Departamento
de Controle do Espaço Aéreo
Department of Airspace Control

ATM047 – ATM Performance Indicators

ATM047 COURSE – ATM PERFORMANCE INDICATORS

Unit 1.2 – ATM PERFORMANCE INDICATORS

Subunit 1.2.1 – GANP Indicators

October - 2024

GANP INDICATORS

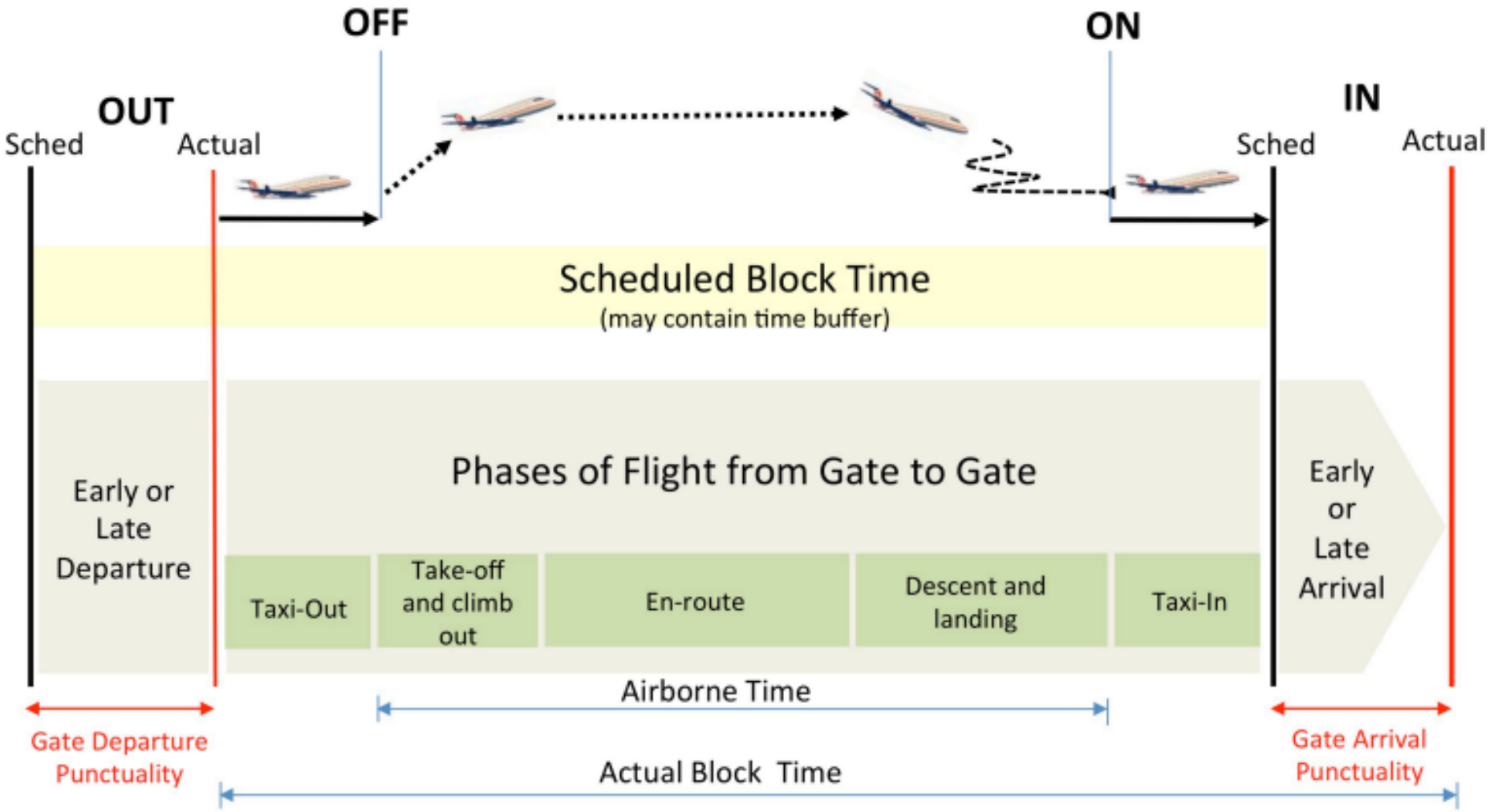
OBJECTIVE

Have knowledge on ATM Performance Indicators recommended by ICAO in the Global Air Navigation Plan (GANP).

