Air Transport Infrastructure Sustainability Action Plan

January 2022

START

INTRODUCTION

Aviation is one of the most difficult sectors to **decarbonise** due to the higher power demands of aircraft and extreme environments in which they operate; these present significant technical challenges to replacing fossil fuels. We are, however, witnessing the emergence of novel (and zero emission) propulsion aircraft which can support the decarbonisation of the sector. This has been identified in the Government's Ten Point plan for a Green Industrial Revolution **"To support the emergence of a market in zero emission we will invest in R&D into the infrastructure upgrades required at UK airports to move to battery and hydrogen aircraft."**

The Committee on Climate Change consider Aviation will be the highest emitting sector by 2050. Aviation will require a multifaceted approach to decarbonisation including: the development of new technology, continued improvements in the efficiency of existing aircraft, sustainable fuels, and off-setting.

Connected Places Catapult has identified that there is an excellent opportunity for aviation to deliver near and medium-term opportunities to address sustainability of the air transport system, separate to the development of new fuels, and complementary of our other work on aviation decarbonisation.

Working with aviation industry, government, and academic stakeholders, Connected Places Catapult has developed an Action Plan aimed to help the aviation industry identify and deliver near and medium-term opportunities to address sustainability of the air transport system. This focuses on the overall aviation ecosystem, including physical, digital, and charging infrastructure.

The Action Plan is based on the outputs from a Stakeholder Workshop held on 21st July 2021, where Connected Places Catapult brought together stakeholders from across the aviation eco-system to help the aviation industry identify and deliver near and medium-term opportunities to address sustainability of the air transport system, separate to the development of new fuels, aircraft and engine technology.

The Action Plan is intended to complement wider Government initiatives including: Aerospace Technology Institute (BEIS), UKRI Future Flight Challenge (BEIS) and Smart Aviation, Heart of the South West HPO (DIT).

The UK has a global advantage in aerospace technology, airport design and operation. This Action Plan seeks to support the maintenance of this position, and stimulate growth, as aviation adopts new forms of zero emission aircraft.

Please note that the button with a cross on the far right hand side will close all the pull-out boxes

We would like to thank the following organisations for supporting the workshop on 21st July:

Airport Operators Association

Arup

Bristol Airport

British Aviation Group

Department for Transport

Heathrow Airport

Loganair

Luton Airport

Manchester Airports Group

Mott MacDonald

NATS

TEKTowr

Thales UK

UK Power Networks Services

University College London

Wood plc

END TO END TRAVEL

Click button to reveal near, medium, and long-term opportunities
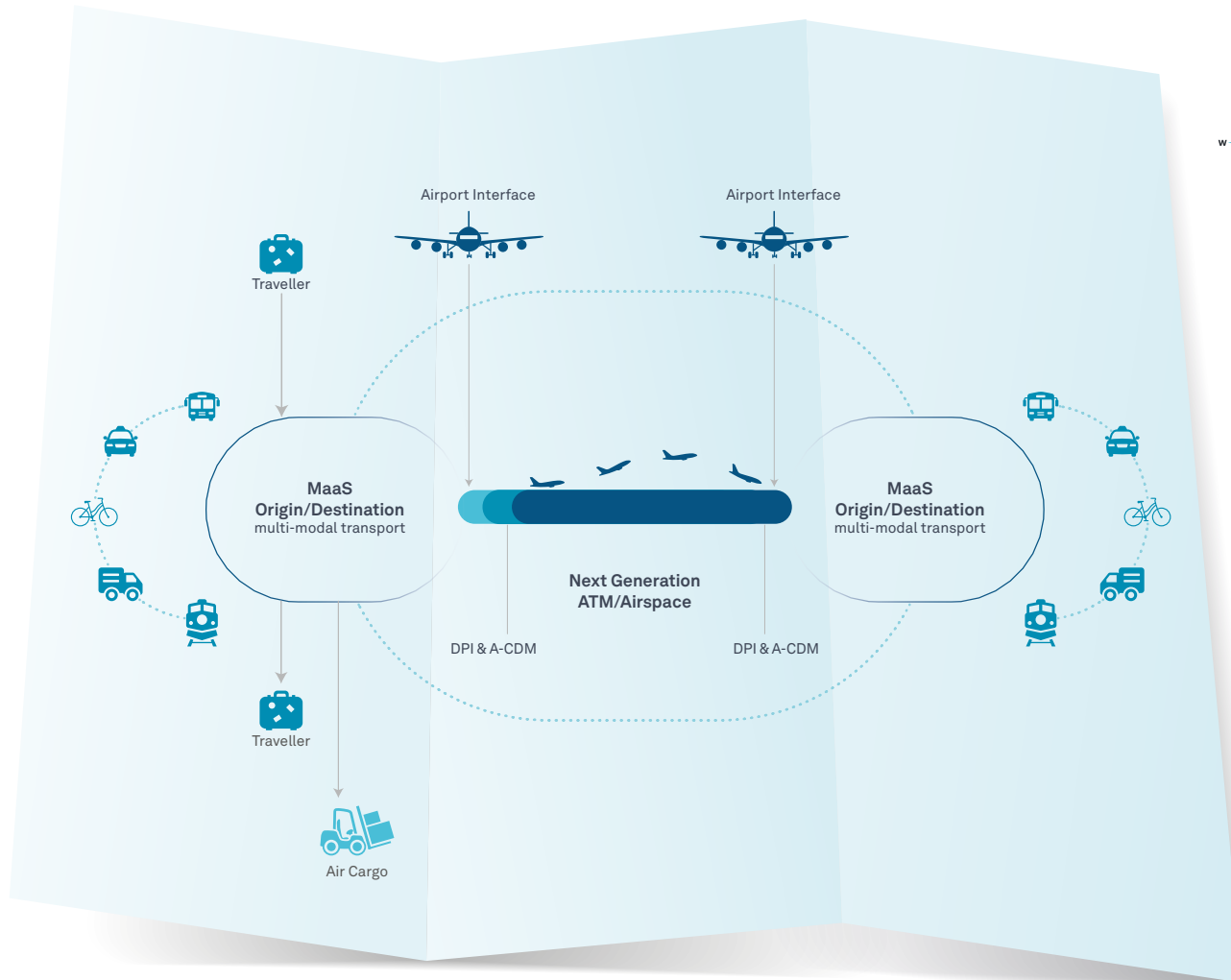
Digitalisation

