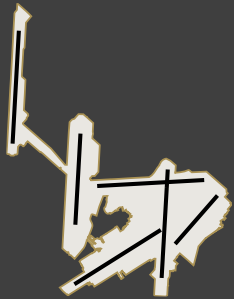
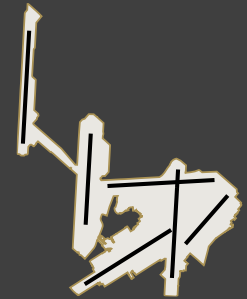
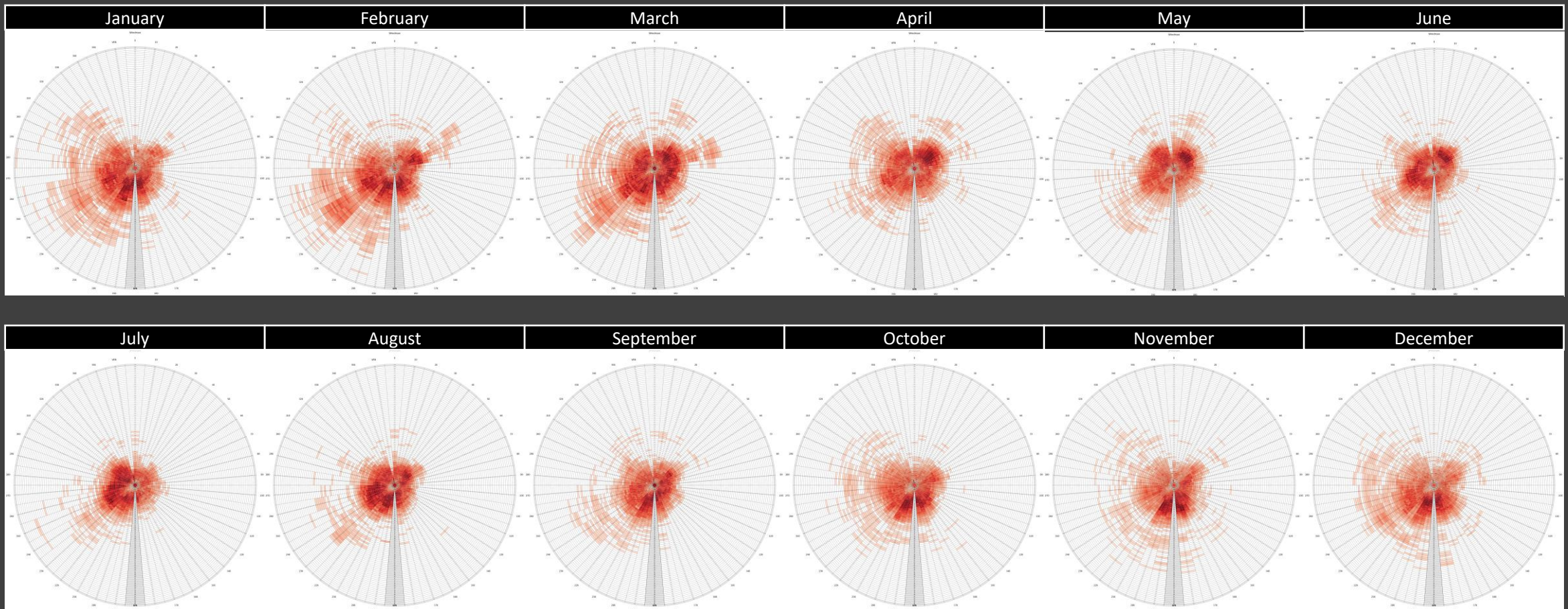


Meteo Analyses for Airside Maintenance

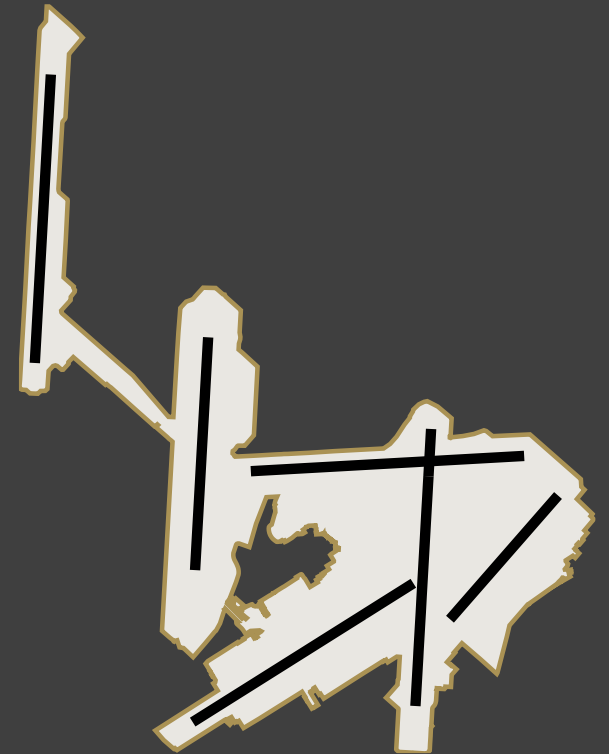


Case Study: Amsterdam Airport Schiphol (AMS / EHAM)



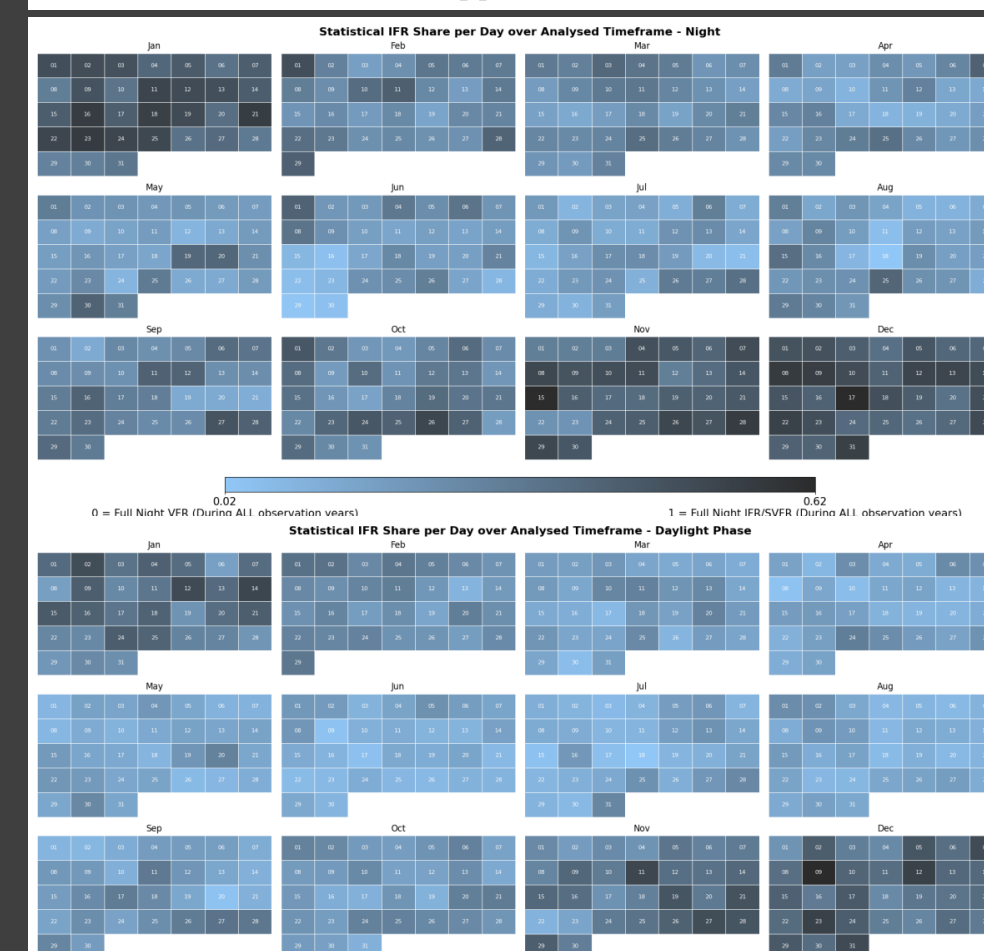
Meteo Analyses

- Case studies into meteorological conditions vs airside maintenance planning
- Visualising and quantifying maintenance phases vs weather statistics and identify phasing options for construction works
 - RWY, TWY or apron maintenance
 - ILS upgrade/replacement planning, etc.
- Case study: EHAM / AMS data
 - During 2026, EHAM features several airside maintenance works
 - RWY 18R/36L: May 4 – 12
 - RWY 18C/36C: May 18 – 27
 - RWY 09/27: August 31 – September 8
 - RWY 06/24: September 21 – 29
 - RWY 18L/36R: October 5 – 13
 - RWY 04/22: October 19 – 27
 - Let's check the meteo statistics for those phases
 - Meteo data: application of METAR reports
 - 10 years of data: 2016 – 2025 (including)
 - Data completeness: 99.69%