KPI – GANP INDICATORS

MCA 100-22
SISCEAB ATM Indicators Methodology
(2020)

KPI – GANP INDICATORS



KPI – GANP INDICATORS

Título do Indicador	TEMPO ADICIONAL DE *TAXI-OUT* (KPI02)
Área do Negócio	Eficiência
Descrição do Indicador	Comparação entre o tempo de *taxi-out* desimpedido e o tempo de *taxi-out* real.
Objetivo	Este KPI tem como objetivo fornecer uma indicação da eficiência no táxi de saída no aeroporto. Isso pode incluir a espera média que ocorre em pistas de decolagem, rotas não otimizadas de táxi e paradas intermediárias durante o táxi de saída. Este KPI também é utilizado para estimar o excesso de consumo de combustível e emissões associadas. O KPI visa identificar o efeito do *layout* do aeroporto, enfocando a responsabilidade do ATM em aperfeiçoar o fluxo de tráfego saindo do *gate* para decolagem.
Identificação das Variáveis	AOBT ATOT Gate Cabeceira utilizada
Fórmula (Métrica)	$KPI_{02} = \frac{\sum Tempo\ adicional\ de\ taxi\ out}{\sum voos\ de\ saída}$

KPI – GANP INDICATORS

TAXI-OUT ADDITIONAL TIME

Definition – Actual taxi-out time compared to an unimpeded/reference taxi-out time.

Measurement Units – Minutes/flight.
Operations Measured – The duration of the taxi-out phase of departing flights.

Variants
Variant 1 – basic (computed without departure gate and runway data).
Variant 2 – advanced (computed with departure gate and runway data).

Objects Characterized – The KPI is typically computed for individual airports, or clusters of airports (selection/grouping based on size and/or geography).

KPI – GANP INDICATORS

TAXI-OUT ADDITIONAL TIME

Utility of the KPI – This KPI is intended to give an indication of the efficiency of the departure phase operations on the surface of an aerodrome. This may include the average queuing that is taking place in front of the departure runways, non-optimal taxi routing and intermediate aircraft stops during taxi-out.

The KPI is also typically used to estimate excess taxi-out fuel consumption and associated emissions (for the Environment KPA). The KPI is designed to filter out the effect of physical airport layout while focusing on the responsibility of ATM to optimize the outbound traffic flow from gate to take-off.

KPI – GANP INDICATORS

TAXI-OUT ADDITIONAL TIME

Parameters – Unimpeded/reference taxi-out time:

- Recommended approach for the basic variant of the KPI: a single value at airport level, e.g. the 20th percentile of actual taxi times recorded at an airport, sorted from the shortest to the longest.

- Recommended approach for the advanced variant of the KPI: a separate value for each gate/runway combination, e.g. the average actual taxi-out time recorded during periods of non-congestion (needs to be periodically reassessed).

KPI – GANP INDICATORS

TAXI-OUT ADDITIONAL TIME

Data Requirement

For each departing flight:

- Actual off-block time (AOBT).
- Actual take-off time (ATOT).

In addition, for the advanced KPI variant:

- Departure gate ID.
- Take-off runway ID.

KPI – GANP INDICATORS

TAXI-OUT ADDITIONAL TIME

Data Feed Providers – Airports (airport operations, A-CDM), airlines (OOOI data), ADS-B data providers and/or ANSPs.

Formula / Algorithm

At the level of individual flights:

