Evaluating the Effects of a Bird Strike Advisory System

Isabel Metz, Thorsten Mühlhausen, Joost Ellerbroek, Jacco M.Hoekstra

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Motivation

Bird Strikes

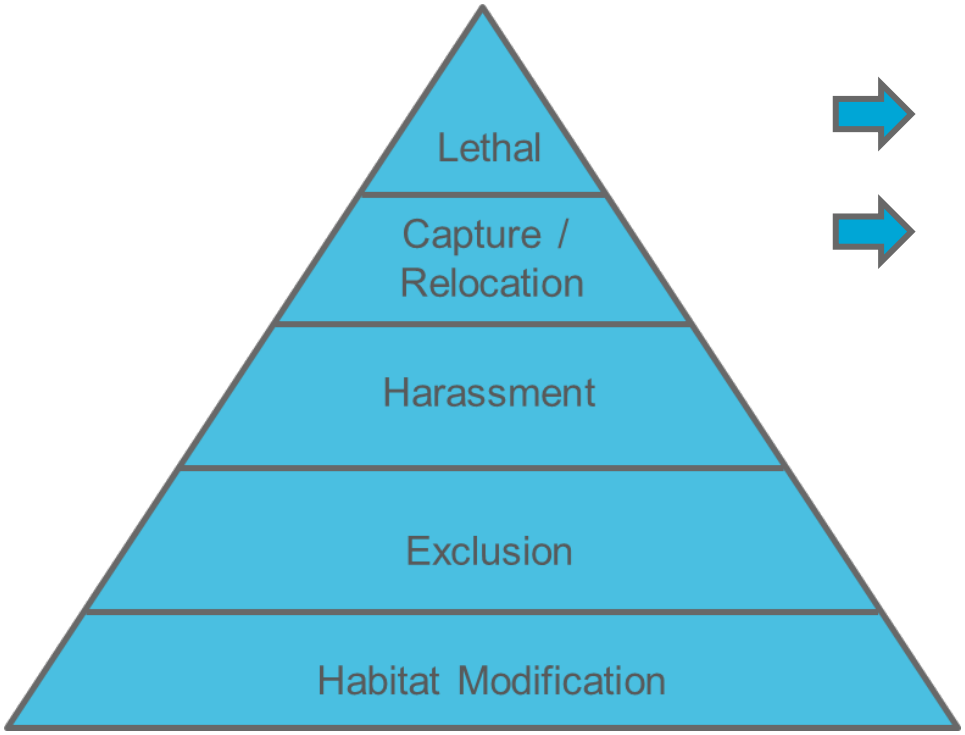
- operational impact
- economic loss
- damage and accidents

US Airways 1549 (January 2009)

Sita Air 601 (September 2012)

Motivation

Bird Strike Prevention in Civil Aviation



source: ACRP

- focus on airport
- sole responsibility of Wildlife Control

Motivation

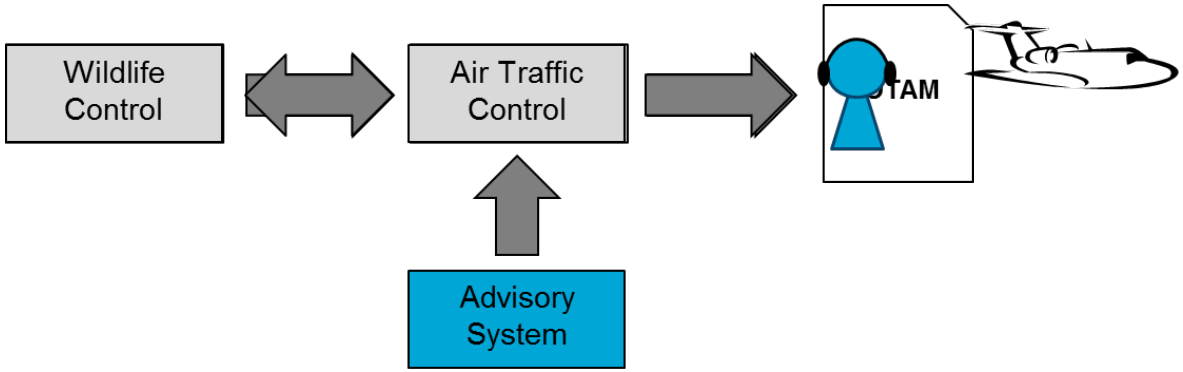
In reality, wildlife strike risk is not an aerodrome problem.