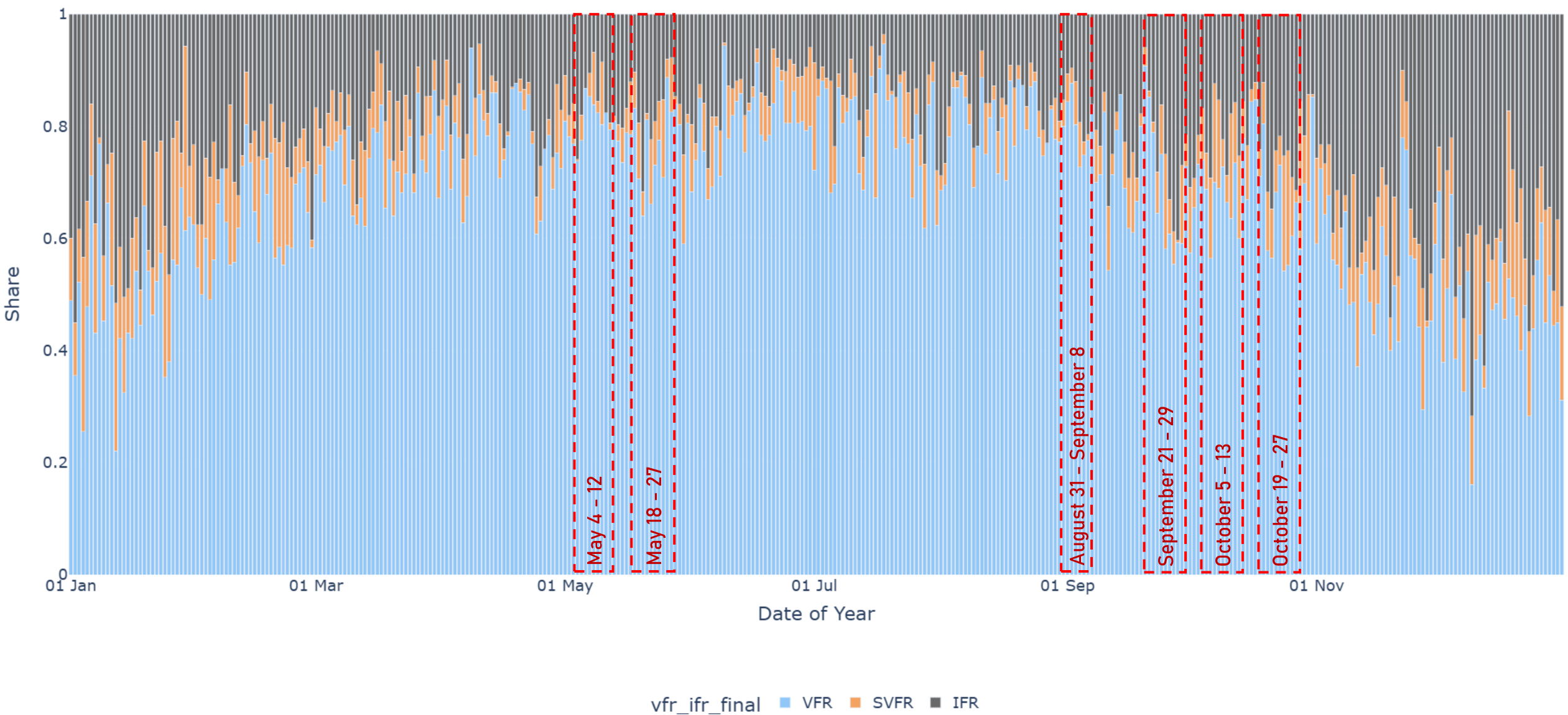
VMC/IMC Conditions

- To answer 1st level questions in the area of “good or bad weather” statistics
- Quantification of:
 - Visual meteorological conditions (VMC, VFR rules apply)
 - Instrument meteorological conditions (IMC, IFR rules apply)
- VMC/IMC as per EASA Standardised European Rules of the Air (SERA) definitions (given airport location)
- Also possible:
 - LVP (low visibility procedures) instead of simple IFR vs VFR
 - Visibility/RVR/vertical visibility relative to approach minima (ILS/RNP/etc)
 - But for today's basic example that is out of scope
- Sensible differentiation in analyses could entail:
 - Day/week/month aggregation
 - Daylight/night/24hr phase
- Different ways of plotting
 - Barcharts
 - Calender plots
 - Etc



VMC/IMC Likelihood – Daylight Phase Example

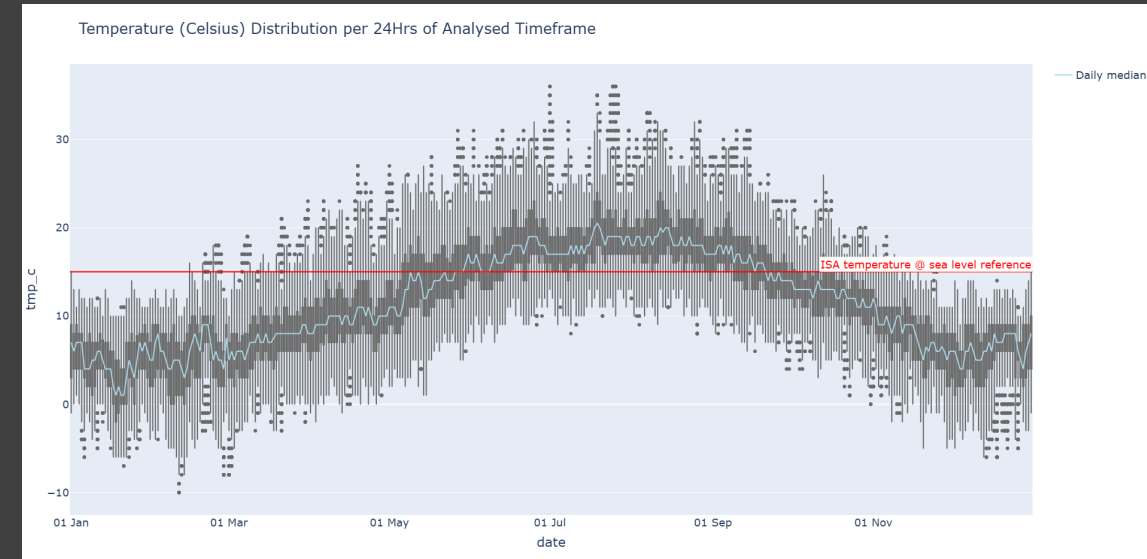
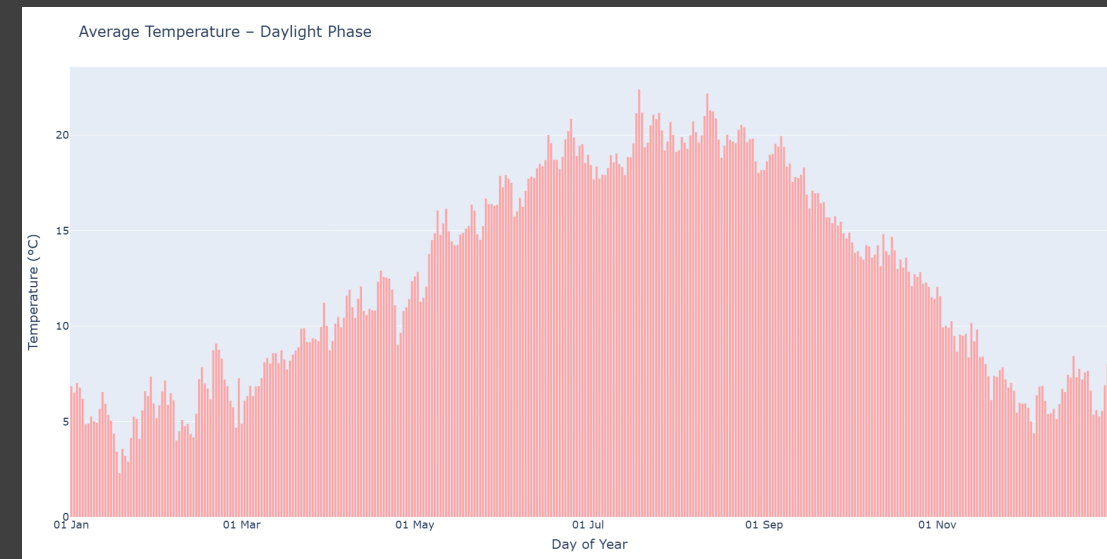
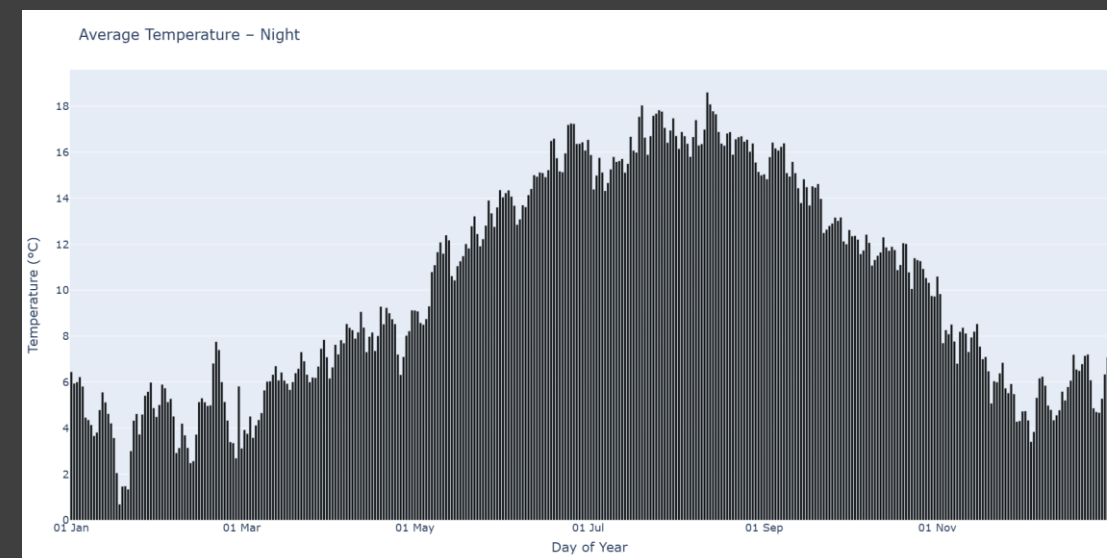
Meteo Conditions Likelihood – Daylight Phase



