Science and Airports

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Science Engineering and Transport Group

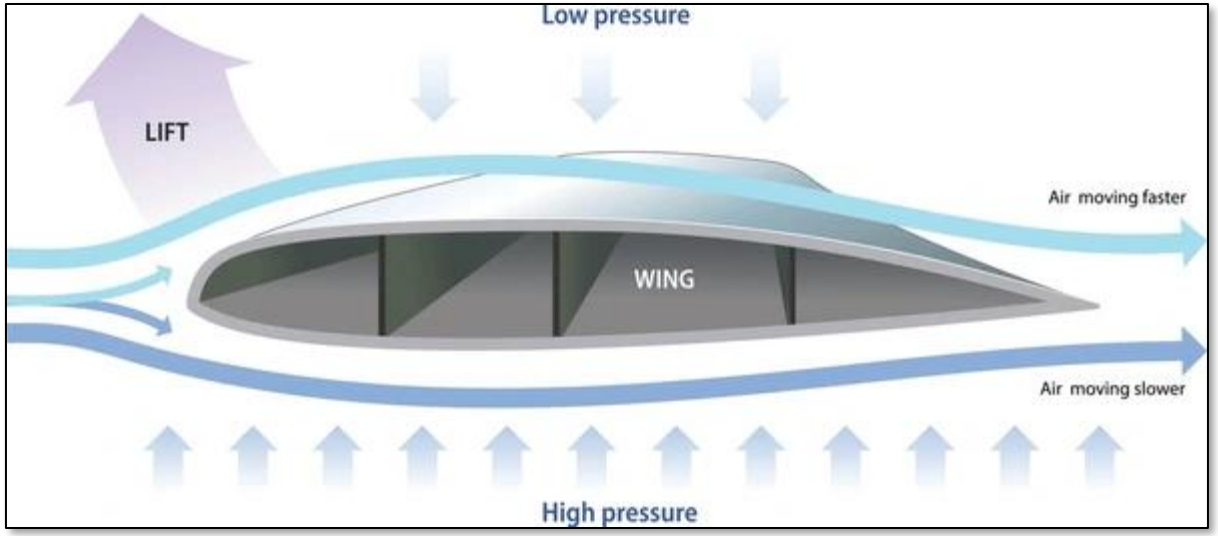

Geography
Physics
Biology
Hydrology
Chemistry
Mathe-
matics
Electro-
magnet-
ism
Meteor-
ology
Ecology
Earth
Science