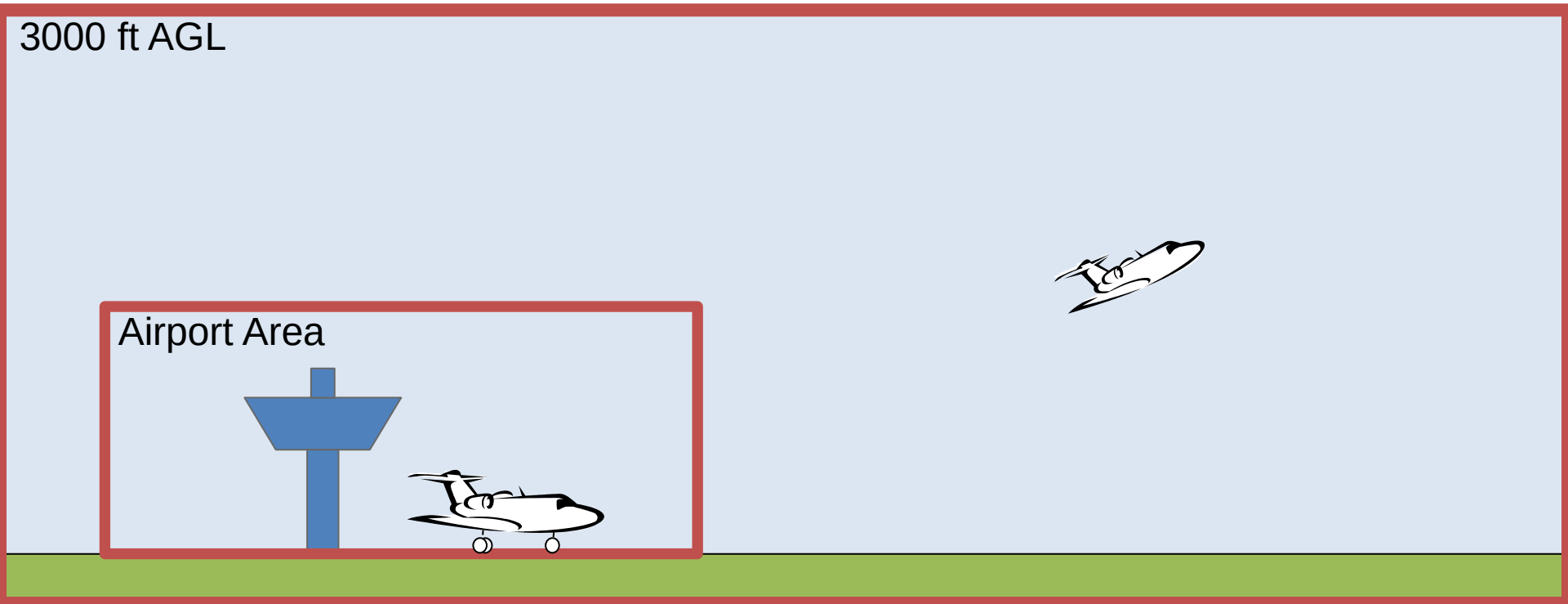
It is a below 3000' AGL airspace problem and thus the primary responsibility for managing the problem should reside with those managing and using the airspace.

McKee, J., Shaw, P., Dekker, A., & Patrick, K. (2016).
Approaches to Wildlife Management in Aviation.
In *Problematic Wildlife* (pp. 465-488).
Springer International Publishing.

