NATS

SEARIDGE TECHNOLOGIES

From digital tower to digital airport

The Digital Control Tower was once a niche concept. Now it's a reality for a growing number of airports worldwide.

From London to Singapore via Budapest and Colorado, operations of all sizes and types are either going digital or preparing to do so.

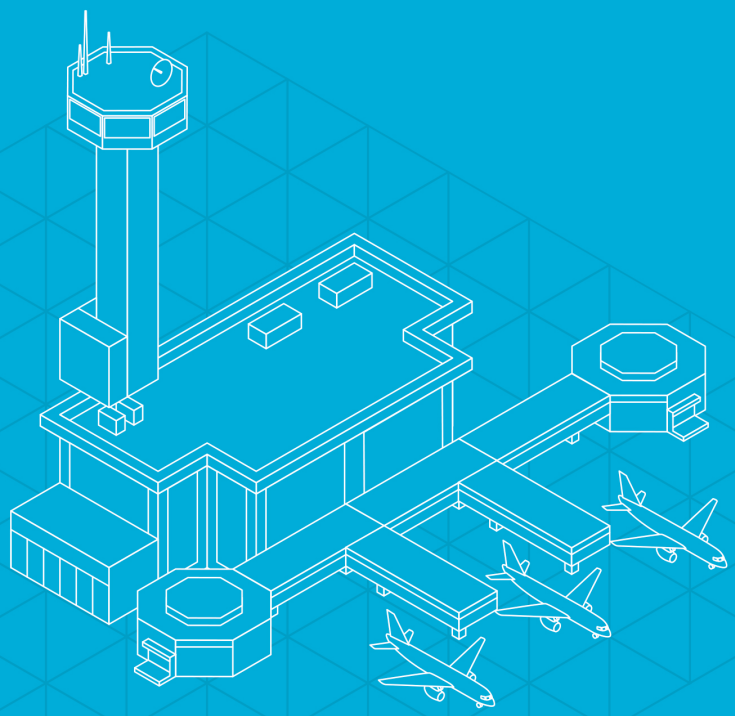
The time is right for a Digital Airport revolution.

What can digital do for you?
The pioneers and early adopters are doing great work to put digital solutions on the map. But many in our industry are still to grasp the extraordinary potential of this technology. They believe a digital tower is a facility in a remote location that looks to reproduce what a controller can already see.

But the reality is so much more. Taking separate 'analogue,' ATC and airport functions and connecting their data using state-of-the-art machine learning and video surveillance technology means better, more efficient performance across airports, airlines and ANSPs.

Enormous potential
It's an exciting time to be working with emerging technology like this.

The reality is that a 'digital tower' can be whatever an airport needs it to be - from a turnkey solution that replicates operations more cost efficiently, to something underpinned by industry leading artificial intelligence that addresses complex and specific operational challenges. Almost anything is possible if we allow ourselves to explore what this technology is really capable of.



Beating the bottlenecks

No matter the size or configuration, every airport faces performance challenges of some kind.

For some it's about maximising runway capacity. For others it's managing scarce resources, dealing with bad weather or more effective apron and stand management.

In all these cases and more, a combination of high-fidelity cameras and artificial intelligence can help you overcome these obstacles. How? By giving your people the tools they need to make smarter, better, quicker decisions.

Augmentation and collaboration
So far, most digital towers make use of a static camera array that stares at the airfield without adding any further intelligence. But the NATS and Searidge approach is different. By distributing cameras at key airfield pinch-points, specific operational challenges can be addressed in a way that is entirely scalable to an airport's individual needs.

This approach doesn't mean replacing your existing tower – it's about augmenting what you already have so your controllers, and the wider airfield operation, can make better decisions. This is happening at airports worldwide today, who are all collaborating through a growing network of Digital Airport facilities facilitated by NATS and Searidge.

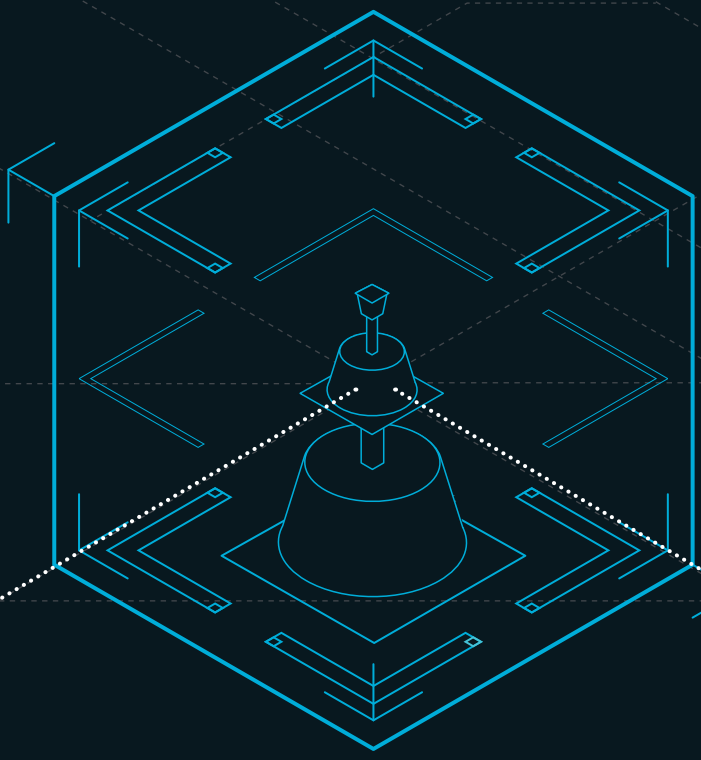
Outlining the bottlenecks

Maximising runway capacity

Effective apron and stand management

Dealing with bad weather

Managing scarce resources



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ULTRA HD 4K
CAMERA

STREAMING FEED
TO ATC TOWER...