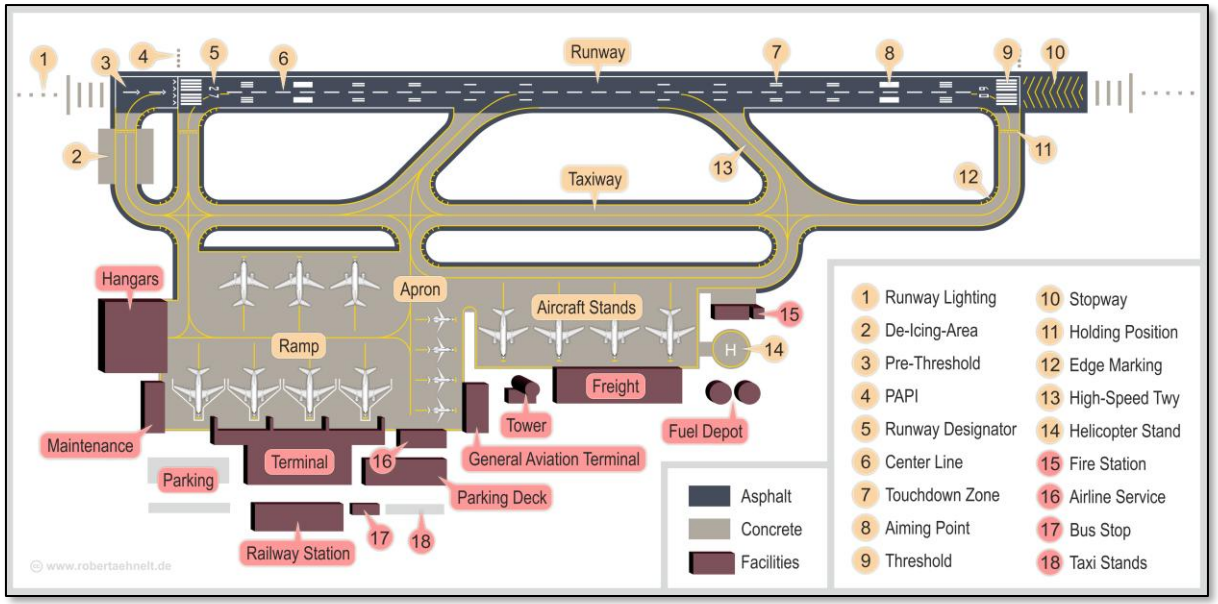
Geography

- Settlements
- Surface Transport
- Landform
- Geology

Physics

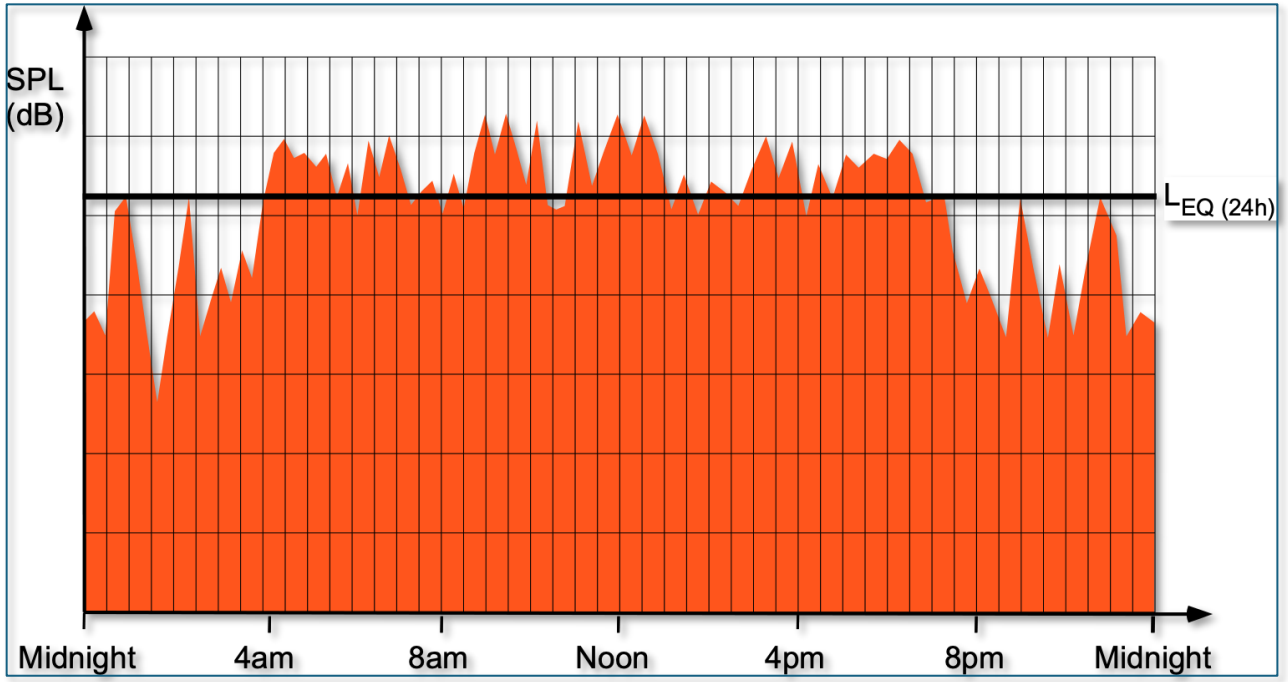
- Aerodynamics
- Thrust, drag, lift and weight
- Momentum
- Runway layout