Motivation

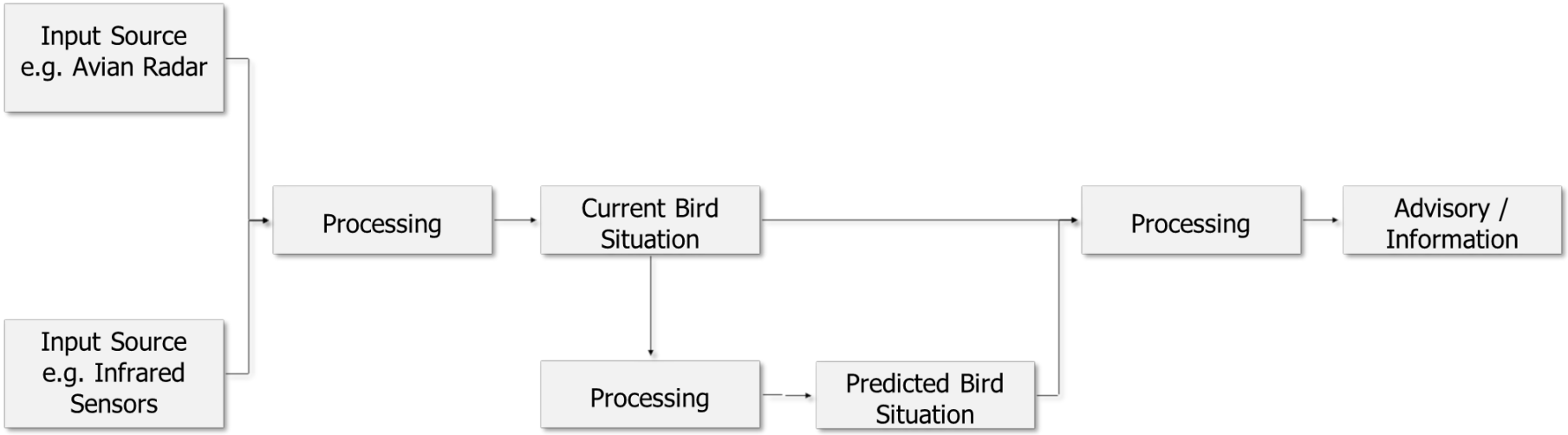
What if...





Concept

a Bird Strike Advisory System for ATC

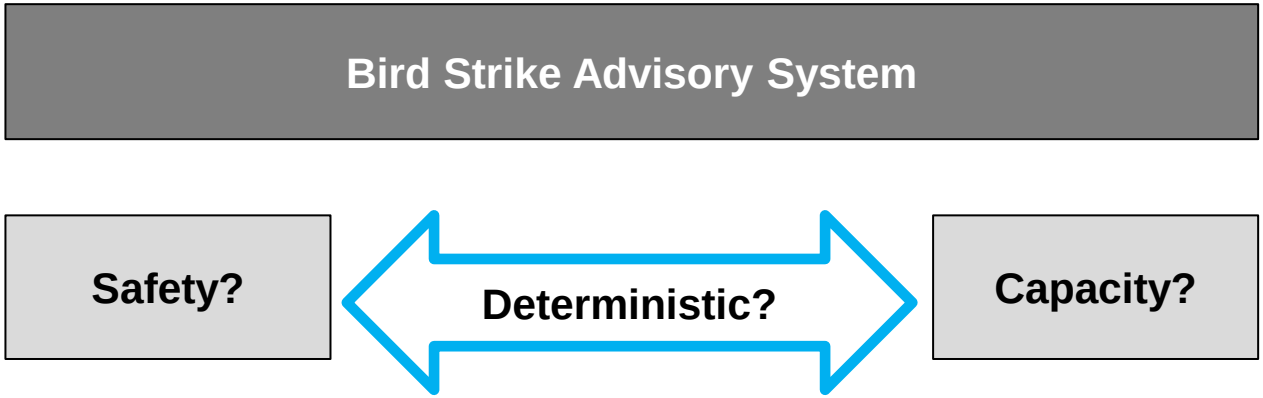


possible reactions:

