

AT&T's two layers diverge more than the other carriers'. Its LTE median at the gate points is -90.8 dBm (102 of 134 healthy) against a 5G median of -100.2 dBm, and 53% of its on-airport tiles carry only an LTE reading. Inside the footprints its 5G footprint share is T1 70%, T4 67%, T5 63%, T7 39%, T8 60% against T-Mobile's 98%, 96%, 96%, 93%, 94%, so where AT&T reports 5G it is a smaller, strong-signal subset; its healthy share of reporting tiles is 10% to 60%. Its weakest footprint is Terminal 1 (10% healthy of $n=226$ reporting tiles, median -109.0 dBm), a building that the New Terminal One program replaces (cited source).

3.4 5G footprint and coverage-band attachment

JFK: 5G NR footprint share per carrier (panel-sensitive: a no-reading tile may be a panel gap)

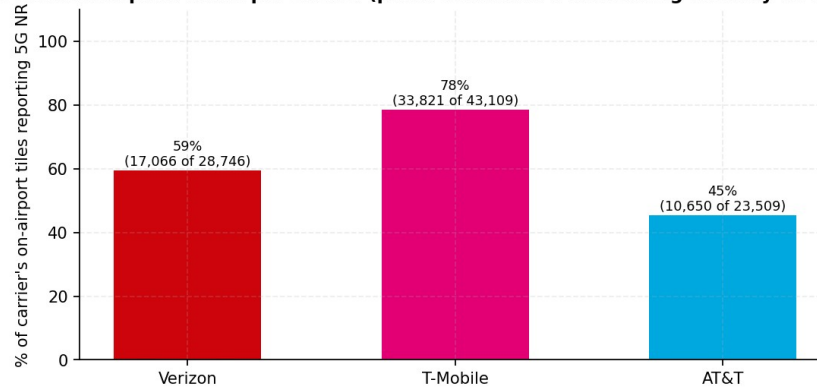


FIG. 5. Share of each carrier's on-airport tiles that report a 5G NR reading (metric 14, 5G footprint). Panel-sensitive: a no-reading tile may be a panel gap on that carrier. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

JFK: sub-1 GHz LTE reliance per carrier (higher = more coverage-band dependence)

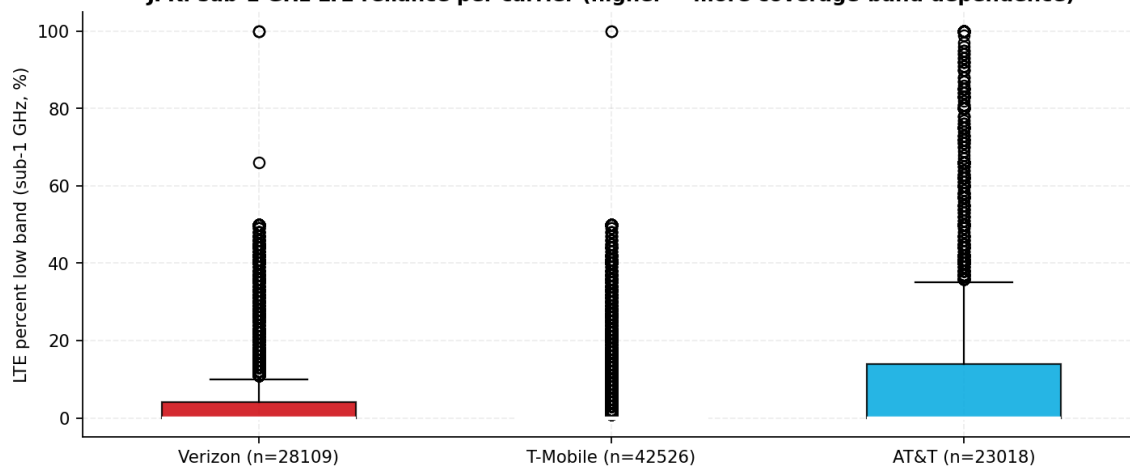


FIG. 6. LTE percent-low-band distribution per carrier. Higher means more attachment to sub-1 GHz coverage bands. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

The percent-low-band statistic describes LTE coverage-band attachment. A tile that attaches to sub-1 GHz spectrum is using a coverage-grade band, which propagation, carrier idle-mode priorities, and site geometry all drive. Verizon mean 6.5%, median 0% (tiles above zero: 27% of n=28,109) · T-Mobile mean 3.2%, median 0% (tiles above zero: 22% of n=42,526) · AT&T mean 15.4%, median 0% (tiles above zero: 40% of n=23,018).

The LTE metric does not see 5G low band. On the 5G side: Verizon: NR850 on 759 tiles, 13.8% of its 5,506 band-reporting NR tiles. T-Mobile: NR600 on 4,273 tiles, 15.5% of its 27,561 band-reporting NR tiles. AT&T: NR850 on 95 tiles, 23.2% of its 409 band-reporting NR tiles. T-Mobile has the widest 5G footprint (78%).

JFK terminal area, LTE RSRP by tile in the locked coverage classes (2025-09-01 to 2026-08-31)

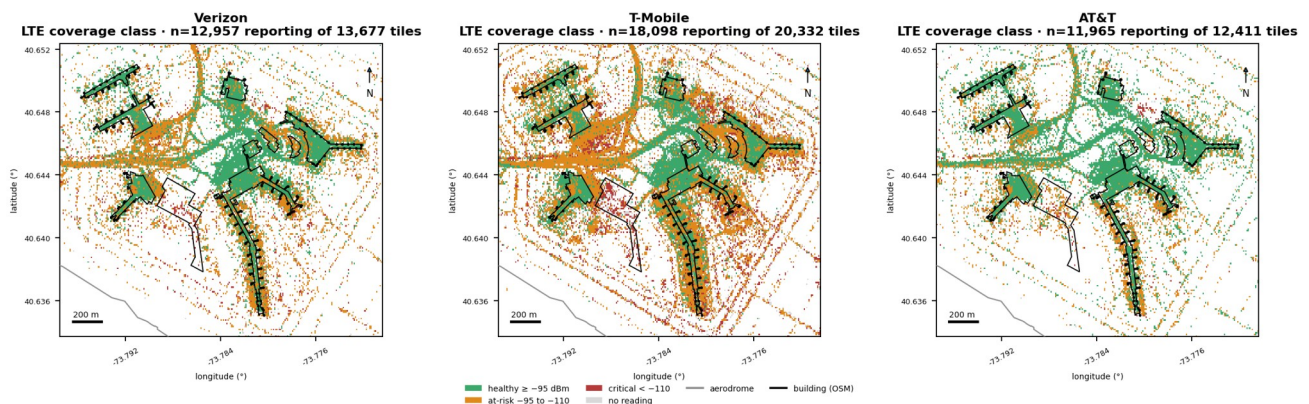


FIG. 7. Terminal-area map of LTE RSRP by tile and carrier, colored by the locked coverage class. Grey tiles carry no LTE reading. Same extent and tile geometry as FIG 4; gate labels are off for legibility. This is the LTE layer that carries AT&T's traffic where its 5G footprint is thin. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

3.5 RSRQ, channel quality (CQI), and optimization priority

JFK: reference signal received quality (RSRQ) distribution

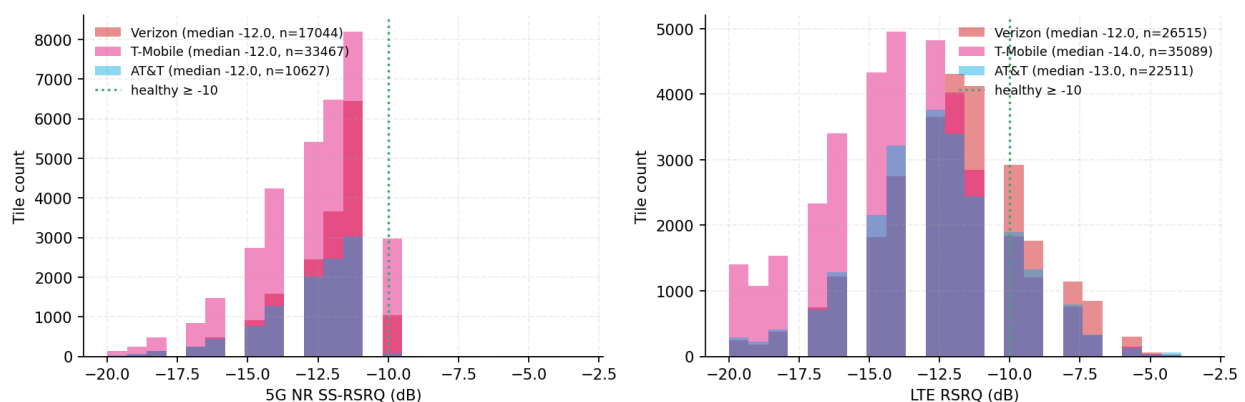


FIG. 8. 5G NR and LTE reference signal received quality (RSRQ) distributions per carrier. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

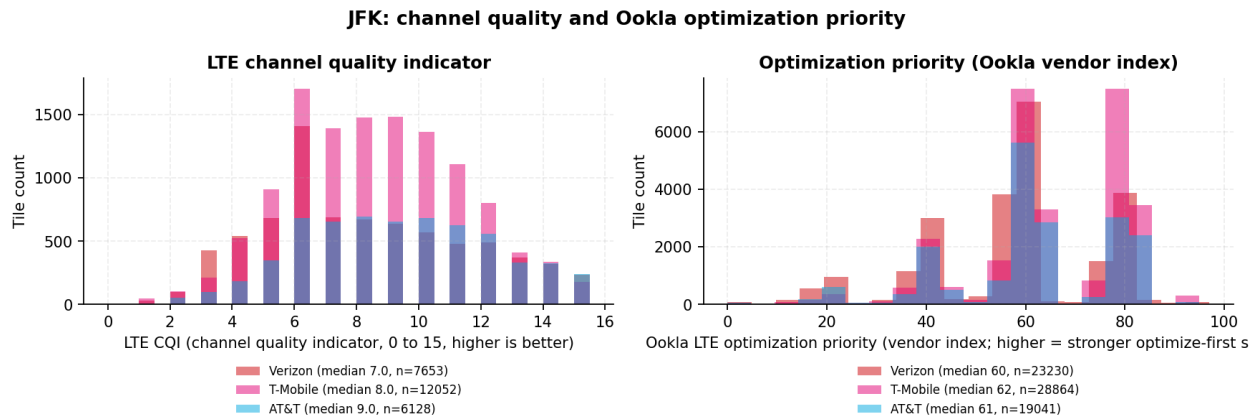


FIG. 9. LTE channel quality indicator (CQI, 0 to 15, the handset's report of achievable modulation) distribution and Ookla's LTE optimization priority index, the vendor's own index for tiles where signal is strong but quality is poor. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

RSRQ medians: Verizon NR -12.0 / LTE -12.0 dB; T-Mobile NR -12.0 / LTE -14.0 dB; AT&T NR -12.0 / LTE -13.0 dB. RSRQ degrades as subframe utilization rises, so a weak RSRQ on a strong-RSRP network is consistent with a loaded serving layer. This is an inference; the export carries no load field (section 16).

CQI medians: Verizon median 7.0 (n=7,653); T-Mobile median 8.0 (n=12,052); AT&T median 9.0 (n=6,128). CQI is the closest throughput proxy in an export that carries no throughput fields.

Optimization priority medians: Verizon median 60 (n=23,230); T-Mobile median 62 (n=28,864); AT&T median 61 (n=19,041).

3.6 Serving-cell volatility (handover-churn proxy)

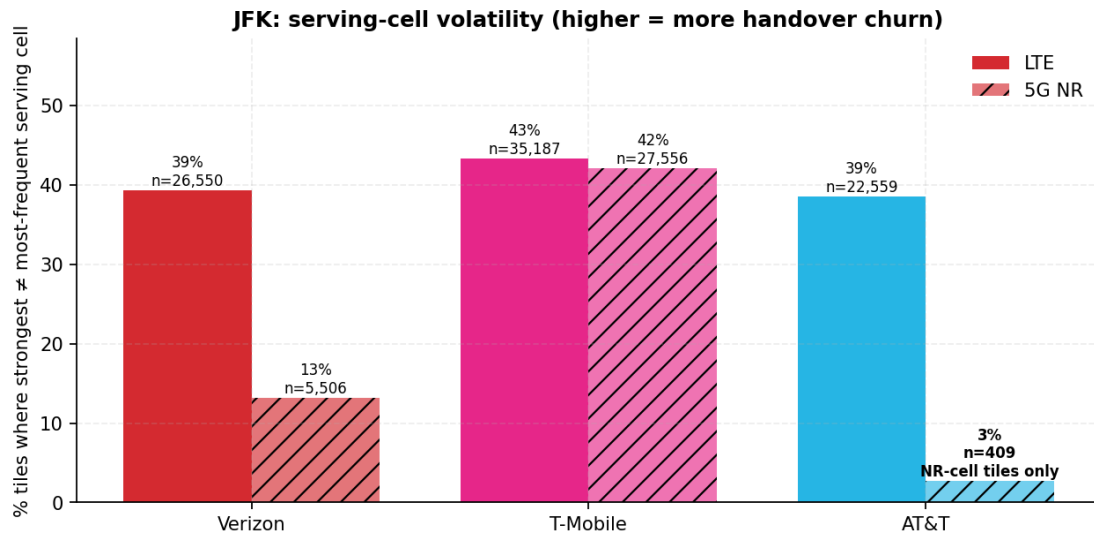


FIG. 10. Share of tiles where the strongest observed cell differs from the most-frequent serving cell, with the tile n on each bar. Proxy for handover instability and dominance conflict. AT&T's 5G bar rests on the tiles where an NR serving cell was resolved. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

Where the strongest cell at a tile is not the most-frequent serving cell, the network is handing over between competing cells. Measured churn: Verizon LTE 39% (n=26,550) / 5G 13% (n=5,506); T-Mobile LTE 43% (n=35,187) / 5G 42% (n=27,556); AT&T LTE 39% (n=22,559) / 5G 3% (n=409). Cell, PCI, and

band fields populate only where Ookla resolved a serving cell, which is why AT&T's 5G n is 409 here against 10,650 for RSRP (field population table, section 16). Inference: an NR serving cell that resolves on 4% of AT&T's 5G tiles is consistent with non-standalone (NSA) anchoring, where the handset reports the LTE anchor as its serving cell; it would also fit AT&T's 53% LTE-only share. The export cannot confirm it. AT&T's 5G volatility and PCI diversity therefore describe a 409-tile subset and are not comparable with the other carriers' bars. A neutral-host DAS operated by Boingo serves JFK (section 8); the export cannot tell DAS sectors from macro sectors, so churn is read as a proxy for dominance conflict regardless of source.

4. The view by terminal

Two bases. Building-masked: tiles whose centroid lies inside the pinned OpenStreetMap terminal polygon; the healthy share of 5G-reporting tiles inside it decides the terminal leader (n ≥ 30 reporting tiles per carrier; margins under 5 points are ties; the carrier's 5G footprint share inside the polygon is printed beside it). Gate-area: the mean of tiles within 80 m of each gate point, which straddles the apron (terminal gate counts T1 16, T4 47, T5 29, T7 10, T8 32; mean interior share T1 24%, T4 22%, T5 33%, T7 41%, T8 30%). Gate-area tallies are counts with n visible and are never rankings. New Terminal One holds no gates and no tenant points in the window and appears only as a count-only footprint.

4.1 Terminal leaders on the building-masked basis

Terminal	Verizon: 5G-reporting tiles inside the polygon (n) · footprint share · healthy % of those · median	T-Mobile: 5G-reporting tiles inside the polygon (n) · footprint share · healthy % of those · median	AT&T: 5G-reporting tiles inside the polygon (n) · footprint share · healthy % of those · median	Leader (margin)
Terminal 1	192 of 306 inside (fp 63%) · 49% healthy · -96.0 dBm	330 of 338 inside (fp 98%) · 62% healthy · -91.0 dBm	226 of 321 inside (fp 70%) · 10% healthy · -109.0 dBm	T-Mobile (+13 pts)
New Terminal One (under construction)	23 reporting of 133 inside (count only, below n=30)	131 of 333 inside (fp 39%) · 8% healthy · -108.0 dBm	10 reporting of 199 inside (count only, below n=30)	count only
Terminal 4	558 of 880 inside (fp 63%) · 36% healthy · -99.0 dBm	885 of 926 inside (fp 96%) · 69% healthy · -91.0 dBm	530 of 790 inside (fp 67%) · 39% healthy · -98.0 dBm	T-Mobile (+30 pts)
Terminal 5	385 of 610 inside (fp 63%) · 34% healthy · -101.0 dBm	618 of 647 inside (fp 96%) · 70% healthy · -90.0 dBm	334 of 530 inside (fp 63%) · 60% healthy · -94.0 dBm	T-Mobile (+10 pts)
Terminal 7	92 of 198 inside (fp 46%) · 30% healthy · -98.5 dBm	200 of 214 inside (fp 93%) · 77% healthy · -89.0 dBm	75 of 191 inside (fp 39%) · 43% healthy · -97.0 dBm	T-Mobile (+34 pts)
Terminal 8	311 of 505 inside (fp 62%) · 40% healthy · -99.0 dBm	521 of 555 inside (fp 94%) · 82% healthy · -87.0 dBm	311 of 517 inside (fp 60%) · 35% healthy · -100.0 dBm	T-Mobile (+42 pts)

Leader list (printed once; referenced everywhere else). Decisive: Terminal 1 T-Mobile by 13 points; Terminal 4 T-Mobile by 30 points; Terminal 5 T-Mobile by 10 points; Terminal 7 T-Mobile by 34 points; Terminal 8 T-Mobile by 42 points. Ties: none. Count-only footprints: New Terminal One (under construction). Cross-check: the leader on the panel-sensitive present-and-healthy share of all tiles inside the polygon agrees with the conditional leader in every ranked terminal. Conditional-median leader by terminal: T1 T-Mobile, T4 T-Mobile, T5 T-Mobile, T7 T-Mobile, T8 T-Mobile. Tally of decisive leads: T-Mobile 5.