Accoustics

- From engines, landing gear, airframe
- Measured by decibels
  - Log scale
  - Averages, maxima, exceedances
- Relationships to disturbance, sleep, health, learning
- Comparison with other sources of noise



Electromagnetism

- Radio (speech)

Electromagnetism

- Radio (speech)
- Radio (VHF - ILS)

Electromagnetism

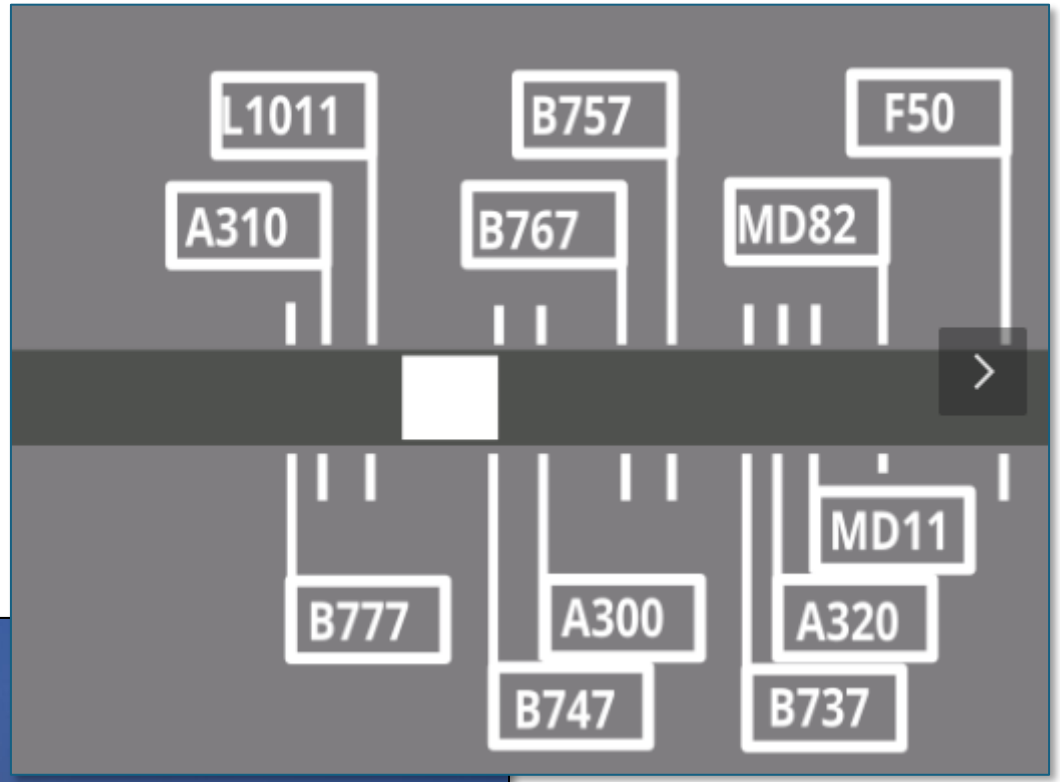
- Radio (speech)
- Radio (VHF - ILS)
- Radio (VOR)