1. Select departing flights, exclude helicopters.

2. Compute actual taxi-out duration: ATOT minus AOBT.

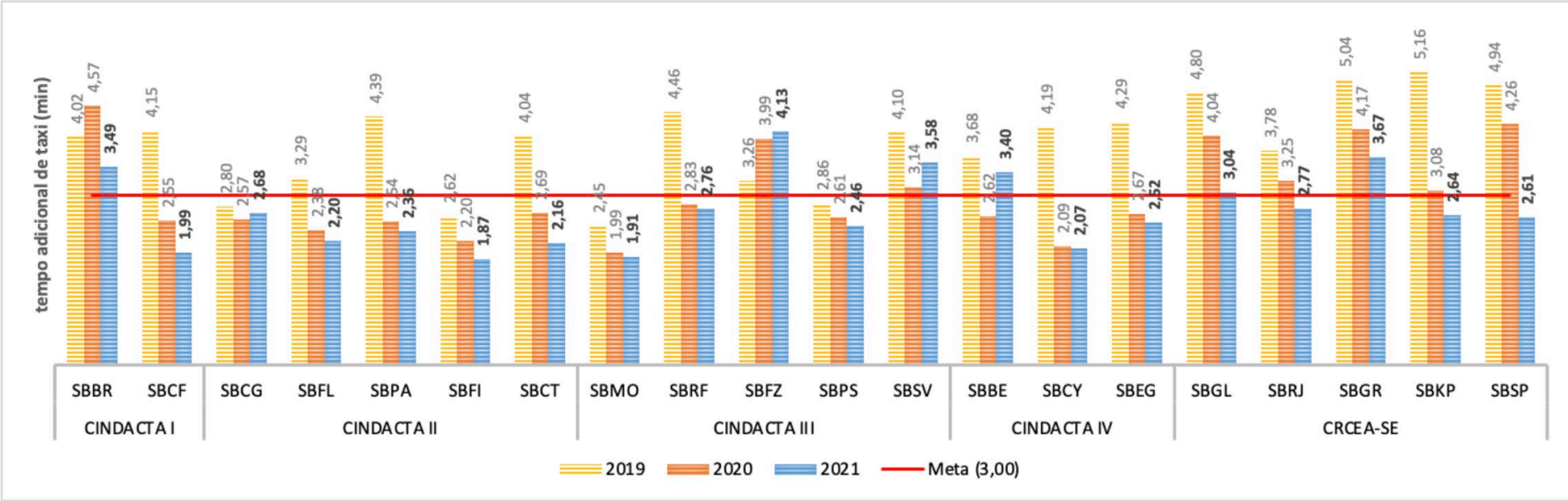
3. Compute additional taxi-out time: actual taxi-out duration minus unimpeded taxi-out time.

At aggregated level:

4. Compute the KPI: sum of additional taxi-out times divided by number of IFR departures.

KPI – GANP INDICATORS

Figura 48 - Tempo adicional de *taxi-out* por aeroporto



Fonte: BIMTRA.

Source: *Relatório de Performance do SISCEAB 2021*

KPI – GANP INDICATORS

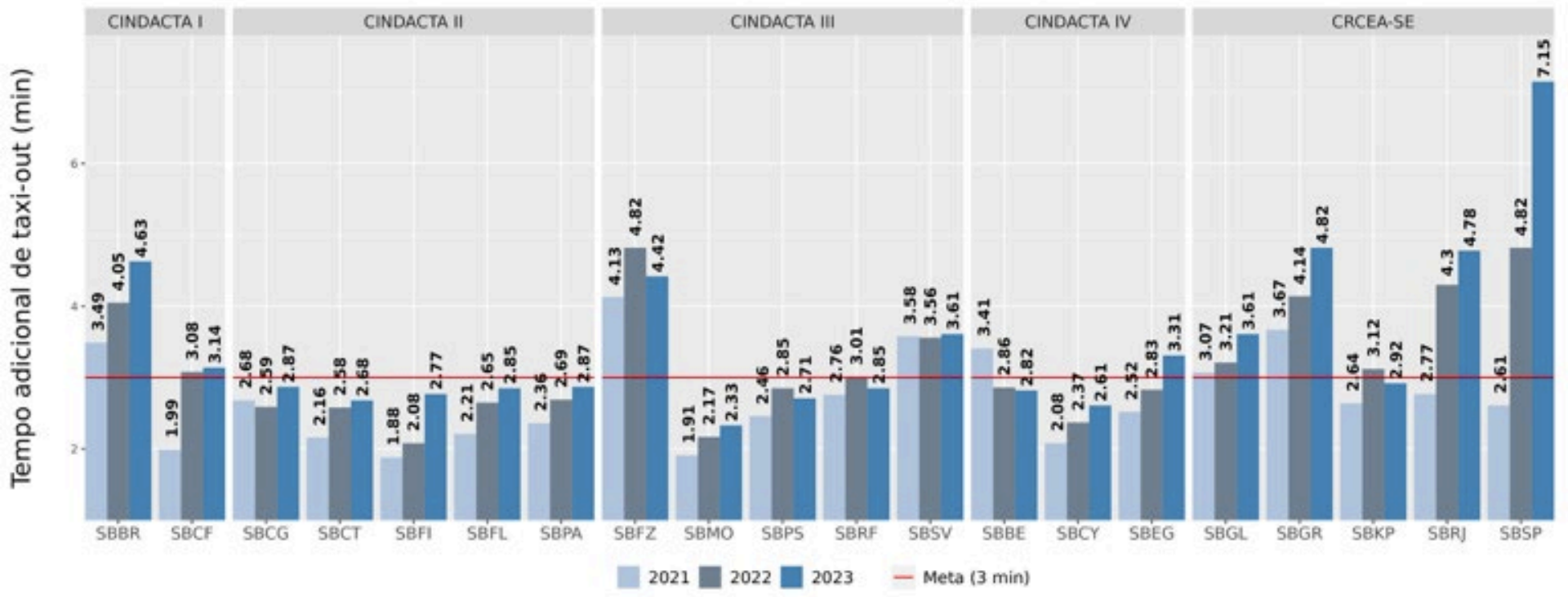


Figura 3.11: Tempo adicional de taxi-out (KPI02)