Low carbon

Practical changes to business as usual (air travel)

Practical changes to business as usual (medium term)

Multimodality

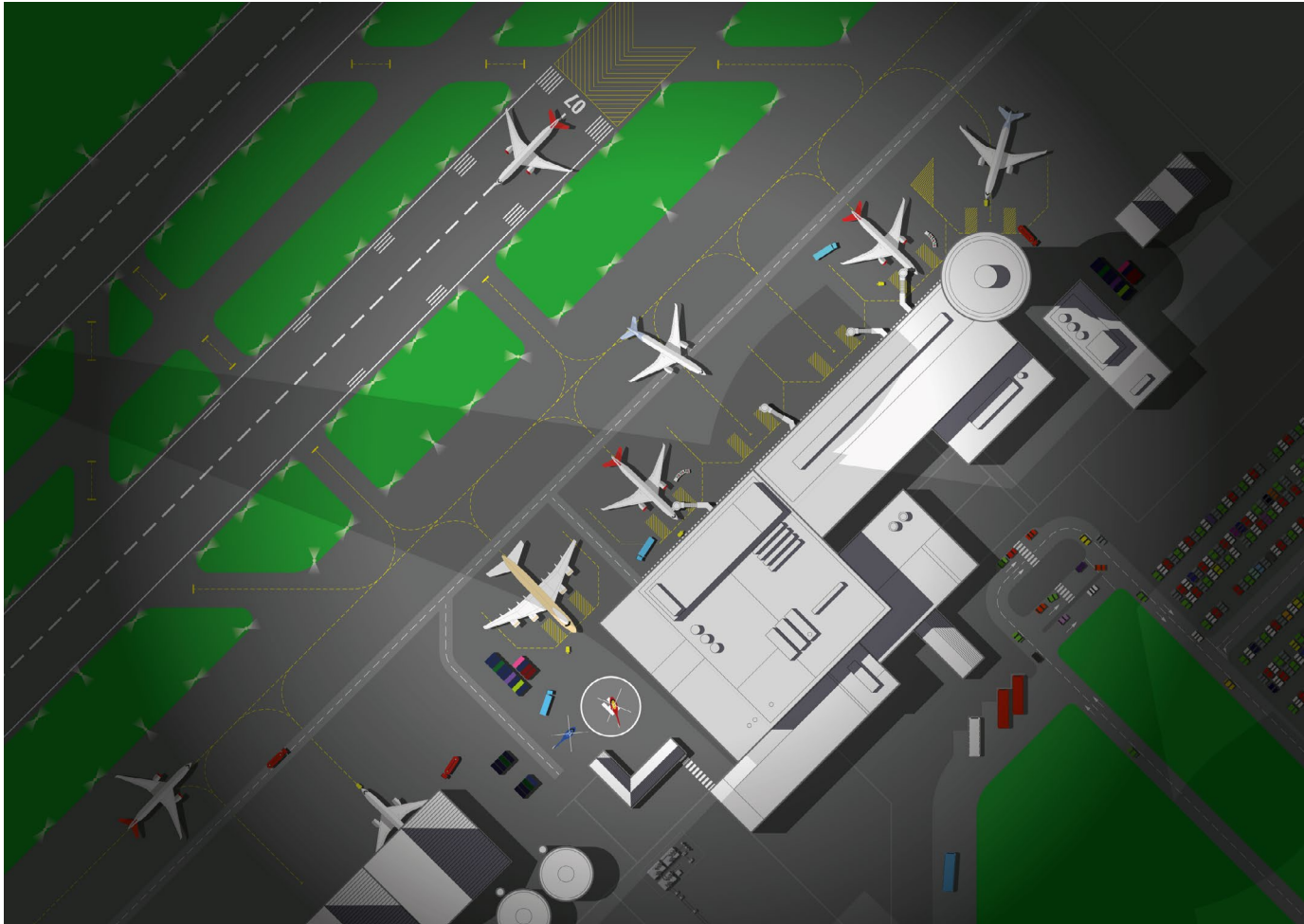Practical changes to business as usual (stakeholder investment)