Electromagnetism

- Radio (speech)
- Radio (VHF - ILS)
- Radio (VOR)
- Radar

Electromagnetism

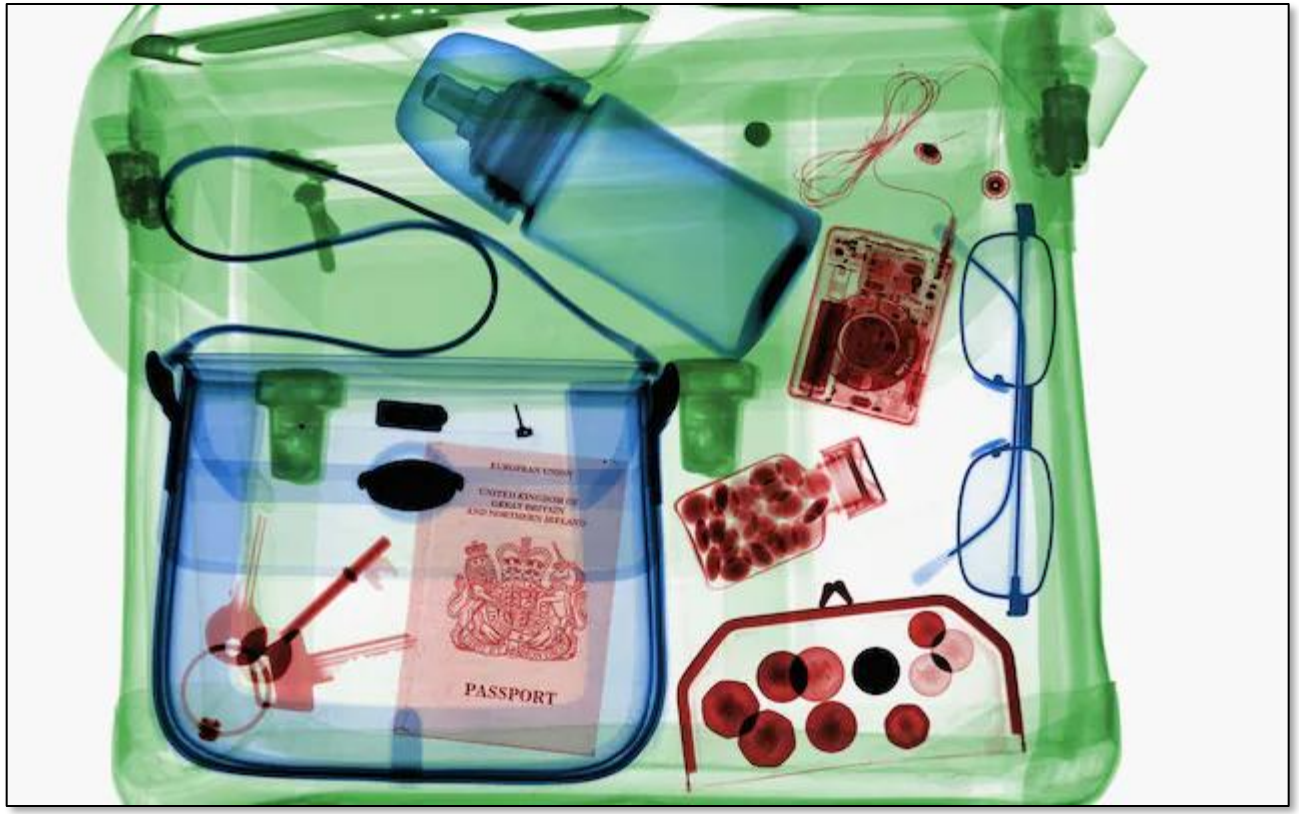
- Radio (speech)
- Radio (VHF - ILS)
- Radio (VOR)
- Radar
- Light



PAPA Parallax Aircraft Parking Aid

Electromagnetism

- Radio (speech)
- Radio (VHF - ILS)
- Radio (VOR)
- Radar
- Light
- X-rays (or millimetre waves)