CAMERA
INSTALLED

CAMERA
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STREAMING FEED
TO ATC TOWER...

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STREAMING FEED
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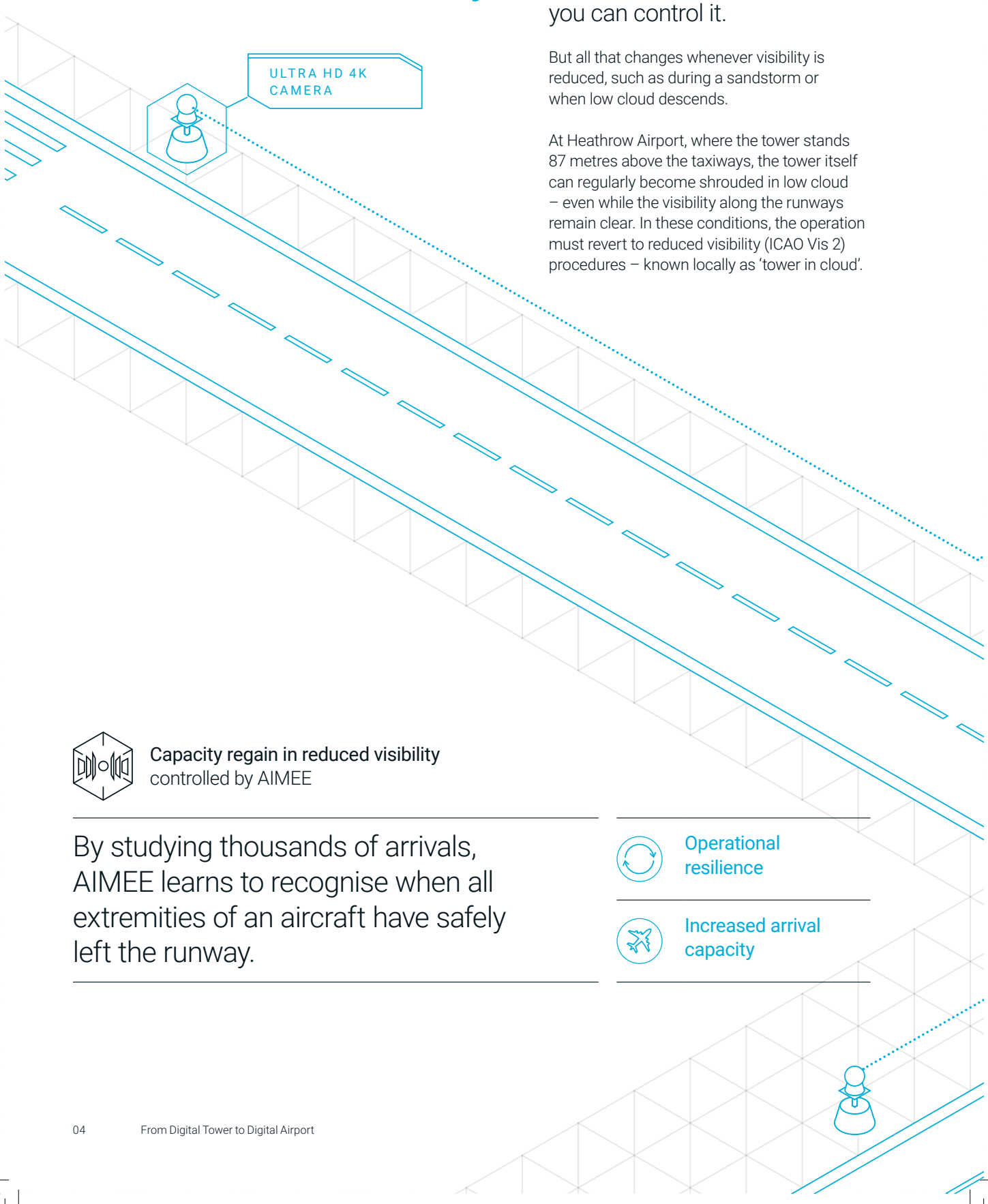
Regaining capacity in reduced visibility

For all our industry's modern technology, tower-controlling remains fundamentally a visual job – if you can see the aircraft you can control it.

But all that changes whenever visibility is reduced, such as during a sandstorm or when low cloud descends.

At Heathrow Airport, where the tower stands 87 metres above the taxiways, the tower itself can regularly become shrouded in low cloud – even while the visibility along the runways remain clear. In these conditions, the operation must revert to reduced visibility (ICAO Vis 2) procedures – known locally as 'tower in cloud'.



Capacity regain in reduced visibility
controlled by AIMEE

By studying thousands of arrivals, AIMEE learns to recognise when all extremities of an aircraft have safely left the runway.

