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A-CDM Performance Metrics Template (Measurement Framework)

This template provides a structured approach to defining and tracking Key Performance Indicators (KPIs) for Airport Collaborative Decision Making (A-CDM). It aims to help airports and stakeholders establish a clear measurement framework to assess the effectiveness and benefits of their A-CDM implementation.

1. Objectives:

- Clearly define the overall objectives of implementing A-CDM at the airport.
- Examples include:
    - Improve on-time performance (OTP) for departures and arrivals.
    - Increase runway throughput and airport capacity.
    - Reduce departure taxi times.
    - Enhance predictability of flight events.
    - Optimize resource utilization (gates, stands, etc.).
    - Improve stakeholder collaboration and information sharing.
    - Reduce environmental impact (e.g., engine running time).

2. Key Performance Areas (KPAs):

- Categorize the objectives into key performance areas to provide a structured overview. Examples include:
    - **Efficiency and Capacity:** Focuses on optimizing the use of airport infrastructure and resources.
    - **Predictability and Punctuality:** Measures the accuracy of timelines and the adherence to schedules.
    - **Collaboration and Information Sharing:** Assesses the effectiveness of communication and data exchange between stakeholders.
    - **Resource Management:** Tracks the utilization of airport resources.
    - **Environmental Impact:** Measures the environmental benefits of A-CDM.

3. Key Performance Indicators (KPIs):

- For each KPA, identify specific and measurable KPIs. Ensure that each KPI is:
    - **Specific:** Clearly defined and unambiguous.
    - **Measurable:** Quantifiable using available data.
    - **Achievable:** Realistic given the airport's context.
    - **Relevant:** Directly linked to the A-CDM objectives.
    - **Time-bound:** Tracked over specific periods.

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Key Performance Area	KPI	Unit of Measurement	Target Value (Example)	Baseline (if applicable)	Data Source(s)
Efficiency and Capacity	Runway Throughput	Movements per hour	X movements/hour	Y movements/hour	ATC,AOCC
	Average Departure Taxi Time	Minutes	< Z minutes	W minutes	ATC,AOCC
	Adherence to Calculated Take-Off Time (CTOT)	Percentage	> AA%	BB%	ATFM Systems, AODB
Predictability and Punctuality	Improvement in On-Time Performance (OTP) - Departures	Percentage	> CC%	DD%	Flight Data Systems, AODB
	Accuracy of Target Off-Block Time (TOBT) Prediction (within +/- X min)	Percentage	> EE%	FF%	AODB, Airline Systems
Collaboration and Information Sharing	Percentage of Flights with Updated Target Times Shared by Airlines	Percentage	> GG%	HH%	AODB
	Number of Stand Conflicts	Number	< II conflicts	JJ conflicts	AOCC/AODB/ATC
Resource Management	Average Gate Occupancy Time	Minutes	< KK minutes	LL minutes	AOCC/AODB
	Turnaround Time Variance (Planned vs. Actual)	Minutes	+/- MM minutes	+/- NN minutes	AODB, Airline Systems, Ground Handler Systems
Environmental Impact	Average Engine Running Time Before Take-Off	Minutes	< OO minutes	PP minutes	AODB, Fuel Monitoring Systems

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Data Collection and Analysis:

- Specify the data sources for each KPI and the methods for data collection.
- Define the roles and responsibilities for data gathering, validation, and analysis.
- Establish a process for regular data analysis and reporting.
- Consider using visualization tools to present the data effectively.

Target Setting and Benchmarking:

- Set realistic and challenging target values for each KPI, considering historical performance, industry benchmarks, and stakeholder expectations.
- Regularly review and adjust targets as needed based on performance and evolving operational needs.

Reporting and Communication:

- Define the reporting frequency and format for the A-CDM performance metrics.
- Identify the stakeholders who will receive the reports.
- Establish communication channels for discussing performance, identifying areas for improvement, and sharing best practices.

Review and Improvement:

- Regularly review the effectiveness of the A-CDM measurement framework.
- Assess whether the chosen KPIs are still relevant and providing valuable insights.
- Make adjustments to the framework, KPIs, and targets as necessary to ensure continuous improvement of the A-CDM implementation.

Customization:

- This template provides a general framework. You will need to customize it based on the specific context, objectives, and available data at your airport. Consider involving all relevant stakeholders in the process of defining KPIs and targets to ensure buy-in and ownership.
- By implementing a robust A-CDM performance metrics framework, airports can effectively monitor their progress, demonstrate the value of A-CDM, and drive continuous improvement in their operations.