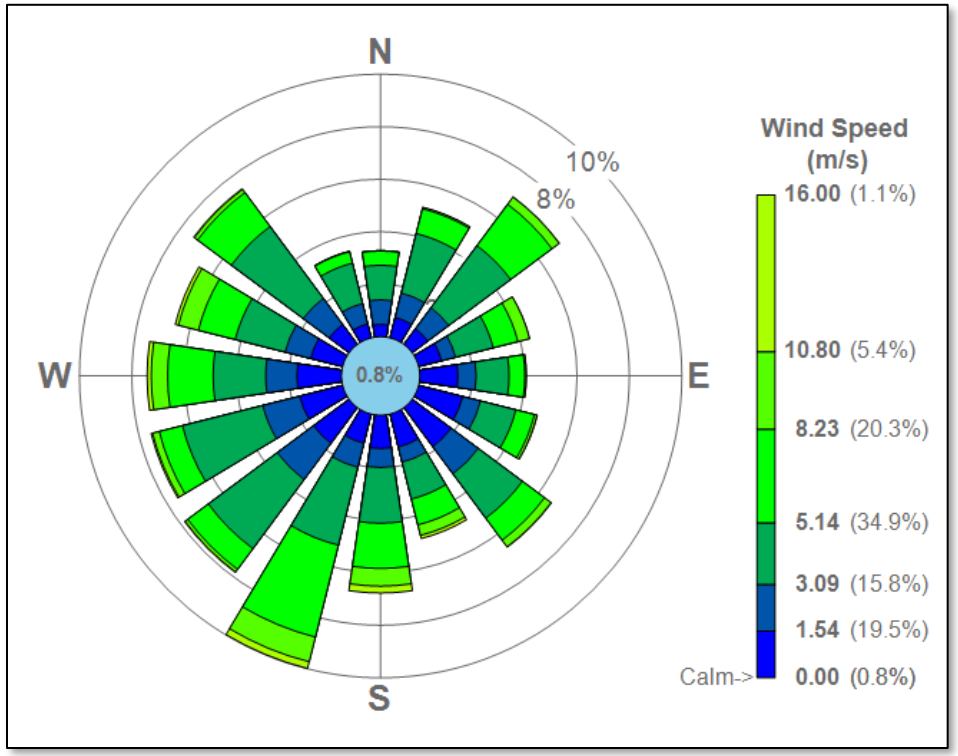


Chemistry

- Aviation fuel
- Sustainable aviation fuel
- De-icing fluid (propylene glycol or ethylene glycol)