Operational resilience

Increased arrival capacity

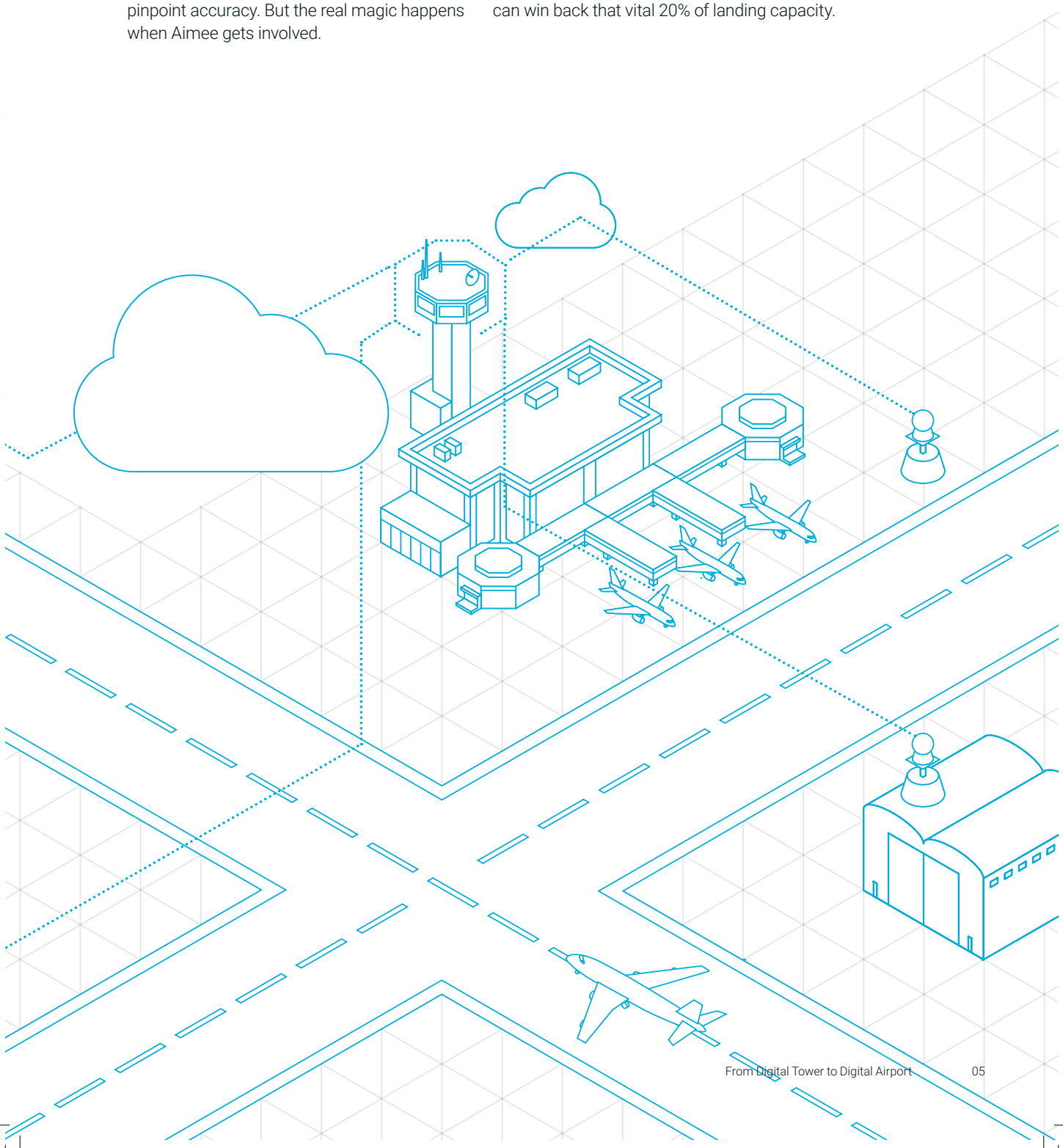
These procedures immediately cut the landing rate by 20%. For any airport, this would create immediate challenges. But for one scheduled to near 98% capacity it's especially disruptive. That's where NATS and Searidge have been able to make a difference.

Introducing 'Aimee'

Working with Heathrow, we're using a distributed network of 4K cameras positioned at each of the runway exit points. These cameras provide a view beneath the cloud with pinpoint accuracy. But the real magic happens when Aimee gets involved.

Aimee is Searidge's AI assistant. By meticulously studying thousands of arrivals, Aimee learns to recognise when all extremities of an aircraft have safely left the runway-protected area. Then, at exactly the right time, Aimee alerts the controller who can clear the next arrival with confidence.

All this is possible within the existing tower. There's no video wall or new operations room – Aimee integrates seamlessly with existing tower systems. Most importantly, the operation can win back that vital 20% of landing capacity.



Dynamic stand management

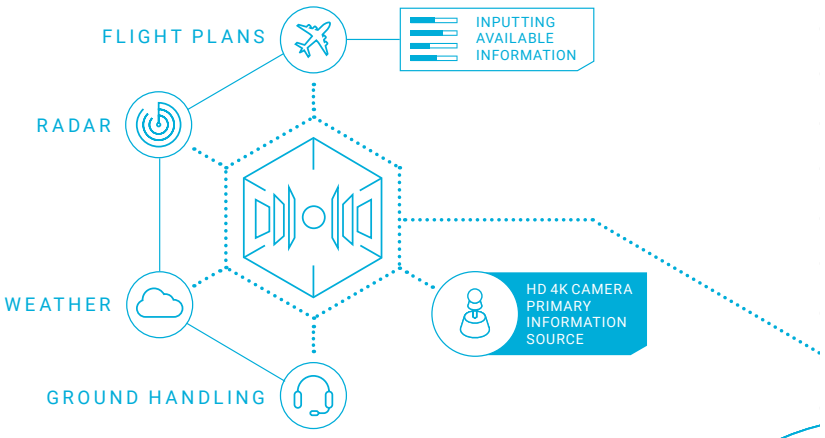
Airports spend a lot of time preparing stand management plans.

