Shaping future transport: UAVs in logistics using a board game approach

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Introduction

Policy makers are keen to understand public views in relation to the deployment of UAVs (Uncrewed Aerial Vehicles also known as drones) in logistics. While the technology is not new, the public is largely unfamiliar with this use-case as they are not directly exposed to logistic drones beyond a few isolated trials (Smith et al. 2022a).

Existing research has focused on common themes such as privacy and safety using surveys and polls rather than exploring what people are comfort with and how it may impact their local settings. There is a need to provide the public with some contextualisation about logistic drones and their operational parameters by developing tools that facilitate exposure to real world logistic drone scenarios, and a space to engage in more informed debate about this potential transport future (Smith et al. 2022b).

This research focuses on developing a new approach to engage the public in a more productive debate about the future of their local area whilst contributing to knowledge by understanding public perceptions to inform future policies.

Public concerns and attitudes towards adoption

Public concerns

Technical Issues | Safety & Security | Economic Aspects | Regulations | Privacy | Psychological Impact

Public attitudes & awareness

Attitudes (Bajde et al. 2017)

Tolerantly negative → Cautiously positive

Risk gets compensated over benefits (Herron et al. 2014)

Facilitating public views

A board game is being developed to collect data. It provides people a space to share ideas and reflect on the use of delivery drones in their local area. A game removes the risk of any real-world consequences, allowing the participants to explore, test and discuss scenarios they otherwise may not be able to.

Value of games as a public engagement tool

- Games have four general characteristics that highlight their potential usefulness (Olejniczak et al. 2020):
  - o Universal language
  - o Flexibility to explore uncertainties and complexities
  - o Opportunity for timely collection of relevant data
- Games and simulated environments allow players to explore situations they are impossible in the real world for the reasons of safety, cost, time (Corti 2006; Squire and Jenkins 2003).
- Provide players the opportunity to plan, negotiate, analyse and make decisions while receiving immediate feedback (Allery 2014; Pope 2021).
- Provide participants a shared space where they can create shared experiences and involve diverse stakeholders (Deilman & Huisingh 2016)
- Ability to explore spaces and players can form opinions while interacting with them, enhancing their critical thinking (Gomes et al. 2021).
- Value of games lies in triggering group discussions and supporting the decision making processes (Ampatzidou et al. 2018).

Development of the board game

Key game mechanics implemented:

Mechanic	Application in Board game
Action Points	Players provided a total of 100 energy points to complete mission.
Board space abilities	- Players pick up feedback card (Flight update) each turn - Player pick up comment card if they land on a space with speech bubble icon
Deadline	-Players given limited energy to complete mission. - Players provided a limited amount of risk to complete missions. Ending on high risk will fail mission.
Differing player goals	Players provided different missions to play and decide their goals.
Individual decks	Flight update, comment cards
Press your luck	Players can move to high risk area, trading off risk to make their route shorter- ending on a higher risk and risking losing their energy points on the way.
Race to end	-Leader board maintained for fastest delivery. -Mission failed/completed cards handed out at end.
Resource budget	Finite resources: - Energy (100) - Risk (15 boxes)
Rewards	Players are able to gain energy depending on the feedback card.

Factors enhancing game experience:

Sociality | Intellectual challenge | Materiality | Play environment

Game Objective:

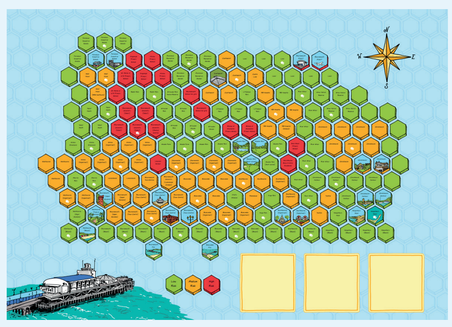
Keeping in mind route, risk and energy make efficient drone delivery each round.

Game Components:

Board, Mission cards, Energy Tokens, Comment cards, Flight update cards, Leader board

Feedback and Comment cards

How to Play:



Board illustrating map of Bournemouth, UK

The board illustrates locations around Bournemouth, United Kingdom. Areas are marked according to risk. At the start of the game, each player is provided a total of 100 energy to be used for their delivery. A risk meter is also provided that players adjust with every move. Players need to identify an efficient route by balancing risk and energy to complete their mission. Players are given feedback cards called 'Flight Update' and also pick comment cards that are prompts for them to share their thoughts.

The 90- minute game play is divided into three phases

Introductory Phase
- Brief Introduction
- Rules
- Pre- game questions

Exploratory Phase
Questions & feedback embedded within the game.

Debriefing Phase
Participants are involved in a brief discussion with the researchers.

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More information about the project can be found at: https://www.e-drone.org/