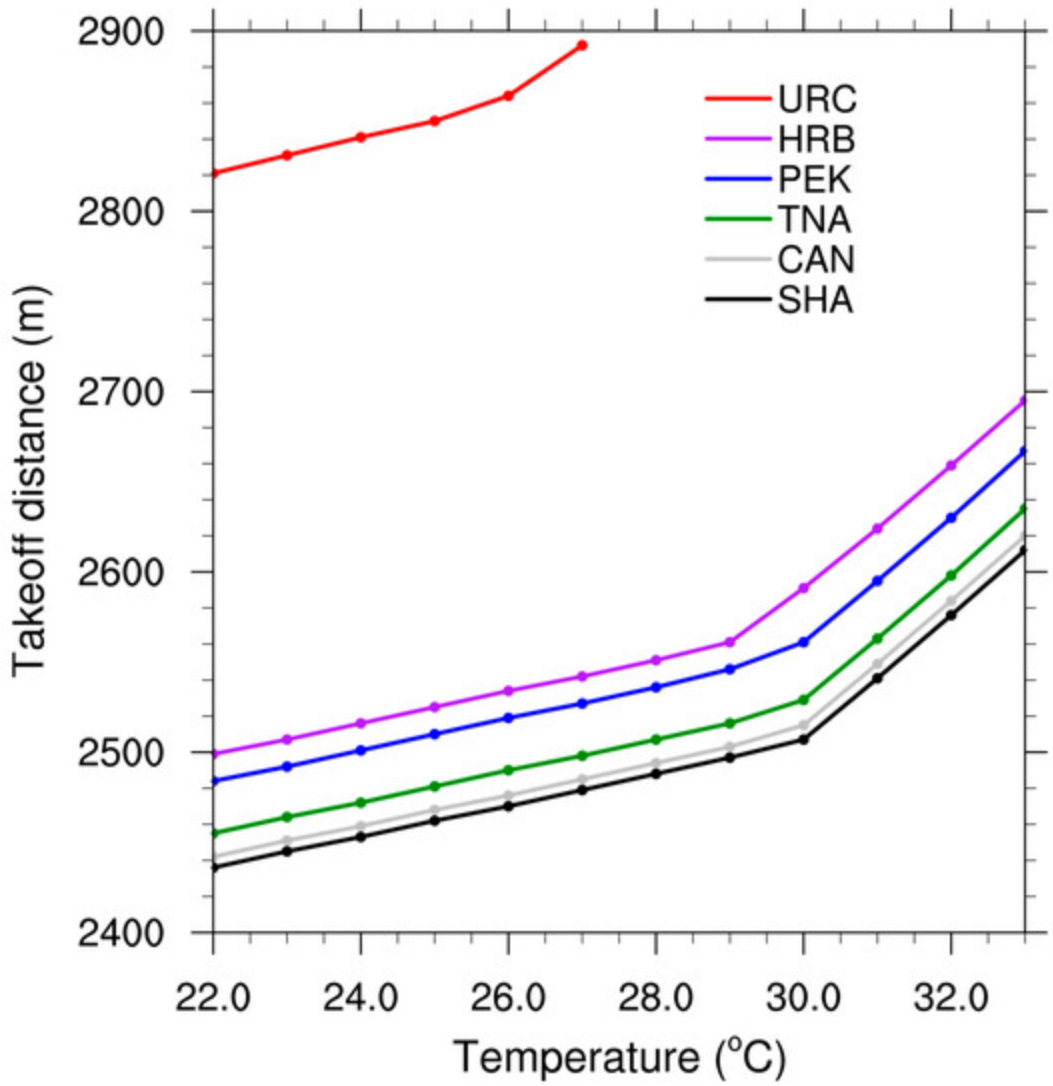
Meteorology

- Wind



Meteorology

- Wind
- Temperature



Meteorology

- Wind
- Temperature
- Fog

Meteorology

- Wind
- Temperature
- Fog
- Snow

Hydrology

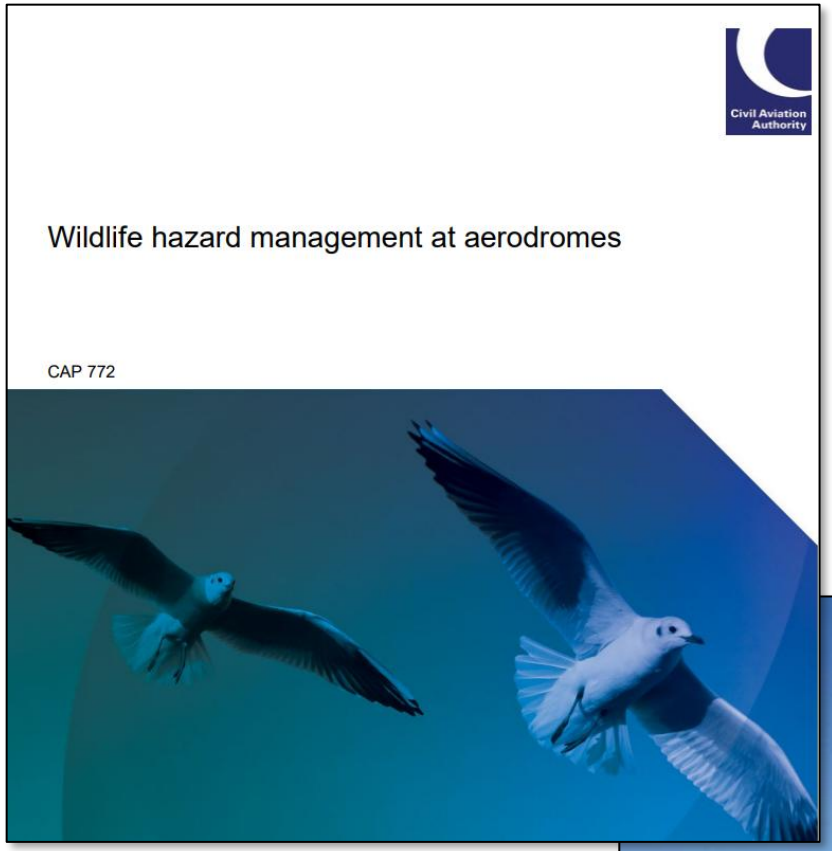
- Runoff from runways and aprons
- Pollution control
- Heathrow twin rivers – Duke of Northumberland's and Longford