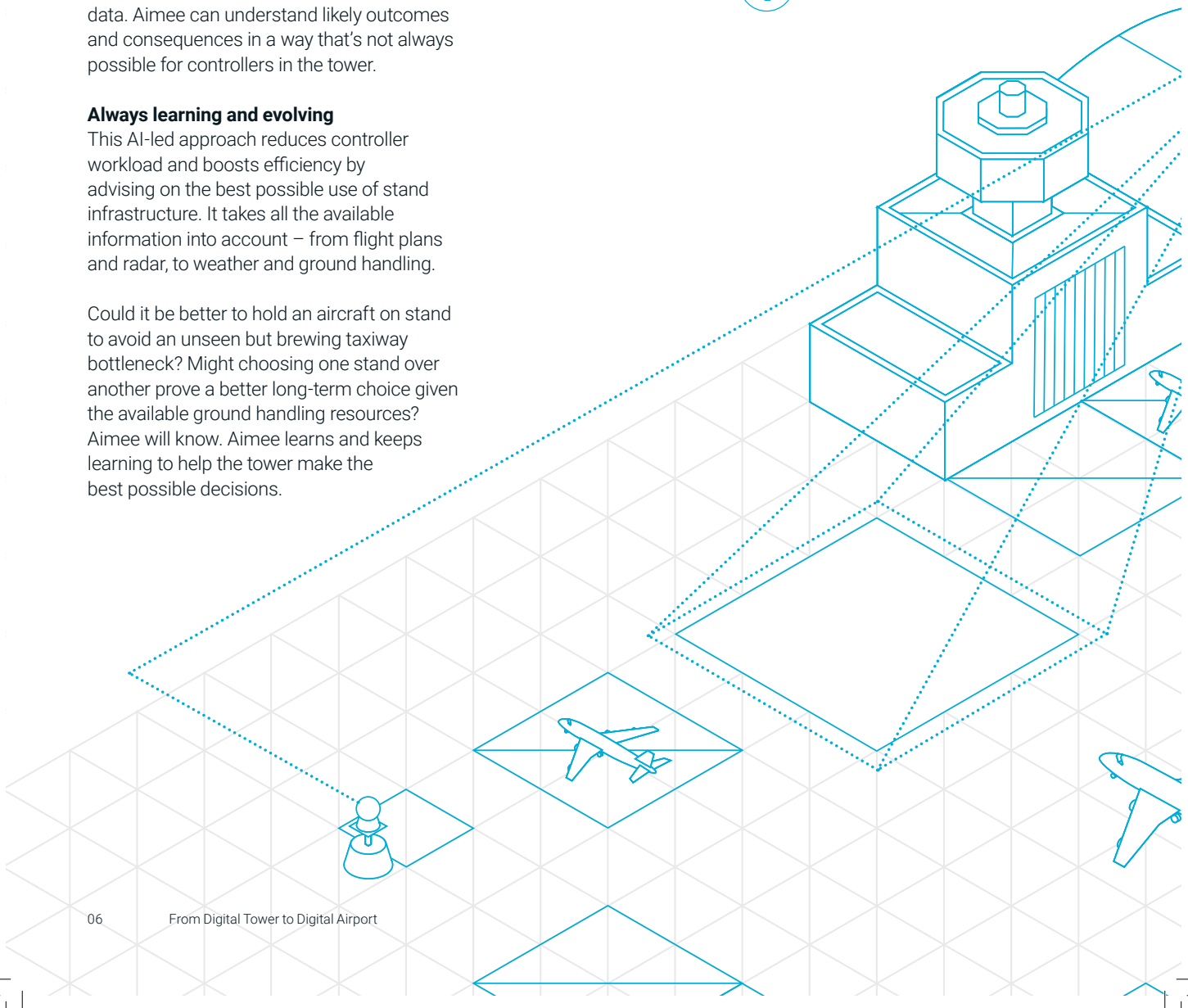
All too often, these fall apart in the face of a live and often unpredictable operation. But digital tower technology – powered by AI assistant Aimee – can allow for dynamic stand management.

Aimee advises stand managers/controllers of the best possible plan in real-time by learning from historic, live and scheduled operational data. Aimee can understand likely outcomes and consequences in a way that's not always possible for controllers in the tower.

Always learning and evolving
This AI-led approach reduces controller workload and boosts efficiency by advising on the best possible use of stand infrastructure. It takes all the available information into account – from flight plans and radar, to weather and ground handling.

Could it be better to hold an aircraft on stand to avoid an unseen but brewing taxiway bottleneck? Might choosing one stand over another prove a better long-term choice given the available ground handling resources? Aimee will know. Aimee learns and keeps learning to help the tower make the best possible decisions.

