Development and demonstration of a "SWOT in a Box" card game to help socialise Triple Access Planning

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ABSTRACT

In a changing world, not being able to simply carry on doing what we have always done and getting what we have always got gives rise to an appetite for alternative approaches. Yet an alternative approach must contend with established practice and the associated norms and sense of familiarity that surround that. This paper addresses the following question. How can an approach be designed and used to effectively engage people in a critical examination of Triple Access Planning (TAP)? TAP is an alternative approach to established transport planning. The paper sets out the rationale for, development of, and application of, a serious game. Specifically, a serious card game methodology is put forward that draws upon SWOT analysis for its core design. Its intention is to allow teams of players to become more familiar with the alternative approach in question and to critically examine and prioritise its strengths, weaknesses, opportunities and threats. The SWOT in a Box methodology is applied to TAP. Results are presented from over 40 game runs. Insights from developing and applying the game suggest that the methodology is adaptable and readily transferable to other domains. The paper reveals the SWOT in a Box methodology to be an effective tool for shared learning: (i) players learn from the game; (ii) players learn from each other as they exchange experiences and views; and (iii) the game designers can learn from the players playing the game. It generates insights and empirical evidence. It is fun and it is useful.

1. Introduction

This paper addresses the design and application of a serious card game methodology called SWOT in a Box.[1] It is applied to considering an alternative approach to transport planning called Triple Access Planning.

It is not a conventional research paper centred upon empirical data where analytical rigour and generalisability of results are considered. Instead it addresses the development of an engagement methodology and considers insights from its application.

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  [1] 'in a Box' reflects the SWOT analysis involved being encapsulated in a deck of playing cards.

1.1. An engagement methodology for weighing up an alternative approach

Imagine there being an *alternative approach* to an *established practice*. Imagine then that you want to socialise this approach among those who understand and apply the established practice to enable them to judge the merits of the alternative. You could write a paper explaining the alternative approach and your views on its merits relative to established practice. It might get read. It might or might not be relatable to the reader and the environment in which they encounter established practice. It may or may not lead to multiple readers sharing their views about the alternative approach and, if appropriate, it starting to move from theory into practice.

This paper is not that paper. It describes instead the development and application of a serious game that enables participants to: (i) be exposed to the alternative approach; (ii) engage in a participatory activity to explore its strengths, weaknesses, opportunities and threats (SWOT) and their relative importance; and in turn (iii) form an overall judgement about whether *or not* the alternative approach is suitable, acceptable and feasible for adoption.

1.2. Applying the methodology

The paper addresses the following specific case. The *established practice* for which an alternative approach is proposed is *transport planning* – the strategic process of identifying what changes in the transport system and its use in future are anticipated or desired and what interventions are needed to facilitate progression towards this. The *alternative approach* under examination is called *Triple Access Planning* (TAP).

We, this paper's authors (academics and practitioners), have all been part of the pan-European project 'Triple Access Planning for Uncertain Futures'.[2] The project has focused upon deepening understanding of the prospects of TAP and developing guidance for its adoption and application (Lyons et al., 2024). We are conversant with TAP and have good knowledge of the transport planning field. Over a period of years and many conversations in professional circles, we have rehearsed and come to understand the potential pros and cons of TAP.

1.3. Purpose of the paper and its structure

The practical question giving rise to the methodology and its application described in this paper was as follows. How can an approach be designed and used to effectively engage people in a critical examination of TAP? The paper is structured to take the reader through the following sequence: methodological background for, and design of, SWOT in a Box; an introduction to TAP; insights from the application of the SWOT in a Box methodology to TAP (TAP-SWOT in a Box); evaluation and wider application; and conclusion.

The paper reveals SWOT in a Box to be an effective tool for shared learning: (i) players learn from the game; (ii) players learn from each other as they exchange experiences and views; and (iii) the game designers can learn from the players playing the game. It generates insights and empirical evidence. It is fun and it is useful.

2. Methodological background

In this section we briefly introduce and provide insights into SWOT analysis and serious games that represent the foundational elements of SWOT in a Box. The intention is not to offer an in-depth and rigorous review which is beyond the scope of this paper, although such a review allied to experience of undertaking SWOT analyses and designing/running serious games could provide further value in critically examining how the two come together in terms of educational effectiveness. We draw instead on reviews undertaken by others that help in synthesising key considerations of relevance to this paper.