Ecology

- Losses from expansion, and mitigation

Ecology

- Losses from expansion, and mitigation
- Bird strike hazards
- Grass cutting



Ecology

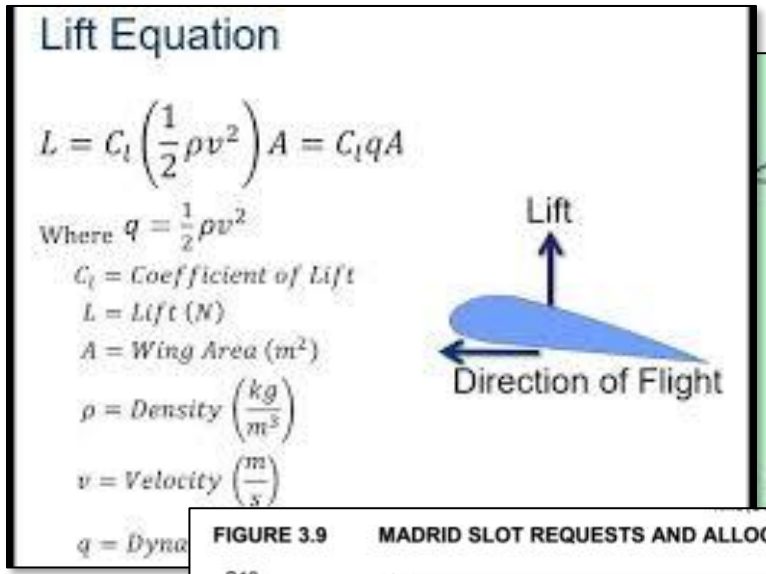
- Losses from expansion, and mitigation
- Bird strike hazards
- Grass cutting
- Pollution control