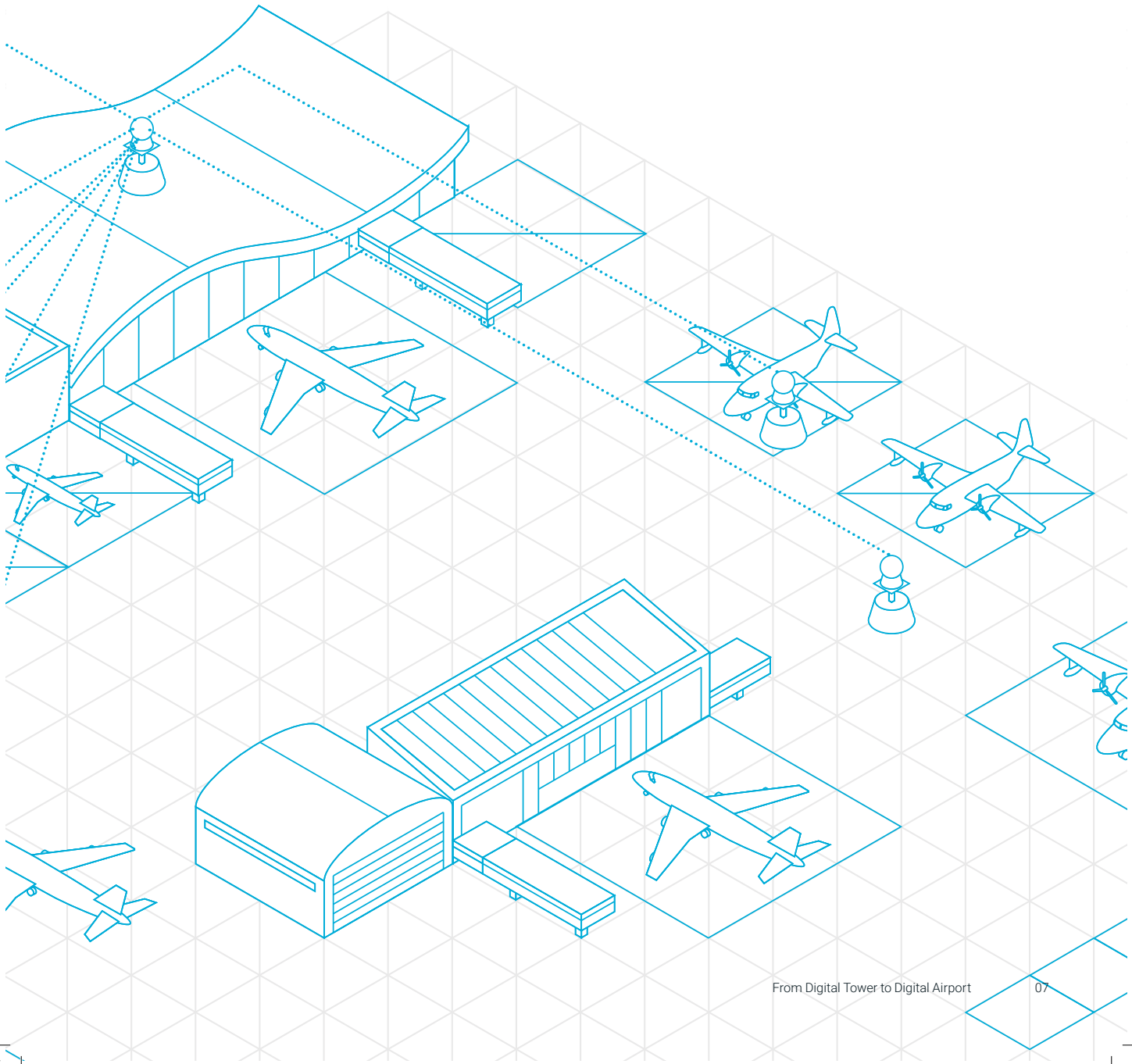




Stand Management
controlled by AIMEE

Digital tower technology – powered by AI assistant Aimee – can allow for dynamic stand management; advising controllers of the best possible plan in real-time by learning from historic, live and scheduled operational data.

- Improved on time performance
- Optimise available infrastructure
- Reduced controller workload