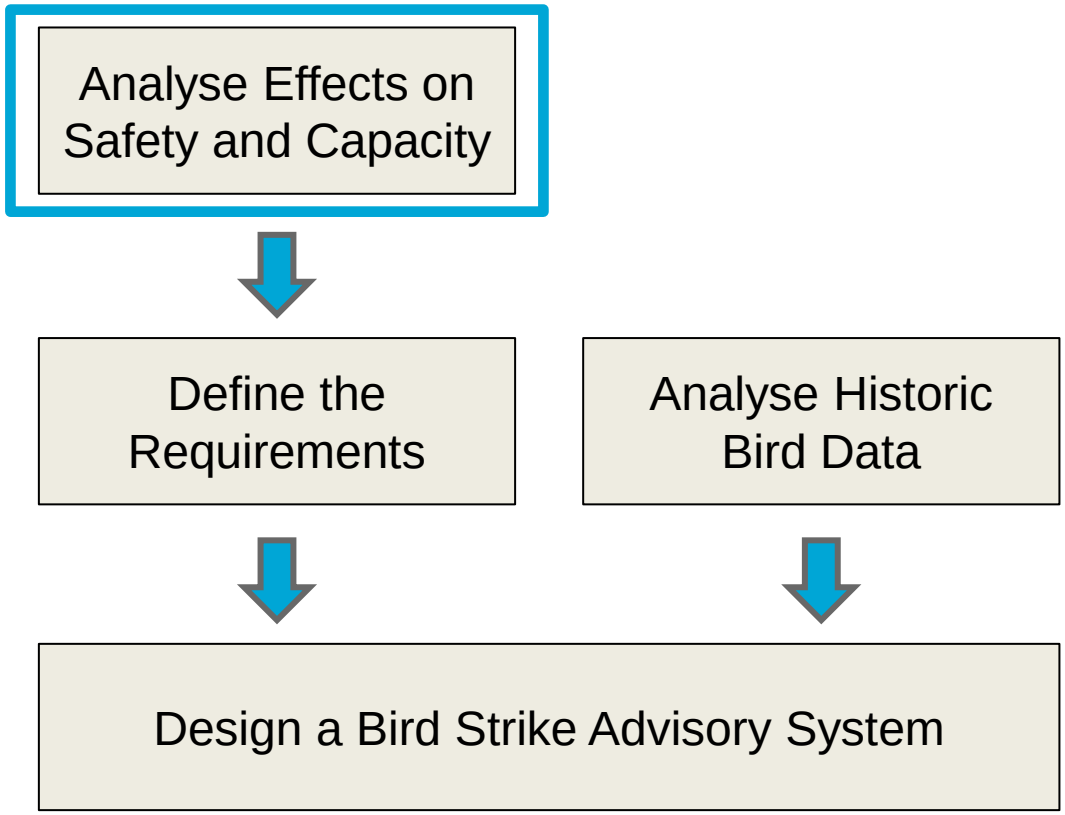
- delay
- reroute
- warn

→ what are the consequences?