2.1. SWOT analysis

Some readers will already be familiar with what is meant by a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis, a technique that originated in the 1950s and 60s (Benzaghta et al., 2021). This section provides a brief introduction to the technique.

In relation to an entity or process, strengths and weaknesses are internal factors (characteristics of the entity or process); meanwhile opportunities or threats reflect external factors (present and future circumstances faced by the entity or process). A SWOT analysis aims to identify "what needs to be done to capture and build on opportunities", "what needs to be done to mitigate threats", and "internal priorities and challenges" (GOS, 2017: 61). It helps planners to "better understand how strengths can be leveraged to realize new opportunities and understand how weaknesses can slow progress or magnify organizational threats" (Helms and Nixon, 2010: 216). SWOT analysis has long been recognised as a suitable and straightforward framing for group discussion (Hill and Westbrook, 1997).

Undertaking a SWOT analysis can be prone to one or more of three limitations in terms of its value (Pickton and Wright, 1998): (i) inadequate definition of the factors; (ii) lack of prioritisation of factors (Helms and Nixon, 2010); and (iii) over-subjectivity in the generation of factors (compiler bias). Analysis that leads to meaningful and well-founded action needs to guard against these and go beyond simple listings of factors. This said, SWOT analysis in such simplistic form can still have value as part of the initiation and pump-priming of a strategy planning process (Helms and Nixon, 2010).

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[2] https://www.tapforuncertainty.eu/.

SWOT analysis can be comparative in nature. This can involve a common set of factors that are then judged in terms of their relative importance between different entities or processes (see for example Rachid and El Fadel, 2013). Alternatively, it can involve different processes each having their own set of factors generated as a basis for subsequently examining their relative merits overall (see for example Nagara et al., 2015). SWOT analysis can be extended into a more dynamic TOWS analysis in which factors are combined to inform strategic choices. S–O, S-T, W–O and W-T combinations are considered in matrix format (Weihrich, 1982) such that, for example, internal strengths can be considered in relation to being able to exploit external opportunities. It is also recognised that those undertaking a SWOT analysis who are on the inside looking out may have biases and gaps in their knowledge that could be tested and, as appropriate overcome, by engaging other experts on the outside who are looking in to undertake a SWOT of the entity or process in question.[3]

2.2. Serious games

2.2.1. Games that are educational and fun

Sauvé et al. (2007) point to five attributes that reflect the concept of a game: "player or players, conflict, rules, predetermined goal of the game, and its artificial nature". For educational games, a sixth attribute is that of its "pedagogical nature" (Sauvé et al., 2007: 248). 'Serious games' as a term can seem to be a contradiction or oxymoron since 'games' conjure up the notion of being or having fun (Breuer and Bente, 2010). However, the intention is that serious games are both educational (serious) and fun (for amusement) (ibid) while having the former purpose as primary (Kordaki and Gousiou, 2017; and Madania et al., 2017), enabled in part by the latter. Balancing the two is important (Ampatzidou et al., 2018). They are able to provide, as part of their educational effectiveness (Stanitsas et al., 2019), a safe environment for participants "to freely express their thoughts in a group in a way that will not be judged" (Aubert et al., 2022: 1), and "without external consequences" (Kordaki and Gousiou, 2017: 122). In such a setting, participants can be motivated by tasks in turn "promoting thinking about the topic and triggering learning" (Aubert et al., 2022: 2).

There is a distinction between serious games that result in winners and losers and those that do not (Madania et al., 2017). In any case, the intention is that a serious game is designed such that motivation and interest in the information content of the game fosters learning, and can also help enhance the social skills of participants (ibid). König et al. (2019) point to evidence of the effectiveness of serious games for learning and knowledge retention, indicating them to be "engaging, situated and problem-based, ensure the learners attention, provide continuous and immediate feedback and an appropriate level of challenge" (König et al., 2019: 2).

2.2.2. A diversity of game forms and functions

Serious games can come in many forms, and interest in their use spans disciplines. For example, Huang and Levinson (2012) explored multiple forms of board games with transport planning students while Reinart and Poplin (2014) examine board and card games as well as digital and pervasive games in urban planning. More recently Flood et al. (2018) have reviewed serious games for climate change adaptation, and Freese et al. (2020) have considered in more detail three digital serious games in transport. Meanwhile, Kordaki and Gousiou have undertaken a 10-year review focused on digital card games. Aldea et al. (2014) have explored a serious game approach to strategic planning involving cards and SWOT analysis. However, this last example and several others pointed to here use games to engage people in a safe, playful means of *experiencing how to apply* a planning approach. In contrast, the current paper considers using a serious game to *critically examine* a planning approach.

