

# moving dot

Experts in air traffic  
management

# Aviation Experts

We are aviation experts with a focus on air traffic management. We are eager to share our knowledge and experiences, by solving your complex aviation and air traffic management challenges together with you. Our effective solutions will also benefit your time-critical change processes as well as your operation and your safety goals. Your policies will achieve broader operational support and thus become more effective. Browse through the sample of our results and contact us to explore how we may support you.

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# Our company

Aviation experts with a focus on air traffic management. We connect the worlds of policy making and of operational reality. Whether to realise a higher ATC operational efficiency or further optimise airport operations, to meeting national requirements or achieving your company strategic goals. Our strength is in providing you realistic solutions through a pragmatic approach in the projects we carry out.

The MovingDot office is located in Hoofddorp, just 10 minutes away from Amsterdam Airport Schiphol.

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Please visit us for a chat and a cup of coffee!



ISO certified

Founded in **2010**

Independent consultancy firm  
Limited Liability Company (B.V.)

Member of the **Civil Air Navigation Services Organisation**



**canso**  
civil air navigation services organisation

Owned by former ANSP senior management

In-depth understanding of ATM policy and operational affairs



Operational ATC expertise



EASA (EU) 2017/373 certified Flight Procedure Design Service Provider

# Our people

MovingDot experts have a solid background in various parts of the value chain and puts them in an ideal position to help you. They can assist you with problems ranging from those of a pure technical nature to issues involving high level policy making, for both civil and military customers.

**23** Air traffic management experts

**7** Operational ATC experts  
TWR - APP - ACC

**5** Former ANSP senior managers

**5** Flight Procedure Designers





# Our markets, customers & services

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# Our markets

MovingDot's services cover various domains of the aviation market. Central to our services is our added value: connecting the worlds of policy and operations.



## Air Navigation Service Providers

Our experts assist air traffic control organisations, both in the Netherlands and abroad, with realistic, practical, and effective advice, services, and solutions.



## Airports

Airport processes are complex and often include many stakeholders. We streamline your operational airside processes. Concepts such as Demand-Capacity Balancing and developing your Airport Operations Centre (APOC) are part of our knowledge and experience.



## Authorities

We understand the language of air transport, allowing our professionals to work with you and connect policy making with that of operational reality. This provides you with realistic and sustainable solutions in the complex regulatory aviation environment.



## Industry

We assist industry, component suppliers and system integrators in obtaining a detailed understanding of the intricacies of the ATC operation.

# Our customers

It is our belief that it is always the people who make the difference. We value the relationship between our customers and employees. We guarantee a high quality result by having a sincere, result-driven attitude. Continuity and quality are of primary importance while respecting the customers' wishes.



### The Netherlands

Air Traffic Control the Netherlands (LVNL)  
Amsterdam Airport Schiphol  
ANWB Medical Air Assistance  
Hospitals (Erasmus MC, Radboudumc)  
Knowledge and Development Centre Mainport Schiphol (KDC)  
Lelystad Airport  
Ministry of Infrastructure and Water Management  
TenneT TSO B.V.  
Twente Airport

### Oro Navigacija

### Europe

SESAR Joint Undertaking  
European Commission  
EUROCONTROL

Skeyes

DSNA

DFS

PANSA

Skyguide

HungaroControl

ENAIRE

Qatar CAA

Taiwan CAA

Vietnam CAA

### Dutch Caribbean

Aruba Airport Authority (AAA)  
Air Navigation Services Aruba (ANSA)  
Bonaire International Airport (BIA)  
Curaçao Airport Partners (CAP)  
Dutch Caribbean ANSP (DC-ANSP)  
Saba

# Our services

We provide consultancy services on many levels

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## Airspace and airports

MovingDot offers a broad range of support and advice in the (re-)design and implementation of airspace changes, routes and operational procedures as well as integrating technical ATM systems. From high-level strategic plans down to specific controller working instructions, we will work with you and provide customised solutions.