Key Questions

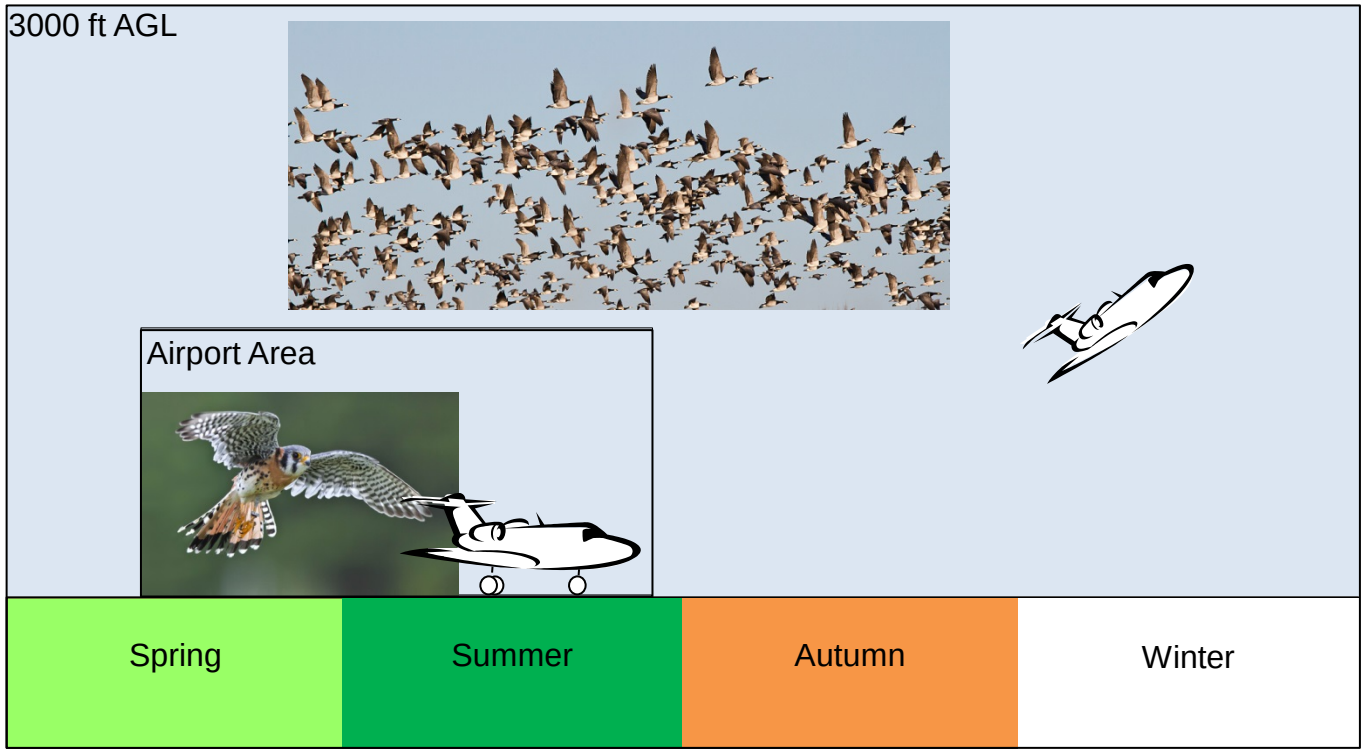


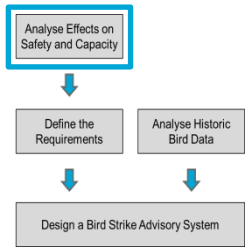
Approach


Analyse Effects on Safety and Capacity
Define the Requirements
Analyse Historic Bird Data
Design a Bird Strike Advisory System

Approach

Step 1: Analyse the Effects on Safety and Capacity





Approach

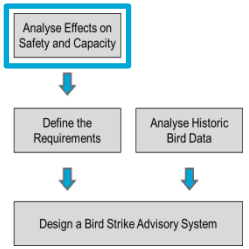
Step 1: Analyse the Effects on Safety and Capacity

