



# Deep Turnaround

Predictable turnarounds,  
fewer delays, and improved  
collaboration



# Turnaround improvements driven by AI-generated insights

Deep Turnaround helps airports improve their aircraft turnaround processes based on historic, real-time and predictive insights for all stakeholders. We do this by leveraging data and artificial intelligence, but we don't stop there.

How do you fully integrate the insights in your gate-planning process? How do you make sure airlines and ground-handlers are on board? And how can this be your first step towards an autonomous apron operation? We help you shape an environment where Deep Turnaround leads to actual value for all partners. Schiphol's experience as an airport is key in fostering the base of success for this cutting-edge technology.

## Deep Turnaround: Foundational technology for achieving strategic goals

At Schiphol, Deep Turnaround is considered a foundational technology, imperative to achieving our strategic goals. Over the years, technological advancements and increased interest from sector partners, have driven Schiphol to continuously improve the Deep Turnaround solution to be faster, more efficient, accurate, while being easy to use. The availability of actionable insights has created a large group of Deep Turnaround users.

Here's why we are the right turnaround solution partner for you:

### **Airport experience**

As an airport, we know what it takes to make this happen. Insights alone don't bring you value. You will benefit from our learnings and our expertise to ensure value is created from the start.

### **One data Model for all airports**

Our unique data model and technical capabilities bring you accuracy, efficiency, maintainability and experience with limited required calibration at your airport.

### **End-to-end delivery**

You want a solution that delivers results. Schiphol and its partners, PA Consulting and Microsoft, bring years of tech implementations and run experience to the table. We've got you covered, end-to-end.

## **The Turnaround process – a source of delays and misalignment**

The turnaround process, at the heart of airport processes and yet a blind spot in terms of insight. Every day, this is causing delays, capacity inefficiencies and posing challenges in collaboration with sector partners.

At most airports, between 40-50% of delays occur during the turnaround process. Delays usually lead to more delays: delays in the turnaround of one aircraft can lead to a last-minute gate change for another, which again could cause delays in ground handling leading to a missed runway slot. Throughout this process, we often see misalignment between all involved sector partners, with different perspectives of the truth. Deep Turnaround is here to help.

# Deep Turnaround: Know, predict, plan improve

## Decrease the number and duration of delays

Deep Turnaround gives insight into what before was a blind-spot in data. Historical insights provide the opportunity to change processes structurally.

## More predictable turnarounds

Based on over 200 days of machine learning, Deep Turnaround's predictive capabilities detects delays before anyone else can.

## A single source of truth for all stakeholders

Effective communication is key for effective airport processes. Objective turnaround data facilitates a base for constructive discussion and cooperation.

# Choose the right product for your airport

Using AI image-based processing, the Deep Turnaround algorithm detects and reports over 70 unique turnaround events in 30 turnaround processes. After coupling this data to flight data, a second algorithm comes into action. Having learned from other turnarounds, it is able to detect delays as early as 40 minutes before the targeted off-block-time, allowing for informed decisions to improve processes.

Finally, the insights are conveniently made available to you through a dashboard and/or data stream. We offer three type of packages of our Deep Turnaround solution:

## Turnaround Insights Dashboard

Access to the turnaround insights dashboard, including:

- All turnaround events
- All predictive indicators
- Customisable dashboards; only share specific turnaround data with groups you choose

## Deep Turnaround Data Stream

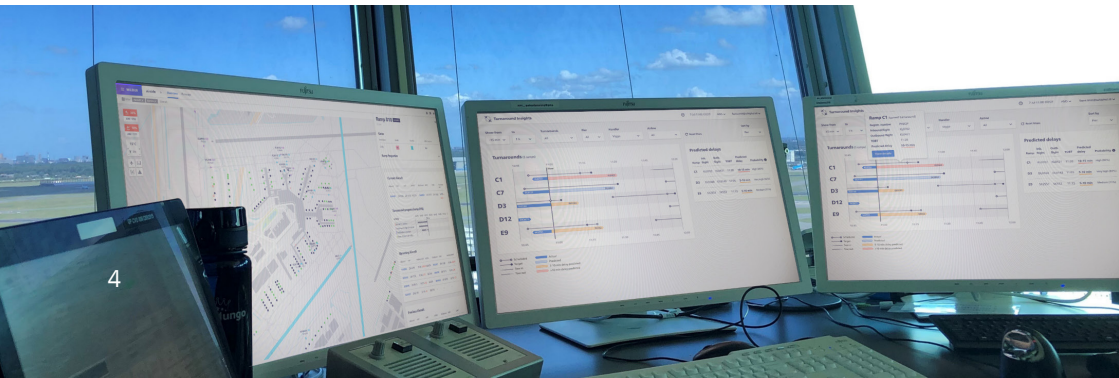
Access to a real-time data stream of all turnaround events, including:

- All turnaround events
- All predictive indicators
- Access to historical data to conduct analyses

## Deep Turnaround Data Stream + Turnaround Insights Dashboard

Access to a real-time data stream of all turnaround events, including:

- All turnaround events
- All predictive indicators
- Customisable dashboards; only share specific turnaround data with groups you choose
- Access to historical data to conduct analyses



# The value at Schiphol explained

## Optimal slot usage

Runway slot allocation is used in congested airports to share scarce airport resources. Runway slots can be missed due to turnaround delays, waiting for the next available slot can take a long time. Deep Turnaround gives decision-makers timely information on predicted delays. This allows airports and airlines to optimise available airspace, reduce the duration of delays, and improve on time performance by up to 2%.