### Concept of Operations

Each ATM or airport design begins with describing the changed ATM system in a Concept of Operations (ConOps). The ConOps specifies what the preconditions, the operational performance and the requirements must be for human, machine and procedures in the changed environment. For instance, if you would like to introduce a new air traffic control sector-layout or if you think of introducing advanced surface movement guidance and control (A-SMGCS) on your airport: the ConOps defines the common reference for the follow-up design.

### Airspace and route design (PANS OPS)

In our team we have certified PANS-OPS designers who convert operational concepts into ICAO compliant instrument flight procedures. This

includes conventional procedures as well as Performance Based Navigation procedures (RNAV and RNP). Our designs are converted to charts and descriptions suitable for aeronautical information publications (AIPs). We work with specialised Instrument Flight Procedure design software.

### ATS procedures

Clear and unambiguous operational procedures and supporting documentation are core elements of a safe and effective operation. MovingDot is experienced in developing and maintaining these procedures and corresponding documentation for Air Traffic Services (ATS) personnel, such as Area Control, Approach Control, Aerodrome Control, Flight Information Service and the Aerodrome Reporting Office. Our products are user friendly and comply with the applicable regulations. We also develop and implement processes for keeping the procedures and documentation up to date.

### Airports

Improving the operational efficiency by introducing Airport Collaborative Decision Making (A-CDM) or by (re-)designing runway and taxiway infrastructure based on solid data-analyses, can make the difference in minimising delays on a congested airport. Our airport specialists work with you improving the airport operational processes.



## Safety management

Using International Civil Aviation Organization (ICAO) and European Aviation Safety Agency (EASA) requirements and principles as a foundation, MovingDot's consultants develop a tailored safety strategy based on your needs and requirements.

### Compliance

Demonstrating and monitoring of compliance is an essential part of safety management. Determining which rules and regulations have to be complied with is a first step. Next comes the verification of compliance, where traceability is essential.

We assist you in developing a plan of action for achieving verifiable compliance as well as the execution of the plan. Moreover, we can also support you with resolving identified compliance issues using our extensive aviation expertise. The result is a process for verifying compliance and ongoing compliance monitoring.

### Safety Management Systems

MovingDot's experts have been working with safety management systems on managerial as well as operational level, supporting Air Navigation Service

Providers (ANSPs), airport operations, and Civil Aviation Authorities (CAAs).

### Safety and risk assessments

There is more to safety than making the numbers work. Obtaining insight into impacts of current operations or changes under consideration requires a thorough assessment of not only the technical, but also operational and environmental factors.

Using ICAO and EASA principles, supplemented by national safety regulations and specific needs, MovingDot experts work with you to methodically assess the various risks. We work with you to identify practical and realistic mitigations and develop a corresponding proactive risk management strategy.

### Regulations

Our consultants, with background in senior management and ATM safety oversight, operations and systems, assist you in the implementation of safety management principles and achieving compliance with the ICAO Annex 19 SMS framework as well as achieving and maintaining applicable certification, e.g. ISO 9001-Quality Management Systems.



## MovingDot bridges the gap between UTM and traditional aviation requirements

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### Unmanned Aviation

**The next aviation frontier. In a rapidly developing market, unmanned aviation changes the traditional scope of business and operations. Safe integration in the airspace is key, which is another MovingDot expertise domain.**

#### Vision and Strategy

A well-developed vision and strategy on U-space deployment and UAS integration in uncontrolled and controlled airspace is fundamental in advancing technological development and drone services.

#### U-Space and UTM

Since 2017, MovingDot has been active in the field of unmanned aviation. Using our extensive knowledge and experience in “conventional aviation”, as well as our thorough understanding of the unmanned market requirements, we support the efficient and timely introduction of unmanned services. MovingDot can assist you with your strategy to ensure the most effective implementation of unmanned operations. We are here to support you in safely bridging the gap between UTM and all aviation requirements.

#### BVLOS routes in traditional airspace

Starting with an airspace assessment, we help you develop a concept of operations for your intended unmanned operations.