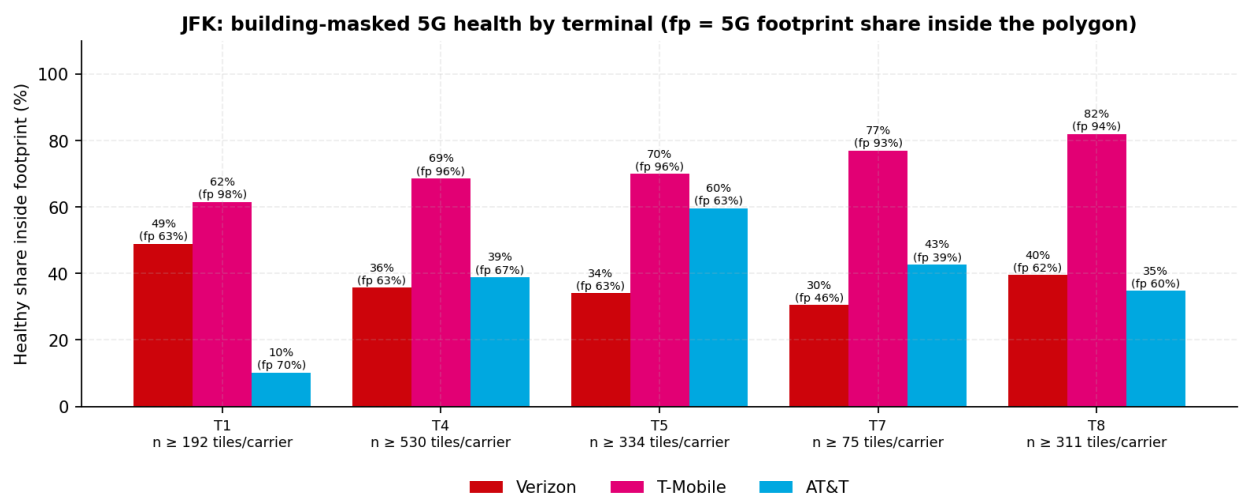


FIG. 11. Building-masked healthy share of 5G-reporting tiles per terminal and carrier, with each carrier's 5G footprint share inside the polygon (fp). The terminal-leader basis. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

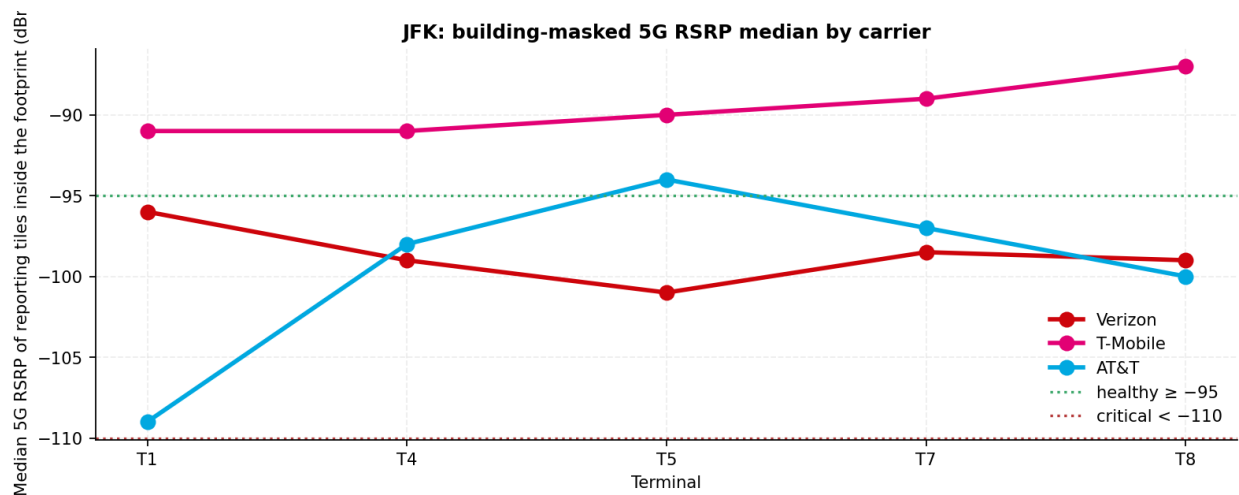


FIG. 12. Building-masked median 5G RSRP of reporting tiles per terminal and carrier. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

4.2 Coverage class and PCI diversity

JFK: coverage-class distribution by terminal and carrier (V=Verizon, T=T-Mobile, A=AT&T; gate-and-concession pool, conditional)

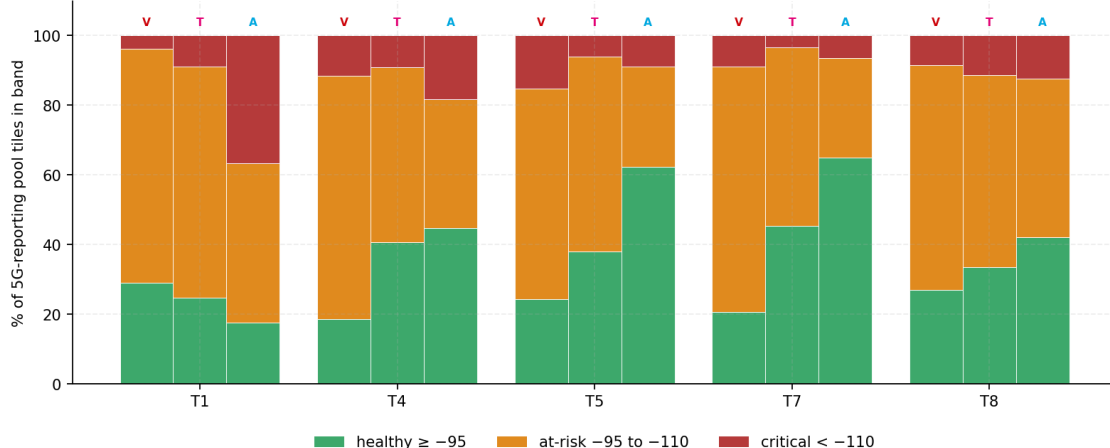


FIG. 13. Coverage-class distribution by terminal and carrier over 5G-reporting tiles in the 80 m gate-and-concession pool (V=Verizon, T=T-Mobile, A=AT&T). Conditional on a reading; not the leader basis. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

Critical-band gate points (below -110 dBm) by carrier: Verizon 0, T-Mobile 0, AT&T 12 of 134 (counts). On the pool basis, the critical share peaks for Verizon in Terminal 5 at 15% of reporting tiles (n=1,057); T-Mobile in Terminal 8 at 11% of reporting tiles (n=2,039); AT&T in Terminal 1 at 37% of reporting tiles (n=457).

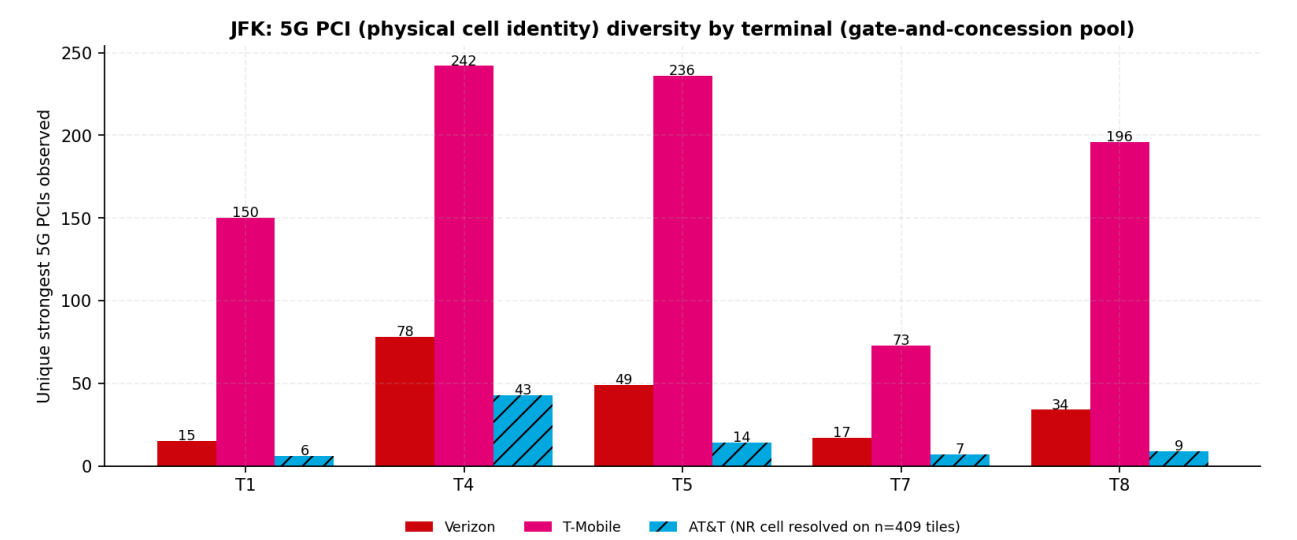


FIG. 14. Unique strongest-serving physical cell identities (PCIs, the cell's over-the-air identifier) per terminal per carrier on the 80 m pool. Reads in both directions; always pair with SINR. Hatched bars rest on the tiles where an NR serving cell was resolved (n on the legend). · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

The PCI picture in each terminal reflects which sectors reach it, macro or hosted. Higher diversity with healthy SINR means several sectors serve the terminal cleanly. Higher diversity with poor SINR means they compete. Terminal 4, the largest footprint, shows the most PCIs for every carrier. AT&T's bars are a 409-tile subset (section 3.6).

4.3 Cross-carrier concordance and the apron caveat

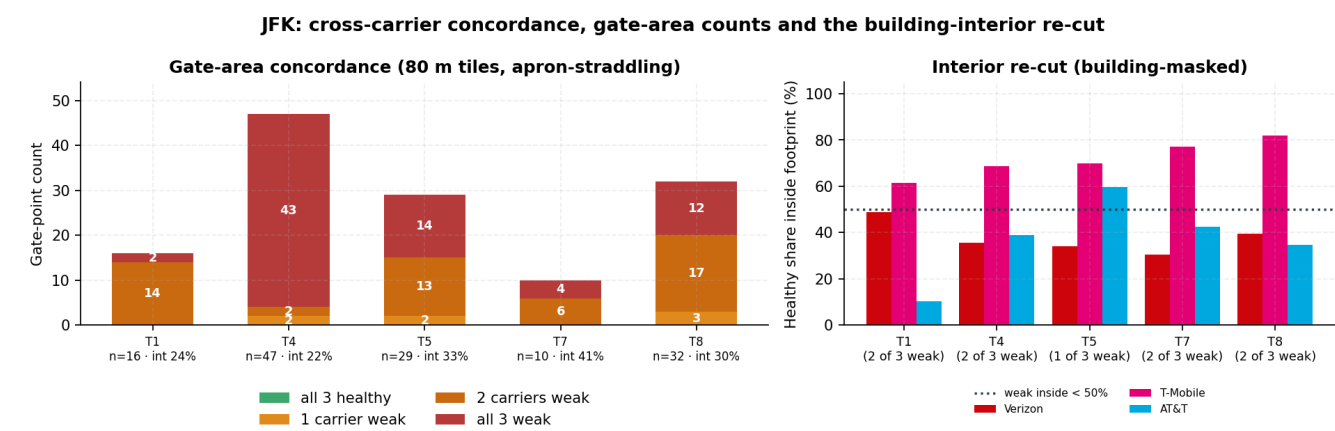


FIG. 15. Left: per terminal, how many of the three carriers are below the healthy line at each gate point (gate-area counts; mean interior share on the axis). Right: the building-interior re-cut, healthy share of 5G-reporting tiles inside each footprint per carrier against the interior weak line. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

Apron caveat first. Each gate point's value is the mean of tiles within 80 m; the share of those tiles whose centroid lies inside a terminal polygon (the interior share) averages T1 24% (median 28%), T4 22% (median 23%), T5 33% (median 30%), T7 41% (median 42%), T8 30% (median 31%). 7 of 134 gate points have an interior share at or above 50% (T1 0, T4 0, T5 4, T7 2, T8 1). Gate-area readings therefore describe the pier edge and the stand more than the concourse.

Gate-area concordance: 0 gate points healthy for all three carriers, 7 weak for one, 52 weak for two, 75 weak for all three (of 134). Where one carrier is weak it is Verizon at 4, AT&T at 3 of 7. By terminal, all-weak gate points: T1 2 of 16, T4 43 of 47, T5 14 of 29, T7 4 of 10, T8 12 of 32.

Interior re-cut (building-masked; a carrier is weak inside a footprint when its healthy share of 5G-reporting tiles is below 50%): Terminal 1 2 of 3 weak (Verizon, AT&T); Terminal 4 2 of 3 weak (Verizon, AT&T); Terminal 5 1 of 3 weak (Verizon); Terminal 7 2 of 3 weak (Verizon, AT&T); Terminal 8 2 of 3 weak (Verizon, AT&T). No footprint is weak for all three carriers on the interior re-cut, while 75 of 134 gate points are weak for all three on the gate-area basis. Read together: the apron-straddling tile sets are weak for everyone, and inside the buildings the weakness is carrier-specific. The sensitivity table in section 16 shows how the gate-area counts move with the healthy line.

4.4 Terminal 4

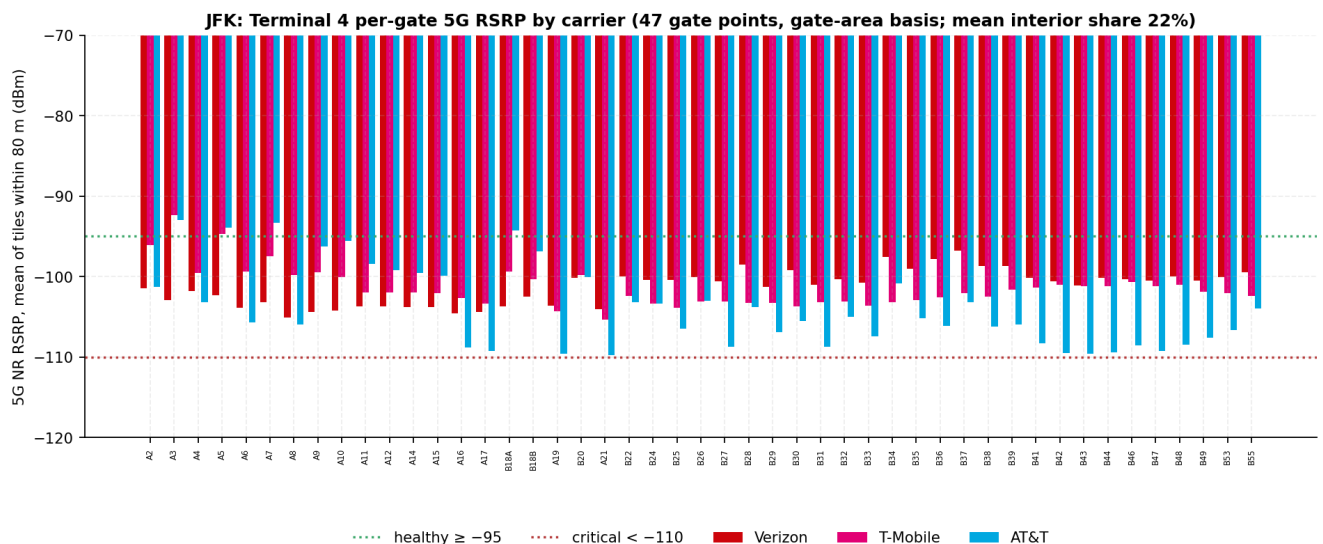


FIG. 16. Per-gate 5G RSRP across the 47 Terminal 4 gate points (gate-area basis; OpenStreetMap inventory after same-ref merge). Each bar is a mean over at least 30 tiles within 80 m of the gate point. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

Terminal 4 hosts Delta plus international carriers (Emirates, Virgin Atlantic, Etihad, KLM, Singapore, LATAM); operated by JFKIAT (Tier B) and holds 47 of the 134 gate points. Building-masked (section 4.1): T-Mobile leads by 30 points; healthy shares of reporting tiles Verizon 36% (n=558, footprint 63%), T-Mobile 69% (n=885, footprint 96%), AT&T 39% (n=530, footprint 67%); interior re-cut 2 of 3 carriers weak (Verizon, AT&T). Gate-area (counts; mean interior share 22%): medians Verizon -100.6 dBm (0 of 47 healthy), T-Mobile -102.0 dBm (2 of 47 healthy), AT&T -105.5 dBm (4 of 47 healthy); best-5G Verizon 24, AT&T 9, T-Mobile 6, 8 tied under the floor; all-weak 43 of 47.