Source: *Relatório de Performance do SISCEAB 2023*

KPI – GANP INDICATORS

Título do Indicador	TEMPO ADICIONAL DE *TAXI-IN* (KPI13)
Área do Negócio	Eficiência
Descrição do Indicador	Comparação entre o tempo médio de táxi de chegada desimpedido e o tempo real por aeroporto ou conjunto de aeroportos
Objetivo	Este KPI tem como objetivo fornecer uma indicação da eficiência no táxi de chegada no aeroporto. Isso pode incluir a espera média que ocorre em rotas não otimizadas de táxi e paradas intermediárias durante o táxi de saída. Este KPI também é utilizado para estimar o excesso de consumo de combustível e emissões associadas. O KPI visa identificar o efeito do *layout* físico do aeroporto, enfocando a responsabilidade do ATM em aperfeiçoar o fluxo de tráfego chegando no *gate*.
Identificação das Variáveis	AIBT ALDT Gate Cabeceira utilizada
Fórmula (Métrica)	$KPI_{13} = \frac{\sum Tempo\ adicional\ de\ taxi\ in}{\sum voos\ de\ chegada}$

KPI – GANP INDICATORS

TAXI-IN ADDITIONAL TIME

Definition – Actual taxi-in time compared to an unimpeded/reference taxi-in time.
Measurement Units – Minutes/flight.
Operations Measured – The duration of the taxi-in phase of arriving flights.

Variants
Variant 1 – basic (computed without landing runway and arrival gate data).

Variant 2 – advanced (computed with landing runway and arrival gate data).

Objects Characterized – The KPI is typically computed for individual airports, or clusters of airports (selection/grouping based on size and/or geography).

KPI – GANP INDICATORS

TAXI-IN ADDITIONAL TIME

Utility of the KPI – This KPI is intended to give an indication of the various taxi-in inefficiencies that occur after landing. Its value may be influenced by unavailability of the arrival gate and effects such as non-optimal taxi routing and intermediate aircraft stops during taxi-in.

The KPI is also typically used to estimate excess taxi-in fuel consumption and associated emissions (for the Environment KPA). The KPI is designed to filter out the effect of physical airport layout while focusing on the responsibility of the airport to provide parking space and ATM to optimize the inbound traffic flow from landing to in-blocks.

KPI – GANP INDICATORS

TAXI-IN ADDITIONAL TIME

Parameters – Unimpeded/reference taxi-in time::

- Recommended approach for the basic variant of the KPI: a single value at airport level, e.g. the 20th percentile of actual taxi times recorded at an airport, sorted from the shortest to the longest.

- Recommended approach for the advanced variant of the KPI: a separate value for each runway/gate combination, e.g. the average actual taxi-in time recorded during periods of non-congestion (needs to be periodically reassessed).

KPI – GANP INDICATORS

TAXI-IN ADDITIONAL TIME

Data Requirement

For each arriving flight:

- Actual landing time (ALDT).
- Actual in-block time (AIBT).

In addition, for the advanced KPI variant:

- Landing runway ID.
- Arrival gate ID.

KPI – GANP INDICATORS

TAXI-IN ADDITIONAL TIME

Data Feed Providers – Airports (airport operations), airlines (OOOI data), ADS-B data providers and/or ANSPs

Formula / Algorithm
At the level of individual flights::