Designing Beyond Visual Line of Sight (BVLOS) routes for drones is necessary to enable their safe and efficient operation, particularly in complex or long-distance missions. As an EASA-certified Flight Procedure Design organisation, we know how to safely integrate them within the traditional aviation infrastructure.

#### U-space implementation and risk assessment

The UAS market is developing rapidly. MovingDot is at the forefront of both technological innovation and regulatory development. As a member of the Dutch Drone Delta we support the implementation and deployment of emerging concepts and services such as U-space/UTM. Our experts have experience in developing the guidelines and carrying out U-space/UTM airspace risk assessments.



## Policy support

### Civil/military co-operation

Airspace fragmentation due to separation of airspace responsibilities between civil and military air navigation service providers can lead to an inefficient use of airspace and thus to increasing costs for its users. Flexible Use of Airspace, co-ordinated airspace management and an integral national airspace strategy can prevent negative effects of having multiple providers. MovingDot has ample experience in working with both civil and military ANSPs to develop and implement steps in a civil/military co-operation or integration process. Harmonisation of procedures and ATM systems is well understood by MovingDot's experts.

### National policy development

MovingDot supports CAAs and Ministries of Transport to develop their national aviation, airspace or, when requested, a more specific national ATM policy. Through a carefully designed implementation process, we stepwise detail your policy, in close co-operation with your team and relevant stakeholders.

### Performance management

Being in control of your organisation is key to any organisation's success. By designing and developing customised performance indicators, supporting systems and processes, you and your team can act at the right time and with the right mitigations and strategies. MovingDot aligns your performance management and strategy.

### Other products

Other products include:

- Cost-benefit analyses
- Investment analyses
- Training and ATM courses



# Our projects

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# Browse through a selection of our projects and get an insight into our expertise and achievements

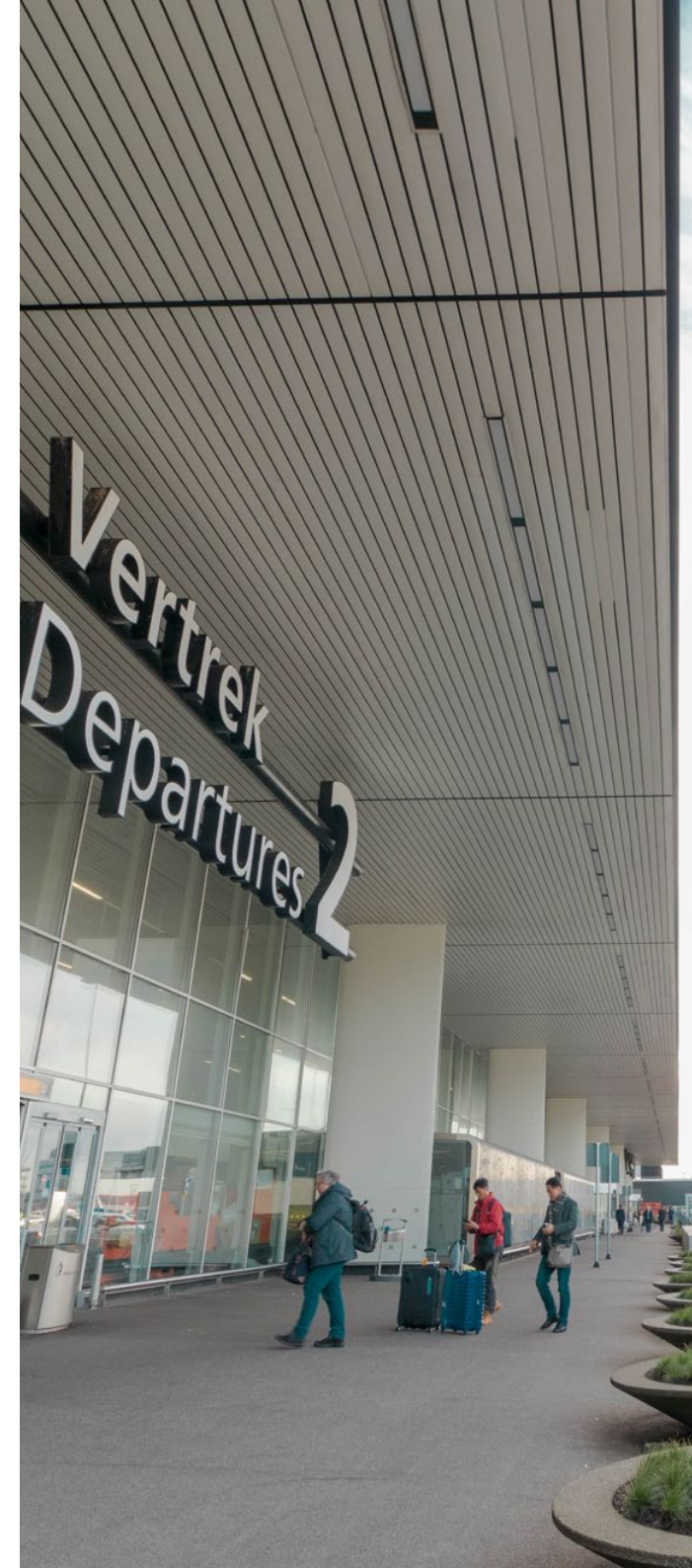
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## Ministry of Infrastructure and Water Management Government support