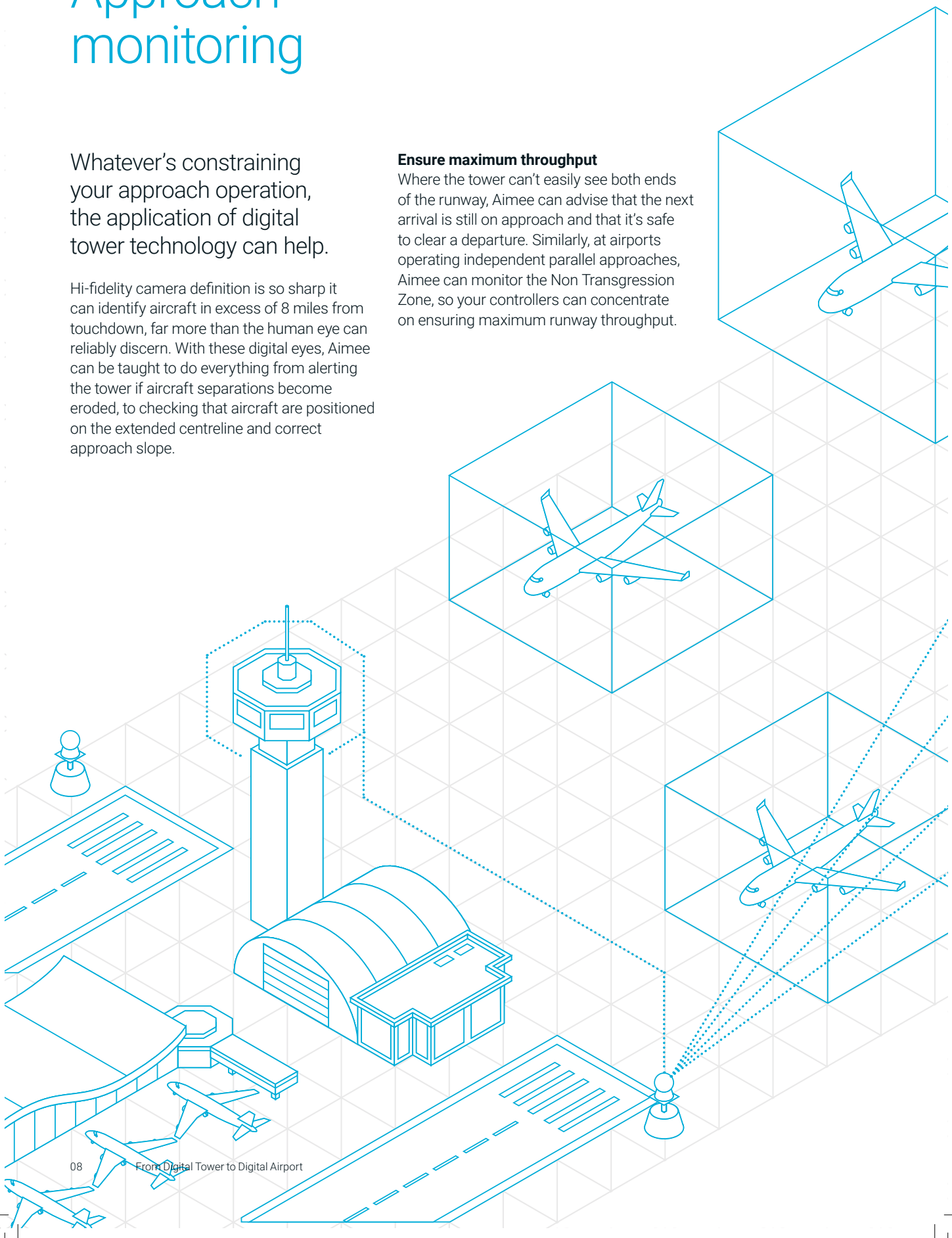
Approach monitoring

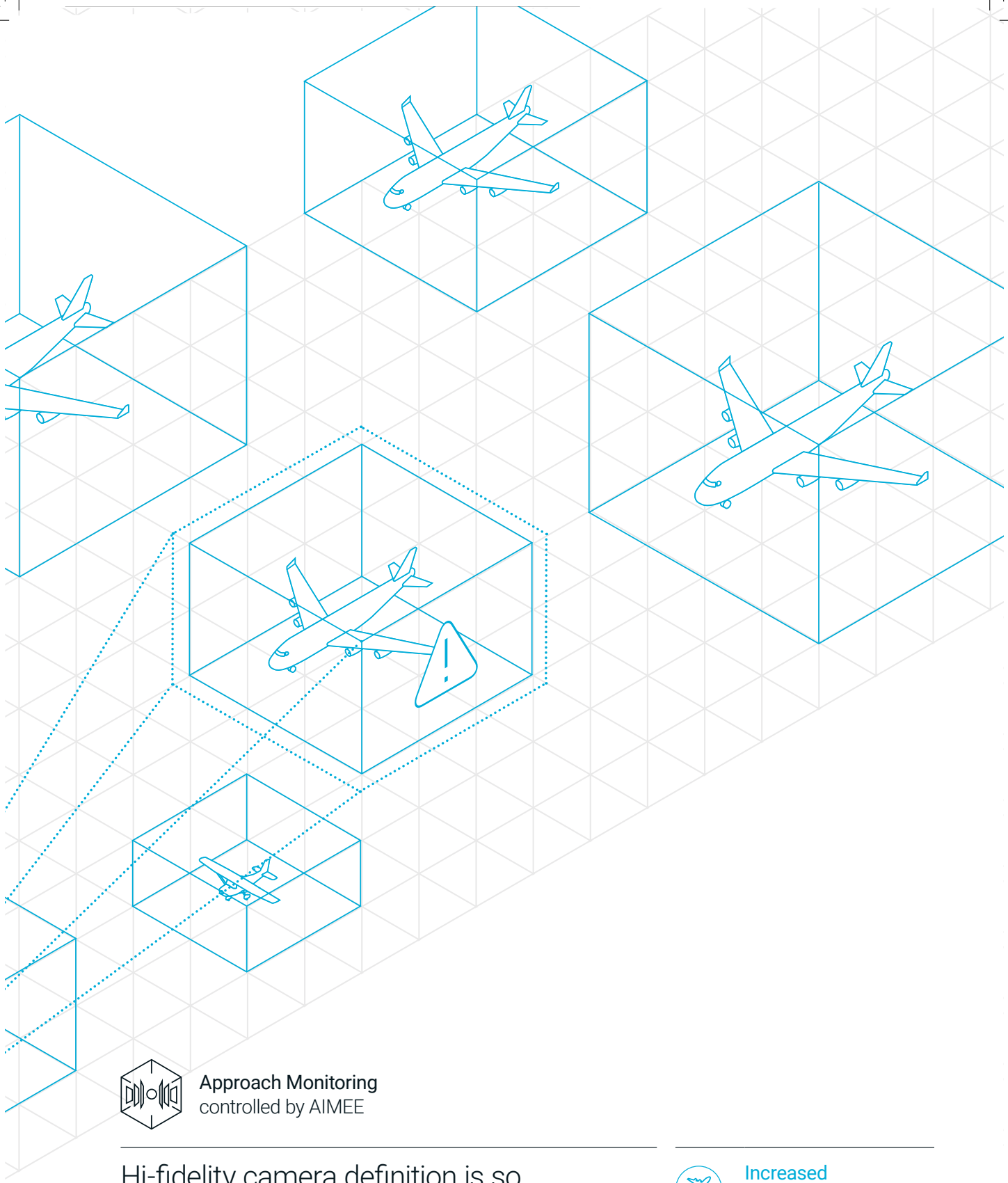
Whatever's constraining your approach operation, the application of digital tower technology can help.