* SVFR (Special VFR) as per EASA SERA.5010 (b) (3) (Regulation (EU) 2024/404) only applies to traffic at max IAS (speed) of 140 kts, hence for normal commercial ops, SVFR in this graph shall be read as 'IFR'

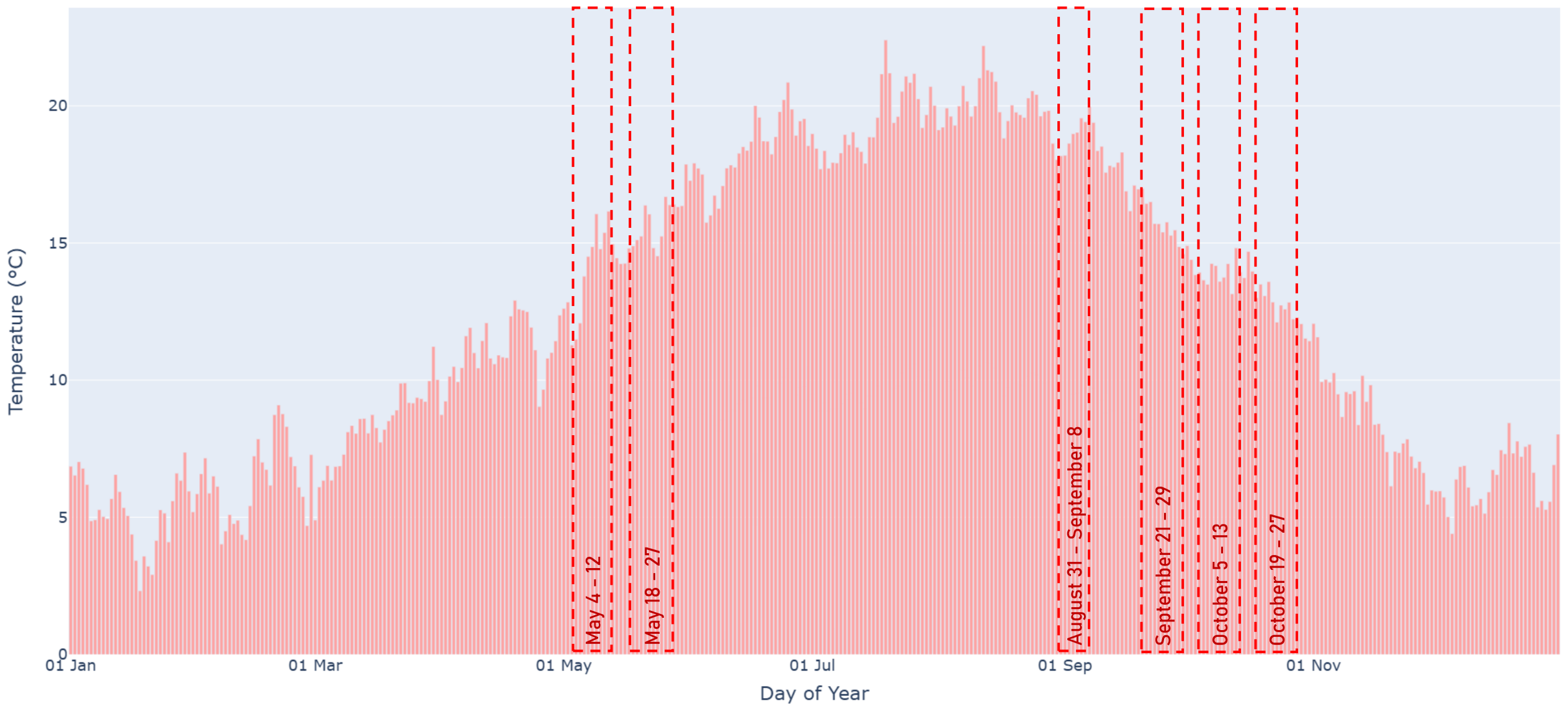
Temperature

- To answer questions in the area of temperature statistics, for impact on the workforce and construction materials
- Statistical distributions quantifying:
 - Min/max temperatures registered over the last 10 yrs per day
 - Average/median temperatures per day
 - Statistical temperature bandwidths
- Sensible differentiation in analyses could entail:
 - Day/week/month aggregation
 - Daylight/night/24hr phase



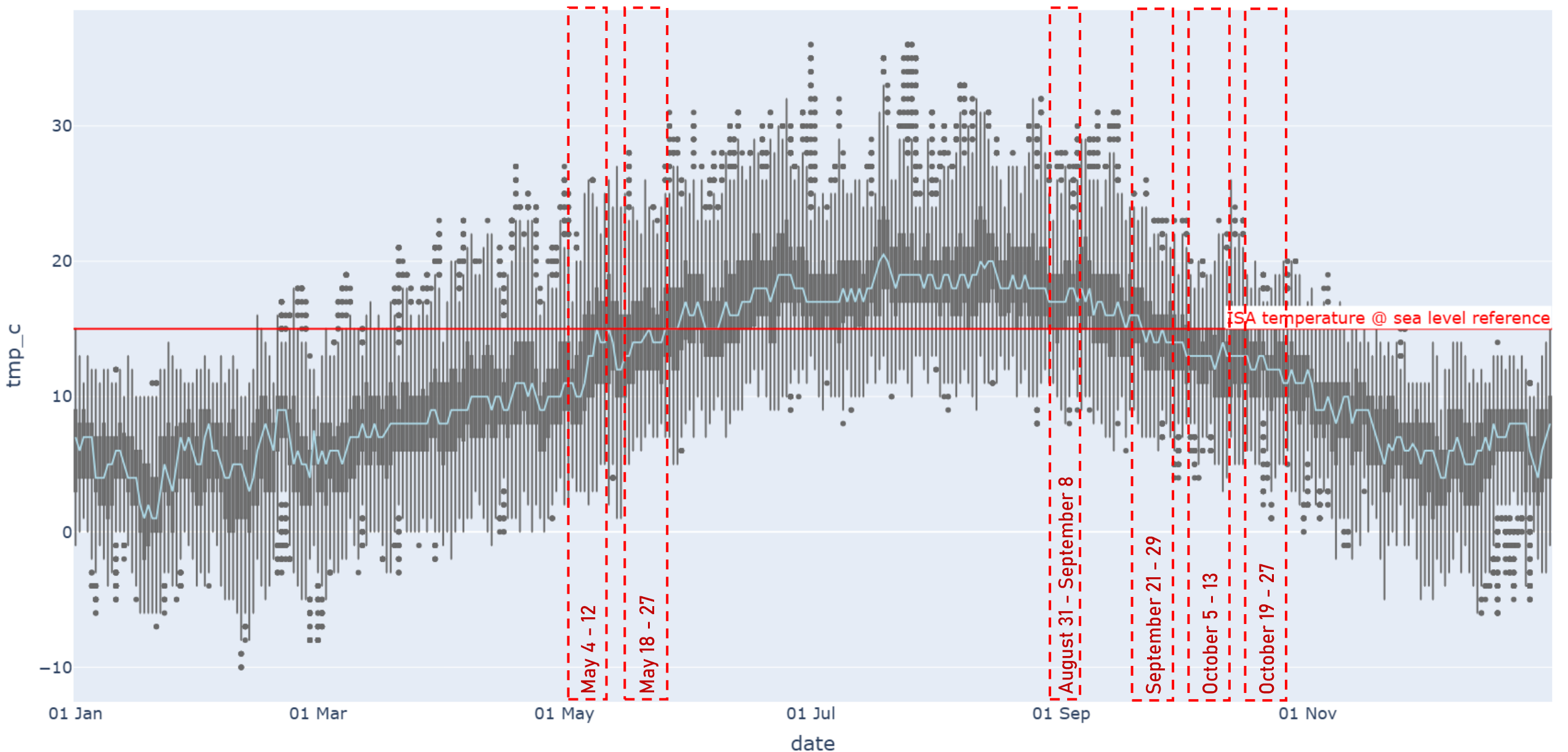
Temperature Statistics – Daylight Phase Example