As part of the Dutch National Airspace Policy deliberations, MovingDot provided an update of a 2012 study. The update led to a multi-year government programme to define and implement changes for an enhanced Dutch airspace. MovingDot's knowledge of Dutch stakeholders' requirements and international ATM policy formed the basis for a sound strategic framework and a clear way forward.

This "Quickscan International Airspace" document provides Dutch decision makers with a comparison of ATM practices in neighbouring countries. It provides a common ground in communicating policy and operational requirements.

At present, MovingDot experts form part of the large-scale redesign programme of the Dutch airspace. Their involvement consists of developing the strategic vision and concept of operations, including coordinating and analysing the vast real-time simulation effort to test various development stages. Additionally, MovingDot safety experts are actively involved to help ensure that safety-by-design is applied.







### Amsterdam Airport Schiphol

#### Operational insights taxiway maintenance

Planning (long-term) maintenance on Schiphol's taxiways and runways is a complicated puzzle, which is aggravated by the desire to disrupt operations as little as possible during maintenance works. MovingDot has helped Schiphol Airport to gain insight into the operational effects of taxiway maintenance.

MovingDot was commissioned by the Asset Management department of Schiphol Airport to visualise the effects of maintenance on Schiphol's taxiway system, opting to quantify these effects on the basis of delay minutes. The purpose of this overview is to gain an initial insight into the effects of maintenance on the taxiway system for the development of the taxiway maintenance strategy. This allows for more effective and efficient planning of runway maintenance considering the various - and at times conflicting - factors.

The results were generated using the by MovingDot developed Taxiway Renovation Tool.

### ANSA (Aruba) & DC-ANSP (Curaçao)

#### Airspace and route design

MovingDot was contracted separately by Air Navigation Services Aruba (ANSA) and Dutch-Caribbean ANSP (DC-ANSP) to respectively redesign their airspace infrastructure and route-structure.

Airspace and route design was carried out by a team of Air Traffic Controllers and airspace design specialists, most of them with a PANS OPS/ PANS ATM background. This enabled MovingDot to closely work together with ANSA and DC-ANSP controllers to design more intuitive procedures that are better aligned with operational practice and needs.

MovingDot developed all AIP and charting materials which the ANSP used for publication at the relevant AIRAC-cycle. We also processed the procedural changes for Air Traffic Control in the documentation. Finally, we trained the air traffic controllers on the new procedures based on the latest training methodologies.



**Ministry of Infrastructure and Water Management**  
**Study on governance and finance structure for U-Space in the Netherlands**

The main reasoning behind U-space regulations is that the current ATM system is not fit for the management of the foreseen large numbers of UAS movements. While in the ATM-system pilot-controller communication plays a central role, the traffic management of UAS will mainly have to be based on automation.