4.5 Terminals 5 and 8

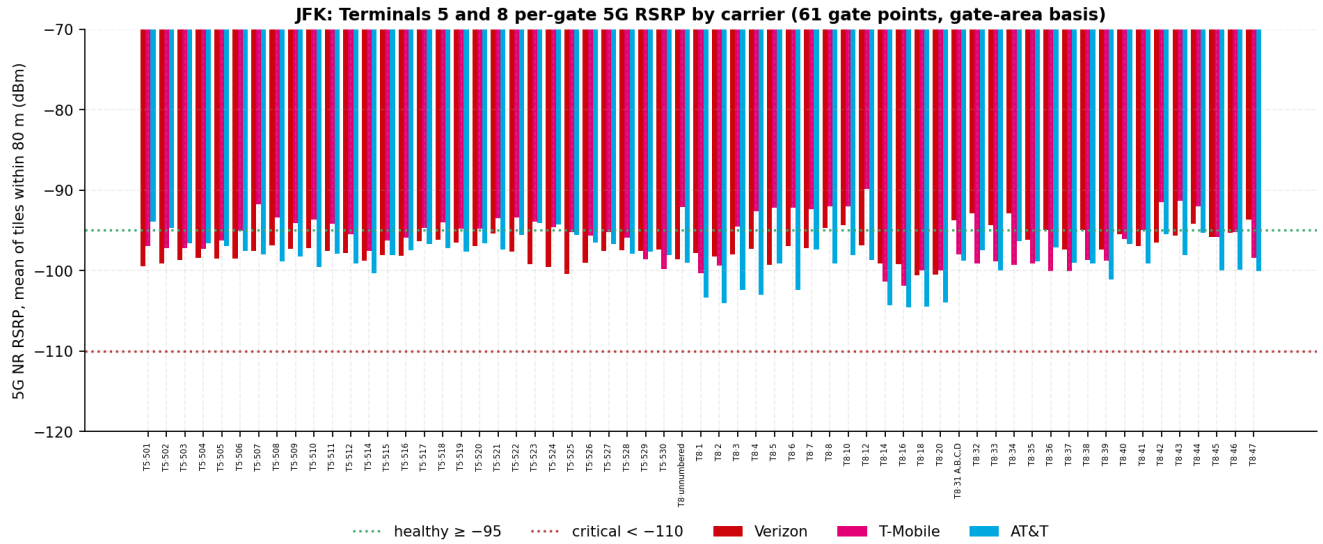


FIG. 17. Per-gate 5G RSRP across the 61 Terminal 5 and Terminal 8 gate points (gate-area basis). · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

Terminal 8 hosts American plus oneworld partners (British Airways, Finnair, Iberia, Japan Airlines, Qatar, Cathay Pacific) and Alaska Airlines (Tier B; Alaska Airlines moved from Terminal 7 to Terminal 8 in October 2025 (upgradedpoints.com), cited source) and holds 32 gate points. Building-masked (section 4.1): T-Mobile by 42 points; healthy shares Verizon 40% (n=311, footprint 62%), T-Mobile 82% (n=521, footprint 94%), AT&T 35% (n=311, footprint 60%); interior re-cut 2 of 3 weak. Gate-area (counts; mean interior share 30%): medians Verizon -96.7 (10 of 32 healthy), T-Mobile -97.0 (13 of 32 healthy), AT&T -99.1 (0 of 32 healthy) dBm; best-5G Verizon 14, T-Mobile 13, 5 tied under the floor.

Terminal 5 hosts JetBlue domestic and daytime international arrivals (Tier B) and holds 29 gate points. Building-masked (section 4.1): T-Mobile by 10 points; healthy shares Verizon 34% (n=385, footprint 63%), T-Mobile 70% (n=618, footprint 96%), AT&T 60% (n=334, footprint 63%); interior re-cut 1 of 3 weak. Gate-area (counts; mean interior share 33%): medians Verizon -97.7 (0 of 29 healthy), T-Mobile -95.2 (13 of 29 healthy), AT&T -97.4 (4 of 29 healthy) dBm; best-5G T-Mobile 18, AT&T 2, 9 tied under the floor.



PHOTO. Terminal 8 concourse interior. Illustrative; the photograph is not a measurement. · Photo: 颐园居, CC BY-SA 4.0 (2024-06-02), via Wikimedia Commons

4.6 Terminals 1 and 7 and the construction program



PHOTO. New Terminal One under construction beside the Terminal 1 site, 2025. Illustrative; the terminal is not open in the measurement window. · Photo: Charles from Port Chester, New York, CC0 (2025-08-02), via Wikimedia Commons



PHOTO. Terminal 7 departures entrance, 2025, a building scheduled for replacement by Terminal 6. Illustrative; the photograph is not a measurement. · Photo: Quintin Soloviev, CC BY 4.0 (2025-02-06), via Wikimedia Commons

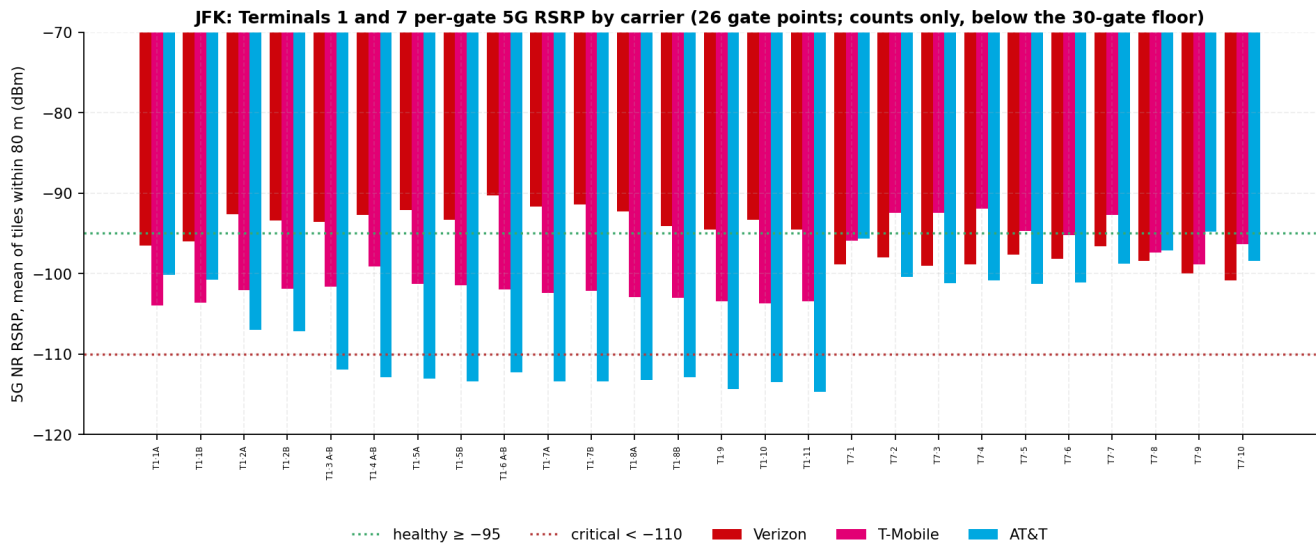


FIG. 18. Per-gate 5G RSRP across the 26 Terminal 1 and Terminal 7 gate points (gate-area basis; counts only, below the 30-gate floor). · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

Terminal 1 hosts legacy Terminal 1 international carriers (moving to New Terminal One or Terminal 6 after the window) (Tier B) and holds 16 gate points. Building-masked (section 4.1): T-Mobile by 13 points; healthy shares Verizon 49% (n=192, footprint 63%), T-Mobile 62% (n=330, footprint 98%), AT&T 10% (n=226, footprint 70%); interior re-cut 2 of 3 weak. Gate-area (counts, below the floor; mean

interior share 24%): best-5G Verizon 16; healthy Verizon 14 of 16, T-Mobile 0 of 16, AT&T 0 of 16; all-weak 2 of 16. Verizon is best-5G at 16 of 16 Terminal 1 gate points and healthy at 14 of 16 on the gate-area basis (counts, below the 30-gate floor; mean interior share 24%); the gate points sit on the piers and the footprint covers the headhouse, so the two bases describe different parts of the building.

Terminal 7 hosts carriers transitioning to Terminal 6 from late 2026; Alaska left for T8 in October 2025 (Tier B) and holds 10 gate points. Building-masked (section 4.1): T-Mobile by 34 points; healthy shares Verizon 30% (n=92, footprint 46%), T-Mobile 77% (n=200, footprint 93%), AT&T 43% (n=75, footprint 39%); interior re-cut 2 of 3 weak. Gate-area (counts, below the floor; mean interior share 41%): best-5G T-Mobile 7, AT&T 1, 2 tied under the floor; healthy Verizon 0 of 10, T-Mobile 5 of 10, AT&T 1 of 10; all-weak 4 of 10.

Both terminals are on the program's replacement list. New Terminal One (NTO; \$9.5 billion, 23 gates) rises on the Terminal 1 site and the former Terminals 2 and 3 site and is not open in the measurement window; the first phase is now expected in early 2027; Terminal 6 (\$4.2 billion, 10 gates) has its first gates expected in late 2026, replacing the former Terminal 6 and eventually Terminal 7. Terminal 2 has been demolished and has no footprint in OpenStreetMap. All cited source. In-building investment in Terminal 1 and Terminal 7 should therefore be scoped to their remaining service life, and the new buildings are where the section 14 criteria should be written into the design.

4.7 Building-masked map and the in-building signature

JFK building-masked view: 5G-reporting tiles inside the OSM terminal polygons, healthy share of those, median (2025-09-01 to 2026-08-31)

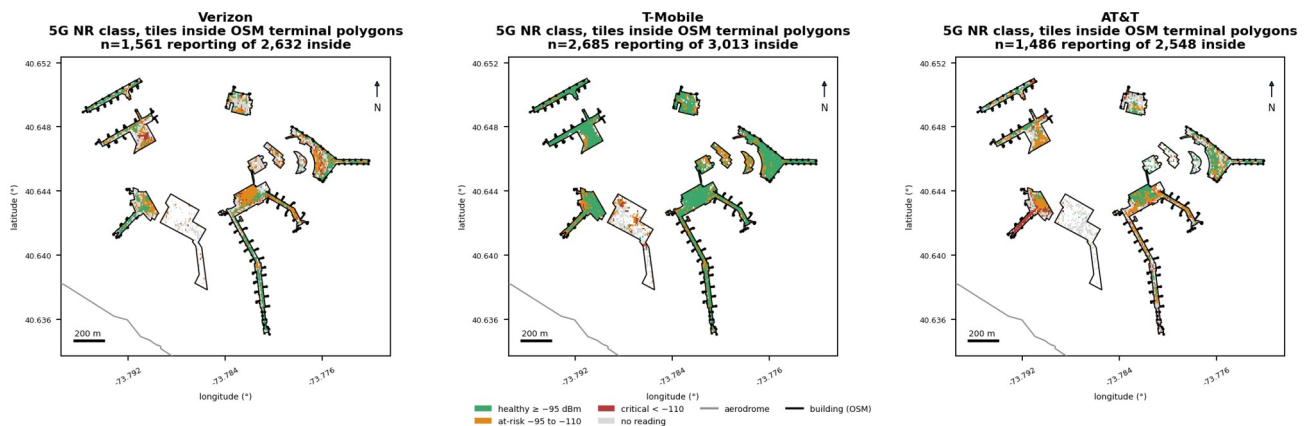


FIG. 19. 5G-reporting tiles whose centroid falls inside a pinned OSM terminal polygon (T1, NTO, T4, T5, T7, T8), colored by 5G NR class; the per-terminal table is section 4.1. This is our OSM building-polygon mask, not Ookla's Indoor layer. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

The mask is a point-in-polygon test of tile centroids against the pinned OpenStreetMap footprints, so it selects tiles over the buildings rather than tiles measured inside them (section 16). It is the only lens in this export that reads the buildings rather than the apron, which is why it decides the terminal leaders and the section 14 criteria.

The building-masked readings are the strongest in-building evidence in this export. T-Mobile's median inside each footprint sits +11 dB (T1), +11 dB (T4), +5 dB (T5), +6 dB (T7), +10 dB (T8) from its own gate-area median in the same terminal, and it holds the highest healthy share inside every ranked footprint (T1 62%, T4 69%, T5 70%, T7 77%, T8 82%). At the Terminal 1 gate points Verizon reads 4 to

22 dB ahead of AT&T with SINR +8.5 to +13.4 dB. Both patterns are consistent with a close-in or in-building source serving those carriers; this is an inference about the radio source, not a statement about which system carries which carrier. What the export does not show is any carrier lifting the gate-area 5G median above the healthy line at most gate points, which is a statement about the apron-straddling 80 m tile sets, not about the concourses.

5. Tenant level

The 414 mapped points come from a Google Places (New) capture supplemented by OpenStreetMap (Google Places (New) + OpenStreetMap, 345 + 70 points, pinned 2026-09-15; Tier B, points only). 137 points sit outside every terminal footprint and more than 400 m from any gate and carry no terminal label; 1 flagged point is excluded from terminal tallies (section 16). Category comparisons run on the tile basis behind each category's points: tiles within 80 m of any point, deduplicated. Point counts appear on every axis.

5.1 Category signal strength and quality

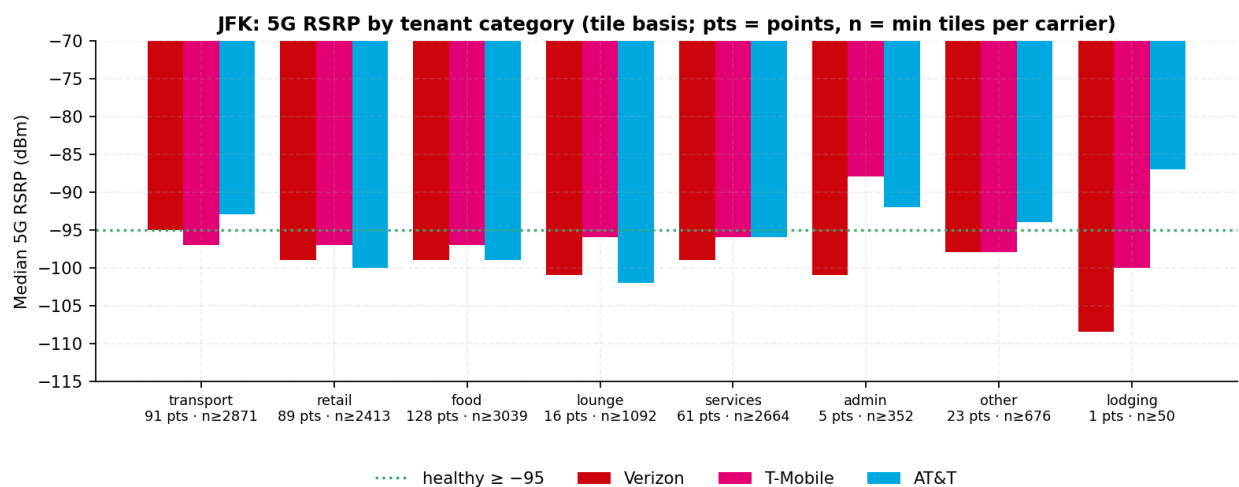


FIG. 20. Median 5G RSRP by tenant category (tile basis; pts = points, n = minimum tiles per carrier). · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

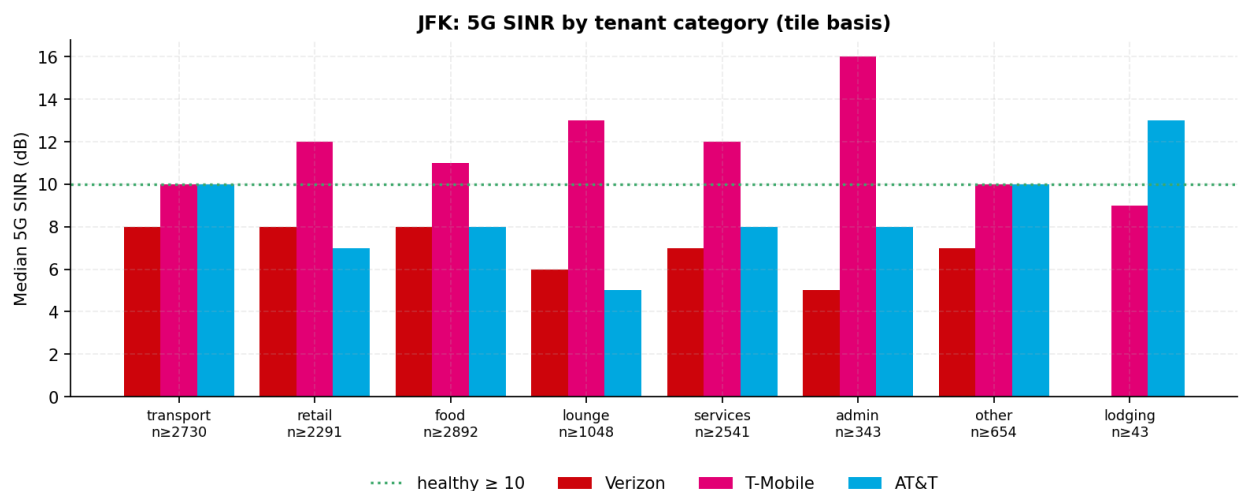


FIG. 21. Median 5G SINR by tenant category (tile basis); categories where a carrier's SINR n is below 30 are reported as counts in the title, not charted. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

Ranked categories clear the floor for every carrier on RSRP: transport_admin, retail, food, lounge, services, admin, other, lodging. Category leaders on the conditional tile median: transport_admin AT&T, retail T-Mobile, food T-Mobile, lounge T-Mobile, services T-Mobile, admin T-Mobile, other AT&T, lodging AT&T. Tally: T-Mobile leads 5, AT&T leads 3 of 8; AT&T trails 3, Verizon trails 3, T-Mobile trails 2. Conditional medians favor a small footprint (section 4.1); these are not terminal leaders.