1. Select arriving flights, exclude helicopters.

2. Compute actual taxi-in duration: AIBT minus ALDT.

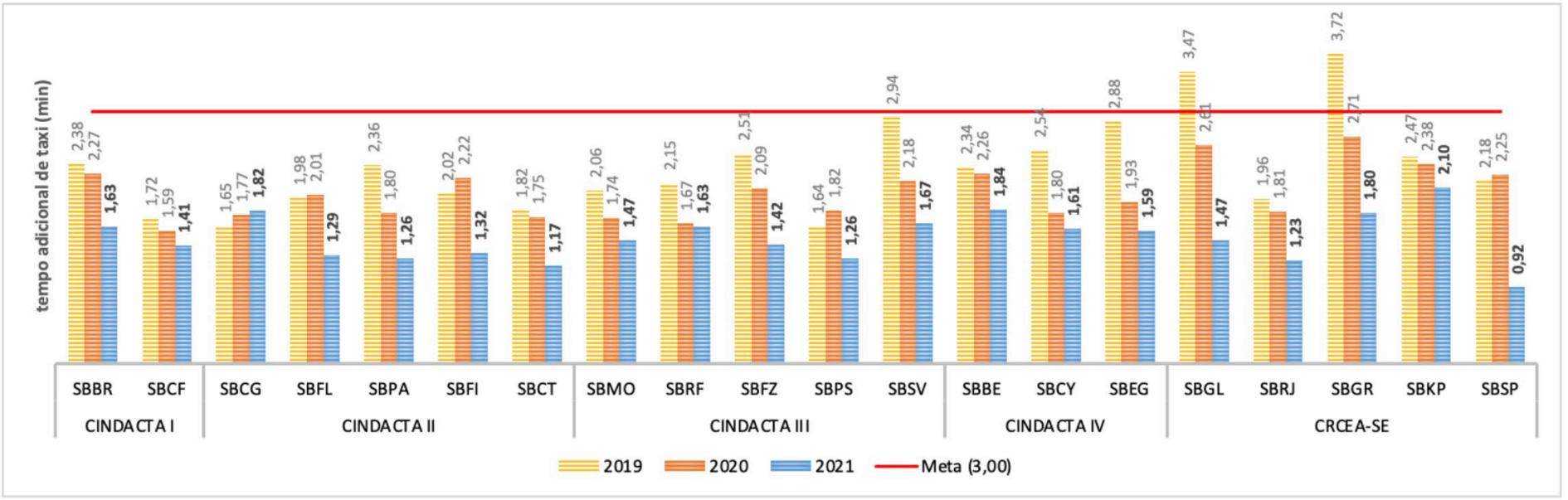
3. Compute additional taxi-in time: actual taxi-in duration minus unimpeded taxi-in time.

At aggregated level:

4. Compute the KPI: sum of additional taxi-in times divided by number of IFR arrivals.

KPI – GANP INDICATORS

Figura 52 - Tempo adicional de *taxi-in* por aeroporto



Fonte: BIMTRA.