Mode/fuel change (long term)

Legal change

Mode/fuel change (medium term)

Financial levies

Traveller

Airport Interface

Airport Interface

MaaS
Origin/Destination
multi-modal transport

MaaS
Origin/Destination
multi-modal transport

Next Generation
ATM/Airspace

DPI & A-CDM

DPI & A-CDM

Traveller

Air Cargo

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AIRPORT TERMINAL

Click button to reveal near, medium, and long-term opportunities

Reuse energy – reducing carbon footprint

IT – reducing carbon footprint

Reducing carbon footprint (immediate)

Reducing carbon footprint (initial research immediate)

Reducing carbon footprint (long term)

Rebranding space – more sustainable use of space

Reducing carbon footprint – minimising energy use

Reducing carbon footprint (long term)

More sustainable waste management

Reducing carbon footprint (long term)

Reducing carbon footprint (medium term)

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AIRSIDE OPERATIONS

Click button to reveal near, medium, and long-term opportunities

Use of technology

Use of operations/planning

Use of technology (immediate)

Mode/fuel change

Reducing carbon footprint

Use of technology

Use of technology and reducing carbon footprint

Reducing carbon footprint

Reducing carbon footprint

Use of technology and reducing carbon footprint

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AIRSPACE

Click button to reveal near, medium, and long-term opportunities

Reducing carbon footprint (long term)

Scheduling (immediate)

Financial levies (medium term)

Scheduling (medium term)

Financial levies (long term)

Monitoring

Reducing carbon footprint (long term)

Airports car freezones

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OVERALL SUMMARY

END TO END TRAVEL

- Introduction of demand-led connected integrated and multi-modal transport systems with airports as interconnection points.

- Utilisation of new air mobility systems – electric aircraft for regional and intra-city travel.

- Consider making airports car-free zones, accessible only by public transport, electric/hybrid vehicles, and autonomous vehicles.

- Introduce the use of autonomous vehicles for airport access and use.

- Surface level access models where airports are part of a physically and digitally connected transport hub.

AIRPORT TERMINAL

- Introduce the concept of airports as energy hubs – that generate and store all their own energy.

- All-electric airports.

- Redefining the customer service, with sustainability at its core.

- At landside (logistics, ground handling, fuel) low-emission energy use for aircraft, airports, road vehicle, public transport, and carpooling.

- Make airports car-free zones, accessible only by public transport, electric/hybrid vehicles, and autonomous vehicles.

- Surface level access models where airports are part of a physically and digitally connected transport hub.

- Research the potential for airports to become a 'place to be', rather than just to fly from.

AIRSIDE

- GHG emission monitoring, analysis, and localised reductions.

- Reduced number of large airport hubs.

- Reintroduction of point to point air travel.

- Research the airside logistics/infrastructure required for hydrogen, electric flights, including increased on-site fuel storage.

- Introduction of AI optimised airside operations, for example common integrated dispatching system for ground handling operations.

- Introduce autonomous electric vehicles, tugs, and GSE.

AIRSPACE

- Fully integrated airspace management.

- Fully automated flight.

- Optimal flight profiling, with the opportunity for in-flight adjustments due to weather.

- Gate to gate planning.

- Integrated air and land-side traffic management.

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