5.2 Terminal vs periphery RSRP proxy

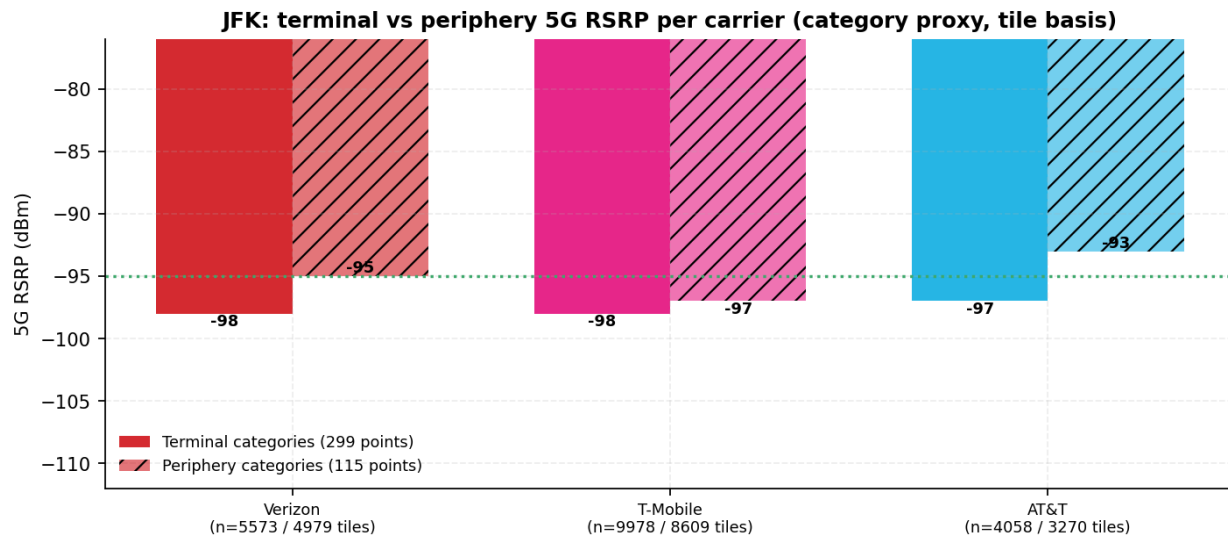


FIG. 22. Per-carrier median 5G RSRP, terminal tenant categories vs periphery categories, on the tile basis. Proxy: category-based masking; the building-masked view (section 4.1) is the sharper in-building lens. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

- Verizon: periphery -95.0 dBm (n=4,979 tiles behind 115 points), terminal -98.0 dBm (n=5,573 tiles behind 299 points), periphery minus terminal +3.0 dB
- T-Mobile: periphery -97.0 dBm (n=8,609 tiles behind 115 points), terminal -98.0 dBm (n=9,978 tiles behind 299 points), periphery minus terminal +1.0 dB
- AT&T: periphery -93.0 dBm (n=3,270 tiles behind 115 points), terminal -97.0 dBm (n=4,058 tiles behind 299 points), periphery minus terminal +4.0 dB

Terminal categories cover the concessions and services inside the terminal footprints; periphery categories cover the parking lots, the AirTrain stations, the hotel, the cargo area, and roadside businesses. A positive periphery-minus-terminal delta is consistent with macro spillover; a negative delta is consistent with an in-building or close-in source; a flat delta is ambiguous. Distance to macro sites confounds all three, and the Site Finder layer (section 15) is queued to resolve it. Deltas: Verizon +3.0 dB, T-Mobile +1.0 dB, AT&T +4.0 dB. The building-masked medians in section 4.1 and the reconciled reading in section 4.7 are the sharper in-building evidence.

5.3 Airline gate clusters

Terminal	Airlines (Tier B, web-verified 2026-09-15)	Gate points (n)	Building-masked leader (section 4.1)
Terminal 1	legacy Terminal 1 international carriers (moving to New Terminal One or Terminal 6 after the window)	16	T-Mobile (+13 pts)
Terminal 4	Delta plus international	47	T-Mobile (+30 pts)

	carriers (Emirates, Virgin Atlantic, Etihad, KLM, Singapore, LATAM); operated by JFKIAT		
Terminal 5	JetBlue domestic and daytime international arrivals	29	T-Mobile (+10 pts)
Terminal 7	carriers transitioning to Terminal 6 from late 2026; Alaska left for T8 in October 2025	10	T-Mobile (+34 pts)
Terminal 8	American plus oneworld partners (British Airways, Finnair, Iberia, Japan Airlines, Qatar, Cathay Pacific) and Alaska Airlines	32	T-Mobile (+42 pts)

An airline reads its exposure through its terminal and the passenger's carrier; the leader column repeats section 4.1 and adds nothing new.

5.4 Retail and food brand coverage

Brand	Points (n)	Verizon median 5G RSRP (dBm)	T-Mobile median 5G RSRP (dBm)	AT&T median 5G RSRP (dBm)
Hudson	16	-99.6	-99.2	-100.5
Starbucks	8	-97.7	-94.7	-99.7
Shake Shack	2	-98.5	-101.3	-104.4
Dunkin'	10	-99.5	-93.0	-98.7
Auntie Anne's	1	-98.1	-90.5	-97.3
Wendy's	1	-91.1	-98.1	-82.5
McDonald's	3	-94.5	-90.5	-98.1
Pret A Manger	3	-97.5	-92.8	-101.3
Cibo Express	7	-95.9	-96.3	-98.4
InMotion	2	-97.8	-94.0	-97.2
Duty Free	4	-96.1	-93.3	-104.6

Multi-location brands are a cross-terminal consistency check. Point counts are small (16 at most), so this table is a count-only view. Each point value is a mean over the tiles within 80 m of the point (per-point tile n in Appendix A).

5.5 Airline lounges

Lounge point	Terminal	Verizon 5G RSRP (class, n)	T-Mobile 5G RSRP (class, n)	AT&T 5G RSRP (class, n)
Air France Lounge	T1	-95.3 (at-risk, n=142)	-99.4 (at-risk, n=182)	-99.4 (at-risk, n=146)
Korean Air Lounge	T1	-94.9 (healthy, n=193)	-93.4 (healthy, n=207)	-104.4 (at-risk, n=197)
Lufthansa Business Lounge - JFK T1	T1	-96.0 (at-risk, n=157)	-94.2 (healthy, n=209)	-110.1 (critical, n=152)
Turkish Airlines Lounge JFK	T1	-93.4 (healthy, n=150)	-100.0 (at-risk, n=209)	-107.2 (at-risk, n=170)
American Express Centurion Lounge	T4	-100.9 (at-risk, n=192)	-92.7 (healthy, n=195)	-101.1 (at-risk, n=177)
Delta Sky Club	T4	-100.7 (at-risk, n=183)	-103.3 (at-risk, n=213)	-106.9 (at-risk, n=147)
Delta Sky Club (A8)	T4	-104.8 (at-risk, n=201)	-98.7 (at-risk, n=201)	-101.2 (at-risk, n=180)
Emirates Lounge	T4	-98.7 (at-risk, n=170)	-102.7 (at-risk, n=211)	-105.5 (at-risk, n=143)
Emirates Lounge (second point)	T4	-103.6 (at-risk, n=202)	-97.1 (at-risk, n=202)	-98.9 (at-risk, n=174)
Etihad Airways / Chase Sapphire Lounge	T4	-100.6 (at-risk, n=194)	-92.7 (healthy, n=202)	-100.0 (at-risk, n=177)
Hello Sky Lounge Terminal 4	T4	-100.4 (at-risk, n=195)	-92.5 (healthy, n=201)	-100.9 (at-risk, n=178)
Primeclass Lounge - JFK T1	point in T4: location disagrees with name	-101.0 (at-risk, n=172)	-90.9 (healthy, n=199)	-100.3 (at-risk, n=174)
Virgin Atlantic	T4	-102.1 (at-risk, n=202)	-96.8 (at-risk, n=210)	-97.9 (at-risk, n=168)

Clubhouse				
Admirals Club	T8	-97.8 (at-risk, n=148)	-91.1 (healthy, n=194)	-98.9 (at-risk, n=152)
American Airlines/British Airways Lounges Terminal 8	T8	-104.5 (at-risk, n=198)	-95.1 (at-risk, n=210)	-100.3 (at-risk, n=195)
Chelsea Lounge JFK - British Airways & American	T8	-104.2 (at-risk, n=178)	-89.4 (healthy, n=185)	-101.6 (at-risk, n=172)
Greenwich Lounge JFK - British Airways & American	T8	-97.2 (at-risk, n=162)	-89.9 (healthy, n=195)	-98.8 (at-risk, n=168)
Soho Lounge	T8	-100.1 (at-risk, n=113)	-94.5 (healthy, n=148)	-101.0 (at-risk, n=122)

18 lounge points are in the pinned capture. Each value is a single-point aggregate over tiles within 80 m; points are listed for scope and not ranked. Flagged points are excluded from terminal tallies.

6. Load and density

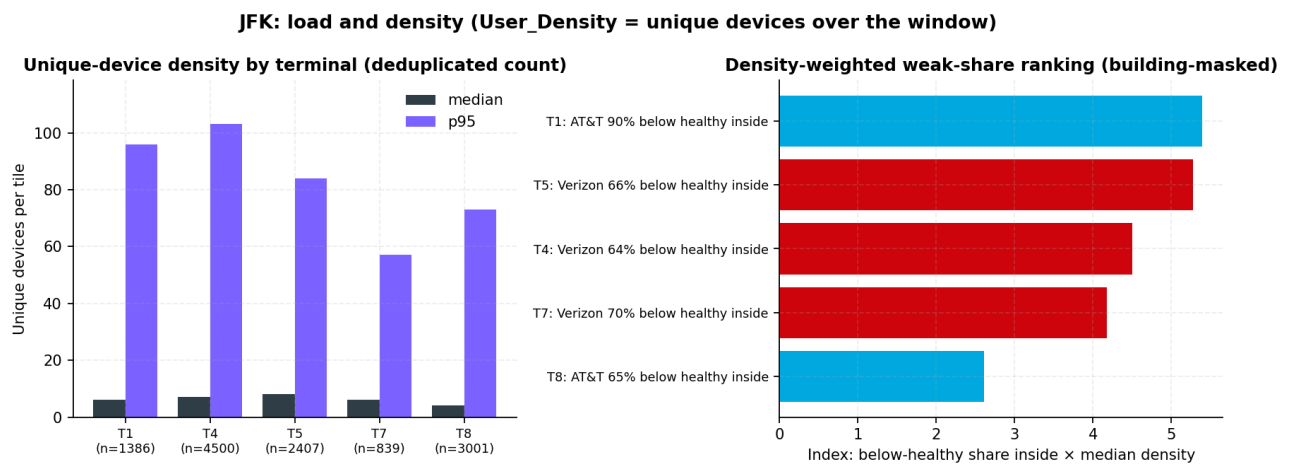


FIG. 23. Unique-device density by terminal (median and p95 per tile, gate-and-concession pool) and the density-weighted weak-share ranking on the building-masked conditional basis. User_Density = unique devices over the window, deduplicated. · Source: Ookla Cell Analytics All Networks usage export, 2025-09-01 to 2026-08-31

Density is this dataset's demand signal. Ookla's User_Density field counts the unique Android devices observed per tile over the window, deduplicated. It does not count simultaneous users and it does not measure time spent. Terminal medians: T1 6 (p95 96, n=1,386), T4 7 (p95 103, n=4,500), T5 8 (p95 84, n=2,407), T7 6 (p95 57, n=839), T8 4 (p95 73, n=3,001). The on-airport median is 3 devices per tile across 50,663 usage tiles.

The density-weighted ranking multiplies each terminal's weakest-carrier below-healthy share inside the footprint (building-masked, conditional) by its median density, so it points to where weak in-building signal meets the most devices. Terminal 1 leads the ranking (AT&T below healthy on 90% of its reporting tiles inside, median density 6). The weakest carrier inside the footprint is AT&T in T1, Verizon in T4, Verizon in T5, Verizon in T7, AT&T in T8, the same list as section 1's reconciliation.

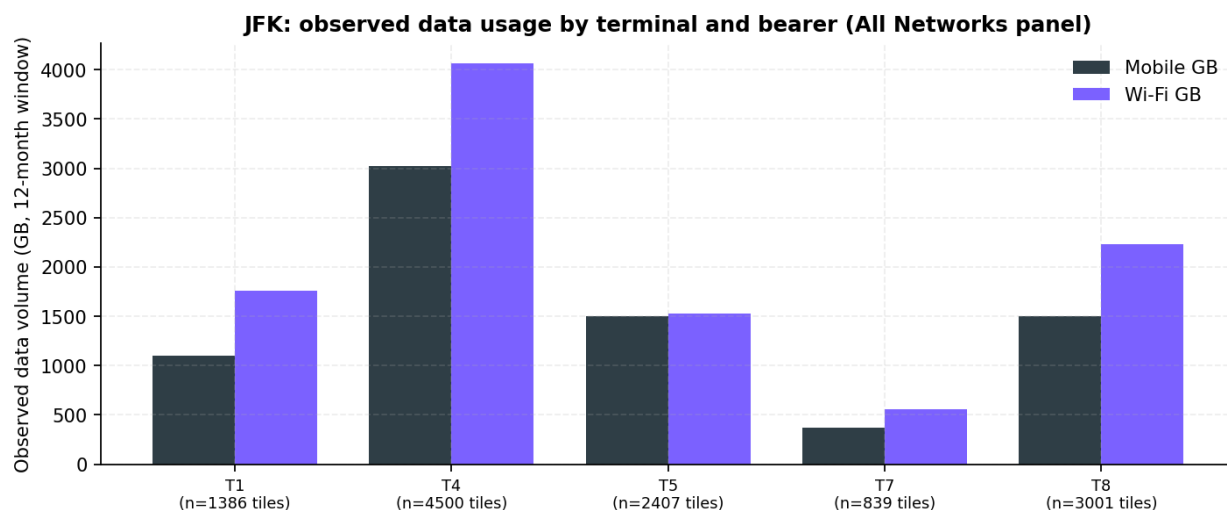


FIG. 24. Observed data volume by terminal and bearer (GB over the 12-month window). · Source: Ookla Cell Analytics All Networks usage export, 2025-09-01 to 2026-08-31

Usage volume shows where bandwidth is consumed, by bearer and by terminal. It is observed sample volume from the crowdsourcing panel. It is not total traffic.

7. Wi-Fi as an augmentation layer

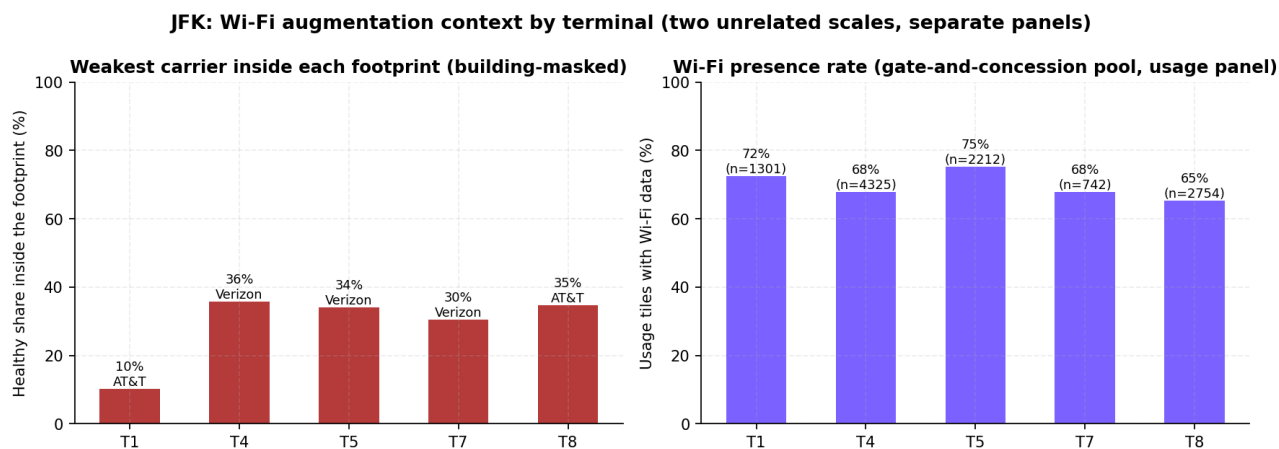


FIG. 25. Left: the weakest carrier's healthy share of 5G-reporting tiles inside each footprint (building-masked). Right: Wi-Fi presence rate on the gate-and-concession usage pool. Two unrelated scales on separate panels; the terminal n counts usage tiles that report the Wi-Fi field. · Source: Ookla Cell Analytics All Networks usage export, 2025-09-01 to 2026-08-31

Wi-Fi usage is observed on 57% of the 40,920 on-airport usage tiles that report the Wi-Fi field. A non-reporting tile means no measurement and is excluded from the denominator; it is not evidence of no Wi-Fi. The augmentation opportunity is largest where the weakest carrier is weakest inside the building and Wi-Fi presence is high.

