





# All TUD faculties contribute to airport and aviation-related research

**Aerospace Engineering**



**Mechanical, Materials and  
Maritime Engineering**



**Architecture & the Built  
Environment**



**Technology, Policy &  
Management**



**Applied Sciences**



**Electrical Engineering,  
Mathematics & Computer Science**



**Civil Engineering & Geosciences**



**Industrial Design Engineering**



# Examples of available expertise:

## **Airport Performance Optimization**

- Resilience & capacity
- Maintenance

## **Safe & Secure Airports**

- Landside & Airside
- Cyber security

## **Green Airports**

- Noise & Emissions
- Energy Efficiency
- Circular Economy

## **Comprehensive Engineering**

- Responsible Innovation
- Value Design
- Policy Making

## **Smart Airports**

- Digitization
- Automation
- New Technologies: AI

## **Seamless door-to-door journeys**

- Passenger Experience
- Future of Baggage
- Cargo
- Intermodality & Connectivity

## **Aerotropolis**

- Airport Cities
- Better Airport Regions
- Airport Networks

## **Emergency Relief Airports**

# Airport expertise can be clustered in multiple themes



## TUD Expertise - examples

### Airport Performance Optimization

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### Aerotropolis

- Airport Cities
- Better Airport Regions
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### Emergency Relief Airports

## Thematic clusters

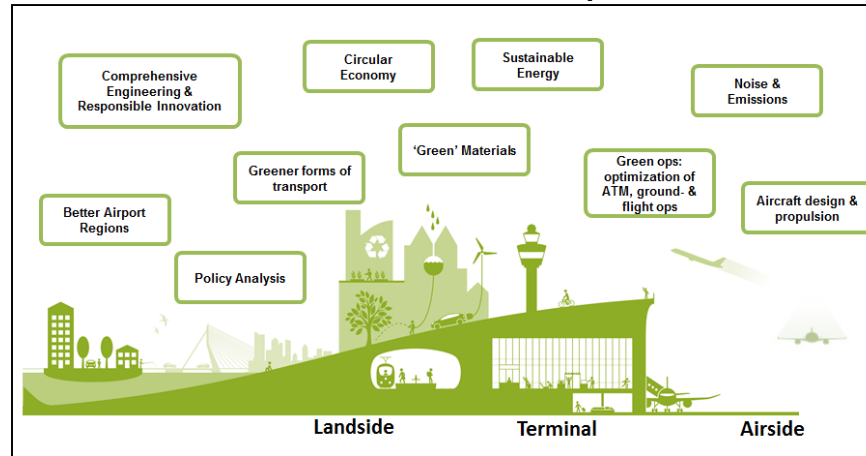
1. Quiet & Green
2. Efficient & Resilient
3. Safe & Secure\*
4. ....