Source: *Relatório de Performance do SISCEAB 2021*

KPI – GANP INDICATORS

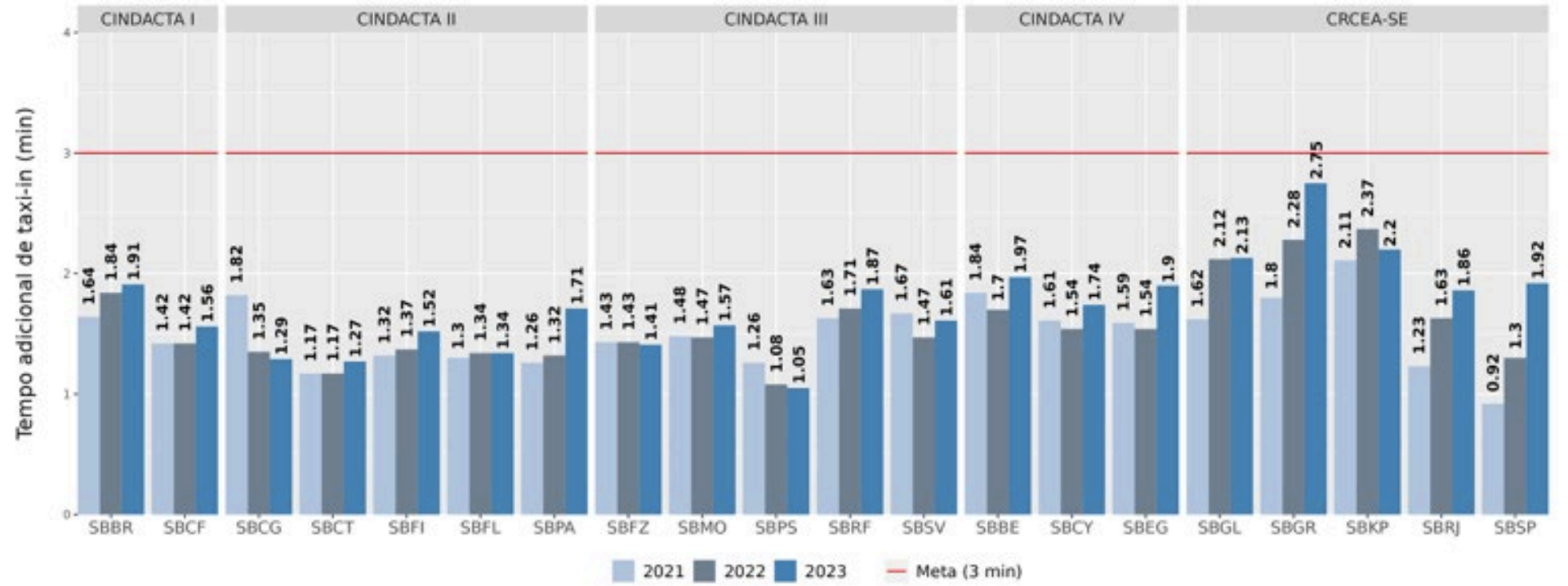


Figura 3.13: Tempo adicional de *taxi-in* (KPI13)

Source: *Relatório de Performance do SISCEAB 2023*

KPI – GANP INDICATORS

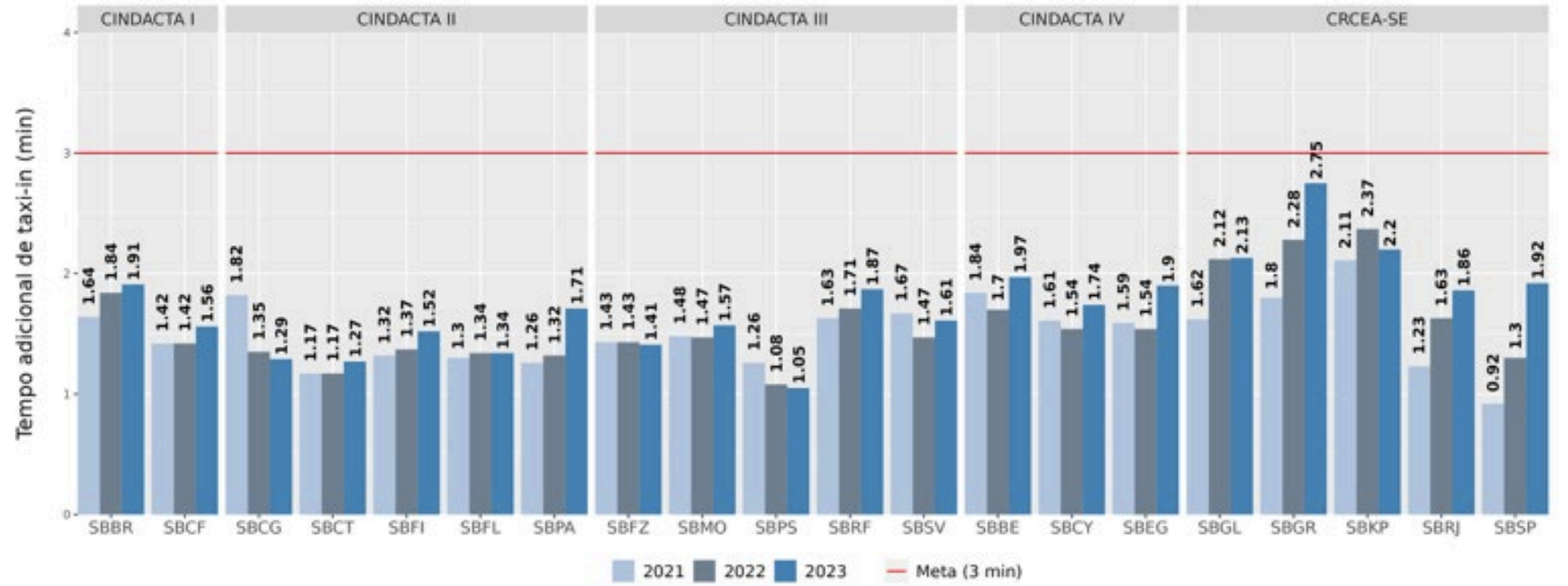


Figura 3.13: Tempo adicional de *taxi-in* (KPI13)