7.1 Wi-Fi share of observed data volume (venue and terminal level only)

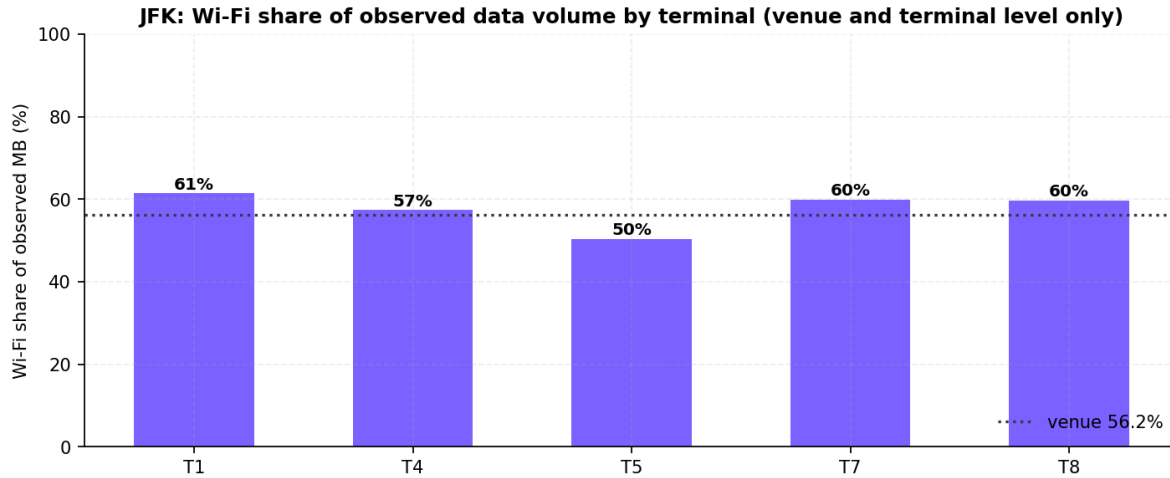


FIG. 26. Wi-Fi share of observed data volume by terminal, with the venue reference line. · Source: Ookla Cell Analytics All Networks usage export, 2025-09-01 to 2026-08-31

Venue-wide, 56.2% of observed data volume moves over Wi-Fi (Σ Wi-Fi MB $\div$ Σ all MB on the All Networks panel, $n=50,663$ tiles). Locked rule (section 16): the share is computed at venue and terminal level only. The export does not attribute Wi-Fi usage to any cellular carrier's subscribers, so a per-carrier share is not derivable and not implied. The figure blends the free Boingo airport Wi-Fi (section 8) with tenant and personal networks, so it is not the airport network's share.

Scope decomposition: tiles assigned to a terminal pool blend to 57.5%; the remaining on-airport tiles (airfield, roadways, cargo, remote lots) run 54.2% Wi-Fi, pulling the venue figure to 56.2%.

7.2 Tenant-level Wi-Fi footprint

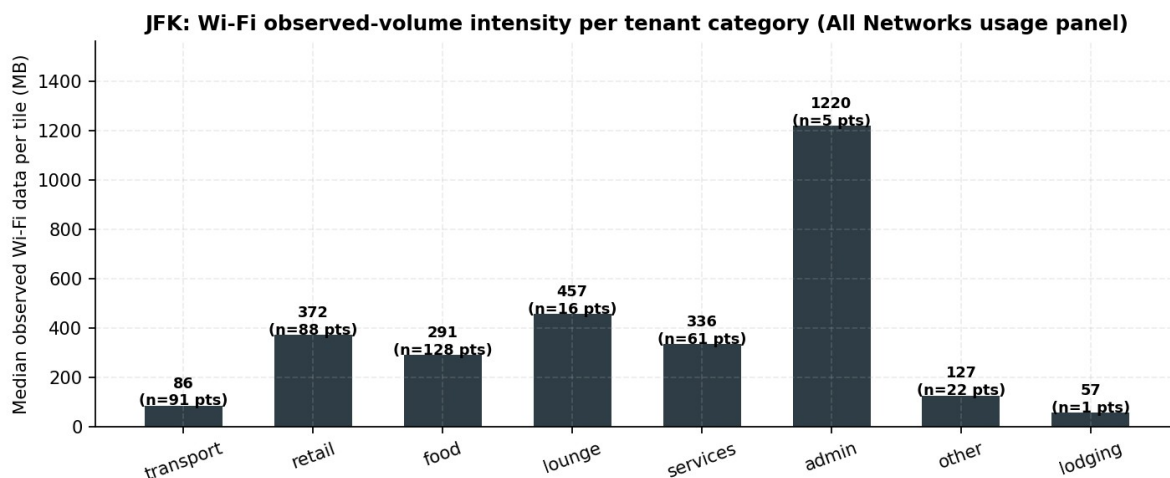


FIG. 27. Median observed Wi-Fi data per tile across tenant categories (points on the bars). Presence rate is not charted: within an 80 m circle it is near 100% for every category and reads as a coverage claim. · Source: Ookla Cell Analytics All Networks usage export, 2025-09-01 to 2026-08-31

Wi-Fi observed volume peaks where passengers spend time. The Wi-Fi figures here come solely from the Ookla usage layer; no network name is asserted. Controller telemetry (section 15) would convert presence into capacity.

8. Private wireless and the neutral-host record

Neutral host: Boingo Wireless is the Port Authority's neutral-host DAS and Wi-Fi provider at JFK (Boingo press release, October 14, 2025, held; PANYNJ board authorization, June 26, 2025, KG record; Airport DAS Master, July 2026, KG record). The agreement was authorized on June 26, 2025 under the 2024 RFP, announced on October 14, 2025 as a long-term agreement to deliver next-generation cellular and free public Wi-Fi across Port Authority properties including JFK, runs 2026 to 2038, and replaces the 1999 New York Telecom Partners agreement under which Boingo already operated at JFK; Boingo also provides Passpoint Wi-Fi at JFK. Boingo Wireless, through its subsidiary New York Telecom Partners, has provided neutral-host distributed antenna system (DAS) and Wi-Fi services at JFK, LaGuardia, and Newark since the 1999 agreement (Boingo press release, August 11, 2014). The sources we hold do not map which terminal buildings ride on Boingo's network versus terminal-operator systems, nor which carriers are on the DAS in each building; ask Boingo for that map. On the Boingo-served venue, the tiles show (section 4.7) that the building-masked readings favor T-Mobile inside every ranked footprint and Verizon at the Terminal 1 gate points, both consistent with a close-in or in-building source (an inference about the radio source; the report does not assign carriers to systems), while the apron-straddling gate-area medians sit below the healthy line for every carrier.

Private wireless: no Citizens Broadband Radio Service (CBRS) or public-safety private-network deployment is recorded for JFK in the sources this report holds, and the public Ookla layer does not characterize private networks. The two JFK-specific questions are whether a CBRS layer is scoped alongside the neutral-host upgrade for the New Terminal One and Terminal 6 construction phases, and whether the federal inspection and baggage workflows in Terminals 4 and 8 ride on the public carriers or on a dedicated layer; both are design questions for the Port Authority and the terminal operators, not measurements.

9. Spectrum and service availability

9.1 Band distribution

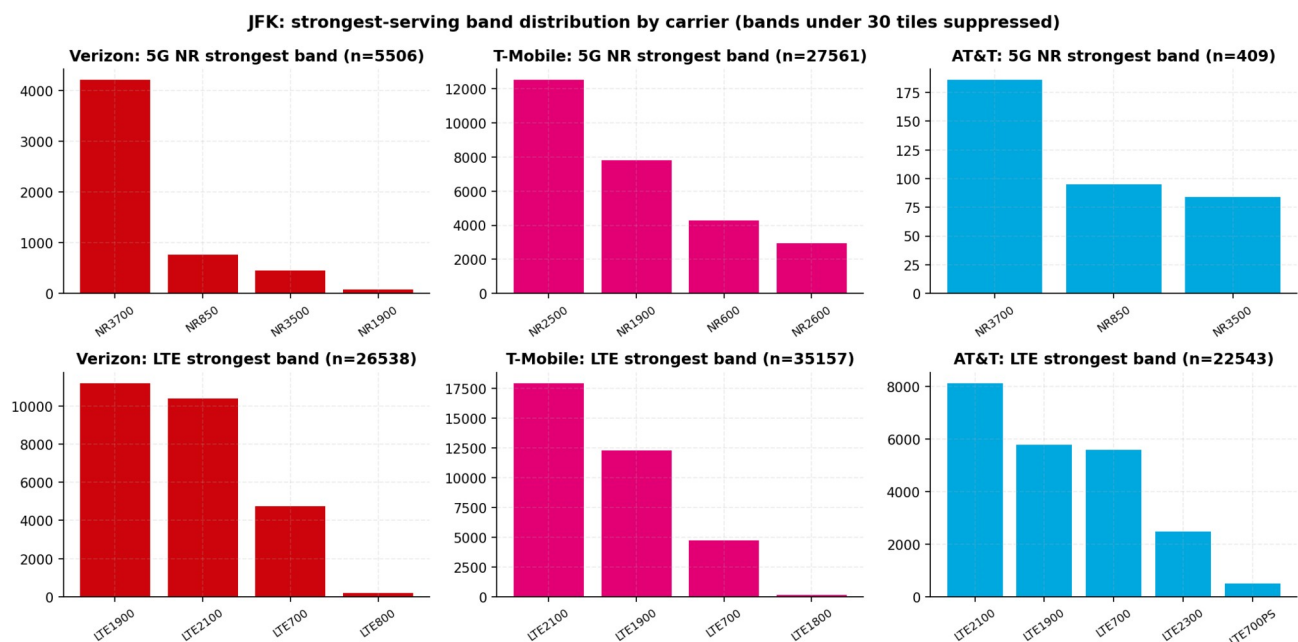


FIG. 28. Strongest-serving band distribution per carrier, 5G NR and LTE (n on each panel; bands under 30 tiles suppressed as label artifacts). · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

Legend: Ookla band labels are technology plus approximate frequency in MHz, printed verbatim from the export. For example, NR2500 and NR2600 are both 2.5 GHz spectrum, and LTE800 and NR850 are both 850 MHz cellular spectrum. LTE700PS is FirstNet Band 14, the public-safety broadband band. Cell, PCI, and band fields populate only where Ookla resolved a serving cell, so band n is smaller than RSRP n (section 16).

The bands a tile attaches to most often show which spectrum each carrier puts to work at the venue. Sub-1 GHz attachment implies coverage-grade bands. Mid-band attachment implies strong penetration or an in-building source. AT&T's NR band table rests on the 409 tiles where an NR serving cell was resolved (NSA-anchoring inference, section 3.6), so its NR mix describes a subset.

Verizon (n = 5,506 NR tiles, 26,538 LTE tiles; 2 NR and 1 LTE rows under 30 tiles suppressed as label artifacts):

NR band	Tiles (n)	LTE band	Tiles (n)
NR3700	4216	LTE1900	11214
NR850	759	LTE2100	10397
NR3500	452	LTE700	4741
NR1900	75	LTE800	185

T-Mobile (n = 27,561 NR tiles, 35,157 LTE tiles; 1 NR and 2 LTE rows under 30 tiles suppressed as label artifacts):

NR band	Tiles (n)	LTE band	Tiles (n)
NR2500	12523	LTE2100	17971
NR1900	7806	LTE1900	12291
NR600	4273	LTE700	4751
NR2600	2953	LTE1800	139

AT&T (n = 409 NR tiles, 22,543 LTE tiles; 6 NR and 2 LTE rows under 30 tiles suppressed as label artifacts):

NR band	Tiles (n)	LTE band	Tiles (n)
NR3700	186	LTE2100	8128
NR850	95	LTE1900	5786
NR3500	84	LTE700	5599
		LTE2300	2478
		LTE700PS	509

9.2 Service availability

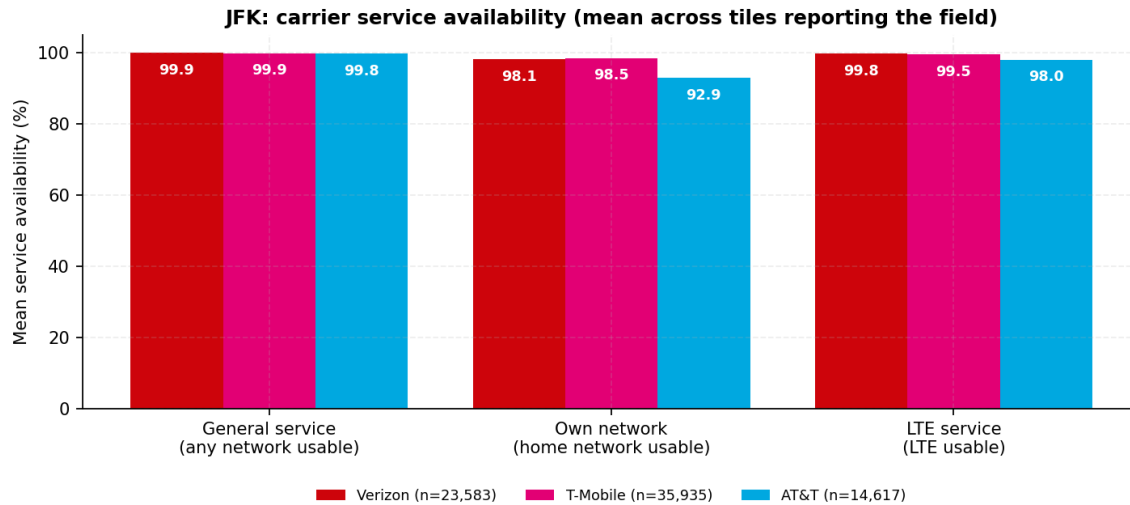


FIG. 29. Service availability, mean across tiles reporting the field: general service (any network usable), own network (the subscriber's home network usable), and general LTE service (LTE usable). · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

On reporting tiles, all three carriers show near-universal LTE service availability, the graceful-degradation floor. Basis disclosure: availability fields are not populated on every tile (general-LTE reporting share: Verizon 82%, T-Mobile 83%, AT&T 63%). The mean is over reporting tiles only.

9.3 Macro-site geometry

Macro-site geometry (Ookla Site Finder centroids) is queued for the next revision, so this report publishes no site figure. Until then, the section 3 and 5.2 readings on macro coverage rest on the RF tiles alone.

10. Carrier-asymmetry atlas

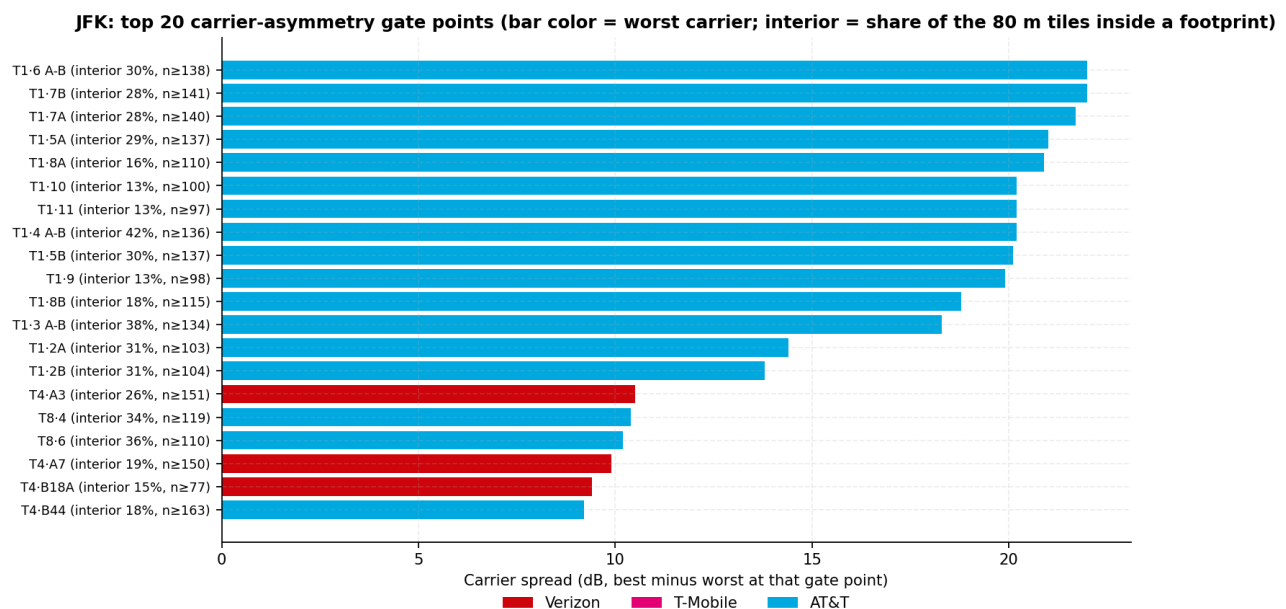


FIG. 30. Top 20 gate points by best-minus-worst carrier 5G RSRP spread, among the 134 gate points where every carrier's per-gate n is at least 30 tiles (gate-area basis; interior share on the label). Bar color is the worst carrier at that gate point. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31

These 20 gate points are where a passenger's experience varies most by carrier on the gate-area basis (spreads of 9 to 22 dB). Worst-carrier tally across all 134 ranked gate points: AT&T 90, Verizon 33, T-Mobile 11. The largest spreads sit in Terminal 1 (14 of the top 20); their interior shares average 25%, so they are pier-edge readings. They serve two purposes: worst-case examples for the stakeholder narrative, and the gate-point validation list for section 14.