input sources

avian radar: historic track data

weather radar: bird density

flight plans with different traffic intensities



Approach

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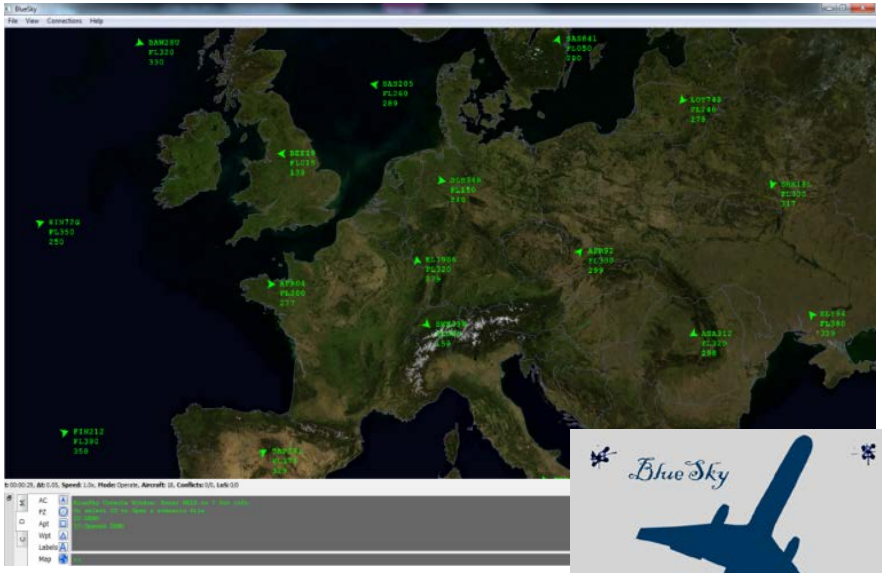
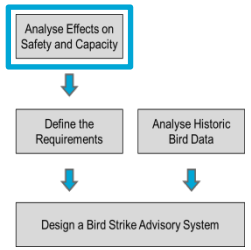


BlueSky Open Air Traffic Simulator

- real- and fast-time simulator
- vizualisation and evaluation of
  - air traffic flows
  - ATM concepts
- open data & open sources

fast-time simulations

- without advisory system → effect on safety
- with advisory system → effect on capacity