## Fewer last-minute gate changes

Looking forward to fewer airplanes with long buffer times and fewer last-minute passenger flows in the terminal? The predictive features of Deep Turnaround can reduce the need for last-minute gate changes by 25-50%. It does so based on the availability of more accurate and timely information to initiate a gate change, as well as better-informed decision by gate planners to buffer an aircraft. This directly impacts on-time performance.



## More efficient asset & workforce utilisation

Resources are scarce in the turnaround process and idle time is costly. Yet it's hard to plan realistically, as operations coordinators often have limited information on all current turnarounds. By providing real-time and predictive information about the turnaround process, Deep Turnaround allows you to plan more realistically and replan when necessary. Improving asset usage, resulting in lower idle time, and lower peak pressure for employees.





# Here's how to make this work at your airport

Awesome, you've made the decision to implement Deep Turnaround at your airport. Here's how we make sure Deep Turnaround delivers the value you expect it to at your airport.

## Step 1: Preparation

First, we determine which package (product, support module, add-ons) is most suitable for your airport. In addition, we will jointly develop a camera plan for your airport, allowing a clear view of the aprons in scope, and we validate the technical requirements.

## Step 2: Deployment

During deployment, cameras will be mounted on site (with your local contractor), The full system architecture is deployed including any physical or virtual infrastructure and integrations with input data is established. The AI model will be calibrated and tested.

## Step 3: Validation and go-live

The system is made live in a production state and all stakeholders are offered role specific demonstrations and training. To make the deployment of Deep Turnaround a success, user onboarding is key and is always included.

## Step 4: Support

During the first months we monitor performance closely and improve the predictive model based on the first data collected at your airport. In addition, we ensure users and stakeholders get confident in using the solution and improving the processes.

# Frequently asked questions

## Who are the typical users of the Deep Turnaround solution?

At Schiphol, the main users of the Deep Turnaround solution are Airport Gate Planners, Air Traffic Control, Ground Handlers, Flight Officers, Apron Controllers and Operational Excellence Managers. In the future, we expect to include features which can benefit safety and sustainability officers/managers as well.

## How many turnaround events are included in your model?

There are 70 turnaround events included in our model, giving insight in over 30 turnaround processes. If you choose to implement Deep Turnaround at your airport, all turnaround events which we have access to at Schiphol are included automatically.

## Is Deep Turnaround suitable for my airport?

Deep Turnaround is suitable for most airports, small and large, and irrespective of apron design. Whether you plan to integrate Deep Turnaround in your own dashboarding using the data stream, or whether you plan to use the Turnaround Insights Dashboard. Deep Turnaround is especially suitable for capacity constrained airports.

## Can Deep Turnaround work with our own cameras?

Yes, under some conditions it is possible to use existing cameras. Cameras have to be IP cameras, as the Deep Turnaround solution needs to be able to connect to them through an HTTP(S) protocol. Furthermore, there are some requirements for how the cameras should be positioned on the apron (approx. 20 meters high), as well as for the image resolution of a minimum of 1280 x 720 pixels.

## How does your product compare to other products on the market?

We work with one end-to-end model of all turnaround events, instead of different models for each turnaround. This makes the model easier to maintain and more cost efficient. Also, our model works on the principle of sharing data, if you select the Deep Turnaround solution you opt-in that your data will be used to train the model. Similarly, you can benefit from the model that was trained at Schiphol Airport (200 training days). In addition, our solution is created at Amsterdam Airport Schiphol in collaboration with users, this allows us to make all Schiphol functionalities, now and in the future, available for other airports as well.

## How long does it take to implement the Deep Turnaround solution?

As our Deep Turnaround solution uses a single model approach, wherein one AI model learns more every time it processes an image, we do not need to start from scratch at your airport. The algorithm instead can build on what it already knows. From the moment the cameras are installed on the aprons, implementation is expected to take around six weeks. That includes setting up and configuring the Deep Turnaround system, integrating different data sources into the Deep Turnaround algorithm, performing security assessments, and training users.

## Our partners



### **Ready for a deeper dive?**

Do you want to increase the rate of innovation? Let's talk technology. Send an email to [aviationsolutions@schiphol.nl](mailto:aviationsolutions@schiphol.nl) to start the conversation.

*Find us on LinkedIn @ Schiphol Group Aviation Solutions*

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