States will have to make choices on several issues when implementing European Regulation 2021/664 on the future air traffic management of unmanned aerial systems, such as designation of U-Space airspace, provision of Common Information Services (CIS), and availability of U-space Service Providers (USSPs).

Our study, created in cooperation with partners, developed four models for shaping the governance and finance structure of U-Space. These models were rated against several assessment criteria, resulting in a preferred model and advice on how to proceed with implementation of the model. The results have enabled the Ministry to pursue an operational unmanned airspace.

**ATC The Netherlands (LVNL)**  
**Introduction of PBN and Minimum Operational Network (MON) for Schiphol Airport**

MON is aimed at reducing the number of conventional nav aids, required as a backup infrastructure and contingency resource in the case of GNSS outage, to a minimum. In the Amsterdam FIR this program started with phasing out the first set of nav aids in May 2019, with the rest of the nav aids taken out of service in the 2019-2022 timeframe.

As a result, several NDB locators and VORs were decommissioned. Four VOR/DMEs have been retained as a fallback and resilience network to manage the impact of GNSS outages. Additionally, to have a back-up approach procedure for ILS approaches following the decommissioning of all NDB- and VOR-approaches, MovingDot flight procedure designers developed RNP APCH procedures to all Schiphol runway ends.

As of August 2021, conventional arrival or departure procedures no longer exist in the Schiphol Terminal Area, only RNAV 1 SIDs and STARs are used.

## Amsterdam Airport Schiphol

### Concept of Operations “Follow the Greens”

The 6-runway layout and vast taxiway infrastructure at Schiphol Airport creates a complex operation of handling aircraft on the ground. Dedicated air traffic controllers for this phase, the ground controllers, guide the aircraft from their gate to the runway and vice versa.

Ground controllers are supported by various ground surveillance systems: Advanced Surface Movement Guidance and Control Systems (A-SMGCS) form an important part in the safe and efficient ground movement of aircraft. However, in the view of pilots and ground air traffic controllers, complexity of the operation could probably be further decreased by introducing A-SMGCS Level 4 possibilities.

MovingDot provided Amsterdam Airport Schiphol with a detailed Concept of Operations on how to make use of an advanced technology, called “Follow the Greens”. Schiphol currently carries out pilot projects.



“Follow the Greens” is an innovative taxi guidance concept. By automatically illuminating individual center line lights just in front of an aircraft, and subsequently turning them off, the aircraft is easily guided through a vast and complex airport taxiway infrastructure.

## Twente Airport

### Concept of Operations Remote Tower

Twente Airport, a former military airbase situated near Enschede, The Netherlands, is attracting new civil aircraft movements and innovative business opportunities. The number of actual movements is such that multiple options were considered for providing air traffic services. One of those options is to create a Remote Tower at another location to provide the services needed for Twente’s airport users.

A MovingDot team successfully worked on the Concept of Operations for such a Remote Tower, including the transition period to design, build and commission the Remote Tower.

## Ministry of Infrastructure and Water Management

### BVLOS airspace design

The Dutch aviation charts show a densely packed system of international airports, green fields and military bases, in probably, the most populated per square meter country in the world. The Ministry of Infrastructure and Water Management is at the forefront of developing a Dutch infrastructure for a well-defined and organised U-space environment to allow emerging drone services.

MovingDot has been involved from the very beginning with designing eVTOL routes between cities and airports. With its team of experienced and specialised airspace and flight procedure designers easily tackling new UAS route requirements. For this reason, MovingDot was assigned an initial airspace assessment and the design of two BVLOS corridors in the Netherlands. As a second step, MovingDot designed BVLOS routes to connect the different unmanned test centres to these BVLOS corridors, in order to facilitate the first test and experiment BVLOS flights in the Netherlands.

With our strategic drone-company partnerships we are able to cover all aspects of the unmanned operations. From the drone pilot or operator challenges, to licenses and training, including any activities related to the interface of the U-space/UTM system with the current ATM system, MovingDot will deliver and support you in your implementation of this fascinating new business area.

MovingDot is a member of the Dutch Drone Delta.



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