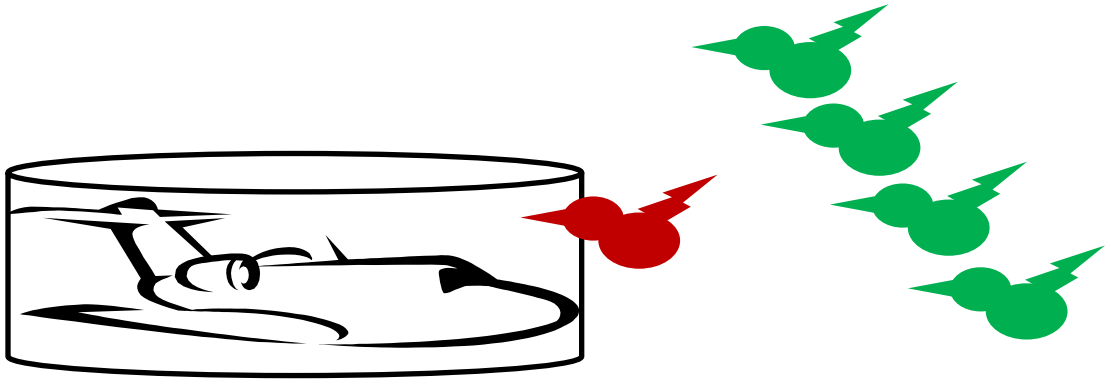


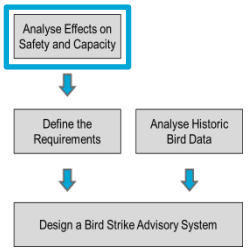
Approach

Step 1: Analyse the Effects on Safety and Capacity

no system: conflict detection

→ effect on safety



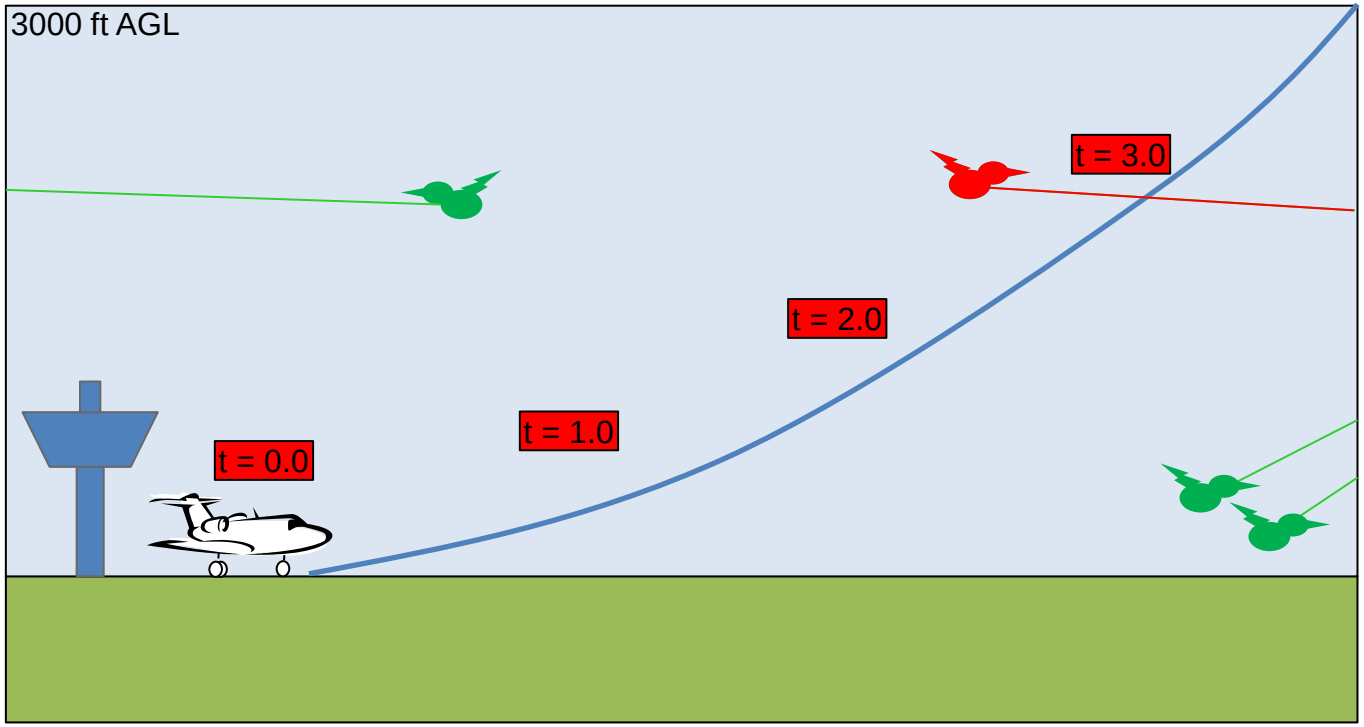


Approach

Step 1: Analyse the Effects on Safety and Capacity

the perfect system: conflict avoidance

→ effect on capacity

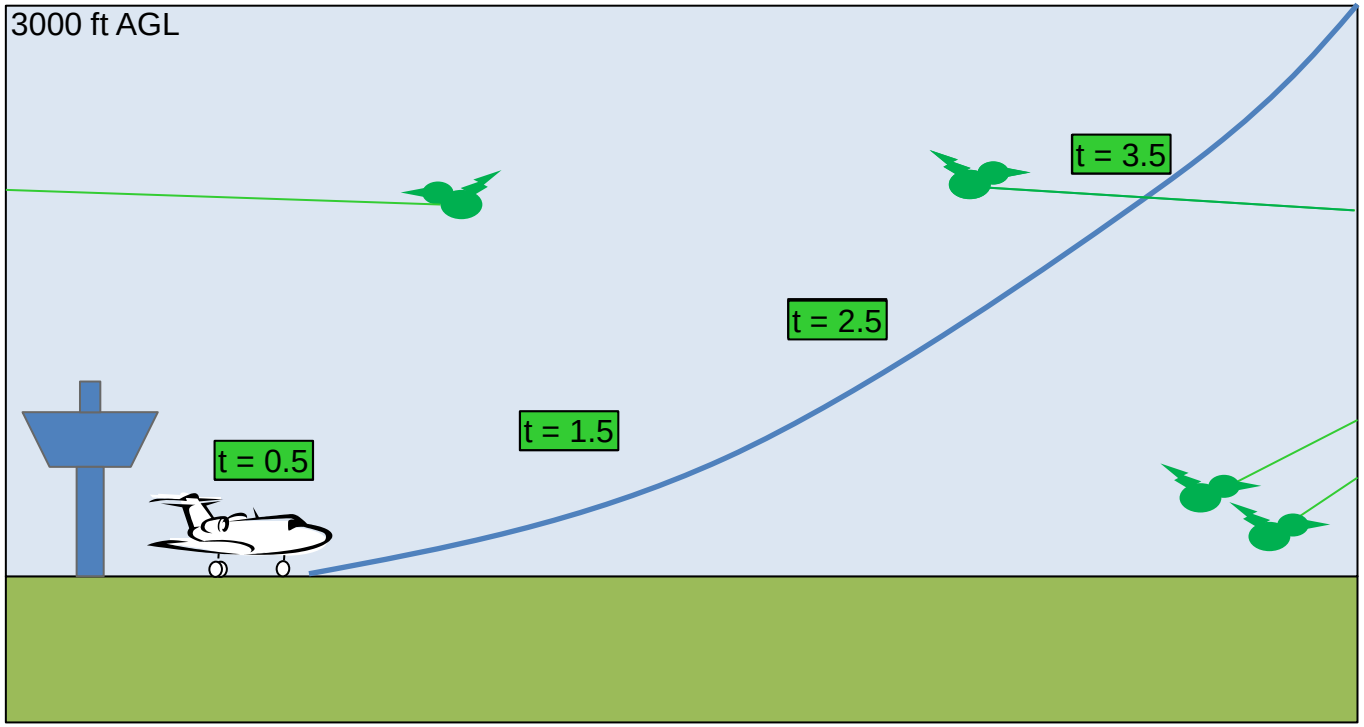


Approach

