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Template for designing an ACDM KPI

A well-designed A-CDM KPI template is a crucial tool for standardizing performance measurement, ensuring consistency in data collection and analysis, and facilitating clear communication among stakeholders. It provides a structured format for defining each KPI, its calculation methodology, targets, and data sources.

A structured presentation of performance indicators ensures a more accurate analysis of the operations and therefore fosters improvements of A-CDM in the long run.

The KPIs may be structured around strategic objectives (e.g. Increase airport efficiency):

- For each objective, one or more strategic performance drivers may be defined (e.g. Improve punctuality, Reduce delays).
- A strategic performance driver can, in turn, be associated to several performance drivers (e.g. optimize turnaround time predictability).
- These performance drivers are associated with a set of performance indicators and related measures (e.g. Turnaround compliance).

Appendix 1 presents an example of strategic objective with associated strategic performance driver, performance drivers, performance indicators and measures.

1. Essential Structural Elements of a KPI Template

Drawing from general best practices for KPI management and specific considerations for the aviation and A-CDM context, an effective A-CDM KPI template should include the following structural elements for each KPI:

- **KPI Name:** A clear, concise, and unique name for the indicator.
- **Unique ID:** A reference code (e.g., ICAO KPI01, Local-001) for easy tracking and database management.
- **Strategic Objective Alignment / Key Performance Area (KPA):** Specifies which overarching A-CDM or airport strategic objective(s) the KPI measures (e.g., Predictability, Efficiency, Capacity, Safety, Environment). This links operational metrics to strategic goals.
- **Detailed Definition:** An unambiguous explanation of what the KPI measures, ensuring common understanding among all stakeholders.
- **Formula / Calculation Method:** A precise, step-by-step algorithm or mathematical formula used to compute the KPI value. This should include any specific conditions or exclusions.
- **Target Value / Benchmark:** The desired level of performance for the KPI. This could be based on historical performance (baseline), industry benchmarks, regulatory requirements, or continuous improvement goals (e.g., 10% improvement over baseline). The rationale for the target should be documented.
- **Data Requirements:** A list of all specific data elements needed to calculate the KPI (e.g., AOBT, ATOT, CTOT, STD, aircraft type).
- **Data Source(s):** Identification of the specific systems, databases, or stakeholders responsible for providing each required data element (e.g., A-CDM platform, Airport Operational Database (AODB), ATC system, Airline data feeds, Ground Handler reports).

- **Measurement Unit:** The unit in which the KPI is expressed (e.g., %, minutes, minutes/flight, count, ratio).
- **Reporting Frequency:** How often the KPI is calculated and reported (e.g., real-time, hourly, daily, weekly, monthly, annually).
- **Owner / Responsible Party:** The individual, team, or department accountable for the KPI's data integrity, calculation, monitoring, analysis, and for initiating corrective actions if performance deviates from target. In a multi-stakeholder A-CDM environment, defining ownership is critical for accountability.
- **Notes / Interpretation Guidance / Variants:** A section for any additional relevant information, such as:
    - Contextual factors that might influence the KPI.
    - Assumptions made in the calculation (e.g., definition of "unimpeded time").
    - Known data limitations or quality issues.
    - Different variants of the KPI calculation for specific circumstances (e.g., basic vs. advanced calculations based on data availability).[16]
    - Guidance on how to interpret KPI values and trends.

2. Guidance on Customizing the Template

While a standardized template provides a strong foundation, it must be adaptable to the unique characteristics and needs of each airport. Customization should consider:

- **Local Airport Needs and Priorities:** The selected KPIs should address the most pressing operational challenges and strategic goals of the specific airport.
- **A-CDM Maturity Level:** Airports in the early stages of A-CDM implementation (e.g. ASBU B0-ACDM information sharing) might focus on foundational KPIs related to data sharing quality and milestone achievement. More mature implementations (ASBU B2-ACDM) can incorporate more sophisticated KPIs measuring integrated planning effectiveness and optimization outcomes.
- **Data Availability and Quality:** The feasibility of calculating certain KPIs depends on the available data and its reliability. The template should reflect what can be realistically and accurately measured.
- **Stakeholder Requirements:** The KPIs should provide actionable insights for all key A-CDM partners. The process of customizing and agreeing upon the KPI template should be a collaborative effort involving all stakeholders to ensure buy-in and relevance.[21]
- **Actionability:** Focus on KPIs that can be influenced by the A-CDM partners and lead to tangible improvements. Avoid "vanity metrics" that do not drive decision-making or operational change.