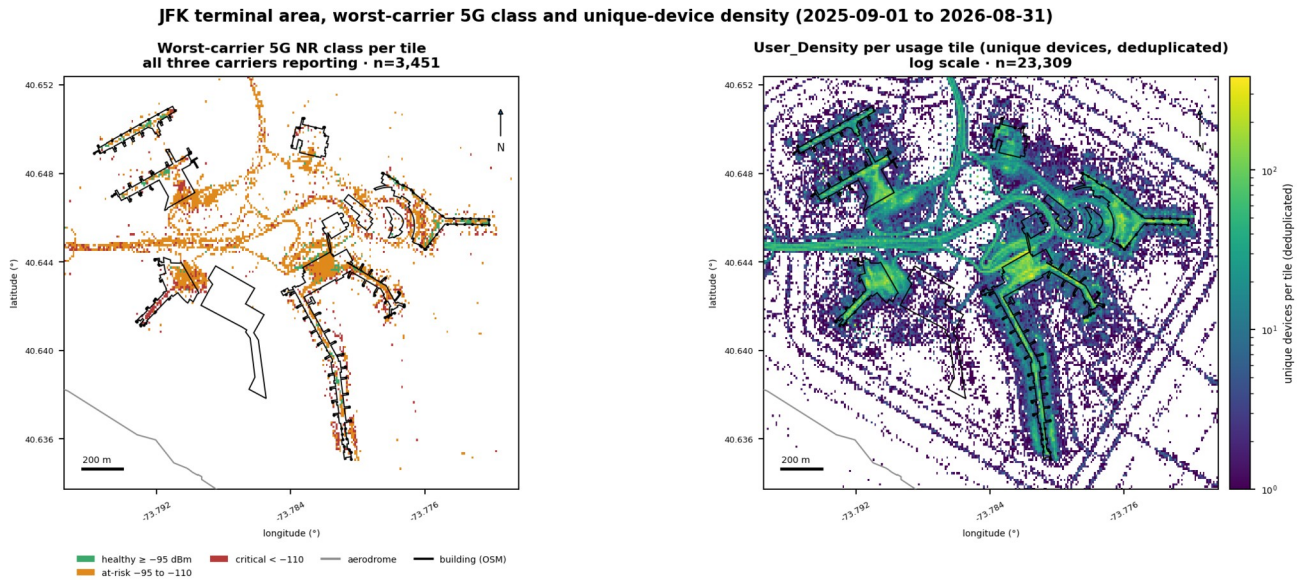


FIG. 31. Left: each terminal-area tile colored by the worst carrier's 5G NR class where all three carriers report. Right: User_Density per usage tile (unique devices, deduplicated) on a log scale over the same extent. · Source: Ookla Cell Analytics per-carrier RF tile export, 2025-09-01 to 2026-08-31; Ookla Cell Analytics All Networks usage export, 2025-09-01 to 2026-08-31

FIG. 31 pairs the two questions a terminal operator asks first: where is the weakest carrier weak, and where are the devices. Amber dominates the apron edges on the worst-carrier panel, and the density panel shows the terminal cores and the AirTrain corridor carrying the highest unique-device counts.

11. Federal and operational-critical tenants

Point (display-normalized name)	Terminal	Per-carrier 5G RSRP (class, n tiles)
U.S. Customs and Border Protection (Terminal 4)	T4	Verizon -100.7 dBm (at-risk, n=194); T-Mobile -87.9 dBm (healthy, n=210); AT&T -89.0 dBm (healthy, n=192)
TSA at Terminal 5, JFK Airport	T5	Verizon -105.0 dBm (at-risk, n=38); T-Mobile -103.7 dBm (at-risk, n=181); AT&T -117.0 dBm (critical, n=37)
Fire Fighting Training Area	outside terminals	Verizon no tiles within 80 m; T-Mobile no tiles within 80 m; AT&T no tiles within 80 m
NYC Police Department Impound Parking	outside terminals	Verizon -76.5 dBm (healthy, n=64); T-Mobile -77.9 dBm (healthy, n=71); AT&T -99.0 dBm (at-risk, n=39)
New York City Police Department Pound	outside terminals	Verizon -78.0 dBm (healthy, n=82); T-Mobile -80.4 dBm (healthy, n=103); AT&T -96.6 dBm (at-risk, n=50)
Port Authority Police Department	outside terminals	Verizon -100.0 dBm (at-risk, n=63); T-Mobile -106.4 dBm (at-risk, n=60); AT&T

		-96.8 dBm (at-risk, n=49)
U.S. Customs and Border Protection	outside terminals	Verizon -102.2 dBm (at-risk, n=60); T-Mobile -103.7 dBm (at-risk, n=123); AT&T -107.0 dBm (at-risk, n=15)

7 federal or operational-critical points are identifiable by name in the pinned capture. 2 Customs and Border Protection (CBP) points are among them (names display-normalized, section 16); the federal inspection facilities of the other terminals need tenant attestation before they can be measured here. AT&T's FirstNet Band 14 (LTE700PS) appears on 509 AT&T LTE tiles (section 9.1); public-safety coverage posture is a section 15 layer. These readings are single-point aggregates, reported for scope and not ranked.

12. Passenger-impact translation

Carrier	Gate points below healthy 5G (gate-area basis)	Share of gate points
Verizon	110 of 134	82%
T-Mobile	101 of 134	75%
AT&T	125 of 134	93%

JFK carried 62.6 million passengers in 2025, a 1.0 percent decrease from its 2024 record of 63.3 million (Port Authority of New York and New Jersey press release, facility volumes for December and full-year 2025, cited source); the figures are quoted as published and are two-way passengers, not enplanements. This report does not distribute passengers across gate points: per-gate and per-terminal volumes are not available to this report, the instrument is a crowdsourced Android panel, and the gate-area tiles straddle the apron. The share-of-gate-points column above is the exposure statement this export supports. A gate-level passenger feed (section 15) would allow a measured translation. For scale, the Imagine knowledge graph records 30,792,806 calendar-year enplanements for JFK (KG record, year as recorded in the graph, cited source); enplanements and two-way passengers are different counts and neither is distributed across gates here.

13. Prioritized recommendations

Ordered by impact, each with an owner. Criteria reference the building-masked basis (section 4.1) and the section 14 table.

#	Recommendation	Owner
1	The sources we hold do not map which terminal buildings ride on Boingo's network versus terminal-operator systems, nor which carriers are on the DAS in each building; ask Boingo for that map, with the phases and go-live dates of the 2025 agreement; every design question below depends on it.	Port Authority (with Boingo)
2	Confirm each carrier's participation on the Boingo system per terminal. The building-masked readings (section 4.7) favor T-Mobile inside every ranked footprint and Verizon at the Terminal 1 gate points, consistent with a close-in or in-building source; Boingo and the carriers can confirm which carriers are live on the DAS in each building and since when.	Port Authority with Boingo and the carriers
3	Write the section 14 criteria into the New Terminal One and Terminal 6 designs: for	Port Authority, terminal developers

	every hosted carrier, a healthy share of 5G-reporting tiles at or above 90% inside the footprint on a like-for-like re-measure (this window's best inside any footprint is 82%), and a healthy 5G median at every interior gate point.	
4	Scope Terminal 1 and Terminal 7 in-building work to their remaining service life. Inside the Terminal 1 footprint AT&T is healthy on 10% of its 226 reporting tiles (median -109.0 dBm) and New Terminal One replaces the building (cited source); a like-for-like fix there should be a bridge, not a build.	Port Authority, terminal operators
5	Treat Terminal 4 as the priority existing building on the interior re-cut: 2 of 3 carriers weak inside the footprint (Verizon, AT&T) on the largest interior tile set (1,973 reporting tiles across carriers); Terminal 1, Terminal 7, Terminal 8 tie on the weak-carrier count with smaller interior sets. Its operator (JFKIAT, Tier B) should be the first design partner. The gate-area count (43 of 47 gate points weak for all three) is an apron-edge reading and is not the justification.	JFKIAT, Port Authority
6	Treat Wi-Fi as a coexisting capacity layer in the design (Wi-Fi share of observed data volume 56%, section 7.1). Obtain controller telemetry to size it, and decide the CBRS and private-wireless question alongside the neutral-host upgrade (section 8), not after it.	Port Authority, Boingo, terminal operators

What Imagine Wireless will add next

#	Item	Owner
7	Re-measure over a like-for-like window after any in-building change goes live: the same 12-month length, or a matched shorter window that is disclosed. Crowdsourced tiles serve as the before-and-after comparison; acceptance itself is per-carrier commissioning against the same thresholds (section 14).	Imagine Wireless
8	Pull the section 15 layers before the next issue: Site Finder centroids, the knowledge-graph contracts and artifact rows, and the Ookla Indoor layer captures. Each upgrades a named claim from proxy to measurement.	Imagine Wireless
9	Reconcile the OpenStreetMap gate inventory against each terminal operator's gate plan (section 16) so gate-named criteria carry the operator's labels.	Imagine Wireless with terminal operators

14. Post-deployment monitoring criteria and re-measurement plan

These are monitoring criteria for the before-and-after comparison, not the acceptance test for any system. Acceptance itself is per-carrier commissioning (walk test and scanner survey) against the same thresholds. Thresholds are the locked ladder (section 16). Criteria are stated on the building-masked conditional set (healthy share of 5G-reporting tiles inside each footprint) and on the 7 gate points whose 80 m tile set is at least 50% inside a footprint; the panel-sensitive present-and-healthy share is not a

criterion. Gate refs come from the OpenStreetMap inventory after the same-ref merge and must be reconciled against each terminal operator's gate plan before adoption.

Terminal or point	Carrier	Criterion (threshold)	Re-test
Terminal 4	Verizon	Healthy share of 5G-reporting tiles inside the footprint $\geq$ 90% (this window: 36% of n=558)	Like-for-like window after go-live
Terminal 4	T-Mobile	Healthy share of 5G-reporting tiles inside the footprint $\geq$ 90% (this window: 69% of n=885)	Like-for-like window after go-live
Terminal 4	AT&T	Healthy share of 5G-reporting tiles inside the footprint $\geq$ 90% (this window: 39% of n=530)	Like-for-like window after go-live
Terminal 5	Verizon	Healthy share of 5G-reporting tiles inside the footprint $\geq$ 90% (this window: 34% of n=385)	Like-for-like window after go-live
Terminal 5	T-Mobile	Healthy share of 5G-reporting tiles inside the footprint $\geq$ 90% (this window: 70% of n=618)	Like-for-like window after go-live
Terminal 5	AT&T	Healthy share of 5G-reporting tiles inside the footprint $\geq$ 90% (this window: 60% of n=334)	Like-for-like window after go-live
Terminal 7	Verizon	Healthy share of 5G-reporting tiles inside the footprint $\geq$ 90% (this window: 30% of n=92)	Like-for-like window after go-live
Terminal 7	T-Mobile	Healthy share of 5G-reporting tiles inside the footprint $\geq$ 90% (this window: 77% of n=200)	Like-for-like window after go-live
Terminal 7	AT&T	Healthy share of 5G-reporting tiles inside the footprint $\geq$ 90% (this window: 43% of n=75)	Like-for-like window after go-live
Terminal 8	Verizon	Healthy share of 5G-reporting tiles inside the footprint $\geq$ 90% (this window: 40% of n=311)	Like-for-like window after go-live
Terminal 8	T-Mobile	Healthy share of 5G-reporting tiles inside the footprint $\geq$ 90% (this window: 82% of n=521)	Like-for-like window after go-live
Terminal 8	AT&T	Healthy share of 5G-reporting tiles inside the footprint $\geq$ 90% (this window: 35% of n=311)	Like-for-like window after go-live
T5 gate 507 (interior 52%)	Every carrier	5G RSRP mean of the 80 m tiles $\geq$ -95 dBm (this window: Verizon -97.6, T-Mobile -91.8, AT&T -98.0 dBm)	Like-for-like window after go-live
T5 gate 522 (interior 53%)	Every carrier	5G RSRP mean of the 80 m tiles $\geq$ -95 dBm (this window: Verizon -97.7, T-Mobile -93.4, AT&T -95.6 dBm)	Like-for-like window after go-live
T5 gate 523 (interior 51%)	Every carrier	5G RSRP mean of the 80 m tiles $\geq$ -95 dBm (this window: Verizon -99.2, T-Mobile -93.9, AT&T -94.1 dBm)	Like-for-like window after go-live
T5 gate 524 (interior 50%)	Every carrier	5G RSRP mean of the 80 m	Like-for-like window after go-live

		tiles ≥ -95 dBm (this window: Verizon -99.6 , T-Mobile -94.6 , AT&T -94.3 dBm)	live
T7 gate 7 (interior 59%)	Every carrier	5G RSRP mean of the 80 m tiles ≥ -95 dBm (this window: Verizon -96.6 , T-Mobile -92.7 , AT&T -98.8 dBm)	Like-for-like window after go-live
T7 gate 10 (interior 57%)	Every carrier	5G RSRP mean of the 80 m tiles ≥ -95 dBm (this window: Verizon -100.9 , T-Mobile -96.4 , AT&T -98.4 dBm)	Like-for-like window after go-live
T8 gate 12 (interior 50%)	Every carrier	5G RSRP mean of the 80 m tiles ≥ -95 dBm (this window: Verizon -96.9 , T-Mobile -89.9 , AT&T -98.7 dBm)	Like-for-like window after go-live
All footprints	T-Mobile	LTE RSRP median of reporting tiles in each terminal pool ≥ -95 dBm (T-Mobile is the only carrier whose venue LTE gate-area median is below -95 dBm: -97.3 ; this window by terminal: T1 -97.0 , T4 -97.0 , T5 -100.0 , T7 -93.0 , T8 -98.0 dBm)	Like-for-like window after go-live

Terminal 1 (remaining service life; New Terminal One replaces it, cited source): the same criteria apply for as long as the building operates, and are listed separately so they are not written into a permanent design.

Terminal or point	Carrier	Criterion (threshold)	Re-test
Terminal 1	Verizon	Healthy share of 5G-reporting tiles inside the footprint $\geq 90\%$ (this window: 49% of $n=192$)	Like-for-like window while the building operates
Terminal 1	T-Mobile	Healthy share of 5G-reporting tiles inside the footprint $\geq 90\%$ (this window: 62% of $n=330$)	Like-for-like window while the building operates
Terminal 1	AT&T	Healthy share of 5G-reporting tiles inside the footprint $\geq 90\%$ (this window: 10% of $n=226$)	Like-for-like window while the building operates

Re-measurement uses the same instrument as this baseline (Ookla Cell Analytics, identical thresholds). The window is like for like: the same 12-month length, or a matched shorter window that is disclosed alongside the result. Ookla's date-range comparison renders the before and after directly. New Terminal One and Terminal 6 enter the footprint set when their OpenStreetMap polygons and gates exist.

15. Next layers to add

Layer	What it resolves	Source
Ookla Site Finder centroids (LTE and 5G)	Macro-site geometry behind the section 3 and 5.2 readings; queued for the next revision	Ookla portal pull
Imagine knowledge-graph contracts and artifact rows	Profile, deployment, vendor, and leadership rows are pinned (2026-09-16); the contracts query and artifact search failed at the pull and the per-terminal DAS scope is not in the graph	imagine-kg (BigQuery)
Boingo per-terminal coverage map	The section 8 open item (recommendation 1); phases and go-live dates of the 2025 agreement	Boingo, Port Authority
Per-carrier panel composition	Whether the 5G footprint gap reflects coverage or the 5G-capable Android share of each carrier's panel	Ookla

Tenant attestation for federal facilities	Federal inspection points in the other terminals are absent from public place data	Terminal operators, CBP
Indoor mask	OSM building-polygon mask shipped in rev 1 (section 4.1); Ookla native Indoor layer pinned as portal captures, Tier B	Ookla portal captures
Date-range comparison	Before and after for any in-building change; converts this snapshot into a trend	Ookla portal pull
Poor multi-network coverage	Vendor-ranked building-versus-carrier problem split; corroborates section 4.3	Ookla portal pull
3D Z-axis view	15 m vertical bands; the export is flat but the portal is not	Ookla portal pull
Per-gate and per-terminal passenger counts	Allows a measured passenger translation (section 12)	Port Authority, terminal operators, airline schedules
Gate plan reconciliation	Aligns OpenStreetMap gate refs with each terminal operator's gate list before gate-named criteria are adopted	Terminal operators
New Terminal One and Terminal 6 footprints and gates	Brings the new buildings onto the building-masked basis when they open	OpenStreetMap, terminal developers
Wi-Fi controller telemetry	Airtime, retries, client density; converts presence into capacity	Port Authority, Boingo
Public-safety (NFPA 1221) coverage	Emergency responder radio coverage posture; FirstNet Band 14 is present in the data	Authority having jurisdiction, integrator
Walk test: jet bridges, baggage corridors, construction zones	Areas crowdsourced cannot reach; the acceptance instrument	Scanner survey

16. Method, thresholds, confidence, and caveats

Measurement source: Ookla Cell Analytics per-carrier RF tile exports and the All Networks usage export for JFK, 12-month window 2025-09-01 through 2026-08-31, clipped to the KJFK aerodrome polygon (OpenStreetMap way 158042008) plus a 200 m buffer (95,364 carrier-tile records over 50,923 unique tiles, retained from 120,686 exported records; 50,663 usage tiles retained from 65,263). Export extent: the export rectangle stops at longitude -73.7618 , so the aerodrome's eastern strip (the runway 4L/22R end and the east cargo area) carries no tiles; no terminal sits in that strip. Measurement freshness at issue is 15 days, within the platform's 90-day policy. Gate join: tiles within an 80 m radius of the gate point; per-gate values are arithmetic means of the tile dBm values within 80 m, and medians of those gate means are used at venue and terminal level. Gates come from a pinned OpenStreetMap inventory of 137 nodes; same-ref nodes within 30 m are merged to one gate position (T4 A6 from 3 nodes; T4 A7 from 2 nodes), giving 134 gate points (T1 16, T4 47, T5 29, T7 10, T8 32); refs repeat across terminals, so every gate is named by terminal and ref, and gate-named criteria must be reconciled against each terminal operator's gate plan. Gate-to-terminal attribution: point-in-polygon against the pinned OSM terminal footprints, with a 150 m nearest-footprint fallback for jet-bridge gates mapped outside the outline. Interior share: the share of a gate point's 80 m unique tile centroids that fall inside any terminal polygon (venue mean 28%). Building-masked basis: point-in-polygon of tile centroids against the pinned OSM footprints, so it selects tiles over a building, not tiles measured inside it; healthy share is conditional on a 5G reading and the 5G footprint share inside the polygon is printed beside it. Gate-and-concession pool: nearest gate or tenant point within 80 m (used for zone distributions, PCI, density, and Wi-Fi; never for leadership). Tenants come from a pinned Google Places (New) and OpenStreetMap capture (414 points, no polygons, no Z-axis). Maps: equirectangular axes in degrees, north up, no basemap tiles, rebuilt from the pinned CSVs. Carrier mapping: the export's Verizon, T-Mobile US, and AT&T US operators are printed as Verizon, T-Mobile, and AT&T. Carrier presentation order: strongest at the gate points first (Verizon, T-Mobile, AT&T), asserted against the data at build time; the adjacent

margins (1.0 and 0.8 dB) are under the 1 dB noise floor, so the venue order is a presentation order, not a ranking.