Average Temperature – Daylight Phase



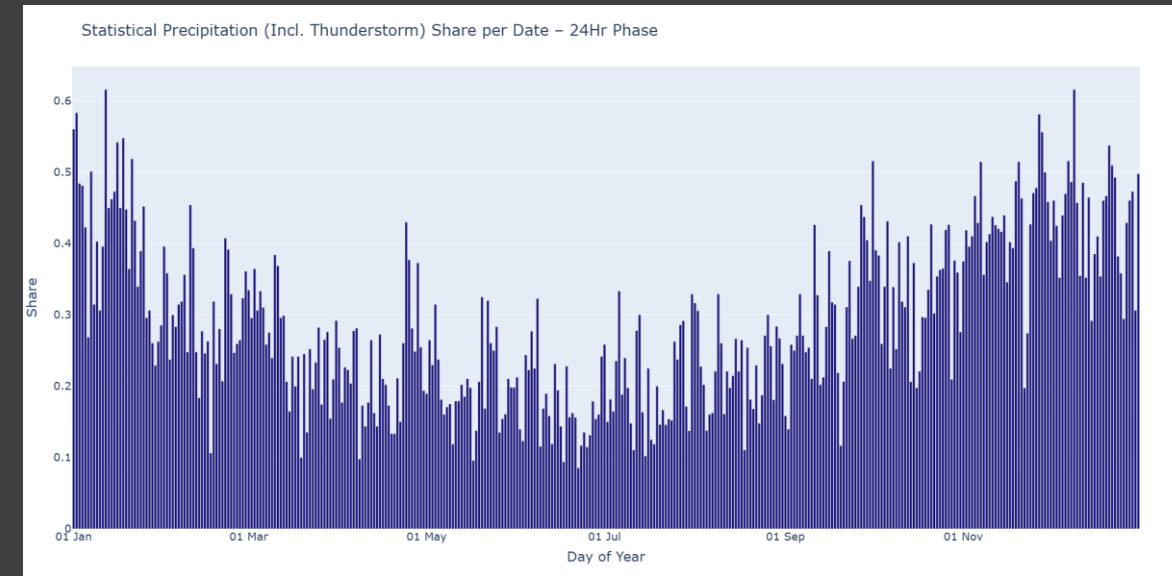
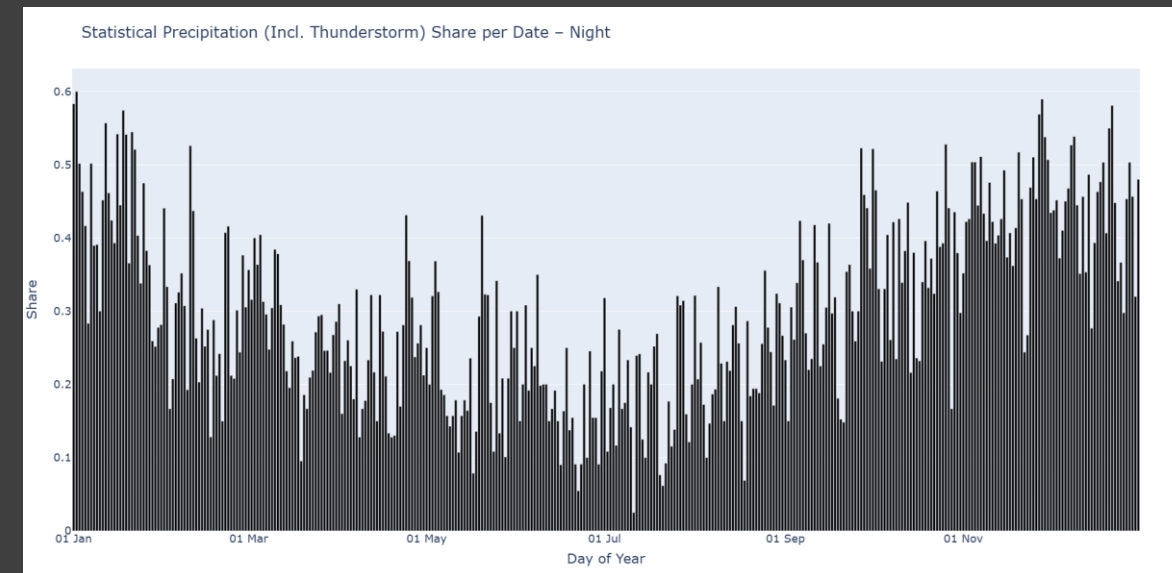
Temperature Statistics – 24Hr Phase Example

Temperature (Celsius) Distribution per 24Hrs of Analysed Timeframe



Precipitation & Thunderstorms

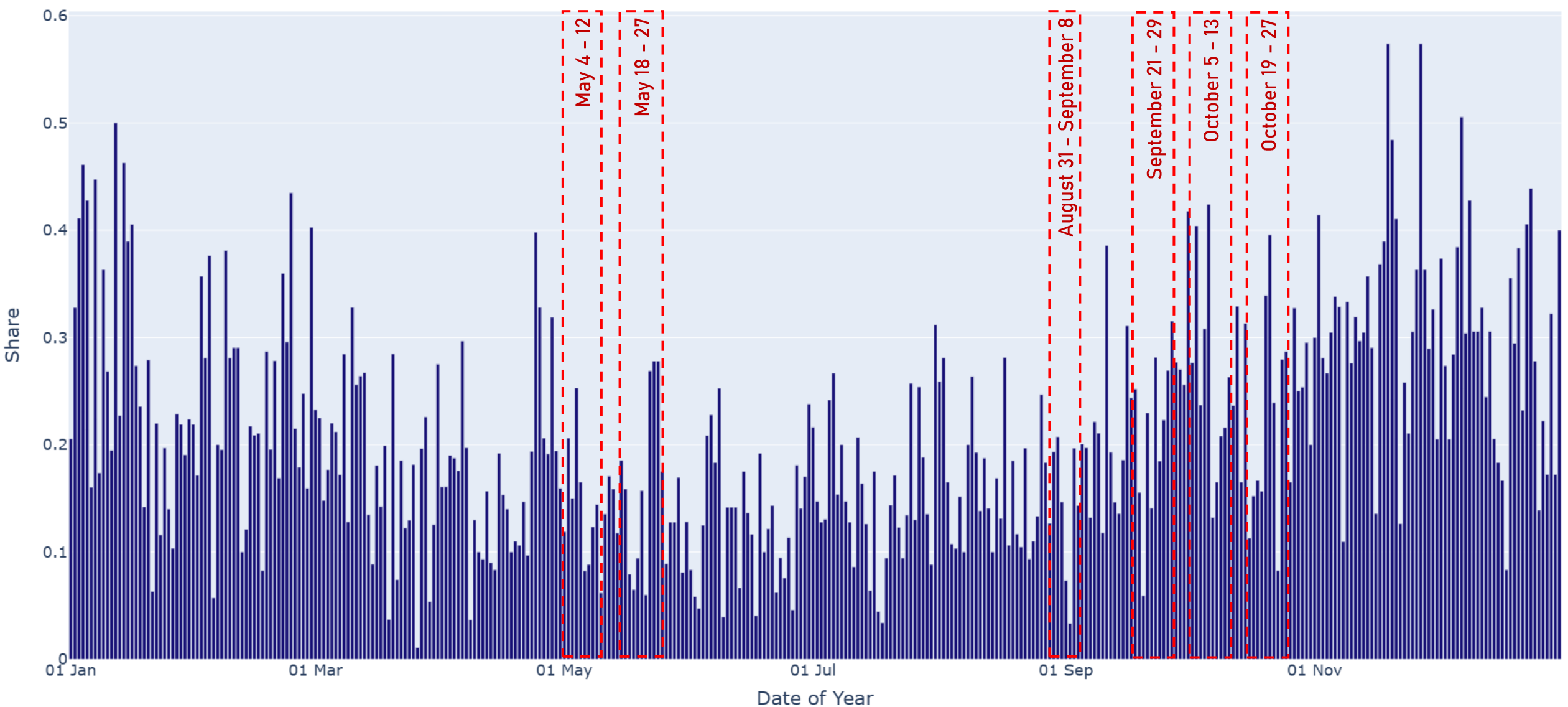
- To answer questions in the area of:
 - “Is work likely executed under dry conditions?”
 - “How likely is a lightning strike?”
 - For impact on the workforce and construction materials
- Precipitation is currently a ‘grouped’ term, ranging from showers to drizzle, hail, snow, etc. Further filtering and detailing possible where relevant
- Sensible timeframes in analyses could entail:
 - Day/week/month aggregation
 - Daylight/night/24hr or operating hours phase such as e.g. 23:00 → 06:00 LT (for those airports following the “LHR way of airside maintenance”)
- Different ways of plotting
 - Barcharts
 - Calender plots
 - Etc