Step 1: Analyse the Effects on Safety and Capacity

the perfect system: conflict avoidance

→ effect on capacity



output: effects of an optimum system

Approach

Analyse Effects on Safety and Capacity

Define the Requirements

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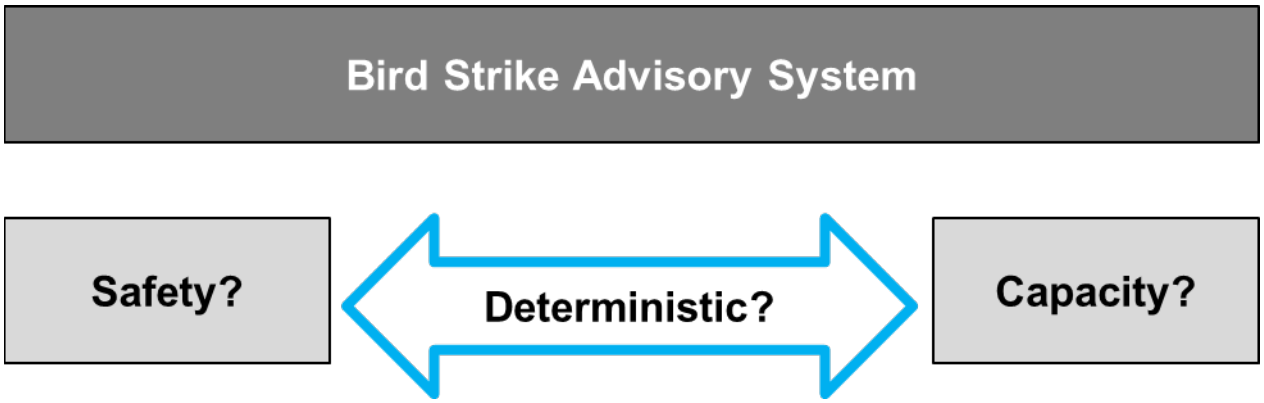
Design a Bird Strike Advisory System

Thanks!


Bird Strike Advisory System
Safety?
Deterministic?
Capacity?


Questions?