ICAO GANP PORTAL

KPI Overview

The 24 global air navigation performance indicators — what each one measures, in what unit, and why it matters.

Training session ICAO GANP Portal, KPI
Efficiency · Capacity · Predictability · Environment · Safety

OVERVIEW

How the KPI set is organised

Punctuality & predictability

KPI 01 · 14 · 15

How reliably flights depart, arrive and hold their planned duration.

ATFM delay & flow management

KPI 03 · 07 · 12

Delay imposed by flow restrictions and how well slots are respected.

Surface & terminal efficiency

KPI 02 · 08 · 13

Extra time absorbed taxiing out, in, and transiting terminal airspace.

Capacity & throughput

KPI 06 · 09 · 10 · 11

How much traffic airspace and airports can safely accept and actually handle.

Flight efficiency, horizontal & vertical

KPI 04 · 05 · 17 · 18 · 19

Distance flown beyond the ideal route and time spent off optimum level.

Environment & safety

KPI 16 · 20 – 24

Fuel burn, noise exposure, accidents, incursions, excursions and separation losses.

GROUP 1 OF 8

Punctuality and predictability

KPI 01 Departure punctuality

% of scheduled flights

Percentage of flights leaving the gate on time against schedule, measured on IFR departures of scheduled airlines. Variants use a ±5 or ±15 minute threshold, either side of schedule or delay-only. It reflects the service quality passengers experience and an airline's ability to execute its schedule.

Illustrative benchmark: 75–80% within 15 min at major hubs; good practice target ≥ 85%

KPI 14 Arrival punctuality

% of scheduled flights

The mirror of KPI 01 at the destination: the share of flights reaching the gate on time versus schedule, using the same 5- and 15-minute thresholds. Arrival performance is what drives connection reliability and downstream aircraft rotations.

Illustrative benchmark: ~78% within 15 min; good practice target ≥ 85%

KPI 15 Flight time variability

Minutes

The spread of actual gate-to-gate times on the same city pair — typically the difference between a fast and a slow percentile of the distribution. High variability forces airlines to pad schedules with buffer time, which costs fuel and capacity even when average performance looks good.

Illustrative benchmark: 10–15 min spread on short-haul pairs; target < 10 min

GROUP 2 OF 8

ATFM delay and flow management

KPI 03 — ATFM slot adherence

% of restricted flights

Percentage of flights taking off within their assigned ATFM slot — calculated take-off time compliance. Measured on IFR flights subject to flow restrictions. Poor adherence wastes scarce capacity that the flow measure was created to protect.

Illustrative benchmark: typically 92–95%; target ≥ 95%

KPI 07 — En-route ATFM delay

Minutes per flight

Delay attributed to air traffic flow management regulations applied to en-route airspace volumes, expressed per flight. It isolates the cost of demand exceeding en-route capacity, separate from airport-driven delay.

Illustrative benchmark: 0.5–1.0 min per flight in a normal year; target ≤ 0.5 min

KPI 12 — Airport / terminal ATFM delay

Minutes per flight

ATFM delay attributed to arrival flow restrictions at a given airport and its associated terminal airspace volume. Reading KPI 07 and KPI 12 together shows whether the constraint sits in the network or at the destination.

Illustrative benchmark: 0.5–1.5 min per flight; target ≤ 0.5 min

GROUP 3 OF 8

Surface and terminal efficiency

KPI 02 — **Taxi-out additional time** — Minutes per flight

Actual taxi-out time compared with an unimpeded reference time for the same stand-to-runway pairing. The excess captures congestion on the manoeuvring area and departure queuing — time burnt with engines running.
Illustrative benchmark: 3–5 min per flight at a large hub; target ≤ 3 min

KPI 13 — **Taxi-in additional time** — Minutes per flight

The same comparison for the arrival phase: actual taxi-in time against an unimpeded reference, over the duration of the taxi-in phase of arriving flights. It exposes stand availability and apron congestion issues.
Illustrative benchmark: 1–2 min per flight; target ≤ 1 min

KPI 08 — **Additional time in terminal airspace** — Minutes per flight

Actual transit time within terminal airspace compared with an unimpeded time, typically measured from a radius around the airport to landing. It quantifies holding and vectoring on arrival — a major contributor to both fuel burn and noise.
Illustrative benchmark: 2–4 min per flight; target ≤ 2 min

GROUP 4 OF 8

Capacity and throughput

KPI 06 — En-route airspace capacity

Flights per hour

The maximum volume of traffic an airspace volume will safely accept under normal conditions in a given period — the supply side of the network.

Illustrative benchmark: 40–60 flights per hour per sector group

KPI 09 — Airport peak capacity

Movements per hour

The highest number of operations an airport can accept in a one-hour time frame, also known as declared capacity.

Illustrative benchmark: 40 movements/hour single runway; 80–90 for dual independent runways

KPI 10 — Airport peak throughput

Movements per hour

The 95th percentile of hourly operations actually recorded, taken across rolling hours sorted from least to most busy — what the airport really delivers at the top end.

Illustrative benchmark: within 5–10% of declared capacity

KPI 11 — Airport throughput efficiency

%

Achieved throughput compared with capacity or demand, whichever is lower. It answers whether declared capacity is genuinely usable in practice.