Precipitation

(Share/Likelihood per Day, Not Millimeters) – Daylight Phase Example

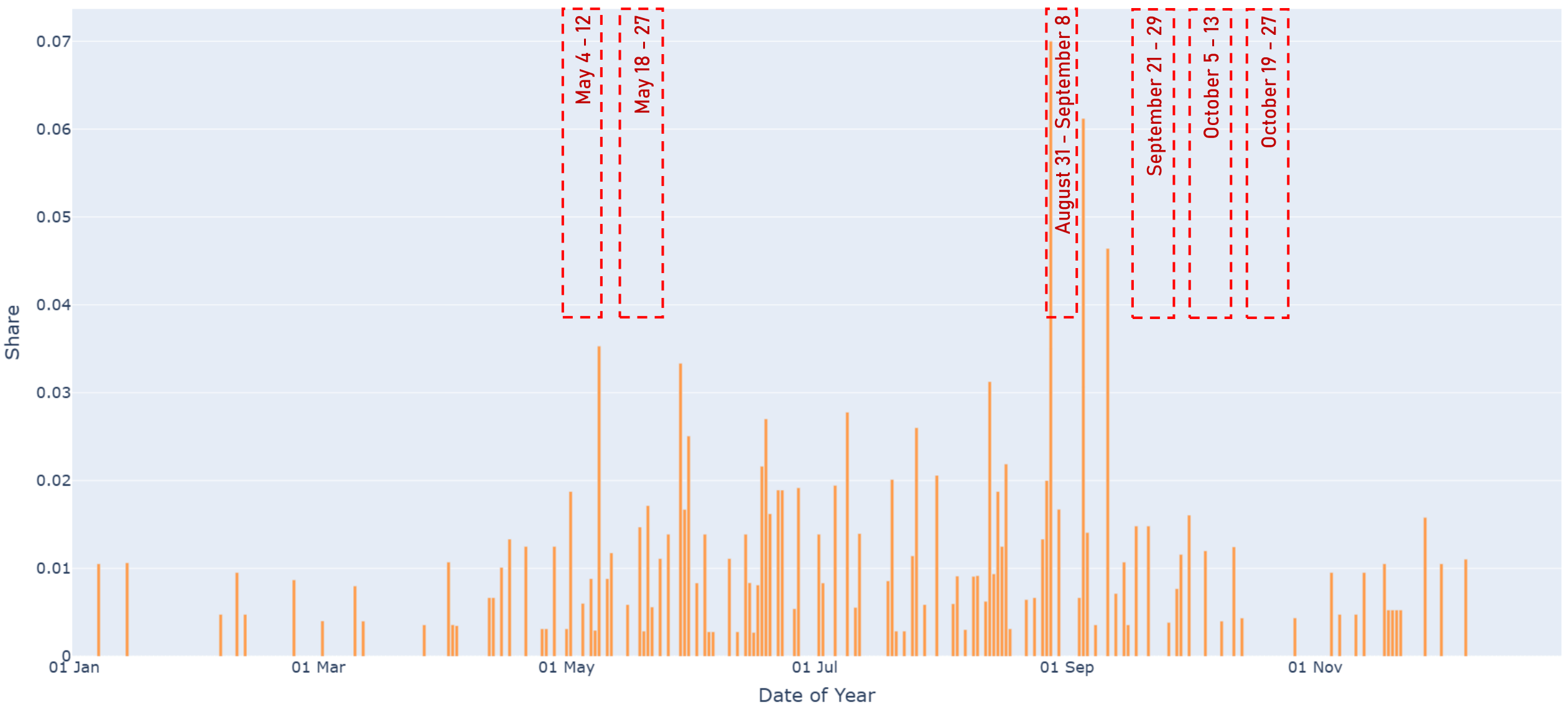
Statistical Precipitation Share per Date – Daylight Phase



Thunderstorms

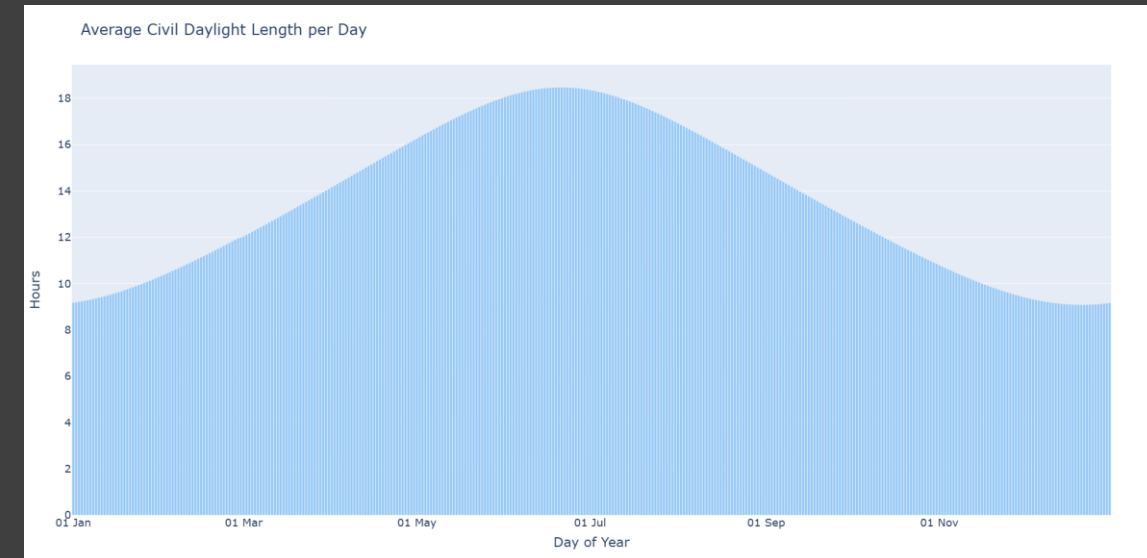
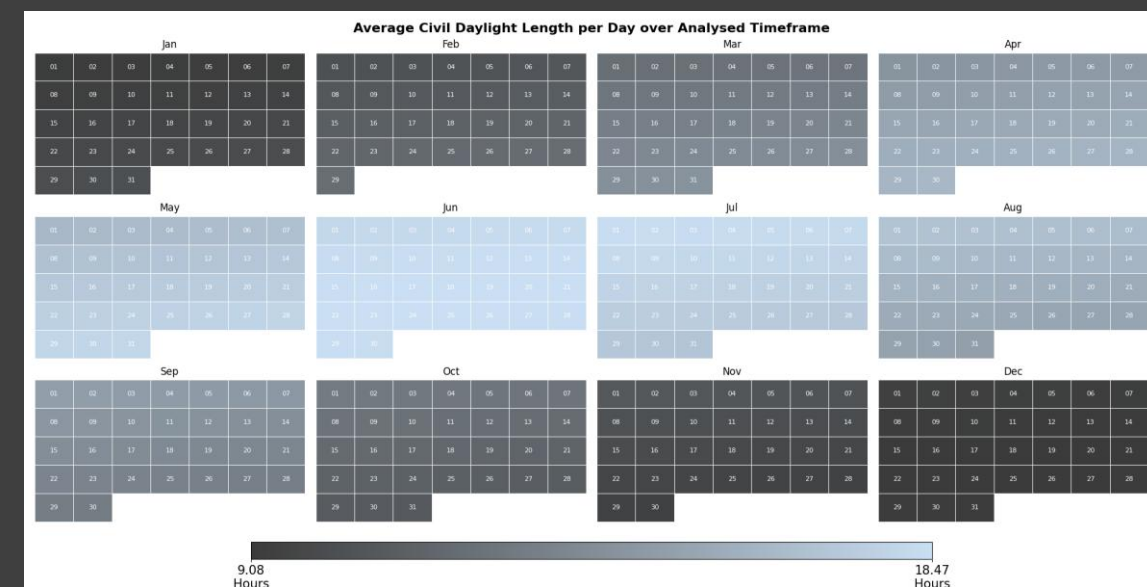
(Share/Likelihood per Day, Not Count) – Daylight Phase Example