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3. Key categories of ACDM KPIs

Here are some key categories of ACDM KPIs:

KPIs	Departure Punctuality	Taxi-Out Additional Time	Arrival Punctuality	Average Aircraft Turnaround Time	Baggage delivery time
Strategic Objective / KPA	Predictability	Efficiency, Environment	Predictability	Efficiency, Stand Capacity	Customer experience
Detailed Definition	% of flights departing from gate on-time vs. STD.	Actual taxi-out time vs. unimpeded taxi-out time.	% of flights at the stand on time vs.STA	Avg. time aircraft spends at stand (AIBT to AOBT).	From AIBT to the last baggage's delivery time
Formula	(On-time Departures / Total Sched. Deps) * 100%	Actual Taxi-Out – Unimpeded Taxi-Out	(On-time arrivals / Total Sched.Arrivals) * 100%	AOBT – AIBT)	Last bagages delivery time- AIBT
Target Value	>85% (within 15 mins of STD)	< 5 minutes (vs. baseline)	>85% (within 15 min STA)	< 45 mins (for narrow-body, type-specific)	< 45min depend on aircraft
Data Requirements	STD, AOBT	AOBT, ATOT, Unimpeded Taxi-Out Time data	STA, AIBT	AIBT, AOBT	AIBT,
Data Source(s)	Airline Sched, Airport Systems	Airport Systems, ANSP	ATFM System, Airport Systems	Airport Systems, Ground Handler	AODB
Measurement Unit	%	Minutes/flight	%	Minutes	Minutes
Reporting Frequency	Daily, Monthly	Daily, Monthly	Daily, Monthly	Daily, Monthly	Daily, Monthly,for each flight
Responsible	Airport Operations / Airline Rep.	Airport Operations / ANSP	Airport Operations	Airport Operations / Ground Handler Rep.	Airport Operations,handler
Notes / Variants	STD +/- 15 min window. Excludes non-sched.	Unimpeded time by runway/gate pair if avail.	STA +/- 15 min window. Excludes non-sched.	Analyze by A/C type, airline.	From 15min to 45 min

APPENDIX 1:

EXAMPLE OF KPIS STRATEGIC OBJECTIVE, PERFORMANCE DRIVERS AND INDICATORS

Strategic objective: *Increase airport efficiency*

Strategic performance driver: *Improve punctuality and reduce delays*

Performance driver	Performance indicator	Performance measurement
Optimize turnaround time predictability	Turnaround compliance	Measure ATTT vs. (SIBT-SOBT)*. Compare MTTT to ATTT
Improve arrival time (ARR) predictability	– Estimated in-block time (EIBT) predictability – Estimated landing time (ELDT) predictability	Measure EIBT vs. time (timeliness). Measure ELDT vs. time (timeliness).
Improve departure time (DEP) predictability	TOBT accuracy and predictability	Compare TOBT to aircraft ready time (ARDT)
Improve the DEP predictability	TSAT accuracy and predictability	Compare TSAT to AOBT.
Reduce aircraft operators/ ground handlers/ANSP reaction times	READY reaction time	Measure AOBT vs. ARD
Reduce average delay of ARR flights	Average delay of ARR flights ARR punctuality index	Compare actual in block time (AIBT) to schedule in block time (SIBT). Measure minutes delay per delayed movement
	Time recovery ratio	Measure percentage (DEP delay < ARR delay)/ARR delay percentage. Calculation: number of rotations which DEP delay is smaller than ARR delay divided by number of ARR delays
	Time lost ratio	Measure percentage (DEP delay > ARR delay)/ARR delay percentage. Calculation: number of rotations which DEP delay is bigger than ARR delay divided by number of ARR delays.
Reduce average delay of DEP flights *	Average delay of DEP flights DEP punctuality index	Compare AOBT to SOBT Measure minutes delay per delayed movement
Improve punctuality *	Punctuality recovery ratio	DEP punctual/ARR not punctual percentage.
Reduce average delay	Delay recovery time	Compare ARR delay in minutes to DEP delay in minutes