Illustrative benchmark: 90–95%; target ≥ 95%

GROUP 5 OF 8

Horizontal flight efficiency

KPI 04 **Filed flight plan en-route extension** % over ideal distance

Flight-planned en-route distance compared with a reference ideal trajectory, usually the great-circle distance. Because it is measured before departure, it isolates inefficiency built into the route network and airspace design itself.
Illustrative benchmark: 3–5% above great-circle distance; target ≤ 3%

KPI 05 **Actual en-route extension** % over ideal distance

Actual distance flown en route compared with the same ideal reference. The gap between KPI 05 and KPI 04 is the extra distance added on the day by tactical vectoring, weather avoidance and traffic sequencing.
Illustrative benchmark: 2–3% above the filed plan; target ≤ 2.5%

GROUP 6 OF 8

Vertical flight efficiency

KPI 17 **Level-off during climb** — Distance & minutes

Distance and time flown in level flight before top of climb. Every interruption to a continuous climb keeps the aircraft at a less efficient altitude for longer and adds fuel burn.
Illustrative benchmark: < 10 km and < 1 min per flight

KPI 18 **Level capping during cruise** — Flight levels

The flight level difference between the maximum levels achieved on a measured airport pair and those achieved on comparable unconstrained pairs — a direct measure of airspace design or military-reservation constraints.
Illustrative benchmark: ≤ 1 flight level below comparable unconstrained pairs

KPI 19 **Level-off during descent** — Distance & minutes

Distance and time flown level after top of descent. It is the counterpart to KPI 17 and the practical measure of how close arrivals get to a continuous descent operation.
Illustrative benchmark: 15–25 km and 2–3 min per flight; target ≤ 15 km

Environmental impact

KPI 16 — Additional fuel burn

kg fuel per flight

Additional flight time, distance and vertical inefficiency converted into estimated extra fuel burn attributable to ATM, computed across actual IFR flights. It is the roll-up metric that expresses every efficiency indicator in one currency: fuel, and therefore CO_2. It is built from the taxi, terminal, en-route and level-off KPIs, each multiplied by an average fuel flow for that phase of flight.

Illustrative benchmark: 50–100 kg per flight; typical target: −10% over five years

KPI 24 — People and area impacted by significant noise

People / area

Quantification of the population and area size exposed to noise above specified thresholds, measured across take-off, departure, arrival and approach operations. Unlike the fuel indicator, this one captures a local rather than global effect — which is why noise abatement routings and efficiency objectives sometimes pull in opposite directions.

Illustrative benchmark: population inside the 55 dB Lden contour; target no growth versus baseline

GROUP 8 OF 8

Safety

KPI 20 — Number of aircraft accidents

Accidents per year

Accidents as defined in ICAO Annex 13, counted across all flight phases within the State or region of occurrence, with a GASP variant covering scheduled commercial air transport.

Illustrative benchmark: global commercial rate ~1.9 accidents per million departures

KPI 21 — Number of runway incursions

Occurrences per year

Occurrences at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for landing and take-off.

Illustrative benchmark: < 10 per million movements; zero high-severity (category A/B)

KPI 22 — Number of runway excursions

Occurrences per year

Veer-offs or overruns of the runway surface, counted per year.

Illustrative benchmark: < 1 per million movements

KPI 23 — Airprox, TCAS alerts and separation losses

Occurrences per year

Airproxes, TCAS alerts, losses of separation, near midair collisions and midair collisions between aircraft in flight.

Illustrative benchmark: zero high-severity losses of separation per year

PUTTING IT TO WORK

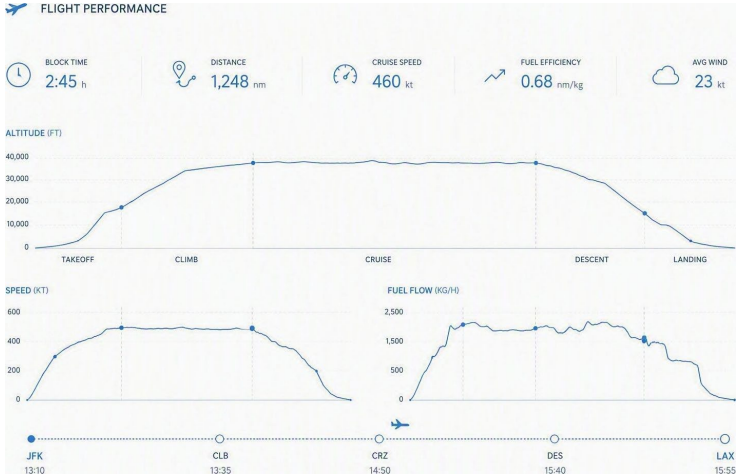
Reading the KPI set together

Pair supply with demand.
Capacity KPIs (06, 09) only mean something next to throughput and delay (10, 11, 07, 12).

Trace delay to its phase.
Taxi, terminal, en-route and level-off indicators localise where time is actually lost.

Convert inefficiency to fuel.
KPI 16 aggregates horizontal and vertical inefficiency into a single environmental figure.

Never trade safety for efficiency.
KPIs 20–23 are the constraint every other indicator is optimised within.



Most indicators are computed for traffic flows, individual airports, or clusters of airports grouped by size or geography — comparisons are only valid within like-for-like groupings.

What the measurement depends on

Flight timestamps

Scheduled and actual off-block, take-off, landing and in-block times per flight.

Reference trajectories

Unimpeded taxi times, ideal great-circle distances and unconstrained level profiles.

Trajectory data

Radar or ADS-B tracks to derive distance flown, level-offs and terminal transit times.

Data feed providers

Schedule databases, airports, airlines and ANSPs — consistency across them sets the ceiling on comparability.

Every KPI also carries defined parameters and thresholds — such as the 5 and 15 minute punctuality windows — that must be fixed before results are compared across States or years.