Statistical Thunderstorm Share per Date – Daylight Phase



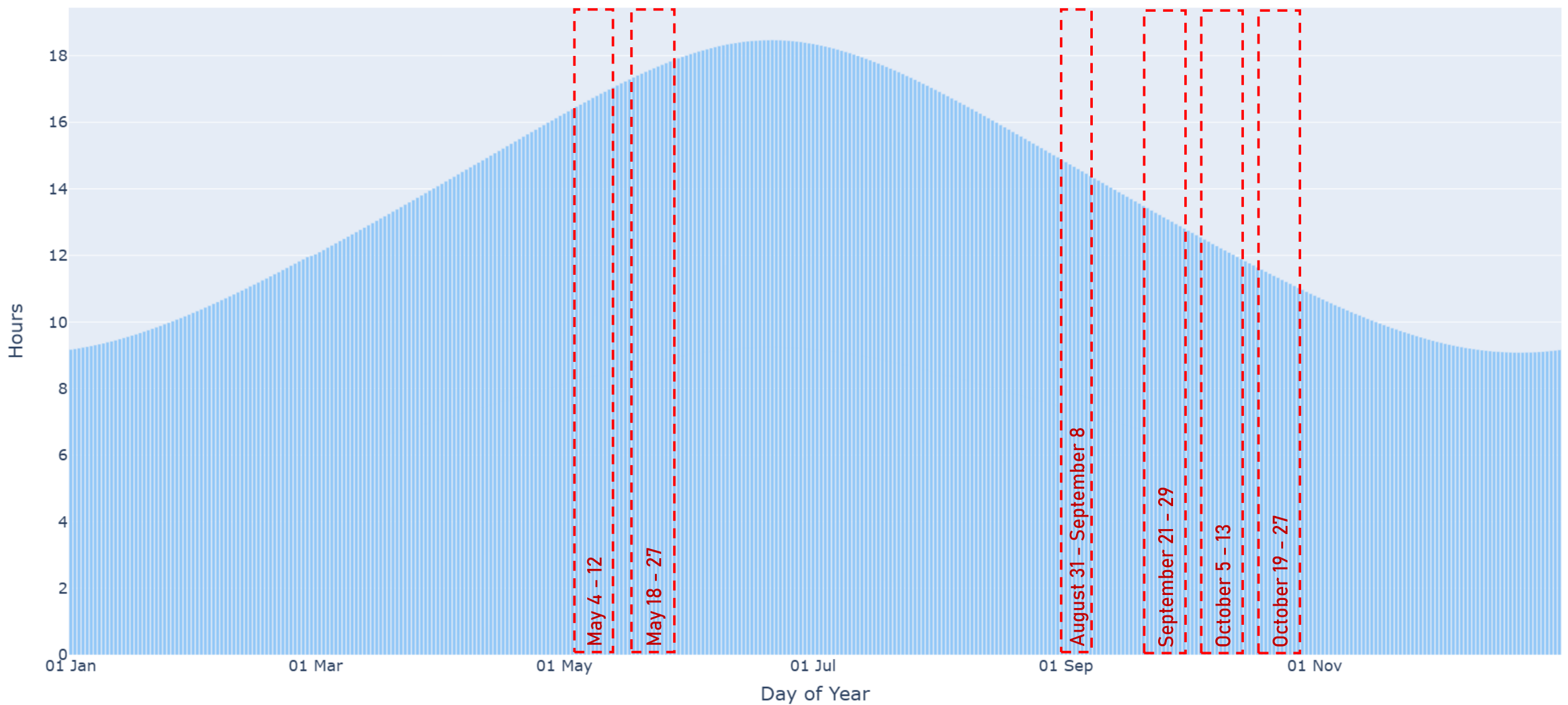
Daylight Duration

- To answer questions in the area of:
 - “Can work be performed during daylight conditions?”
 - For impact on the workforce and work accuracy
- Quantification of:
 - Daylight duration per date (incl. twilight as per civil definition)
 - Also possible: uniform daylight period (UDP)
- Different ways of plotting
 - Barcharts
 - Calender plots
 - Etc