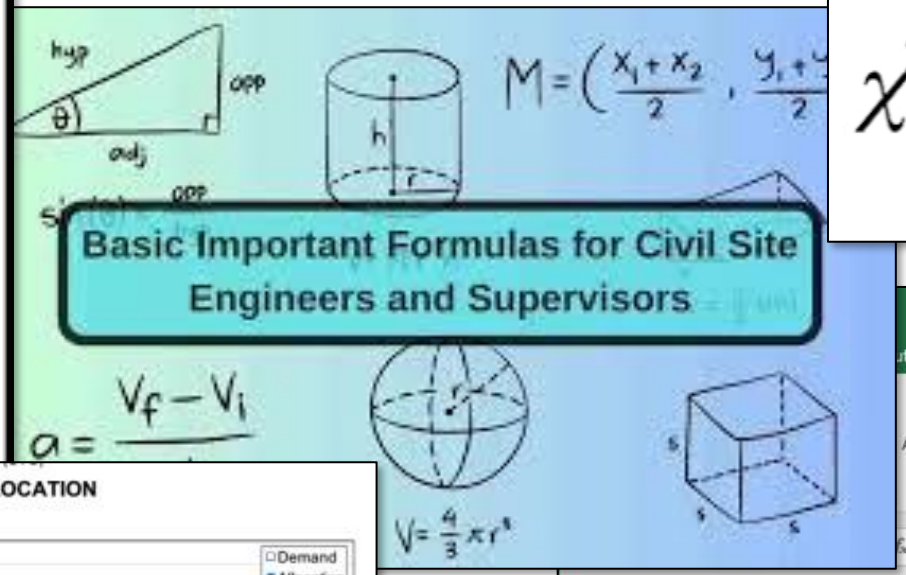
Wood

Air Quality

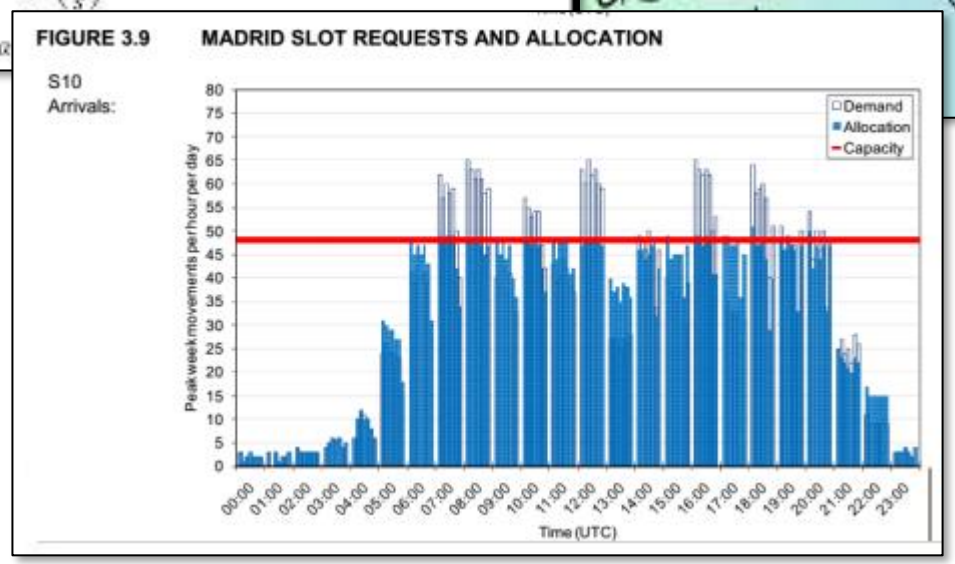
- Local air quality:
  - CO
  - NO_x
  - Particulates
- Greenhouse Gas Emissions:
  - CO_2e
  - <10% from airport buildings and ground operations

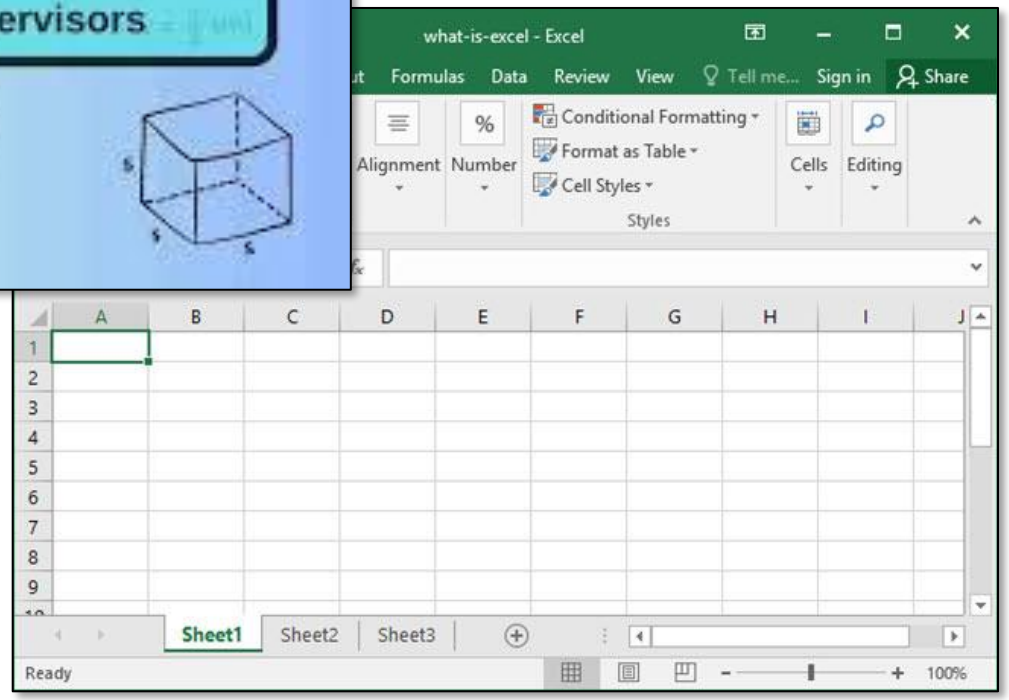
Mathematics





$$\chi^2 = \sum \frac{(O-E)^2}{E}$$





Anything else?