Hi-fidelity camera definition is so sharp it can identify aircraft in excess of 8 miles from touchdown, far more than the human eye can reliably discern. With these digital eyes, Aimee can be taught to do everything from alerting the tower if aircraft separations become eroded, to checking that aircraft are positioned on the extended centreline and correct approach slope.

Ensure maximum throughput

Where the tower can't easily see both ends of the runway, Aimee can advise that the next arrival is still on approach and that it's safe to clear a departure. Similarly, at airports operating independent parallel approaches, Aimee can monitor the Non Transgression Zone, so your controllers can concentrate on ensuring maximum runway throughput.





Approach Monitoring
controlled by AIMEE

Hi-fidelity camera definition is so sharp it can identify aircraft in excess of 8 miles from touchdown, far more than the human eye.

- Increased arrival capacity
- Improved safety monitoring

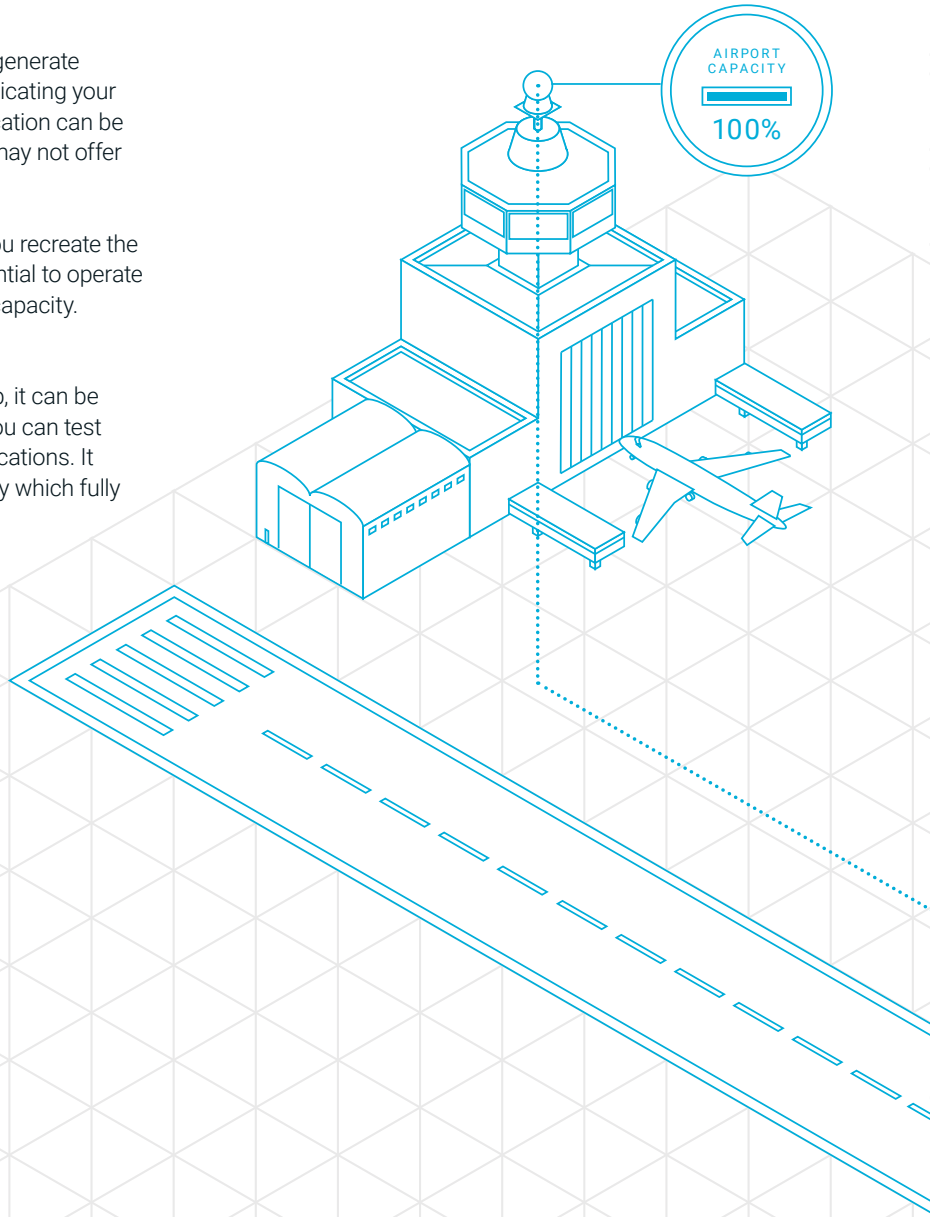
Contingency and resilience

Could you manage normal traffic levels with no loss of service during the transition from primary to contingency operations? A digital tower solution can help you do this, and much more besides.

A break in service can cost millions and generate irreparable reputational damage. But replicating your existing operational facility at another location can be beyond the reach of many. Even then, it may not offer a full like-for-like capability.

However, a digital tower not only helps you recreate the view of the airfield, it also offers the potential to operate a contingency facility that runs at 100% capacity.