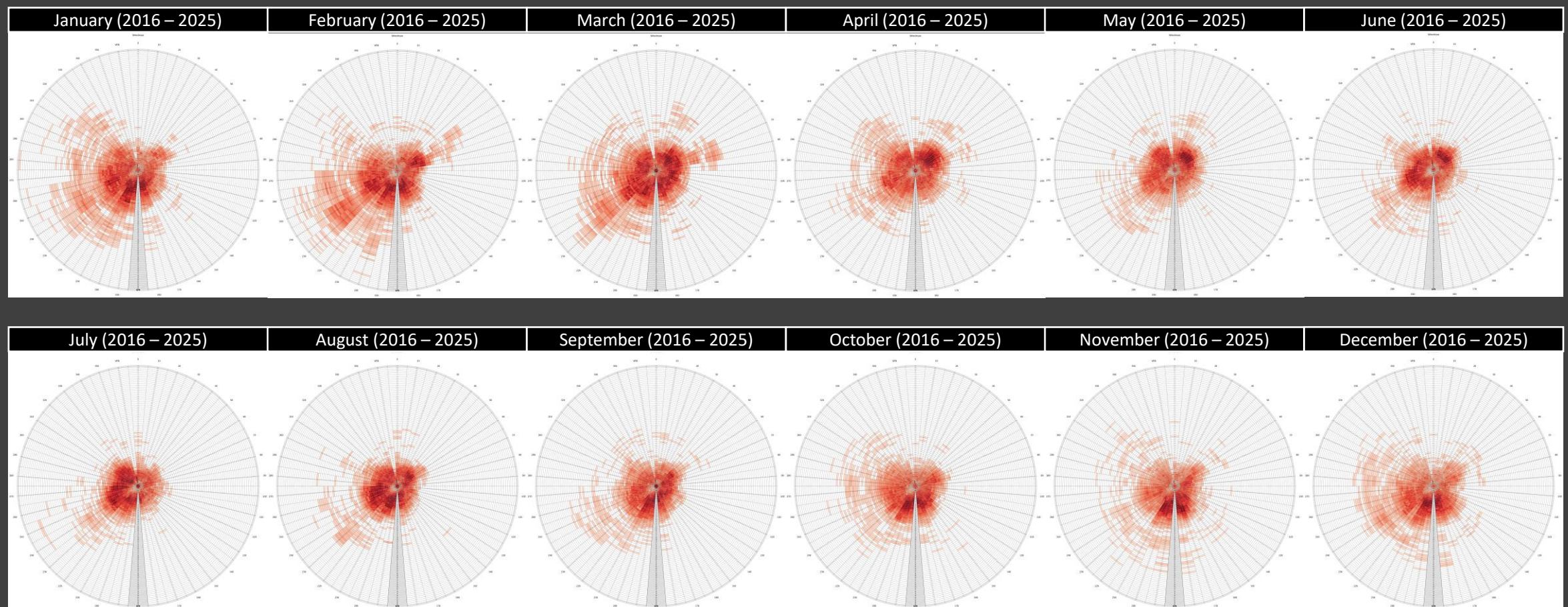
Daylight Duration

Average Civil Daylight Length per Day



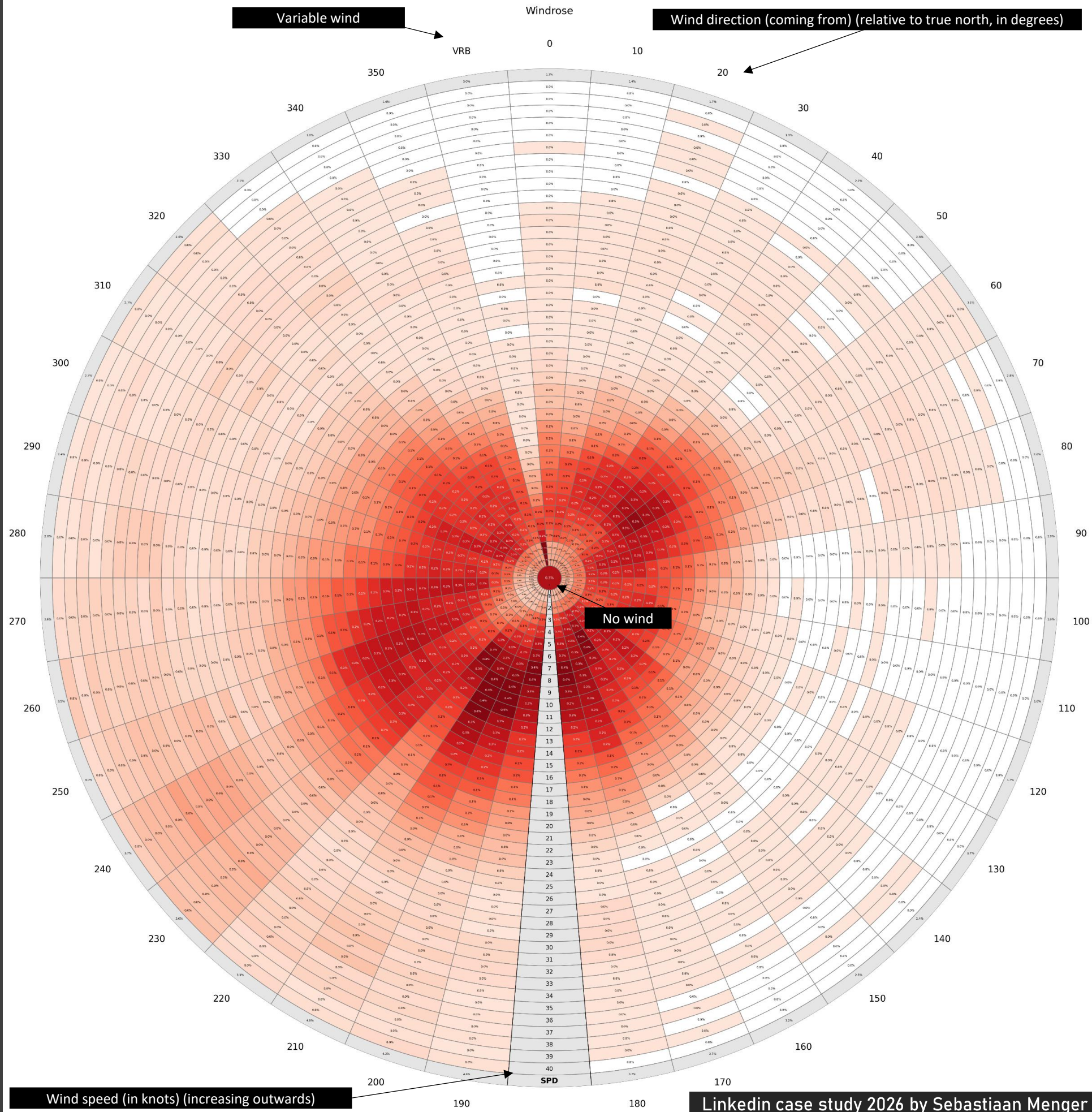
Surface Wind Impacts

- The wind and its impact on RWY availability (so-called “RWY usability factors”) is another meteo component of prime interest → what is the availability of the remaining runways?
- We should consider that:
 - How are remaining runways used for arrivals and/or departures? (eg no departures from RWYs 36R, 06, etc)
 - Are all remaining runways available for all type of traffic (eg RWYs 04-22 not available for certain types of heavies/widebodies)
 - For this basic example, that is out of scope



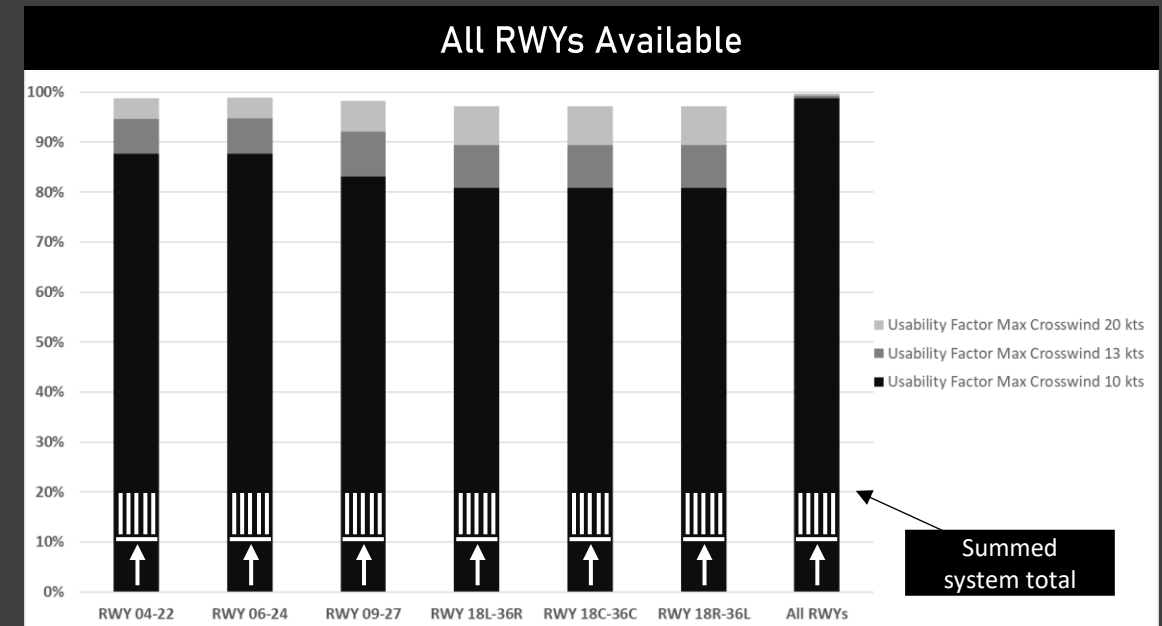
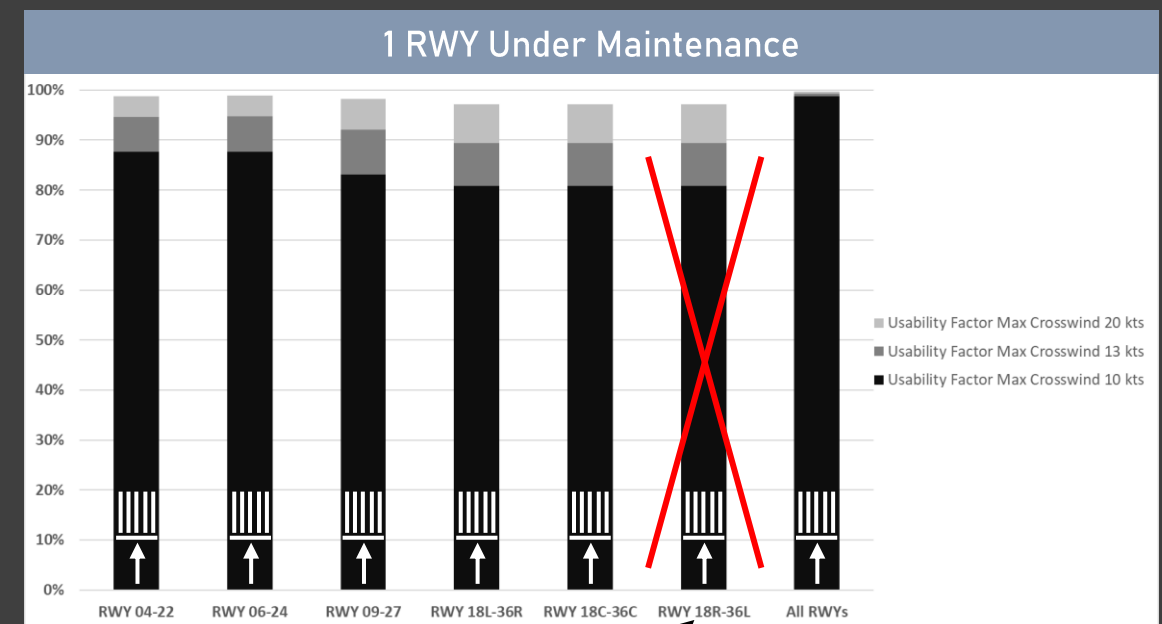
Windrose

- Example is focused on winds between 0-40 kts (for illustration purposes wind >40kts is not shown in this graph)
- Wind observations between 2016-2025 (10 yrs)
- Very diverse range of wind origins over the year given proximity to sea with phenomena such as sea vs land breeze, etc
- Furthermore, during spring and autumn, significant wind shifts due to heating/cooling of land masses