# Thematic clusters

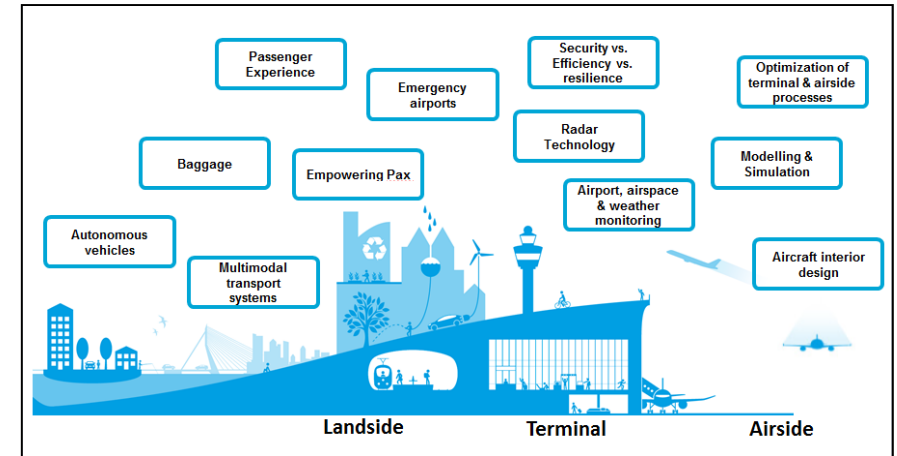
A detailed look

# High-level overview thematic clusters

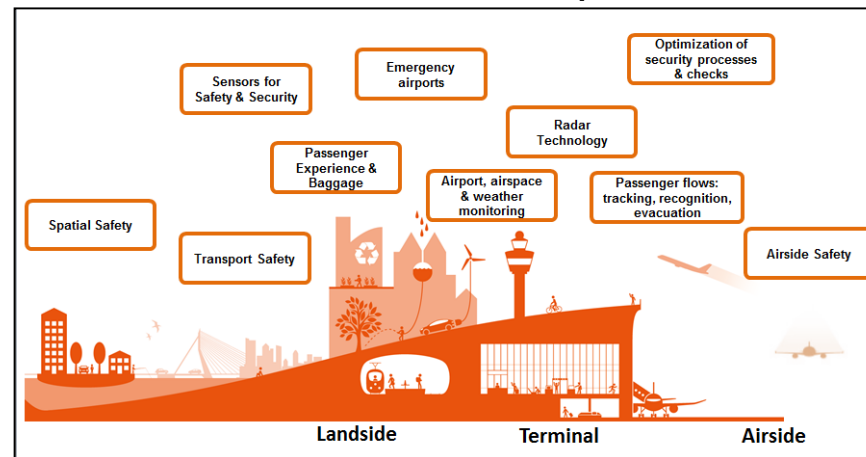
## Quiet & Green Airports



## Efficient & Resilient

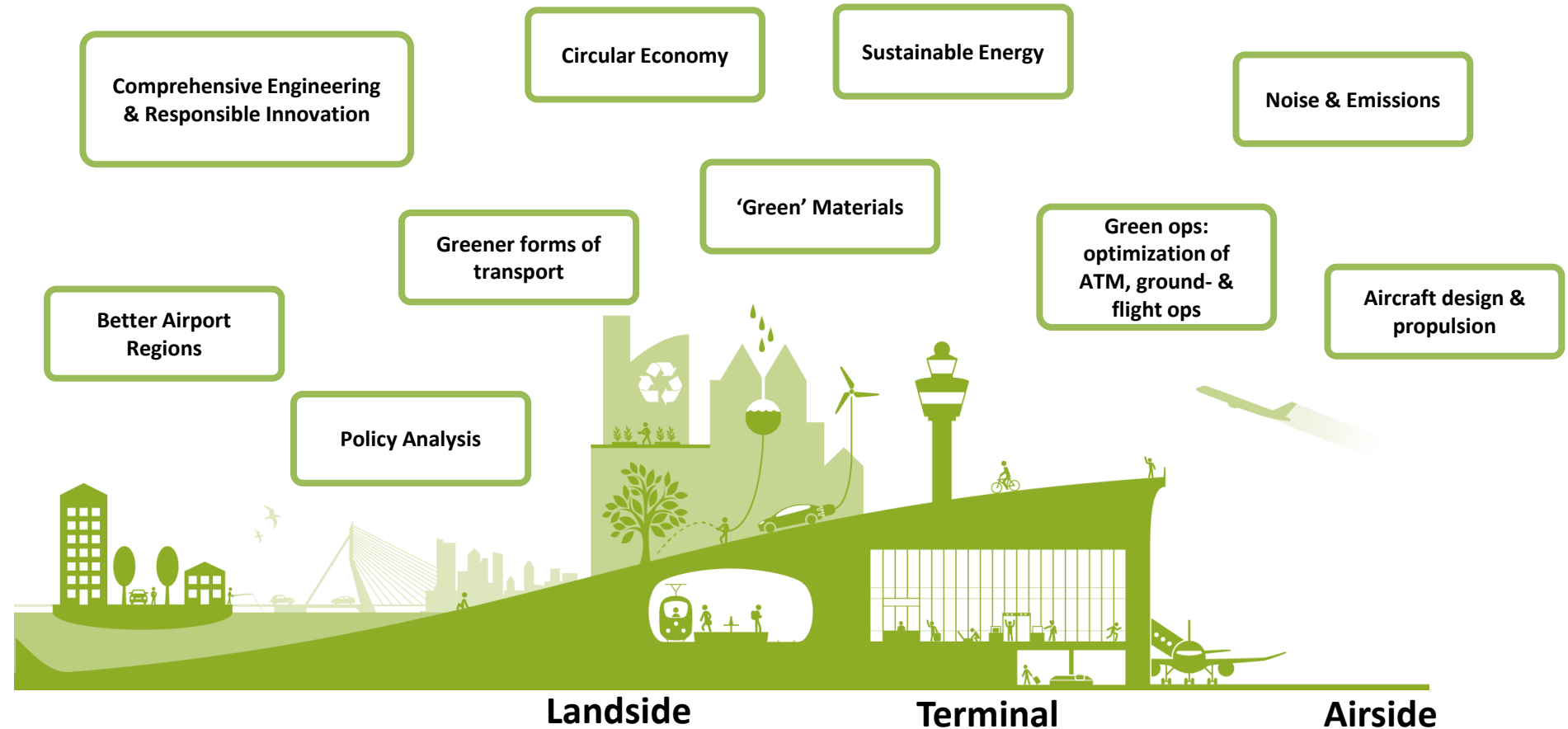


## Safe & Secure Airports\*



\* This topic has strong links with 'Efficient & Resilient' Airports

# High level overview of “Green & Quiet” cluster at TU Delft



# Detailed overview of TUD expertise “Green & Quiet” Airports



## Landside

### Better Airport Regions

- Sustainable urban development
- Urban design
- Spatial planning for noise abatement
- Social Glass (Big Data to understand cities)

### Greener forms of transport

- Electric vehicles
- Autonomous vehicles
- Multimodal transport
- Informing & influencing pax