Source: *Relatório de Performance do SISCEAB 2023*

KPI – GANP INDICATORS

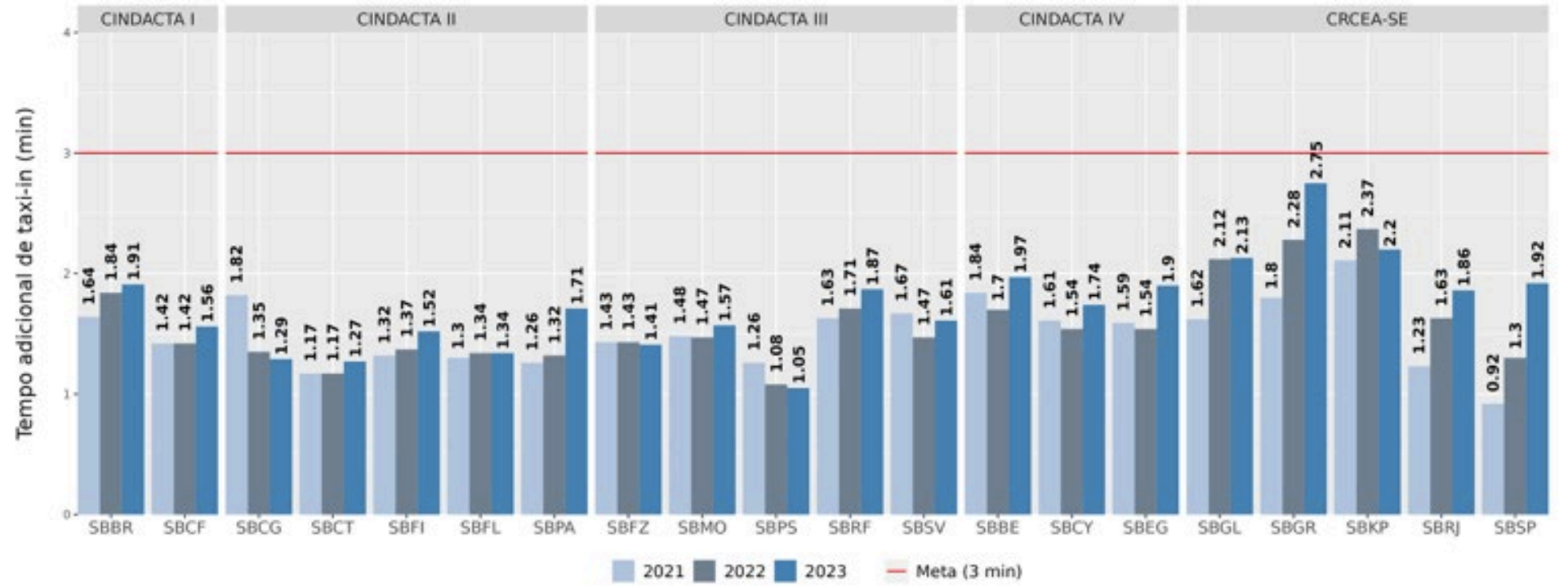
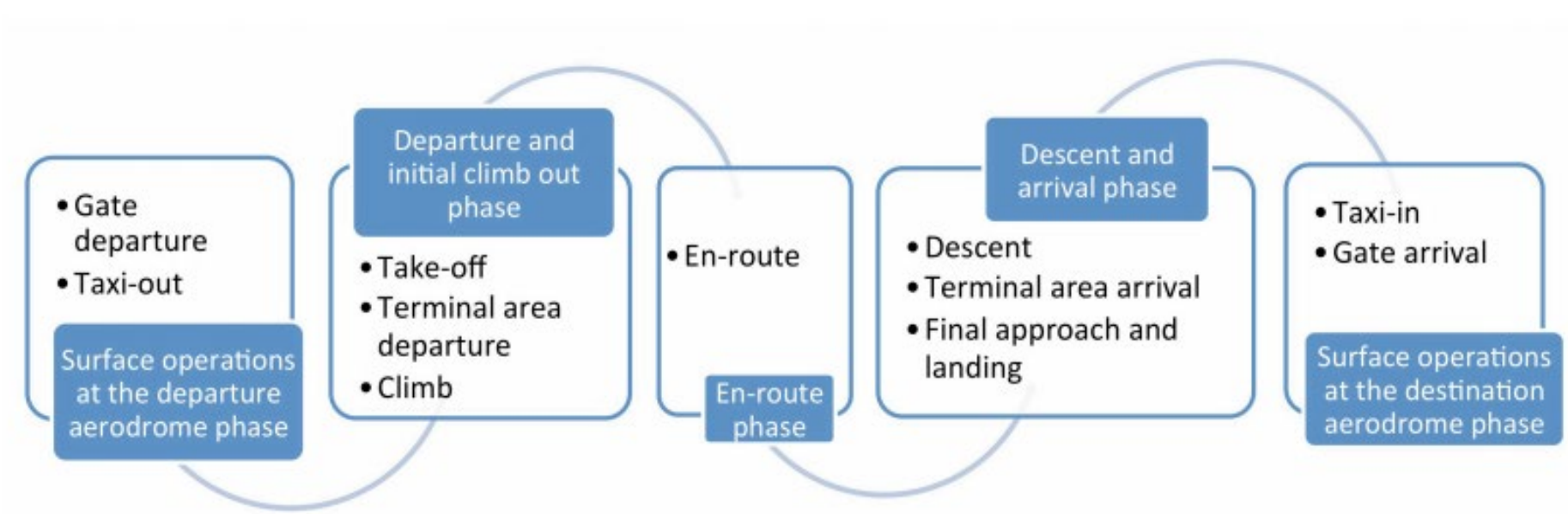