Training and R&D
Once this contingency capability is set up, it can be used as a live R&D environment where you can test a whole range of other digital tower applications. It can also serve as a superb training facility which fully integrates the NATS Ace Simulator.



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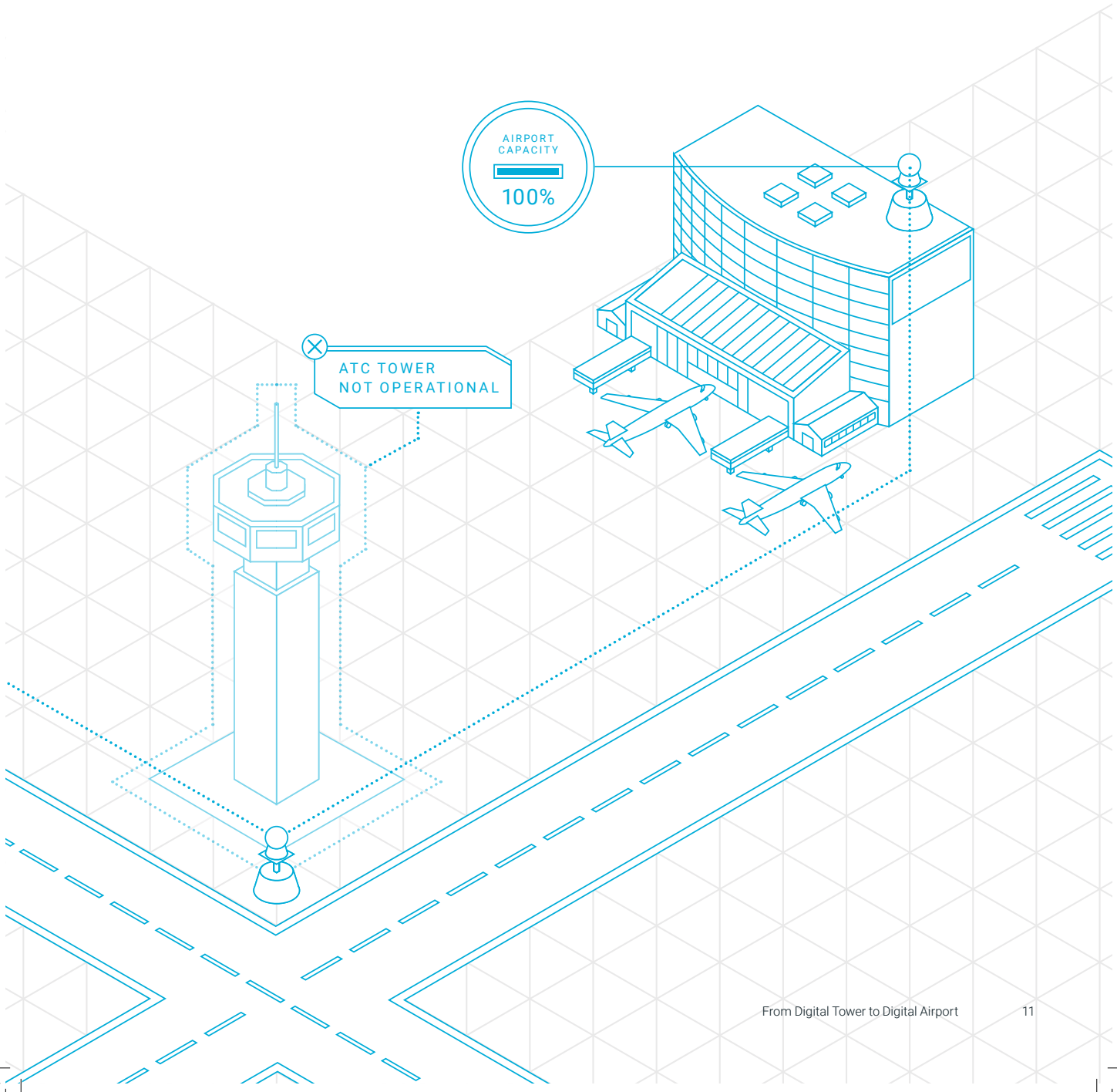
A full service contingency facility located at the airfield

A multi-purpose, cost effective option



Join the revolution

Find out how your airport can benefit from these solutions and many others by becoming part of our Digital Airport network. Benefit from collective learning, industry leading expertise and a pioneering spirit that aims to change how we manage air traffic at the world's airports.

All this, while developing and deploying digital solutions to your specific operational challenges.

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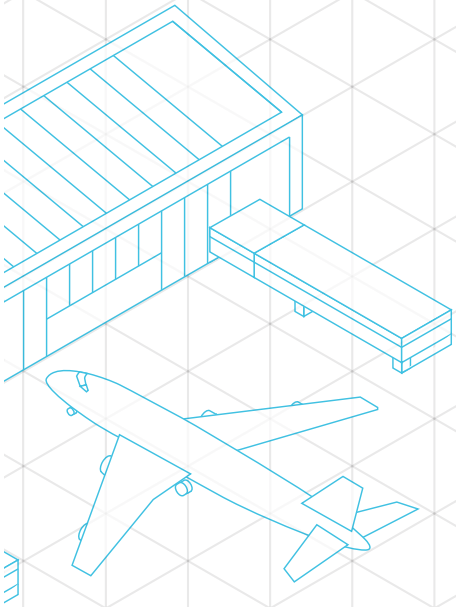

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