Tenant hygiene (display normalization, disclosed): 1 Google point named after the airport itself was dropped as a pseudo-point; two spellings of the Customs and Border Protection point are displayed under one normalized name; 1 point whose name carries a terminal token that disagrees with the point-derived terminal (Primeclass Lounge - JFK T1 (point in T4)) is flagged and excluded from terminal tallies. No coordinate was edited.

Tile geometry and sample basis: each RF tile is 0.0001° by 0.0001°, about 8 m by 11 m at 40.6° N. The three carrier panels cover 50,923 unique tile centroids on the airport, 15,753 of them seen by all three carriers; the 95,364 figure counts carrier-tile records. The export carries no per-tile scan count, so every n in this report counts tiles, not scans. The 30-tile floor guards spatial support, not scan volume.

Field population: cell, PCI, and band fields populate only where Ookla resolved a serving cell, so their n is smaller than the RSRP n for the same carrier. The table shows the number of on-airport tiles that populate each field.

Field	Verizon	T-Mobile	AT&T
NR_SS_RSRP	17,066	33,821	10,650
NR_Strongest_Cell	5,506	27,556	409
NR_Strongest_PCI	5,506	27,561	409
NR_Strongest_Band	5,506	27,561	409
LTE_RSRP	26,538	35,162	22,543
LTE_Strongest_Cell	26,550	35,187	22,559
LTE_CQI	7,653	12,052	6,128
Optimization_Priority	23,230	28,864	19,041
General_LTE_Service	23,598	35,974	14,823
All on-airport tiles	28,746	43,109	23,509

Threshold ladder: 5G NR SS-RSRP and LTE RSRP healthy ≥ -95 dBm, at risk -95 to -110 , critical < -110 ; 5G SS-SINR healthy ≥ 10 dB, at risk 0 to 10, critical < 0 ; RSRQ healthy ≥ -10 dB. This is the Imagine Wireless Venue Network Intelligence ladder, locked across venues so reports compare like for like. No client-specified design target was provided; the Port Authority or a terminal operator may supply its own target, and the table below shows how the gate-area headline moves with the line. Noise floors: dB margins under 1 dB and tile-share margins under 5 points are ties. The same floor decides per-gate best-carrier calls: a gate names a best carrier only when its top-two margin is at least 1 dB, and smaller margins are reported as ties with the margin shown and excluded from every best-serving count (24 of 134 comparable gate points on 5G and 29 of 134 on LTE). Terminal leaders are decided on the building-masked basis only (section 4.1). Minimum-sample rule: no chart or comparative claim ships on fewer than 30 underlying tiles or points; terminals with fewer than 30 gate points and every tenant category report gate or point tallies as counts, not ranked.

Healthy line	Verizon gate points below the line	T-Mobile gate points below the line	AT&T gate points below the line	Gate points below the line for all three
-95 dBm	110 of 134	101 of 134	125 of 134	75 of 134
-100 dBm	40 of 134	57 of 134	69 of 134	20 of 134
-105 dBm	1 of 134	1 of 134	39 of 134	0 of 134

Sensitivity of the gate-area headline to the healthy line (gate-area basis; the building-masked basis in section 4.1 uses the locked -95 dBm line).

Units rule: Ookla User_Density is the count of unique Android devices observed per tile over the measurement window, deduplicated. It does not count simultaneous users and it does not measure time spent, and neither reading appears anywhere in this report. Wi-Fi share of observed data volume = Σ

Wi-Fi MB ÷ Σ (Wi-Fi + Mobile) MB, computed at venue and terminal level only on the All Networks panel; a per-carrier share is not derivable and is not implied, and the figure cannot separate airport-run Wi-Fi from tenant or personal networks.

Sample basis and inference limits: crowdsourced background scans from consumer Android handsets (a panel Ookla characterizes as about 3% of devices; iOS devices are not sampled), aggregated per tile over 12 months. The panel's composition differs by carrier, so cross-carrier comparisons inherit a device-population bias this export cannot correct; the 5G footprint share and the present-and-healthy share of all tiles are panel-sensitive and never decide a rank or a criterion. Supported: medians, shares, and distributions at venue, terminal, gate-cluster, and tenant-category level with n disclosed. Not supported: throughput, latency, or jitter (not in this export), per-carrier Wi-Fi share, sub-tile positioning, and floor separation. Nothing in this report is measured indoors: there is no Z-axis, and gate values are tiles within 80 m of a point that straddle the apron.

Confidence tagging: facts from public sources this report does not hold are tagged "cited source" inline and are Tier C in the claims ledger. Measured claims are Tier A and reproduce from the raw exports through the verification bundle. Held documents are Tier B: the Boingo press release of October 14, 2025 (pinned in the build's source folder) establishes Boingo Wireless as the Port Authority's neutral-host DAS and Wi-Fi provider at JFK, and the terminal airline assignments carry capture dates in the provenance manifest. The Imagine knowledge graph holds a JFK record, pinned 2026-09-16: large hub, 30,792,806 calendar-year enplanements (year as recorded in the graph), a Boingo neutral-host DAS active since 2026 under a 2026 to 2038 agreement, Boingo Passpoint Wi-Fi, and four Port Authority leadership rows; per-terminal DAS scope and carrier participation are not in the graph (KG record, cited source); the contracts query and artifact search failed at the pull and stay open in the audit findings.

Caveats: the dataset is gate-area and public-corridor weighted; it does not cover jet-bridge interiors or baggage corridors. PCI diversity, serving-cell volatility, and band distributions are aggregate proxies, not active traces or carrier network-management data. The optimization priority index is Ookla's vendor-defined layer, reported as such. Engineering inferences about cause are labeled as inferences where they appear.

Provenance discipline: every numerical value in this report is computed from the cited source files at build time or carries an inline cited-not-held tag. No value is estimated or invented.

Photo credits (Tier B, illustrative, Wikimedia Commons; only the photographs used in this report):

Key	Commons file	Author	License	Date
t4_apron_2024	File:John F. Kennedy International Airport (JFK) Terminal 4 Operations.jpg	Oleg Yunakov	CC0	2024-09-15
t8_exterior_2024	File:Terminal 8 at JFKIA 20240602.jpg	颐园居	CC BY 4.0	2024-06-02
faa_diagram	File:JFK Airport FAA Diagram.png	Federal Aviation Administration	Public domain	2025-01-01
jetblue_gate_2023	File:JetBlue E190 N328JB at JFK.jpg	Tim	CC0	2023-08-08
t8_interior	File:John F. Kennedy International Airport Terminal 8 Interior 20240602.jpg	颐园居	CC BY-SA 4.0	2024-06-02
nto_2025	File:New Terminal One	Charles from Port	CC0	2025-08-02

	(NTO), John F. Kennedy Airport (JFK), New York City, New York (USA) (54742642851).jpg	Chester, New York		
t7_exterior_2025	File:JFK Terminal 7 exterior.jpg	Quintin Soloviev	CC BY 4.0	2025-02-06

Appendix A. Lowest-reading mapped points per carrier (5G NR RSRP; $n \geq 30$ tiles only)

The 414 mapped points blend terminal concessions with periphery businesses (lots, hotels, cargo, roadside services). That mix is deliberate: it is the periphery bucket of the section 5.2 proxy. Only points whose per-carrier aggregate rides on $n \geq 30$ tiles appear.

Verizon

RSRP (dBm)	Terminal	Category	Point	n (tiles)
-106.6	T5	transport_admin	JFK Airport (Terminal 5 Departure. (Service provided via Van))	206
-106.2	T5	transport_admin	Yellow Parking	197
-106.1	T5	services	ATM	212
-105.8	T5	transport_admin	Terminal 5 Pick-Up 4	200
-105.5	T5	retail	Dunkin'	211
-105.5	T5	transport_admin	TWA	165
-105.2	T4	food	Farmer's Fridge	202
-105.2	T5	other	Terminal 5 Pick-Up 5	195
-105.0	T5	admin	TSA at Terminal 5, JFK Airport	38
-105.0	T4	other	Terminal 4 Pet/Service Animal Relief Area	147
-104.9	T5	transport_admin	Terminal 5	187
-104.9	T5	food	The Sunken Lounge	195
-104.8	T8	services	ATM	178
-104.8	T4	food	Beacon Bar	193
-104.8	T4	transport_admin	Blue Garage	184
-104.8	T5	food	Connie Cocktail Lounge	187
-104.8	T4	lounge	Delta Sky Club (A8)	201
-104.8	T5	retail	Fly-By Bagels	178
-104.8	T4	retail	Hudson	195
-104.7	T8	retail	Golden Krust Caribbean Restaurant	175

T-Mobile

RSRP (dBm)	Terminal	Category	Point	n (tiles)
-107.9	(outside terminals)	food	Runway Cafe	109
-107.5	(outside terminals)	retail	Delta Building 21	136
-107.4	T8	food	Vino Volo	94
-106.4	(outside terminals)	transport_admin	Port Authority Police Department	60
-105.9	(outside terminals)	other	JFK MedPort	73
-104.9	(outside terminals)	transport_admin	130 Pl/East Hangar Rd	86
-104.9	T4	transport_admin	JFK Airport (JFK Airport, Queens, NY 11430, United States. Service to all terminals is available. Request the driver for your terminal.)	144
-104.7	(outside terminals)	transport_admin	South Van Wyck Expwy Service Rd/Building 23	97

-104.6	T8	transport_admin	JFK Red Parking	183
-104.5	(outside terminals)	transport_admin	Van Wyck North Service Rd/Building 21	139
-103.8	T8	transport_admin	Building 81 Parking	118
-103.8	(outside terminals)	food	Halal food	170
-103.7	(outside terminals)	transport_admin	JFK Cell Phone Lot West	182
-103.7	T5	admin	TSA at Terminal 5, JFK Airport	181
-103.7	T8	transport_admin	Terminal 8	207
-103.7	(outside terminals)	other	U.S. Customs and Border Protection	123
-103.6	(outside terminals)	other	Meditation Area	146
-103.6	T4	food	Pizza Vino	209
-103.6	(outside terminals)	transport_admin	Uber & Lyft hold and waiting area for drivers	184
-103.5	(outside terminals)	other	JFK	103

AT&T

RSRP (dBm)	Terminal	Category	Point	n (tiles)
-117.0	T5	admin	TSA at Terminal 5, JFK Airport	37
-114.0	T1	food	Lavazza	133
-113.9	T1	retail	Coach	138
-113.8	T1	retail	Salvatore Ferragamo	137
-113.7	T1	food	The Local	132
-113.4	T1	food	Taste NY	134
-113.0	T1	retail	Bally	151
-113.0	T1	food	Uptown Market	134
-112.9	T1	services	ATM	146
-112.9	T1	food	Uptown Bar	146
-112.9	T1	retail	Uptown Market	144
-112.8	T1	food	Dunkin'	136
-112.8	T1	retail	Hudson news Gate 4	145
-112.8	T1	food	Pizza Pub	135
-112.8	T1	food	Soy & Sake Asian Eats	129
-112.7	T1	retail	Dunkin' Express	143
-112.7	T1	food	Eat&Go Istanbul/ New York	143
-112.7	T4	transport_admin	JFK Airport (JFK Airport, Queens, NY 11430, United States. Service to all terminals is available. Request the driver for your terminal.)	63
-112.7	T1	retail	iS Duty Free	145
-112.5	T1	food	Pizza Pub	147

Appendix B. Strongest-serving band tables per carrier (with footprint share)

The same bands as section 9.1, extended with each band's share of the carrier's band-reporting tile footprint. Rows under 30 tiles are suppressed as label artifacts (counts in the headings). Labels are Ookla's, printed verbatim (legend in section 9.1).

Verizon: 5G NR strongest band (n=5,506; 2 rows under 30 tiles suppressed)

Band	Tile count (n)	Share of NR footprint
NR3700	4216	76.6%
NR850	759	13.8%
NR3500	452	8.2%
NR1900	75	1.4%

Verizon: LTE strongest band (n=26,538; 1 rows under 30 tiles suppressed)

Band	Tile count (n)	Share of LTE footprint
LTE1900	11214	42.3%
LTE2100	10397	39.2%
LTE700	4741	17.9%
LTE800	185	0.7%

T-Mobile: 5G NR strongest band (n=27,561; 1 rows under 30 tiles suppressed)

Band	Tile count (n)	Share of NR footprint
NR2500	12523	45.4%
NR1900	7806	28.3%
NR600	4273	15.5%
NR2600	2953	10.7%

T-Mobile: LTE strongest band (n=35,157; 2 rows under 30 tiles suppressed)

Band	Tile count (n)	Share of LTE footprint
LTE2100	17971	51.1%
LTE1900	12291	35.0%
LTE700	4751	13.5%
LTE1800	139	0.4%

AT&T: 5G NR strongest band (n=409; 6 rows under 30 tiles suppressed)

Band	Tile count (n)	Share of NR footprint
NR3700	186	45.5%
NR850	95	23.2%
NR3500	84	20.5%

AT&T: LTE strongest band (n=22,543; 2 rows under 30 tiles suppressed)

Band	Tile count (n)	Share of LTE footprint
LTE2100	8128	36.1%
LTE1900	5786	25.7%
LTE700	5599	24.8%
LTE2300	2478	11.0%
LTE700PS	509	2.3%

Appendix C. Full gate table

Per-gate mean 5G NR RSRP and SINR per carrier to one decimal (arithmetic means of tile dBm within 80 m), with the per-carrier tile n and the interior share. Healthy means RSRP ≥ -95.0 dBm. Best 5G carrier is a count, and it is named only when the top-two margin clears the 1 dB noise floor; a smaller margin prints as "tie" with the carrier initials (V Verizon, T T-Mobile, A AT&T) and the margin. Gate labels follow the OpenStreetMap inventory after the same-ref merge and repeat across terminals.