RWY Usability Factors

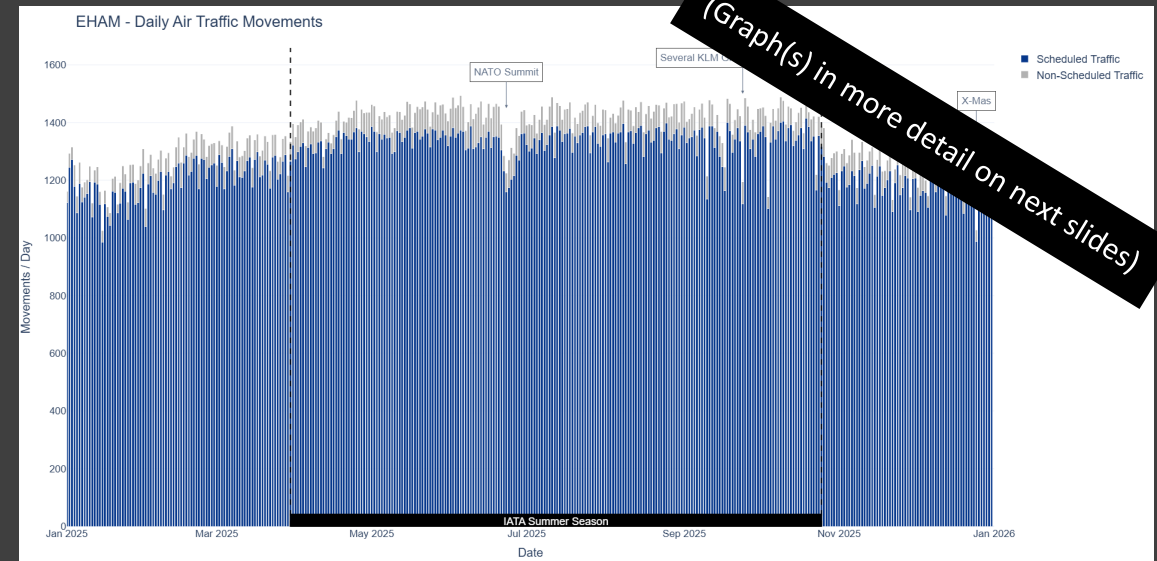
- The availability of each RWY can be quantified based on:
 - Crosswind limits
 - Tailwind limits
 - RWY surface conditions (wet/dry and inherent wind limits)
 - More restrictive airline wind limits
 - ATC procedures such as “reduced runway separation minima” triggering lower tailwind minima
 - Etc (!)
- Furthermore, “availability” doesn’t always equal usage! That is also driven by:
 - Preferential runway systems (PRS) and thereby noise abatement
 - ILS categories (vs IFR/VFR covered before), etc
- Who said this topic is easy? 😊



No impact since multiple RWYs with orientation 18-36.
However one RWY less will have impact on capacity, so we need to look into traffic demand (next slides ...)

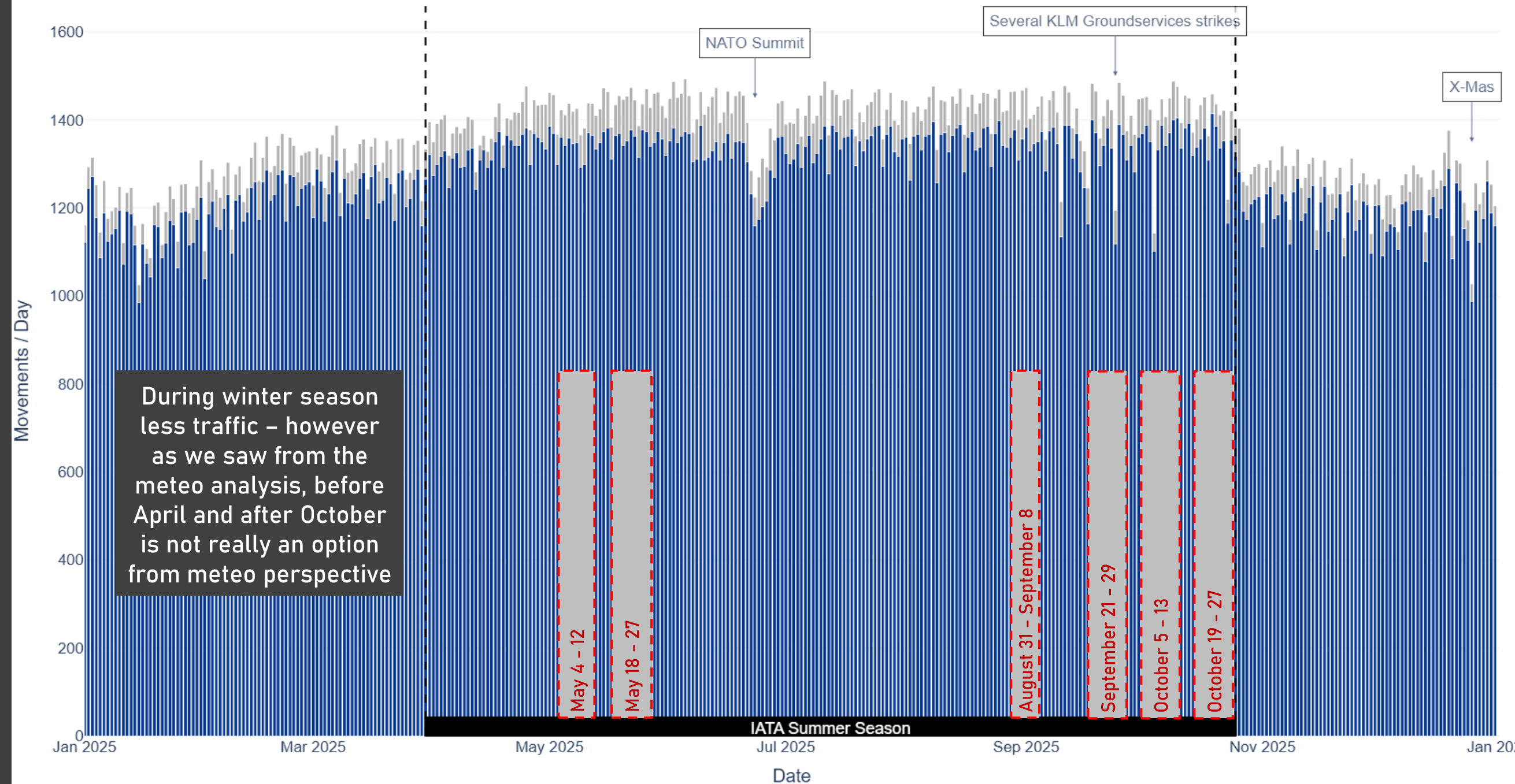
Traffic Demand

- With a RWY undergoing maintenance, we also need to consider the capacity of the remaining runways vs scheduled demand
 - Strategies could revolve around optimizing RWY usage (potentially temporarily disregarding PRS)
 - Or reducing demand by temporarily reducing slots (a fairly complex topic given airline grandfather rights, IATA slot deadlines, etc)
- Let's have a look into traffic demand data from 2025 as orientation for the respective maintenance timeframes/phases



Traffic Demand 2025 Reference

EHAM - Daily Air Traffic Movements



* Yes, here we put 2026 dates on a 2025 reference, which is not 100% comparable – but it gives a high-level indication of demand and seasonality

** 2025 flight schedule derived from open-source ADS-B data

Traffic Demand

- Finally, you could go one step further and look into:
 - (Various) *daily* traffic patterns
 - Peak rankings and their distribution/concentration within the year
 - Etc.
- To answer the question “can the remaining RWYs and their pertaining capacity cover the (hourly) traffic demand?”
- But for this basic example, that is out of scope 😊



About

- I'm Sebastiaan, a freelance simulation and data expert with extensive historical meteo data for thousands of airports.
- Through these meteo studies, I can support airside maintenance projects, allowing to quantify strategies based on weather patterns and identify phasing for construction works. If this is of interest to you, please contact me on [LinkedIn](#).

Meteo Studies: Pricing & Timeline

- **Meteo Analyses** (excluding traffic sub-study)
 - VMC/IMC likelihood statistics
 - Temperature statistics
 - Precipitation & thunderstorm statistics
 - Daylight durations
 - RWY usability factors
 - Windroses
 - (Other parameters or further detailing upon request)
 - (Traffic sub-study upon request)
- **Delivery timeline: 3 days**
- **Costs reference: EUR 1,320 ex. VAT** (includes aforementioned meteo analyses, 10 years of METAR data and slides documentation)