APPENDIX: Examples of performance metrics

Strategic Performance Indicator	Performance Driver	Performance Indicator	Performance Measurement	Milestone Measurement	Stakeholders
1) Improve punctuality and reduce delays	Turnaround punctuality	Turnaround compliance	(ARDT - AIBT) - MTTT > or = 5 minutes (%) (ARDT - AIBT) - (SOBT – SIBT) > or = 5 minutes (%) AOBT – ARDT > or = 5 minutes (%)		Aircraft Operator Airport
	Arrival punctuality **(GANP KPI 14)**	In Block Time accuracy	ALDT – ELDT (minutes) ALDT - ELDT > or = 5 minutes (%) AIBT - SIBT > or = 15 minutes (%) AIBT – EIBT (minutes) AXIT – EXIT (minutes) # of missed approaches, go around per day per RWY (Include explicit times for the missed approaches for each runway)	@ Milestones 3, 4 and 5 @ Milestones 3, 4 and 5 @ Milestones 3, 4, 5 and 6 @ Milestones 3, 4, 5 and 6	Aircraft Operator Airport
	Departure punctuality **(GANP KPI 01)**	➢ Off Block accuracy (lag) ➢ Reduce departure delays	AOBT - SOBT > or = 15 minutes (%) ATOT - TTOT > or = 5 minutes (%) Measure delay @ AOBT-SOBT (minutes) AXOT - EXOT (minutes)	@ Milestones 4,5,6,7,9,10,12, 13,14,15 @ Milestones 4,5,6,7,9,10,12, 13,14,15	Aircraft Operator Airport ATFM

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Strategic Performance Indicator	Performance Driver	Performance Indicator	Performance Measurement	Milestone Measurement	Stakeholders
1) Improve punctuality and reduce delays (ct'd)	Reduce taxi out delay in minutes **(GANP KPI 02)**	➢ Average taxi out time in minutes across a 12-month period ➢ Taxi-out time against benefit baseline (lead) ➢ Taxi-out time accuracy (lag)	Taxi-out delay (minutes) to benefit baseline (minutes and fuel) Average (ATOT – AOBT) – benefit baseline (minutes) Taxi Out Time delay converted to fuel consumption on a flight by flight basis based on # engines and engine type	@ Milestone 15	ATC Aircraft Operator Airport
2) Optimise Airport Infrastructure	Improvement in the gate/bay/stand Utilisation % Time	Overall gate/bay/stand actual occupation time	Compare the overall actual gate/bay/stand occupation time with scheduled gate/bay/stand occupation time (minutes deviation) per flight Measure ARDT - AIBT per gate/bay/stand per flight by aircraft type	N/A	Airport Aircraft Operators
	Improvement in the gate/bay/stand Utilisation % Usage	➢ Gate/bay/stand usage ➢ Assess gate/bay/stand delay (lag)	Measure # of turns (rotations) on each gate/bay/stand per day by Aircraft type AOBT - SOBT (minutes) AOBT - SOBT > or = 15 minutes (%) Average TSAT – TOBT > or = 15 minutes (%)	@ Milestones 9, 10, 12, 13, 14, 15	Airports

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Strategic Performance Indicator	Performance Driver	Performance Indicator	Performance Measurement	Milestone Measurement	Stakeholders
3) Gate /Bay / Stand Management	Reduce the number of late gate/bay/stand changes (e.g. 10 minutes before ALDT) **(GANP KPI 13)**	➢ Gate/bay/stand allocation and passenger gate/bay/stand freezing time (lag) ➢ Gate/bay/stand allocation accuracy (lag) ➢ Gate/bay/stand/bay conflicts (lag)	# of late gate/bay/stand changes within [(ALDT- 10 min) to ALDT] Number of gate/bay/stand changes after landing [ALDT to AIBT] # of bay conflicts per day	@ Milestones 4, 5, 6, 7	Airports
4) Strategic Slot Management	Increase the # of flights that meet strategic slot compliance (GANP KPI 03)	Airport strategic slot adherence	AIBT - SIBT -/+ 30 minutes (%) AOBT- SOBT -/+ 30 minutes (%)	N/A	Aircraft Operators Airports
5) Reduce emissions	Reduce emission from engines on ground **(GANP KPI 16)**	Emission from engines on ground (lead)	Taxi-out delay (minutes) to benefit baseline (minutes and Co2)	N/A	ATC Aircraft Operators Airports
6) Congestion	Reduce number of aircraft moving simultaneously on the manoeuvring area	Number of aircraft queueing on sequence in high demand periods	Queue length (ATOT-AOBT) over a 15 min period, per hour over a 24-hour period	N/A	ATC Aircraft Operators Airports
7) ATFM Slot adherence	Increase ATFM slot adherence **(GANP KPI 03)**	Number of aircraft compliant with ATFM slot (CTOT)	ATOT – CTOT	@ Miletone16	