Terminal	Gate	Interior	Verizon RSRP / SINR (n)	T-Mobile RSRP / SINR (n)	AT&T RSRP / SINR (n)	Best 5G
T1	1A	12%	-96.5 / +12.8 (91)	-104.0 / +4.2 (155)	-100.2 / +6.0 (100)	Verizon
T1	1B	14%	-96.0 / +12.9 (91)	-103.6 / +4.5 (155)	-100.8 / +5.5 (98)	Verizon
T1	2A	31%	-92.6 / +13.4 (103)	-102.1 / +6.8 (169)	-107.0 / +2.1 (111)	Verizon
T1	2B	31%	-93.4 / +12.4 (104)	-101.9 / +7.2 (173)	-107.2 / +2.0 (115)	Verizon
T1	3 A-B	38%	-93.6 / +12.5 (134)	-101.6 / +7.2 (201)	-111.9 / +1.8 (154)	Verizon
T1	4 A-B	42%	-92.7 / +10.8 (152)	-99.1 / +9.7 (205)	-112.9 / +3.3 (136)	Verizon
T1	5A	29%	-92.1 / +10.2	-101.3 / +6.6	-113.1 / +4.5	Verizon

			(137)	(198)	(140)	
T1	5B	30%	-93.3 / +9.6 (137)	-101.5 / +6.6 (197)	-113.4 / +3.9 (138)	Verizon
T1	6 A-B	30%	-90.3 / +11.9 (144)	-102.0 / +6.3 (203)	-112.3 / +5.3 (138)	Verizon
T1	7A	28%	-91.7 / +11.3 (140)	-102.4 / +6.1 (194)	-113.4 / +4.7 (146)	Verizon
T1	7B	28%	-91.4 / +11.4 (141)	-102.2 / +6.4 (195)	-113.4 / +4.8 (144)	Verizon
T1	8A	16%	-92.3 / +9.1 (110)	-102.9 / +6.0 (177)	-113.2 / +4.8 (113)	Verizon
T1	8B	18%	-94.1 / +9.0 (115)	-103.0 / +6.0 (178)	-112.9 / +5.1 (123)	Verizon
T1	9	13%	-94.5 / +8.5 (102)	-103.5 / +5.0 (174)	-114.4 / +3.4 (98)	Verizon
T1	10	13%	-93.3 / +8.8 (100)	-103.7 / +5.3 (174)	-113.5 / +4.5 (103)	Verizon
T1	11	13%	-94.5 / +8.5 (100)	-103.5 / +4.8 (176)	-114.7 / +3.5 (97)	Verizon
T4	A2	42%	-101.5 / +5.7 (191)	-96.1 / +12.2 (200)	-101.3 / +5.8 (168)	T-Mobile
T4	A3	26%	-102.9 / +5.0 (171)	-92.4 / +16.8 (200)	-93.0 / +12.3 (151)	tie: T/A, 0.6 dB
T4	A4	23%	-101.8 / +5.7 (172)	-99.6 / +10.2 (189)	-103.2 / +7.4 (149)	T-Mobile
T4	A5	24%	-102.3 / +4.9 (173)	-94.7 / +14.9 (194)	-93.9 / +13.5 (140)	tie: A/T, 0.8 dB
T4	A6	24%	-103.9 / +3.4 (169)	-99.4 / +10.8 (182)	-105.7 / +4.8 (156)	T-Mobile
T4	A7	19%	-103.2 / +5.0 (167)	-97.5 / +11.8 (186)	-93.3 / +14.5 (150)	AT&T
T4	A8	28%	-105.1 / +2.5 (182)	-99.8 / +10.6 (190)	-106.0 / +3.6 (173)	T-Mobile
T4	A9	24%	-104.4 / +3.9 (162)	-99.5 / +9.1 (196)	-96.3 / +11.1 (145)	AT&T
T4	A10	23%	-104.2 / +3.9 (154)	-100.1 / +8.6 (187)	-95.6 / +11.5 (132)	AT&T
T4	A11	15%	-103.7 / +4.7 (137)	-102.0 / +6.0 (193)	-98.4 / +9.7 (110)	AT&T
T4	A12	15%	-103.7 / +4.8 (136)	-102.0 / +6.2 (192)	-99.2 / +8.9 (109)	AT&T
T4	A14	16%	-103.8 / +5.1 (138)	-102.0 / +6.1 (192)	-99.6 / +8.7 (110)	AT&T
T4	A15	16%	-103.8 / +5.0 (140)	-102.1 / +6.2 (192)	-99.9 / +8.5 (109)	AT&T
T4	A16	17%	-104.6 / +4.3 (155)	-102.7 / +5.3 (195)	-108.8 / +2.3 (140)	T-Mobile
T4	A17	15%	-104.4 / +4.2 (142)	-103.4 / +4.7 (195)	-109.3 / +2.0 (140)	T-Mobile
T4	B18A	15%	-103.7 / +5.2 (106)	-99.4 / +10.3 (165)	-94.3 / +7.3 (77)	AT&T
T4	B18B	18%	-102.5 / +6.6 (115)	-100.3 / +9.4 (180)	-96.9 / +7.4 (87)	AT&T
T4	A19	10%	-103.6 / +4.3 (126)	-104.3 / +4.2 (180)	-109.6 / +1.9 (133)	tie: V/T, 0.7 dB
T4	B20	29%	-100.2 / +8.8 (133)	-99.8 / +9.6 (195)	-100.1 / +7.1 (109)	tie: T/A, 0.3 dB
T4	A21	8%	-104.1 / +4.0 (114)	-105.4 / +3.3 (173)	-109.8 / +1.5 (130)	Verizon
T4	B22	25%	-100.0 / +7.8 (155)	-102.4 / +6.8 (210)	-103.2 / +6.6 (140)	Verizon
T4	B24	23%	-100.4 / +6.7 (158)	-103.4 / +6.2 (205)	-103.4 / +6.7 (134)	Verizon
T4	B25	23%	-100.4 / +6.6 (152)	-103.9 / +5.5 (209)	-106.5 / +4.9 (126)	Verizon

T4	B26	23%	-100.1 / +7.5 (155)	-103.1 / +6.5 (204)	-103.0 / +6.8 (126)	Verizon
T4	B27	23%	-100.6 / +7.2 (146)	-103.1 / +5.7 (208)	-108.7 / +4.4 (129)	Verizon
T4	B28	24%	-98.5 / +8.8 (152)	-103.3 / +5.9 (207)	-103.8 / +5.9 (125)	Verizon
T4	B29	23%	-101.3 / +6.5 (155)	-103.3 / +5.4 (207)	-106.9 / +3.8 (133)	Verizon
T4	B30	28%	-99.2 / +7.8 (163)	-103.7 / +6.2 (208)	-105.5 / +4.2 (128)	Verizon
T4	B31	24%	-101.0 / +6.6 (148)	-103.2 / +4.6 (209)	-108.7 / +3.4 (117)	Verizon
T4	B32	28%	-100.3 / +8.8 (159)	-103.1 / +8.0 (198)	-105.0 / +5.4 (129)	Verizon
T4	B33	26%	-100.8 / +6.9 (147)	-103.6 / +5.2 (209)	-107.4 / +4.8 (126)	Verizon
T4	B34	25%	-97.6 / +10.5 (153)	-103.2 / +7.3 (200)	-100.9 / +8.6 (118)	Verizon
T4	B35	28%	-99.0 / +8.2 (149)	-102.9 / +6.6 (208)	-105.2 / +6.7 (135)	Verizon
T4	B36	26%	-97.8 / +10.0 (160)	-102.6 / +8.1 (198)	-106.1 / +6.5 (119)	Verizon
T4	B37	26%	-96.8 / +8.8 (158)	-102.1 / +6.8 (207)	-103.2 / +8.7 (119)	Verizon
T4	B38	24%	-98.7 / +9.3 (159)	-102.5 / +8.4 (195)	-106.2 / +5.9 (121)	Verizon
T4	B39	26%	-98.7 / +8.2 (155)	-101.6 / +7.7 (200)	-106.0 / +6.2 (113)	Verizon
T4	B41	21%	-100.2 / +7.0 (165)	-101.4 / +7.7 (202)	-108.3 / +4.6 (127)	Verizon
T4	B42	21%	-100.6 / +6.7 (197)	-101.0 / +9.0 (205)	-109.5 / +3.8 (161)	tie: V/T, 0.4 dB
T4	B43	21%	-101.1 / +6.4 (198)	-101.2 / +8.6 (203)	-109.6 / +3.8 (161)	tie: V/T, 0.1 dB
T4	B44	18%	-100.2 / +6.6 (194)	-101.2 / +8.7 (203)	-109.4 / +3.9 (163)	Verizon
T4	B46	18%	-100.3 / +6.6 (186)	-100.7 / +9.3 (199)	-108.6 / +3.7 (155)	tie: V/T, 0.4 dB
T4	B47	18%	-100.5 / +6.4 (199)	-101.2 / +8.4 (207)	-109.3 / +3.5 (161)	tie: V/T, 0.7 dB
T4	B48	18%	-100.0 / +6.7 (168)	-101.0 / +8.7 (183)	-108.5 / +3.5 (135)	Verizon
T4	B49	16%	-100.5 / +6.2 (153)	-101.9 / +7.3 (182)	-107.6 / +4.1 (122)	Verizon
T4	B53	15%	-100.1 / +6.6 (132)	-102.1 / +6.7 (168)	-106.7 / +4.3 (109)	Verizon
T4	B55	13%	-99.5 / +7.1 (88)	-102.4 / +6.5 (125)	-104.0 / +5.3 (70)	Verizon
T5	501	35%	-99.5 / +6.7 (177)	-97.0 / +11.3 (205)	-93.9 / +12.0 (161)	AT&T
T5	502	35%	-99.1 / +6.7 (170)	-97.2 / +11.4 (196)	-94.7 / +11.6 (151)	AT&T
T5	503	29%	-98.7 / +7.3 (164)	-97.2 / +11.4 (189)	-96.6 / +11.5 (140)	tie: A/T, 0.6 dB
T5	504	28%	-98.4 / +7.4 (165)	-97.3 / +11.5 (191)	-96.6 / +11.5 (138)	tie: A/T, 0.7 dB
T5	505	34%	-98.5 / +7.6 (177)	-96.3 / +12.8 (201)	-97.0 / +11.2 (152)	tie: T/A, 0.7 dB
T5	506	42%	-98.5 / +7.8 (175)	-95.1 / +14.4 (201)	-97.6 / +10.2 (154)	T-Mobile
T5	507	52%	-97.6 / +8.7 (179)	-91.8 / +18.5 (196)	-98.0 / +9.9 (161)	T-Mobile
T5	508	41%	-96.9 / +9.5 (178)	-93.4 / +16.1 (209)	-98.9 / +9.3 (169)	T-Mobile
T5	509	29%	-97.3 / +9.3	-94.1 / +15.1	-98.3 / +10.5	T-Mobile

			(158)	(202)	(152)	
T5	510	26%	-97.2 / +8.3 (157)	-93.7 / +14.8 (203)	-99.6 / +10.2 (147)	T-Mobile
T5	511	24%	-97.6 / +8.2 (163)	-94.2 / +14.1 (200)	-97.9 / +11.0 (150)	T-Mobile
T5	512	16%	-97.8 / +8.3 (159)	-95.5 / +12.5 (196)	-99.1 / +10.2 (142)	T-Mobile
T5	514	11%	-98.8 / +7.2 (132)	-97.6 / +10.5 (173)	-100.3 / +9.4 (123)	T-Mobile
T5	515	12%	-98.1 / +7.3 (125)	-96.3 / +11.3 (157)	-98.1 / +10.5 (110)	T-Mobile
T5	516	12%	-98.2 / +7.3 (123)	-95.9 / +11.4 (154)	-97.5 / +10.6 (108)	T-Mobile
T5	517	19%	-96.4 / +8.5 (152)	-94.7 / +12.9 (195)	-96.7 / +11.4 (141)	T-Mobile
T5	518	24%	-96.2 / +8.3 (162)	-94.0 / +13.8 (203)	-97.2 / +10.9 (151)	T-Mobile
T5	519	26%	-96.5 / +8.7 (163)	-94.8 / +14.0 (203)	-97.7 / +11.0 (146)	T-Mobile
T5	520	30%	-97.0 / +8.9 (165)	-94.8 / +14.5 (200)	-96.6 / +10.5 (147)	T-Mobile
T5	521	50%	-95.4 / +10.2 (175)	-93.5 / +15.6 (204)	-97.4 / +9.9 (162)	T-Mobile
T5	522	53%	-97.7 / +8.4 (170)	-93.4 / +14.6 (198)	-95.6 / +11.0 (160)	T-Mobile
T5	523	51%	-99.2 / +7.4 (173)	-93.9 / +13.3 (198)	-94.1 / +11.8 (163)	tie: T/A, 0.2 dB
T5	524	50%	-99.6 / +7.0 (181)	-94.6 / +12.2 (206)	-94.3 / +11.6 (166)	tie: A/T, 0.3 dB
T5	525	44%	-100.4 / +6.3 (181)	-95.2 / +11.6 (197)	-95.6 / +10.8 (160)	tie: T/A, 0.4 dB
T5	526	42%	-99.0 / +6.9 (175)	-95.7 / +11.4 (190)	-96.5 / +10.8 (153)	tie: T/A, 0.8 dB
T5	527	42%	-97.6 / +7.6 (168)	-95.2 / +12.8 (185)	-96.7 / +10.8 (143)	T-Mobile
T5	528	41%	-97.5 / +8.2 (161)	-95.9 / +12.7 (190)	-97.9 / +9.8 (138)	T-Mobile
T5	529	29%	-97.6 / +8.9 (125)	-98.6 / +10.6 (174)	-97.7 / +9.1 (104)	tie: V/A, 0.1 dB
T5	530	21%	-97.4 / +9.0 (91)	-99.8 / +9.0 (168)	-98.1 / +7.9 (82)	tie: V/A, 0.7 dB
T7	1	31%	-98.9 / +7.8 (129)	-95.9 / +11.8 (167)	-95.7 / +6.2 (128)	tie: A/T, 0.2 dB
T7	2	42%	-98.0 / +10.2 (134)	-92.5 / +14.3 (171)	-100.4 / +7.9 (131)	T-Mobile
T7	3	40%	-99.0 / +9.1 (127)	-92.5 / +13.5 (169)	-101.2 / +7.9 (129)	T-Mobile
T7	4	42%	-98.9 / +9.2 (133)	-91.9 / +14.0 (170)	-100.9 / +8.0 (134)	T-Mobile
T7	5	23%	-97.7 / +9.0 (92)	-94.7 / +11.2 (145)	-101.3 / +7.8 (104)	T-Mobile
T7	6	24%	-98.2 / +9.0 (94)	-95.2 / +11.1 (151)	-101.1 / +7.7 (105)	T-Mobile
T7	7	59%	-96.6 / +10.8 (102)	-92.7 / +13.8 (149)	-98.8 / +9.8 (104)	T-Mobile
T7	8	48%	-98.4 / +10.0 (58)	-97.4 / +10.6 (108)	-97.1 / +8.4 (63)	tie: A/T, 0.3 dB
T7	9	44%	-100.0 / +10.2 (50)	-98.9 / +9.4 (105)	-94.8 / +7.2 (55)	AT&T
T7	10	57%	-100.9 / +9.8 (85)	-96.4 / +11.8 (141)	-98.4 / +11.2 (88)	T-Mobile
T8	unnumbered (OSM 11117610517)	37%	-98.6 / +11.2 (109)	-92.1 / +15.8 (149)	-99.0 / +8.8 (125)	T-Mobile
T8	1	11%	-97.8 / +12.7	-100.3 / +8.3	-103.4 / +6.0	Verizon

			(82)	(143)	(80)	
T8	2	13%	-98.3 / +12.5 (89)	-99.4 / +8.6 (157)	-104.1 / +5.3 (92)	Verizon
T8	3	31%	-98.0 / +12.2 (96)	-94.5 / +13.6 (150)	-102.4 / +6.8 (110)	T-Mobile
T8	4	34%	-97.3 / +12.5 (119)	-92.6 / +14.6 (182)	-103.0 / +6.8 (137)	T-Mobile
T8	5	39%	-99.3 / +11.0 (111)	-92.2 / +16.0 (149)	-99.1 / +8.5 (121)	T-Mobile
T8	6	36%	-97.0 / +13.3 (110)	-92.2 / +15.9 (176)	-102.4 / +7.0 (133)	T-Mobile
T8	7	45%	-97.2 / +12.2 (113)	-92.4 / +17.2 (146)	-97.4 / +10.3 (116)	T-Mobile
T8	8	35%	-94.7 / +13.7 (129)	-92.0 / +17.0 (185)	-99.1 / +8.4 (143)	T-Mobile
T8	10	37%	-94.4 / +13.8 (133)	-92.0 / +17.1 (188)	-98.1 / +9.0 (145)	T-Mobile
T8	12	50%	-96.9 / +10.9 (159)	-89.9 / +18.3 (188)	-98.7 / +8.7 (153)	T-Mobile
T8	14	19%	-99.1 / +8.1 (91)	-101.4 / +5.8 (153)	-104.3 / +8.1 (100)	Verizon
T8	16	17%	-99.2 / +7.6 (88)	-101.9 / +5.1 (151)	-104.6 / +8.0 (96)	Verizon
T8	18	28%	-100.6 / +7.1 (79)	-100.0 / +7.1 (146)	-104.5 / +7.0 (93)	tie: T/V, 0.6 dB
T8	20	29%	-100.5 / +7.1 (79)	-100.0 / +7.2 (143)	-104.0 / +6.9 (94)	tie: T/V, 0.5 dB
T8	31 A,B,C,D	14%	-93.8 / +14.3 (60)	-98.0 / +10.6 (98)	-98.8 / +10.8 (72)	Verizon
T8	32	17%	-92.9 / +13.8 (85)	-99.1 / +10.9 (138)	-97.5 / +11.8 (84)	Verizon
T8	33	21%	-94.4 / +12.8 (100)	-98.9 / +11.7 (141)	-100.0 / +10.5 (89)	Verizon
T8	34	31%	-92.9 / +13.5 (120)	-99.3 / +11.2 (167)	-96.4 / +11.5 (117)	Verizon
T8	35	28%	-96.2 / +13.1 (127)	-99.1 / +11.1 (168)	-98.9 / +10.0 (118)	Verizon
T8	36	32%	-95.0 / +12.9 (121)	-100.1 / +11.4 (167)	-97.1 / +10.5 (120)	Verizon
T8	37	30%	-97.4 / +12.4 (139)	-100.1 / +10.9 (179)	-99.0 / +9.2 (128)	Verizon
T8	38	32%	-95.0 / +13.0 (122)	-98.7 / +13.3 (175)	-99.1 / +8.8 (133)	Verizon
T8	39	30%	-97.4 / +12.4 (128)	-98.8 / +12.9 (189)	-101.1 / +7.6 (135)	Verizon
T8	40	35%	-95.5 / +13.3 (132)	-96.1 / +15.7 (178)	-96.7 / +10.4 (136)	tie: V/T, 0.6 dB
T8	41	36%	-97.0 / +12.2 (138)	-95.0 / +16.3 (190)	-99.1 / +8.5 (146)	T-Mobile
T8	42	40%	-96.5 / +12.7 (132)	-91.5 / +18.9 (173)	-95.5 / +11.4 (130)	T-Mobile
T8	43	38%	-95.7 / +12.4 (147)	-91.3 / +18.1 (188)	-98.1 / +9.6 (153)	T-Mobile
T8	44	39%	-94.2 / +13.1 (121)	-92.0 / +17.3 (160)	-95.3 / +11.4 (121)	T-Mobile
T8	45	24%	-95.8 / +11.6 (104)	-95.8 / +13.5 (163)	-100.0 / +9.7 (132)	tie: T/V, 0.0 dB
T8	46	27%	-95.3 / +11.8 (74)	-95.2 / +13.3 (130)	-99.9 / +9.8 (103)	tie: T/V, 0.1 dB
T8	47	18%	-93.7 / +12.1 (72)	-98.4 / +11.0 (122)	-100.1 / +9.5 (108)	Verizon