Figura 3.13: Tempo adicional de *taxi-in* (KPI13)

Source: *Relatório de Performance do SISCEAB 2023*

KPI – GANP INDICATORS



KPI – INDICADORES GANP

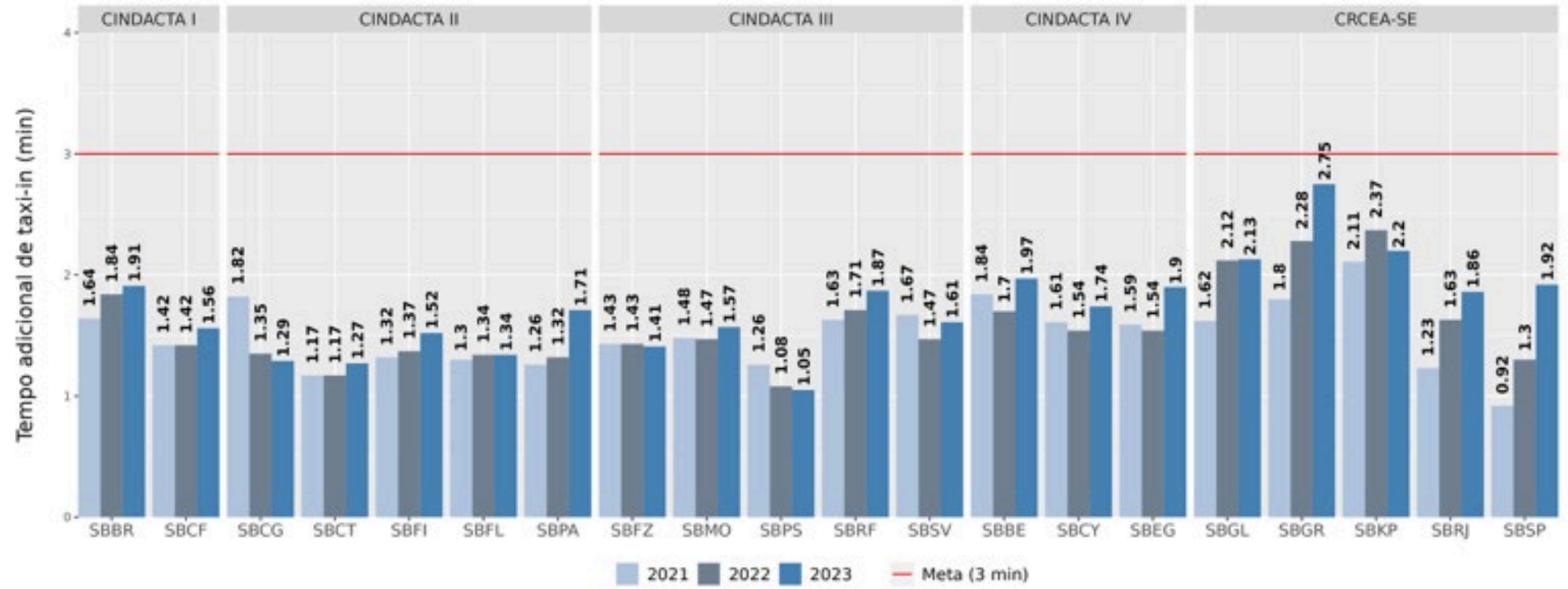


Figura 3.13: Tempo adicional de *taxi-in* (KPI13)

Source: *Relatório de Performance do SISCEAB 2023*

Muito obrigado!

CURSO ATM047 – INDICADORES DE DESEMPEÑO ATM

Unidad 1.2 – INDICADORES DE DESEMPEÑO ATM

Subunidad 1.2.1 – INDICADORES GANP

Departamento
de Controle do Espaço Aéreo
Department of Airspace Control

FORÇA AÉREA BRASILEIRA
Asas que protegem o País