## Terminal

### Airport Terminal Design

## Airside

### Aircraft design & propulsion

- Hybrid & electric aircraft
- Alternative fuels: biofuels

### Operations Optimization

- Flight Ops & ATM
- Maintenance
- Ground ops: e.g. electric taxiing

### Noise & Emissions

## Other

Circular Economy

Comprehensive Engineering

Policy Analysis

Sustainable Energy

Power Parking

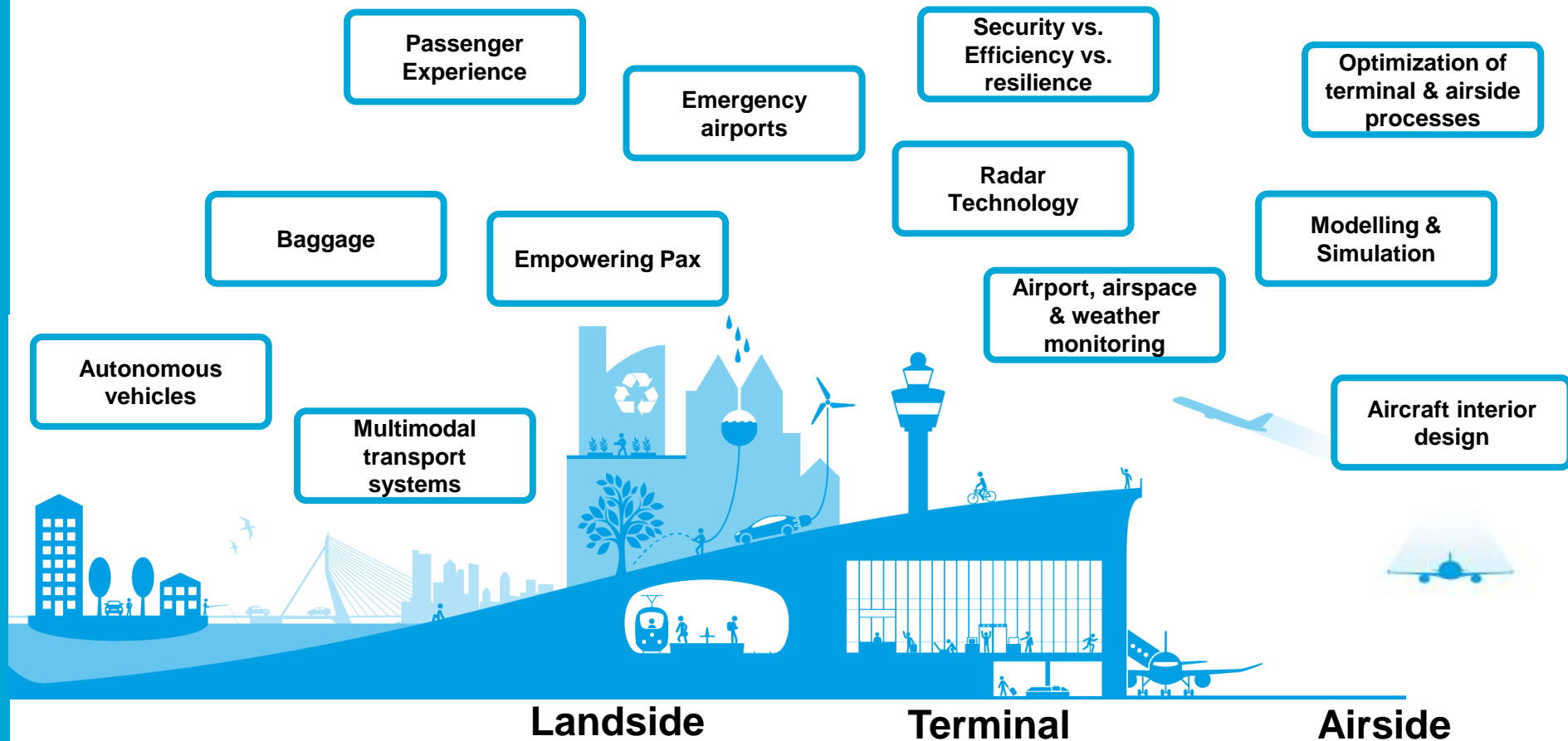
Critical Materials

3D Printing

Self healing concrete



# High level overview of “Efficient & Resilient” research cluster at TU Delft



# Detailed overview TUD Expertise – “Efficient & Resilient” Airports



## Landside

### Transport & Planning

- Multimodal transport systems
- Impact of transport modalities
- Autonomous vehicles
- Cargo

## Terminal

### Process improvement

- Agent-based modelling: trade-off ‘security vs. resilience’
- Passenger flows: modelling, monitoring & tracking, evacuation
- Radar Technology for efficient security
- Terminal design

## Airside

### Operations Optimization

- Flight Ops & ATM: e.g. time based separation
- Ground ops: e.g. turnaround
- (Predictive) Maintenance
- Network & gate scheduling
- AI: machine learning techniques

### Airspace, Runway, Weather & Turbulence Monitoring

Digital  
Empowerment

Baggage handling  
concepts &  
technologies

Wayfinding

### Passenger Experience & Comfort

Passenger Centric Design

Improving processes (security,  
boarding, etc)

Aircraft Interior  
Design

### Other

Big Data

AI

Modelling &  
Simulation

Passenger Tracking

Radar Technology

Emergency Airport

Decision making Tools

Resilience

# High level overview of “Safety & Security” research cluster at TU Delft



# Detailed overview TUD Expertise – “Safe & Secure” Airports



## Landside

**Spatial Safety**

**Transport Safety**

## Terminal

**Sensors for Safety & Security**

**Safety & Security of Terminal Operations**

- Agent-based modelling: trade-off 'security vs. resilience'
- Passenger flows: modelling, monitoring & tracking, recognition evacuation
- Radar Technology for efficient security

## Airside

**Airside Safety**

- Flight Ops & ATM
- Ground ops: e.g. turnaround, taxiing, runway, operations
- Maintenance

**Airspace, Runway, Weather & Turbulence Monitoring**

## Other

Modelling & Simulation

Safety Science

Passenger Experience & Baggage

Risk Ethics

Cyber Security

Emergency Airport

Safety Models & Tools