2.2.3. Methodological considerations

Freese et al. (2020) very usefully address key considerations for designing, developing and using a serious game (in the transport field). They set out a framework for analysis of serious games. The framework has five categories: 'requirement analysis' (the suitability of a serious game as a methodological approach for the research question); 'design concept' (what game mechanics are needed to make a game engaging and sufficiently realistic); 'implementation' (testing of, and any refinements to, the game and consideration of the methodological role of the game); 'research framework' (briefing and debriefing of game players and the collection of data); and 'evaluation' (focusing on the suitability of the game for its purpose). This we draw upon in the rest of the paper and its section headings.

3. SWOT in a Box methodology

In this section we set out the rationale for, and the detail of, the methodology developed.

3.1. Requirement analysis - the choice of a serious game approach

Our methodological requirement was for an approach that could capture and convey in an engaging way the introduction of an alternative approach to established practice that allows for a critical consideration of its merits in a reasonable amount of time. While our specific requirement concerned TAP (as the alternative approach in question), the methodology in principle lends itself to other areas of application. Accordingly, we set it out below in generic terms rather than specifically in terms of TAP.

A serious game format for addressing our methodological requirement appealed. Other participatory formats also exist including

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[3] https://listenbrian.medium.com/double-swot-analysis-34717fc1635d.

focus groups and the Delphi methodology. Brief consideration of these is as follows. A focus group approach could have allowed for critical consideration. Indeed, focus groups can be used as environments for playing serious games as part of exploratory discussion with participants. Smithson (2000) highlights the performative nature of focus groups and the complexity of focus group behaviour. The Delphi methodology, as an established form of participatory foresight, is another means of securing involvement of multiple contributors of perspective and opinion on a topic (Helmer, 1967). In essence it involves eliciting diverse expert input via questionnaire rounds between which a facilitator plays back insight from the previous round, often (though not always (de Loë et al., 2016)) with a view to moving towards consensus on the topic or issues within it. The approach, with its process and anonymity between the expert participants, has the prospect of avoiding the normative social influence that can be seen amongst people in groups (Bolger and Wright, 2011).

We chose to pursue a serious game approach rather than alternative participatory formats because it held the prospect of being able to address all of the following considerations: (i) *synchronous contributions from participants* (rather than asynchronous) involving direct interaction, without anonymity, between them (promoting engagement, active learning and socialisation of the alternative approach in professional circles); (ii) *scalable, repeatable and flexible* in terms of the number of participants within and across facilitated sessions (allowing an agile and consistent means of delivering shared learning); (iii) *highly structured* (to foster a balanced input across players and open consideration of strengths, weaknesses, opportunities and threats); and (iv) *time-limited* (allowing the exercise to be completed in a single sitting and within the time constraints faced by those taking part).

3.2. Design concept – the form and mechanics of the game

3.2.1. Game form

The basis of the game's design is the creation of a deck (Box) of playing cards, wherein the cards are comprised of pre-established SWOT elements concerning the alternative approach to the established practice under consideration. There are four suits in the deck (equivalent to diamonds, clubs, hearts and spades) for strengths, weaknesses, opportunities and threats (ten cards in each suit).

Previous studies have demonstrated that card games offer various advantages, encompassing sociological and developmental aspects. Players not only develop mental computation skills during play but also internalise essential values like sportsmanship and honesty (Singh et al., 2021). In addition, during gameplay, players may engage in negotiations to achieve mutually beneficial exchanges, something that can help prepare players to negotiate effectively in real-life situations (Turkay et al., 2012). Considerations in designing the game included:

- *Shared learning* - Making it multi-player to foster interaction between individuals who may have different perspectives – creating task conflict rather than emotional conflict (Curşeu and Schruijer, 2017) in order that they share views in a thought-provoking but non-threatening environment.
- *A familiar format* - Emulating the widespread appeal, and capitalising upon the familiar format, of a traditional deck of playing cards (Kordaki and Gousiou, 2017) – with four suits and one or more jokers or blank cards. Being dealt cards, sorting cards, exchanging or discarding cards, and picking cards from a deck are readily understood actions.
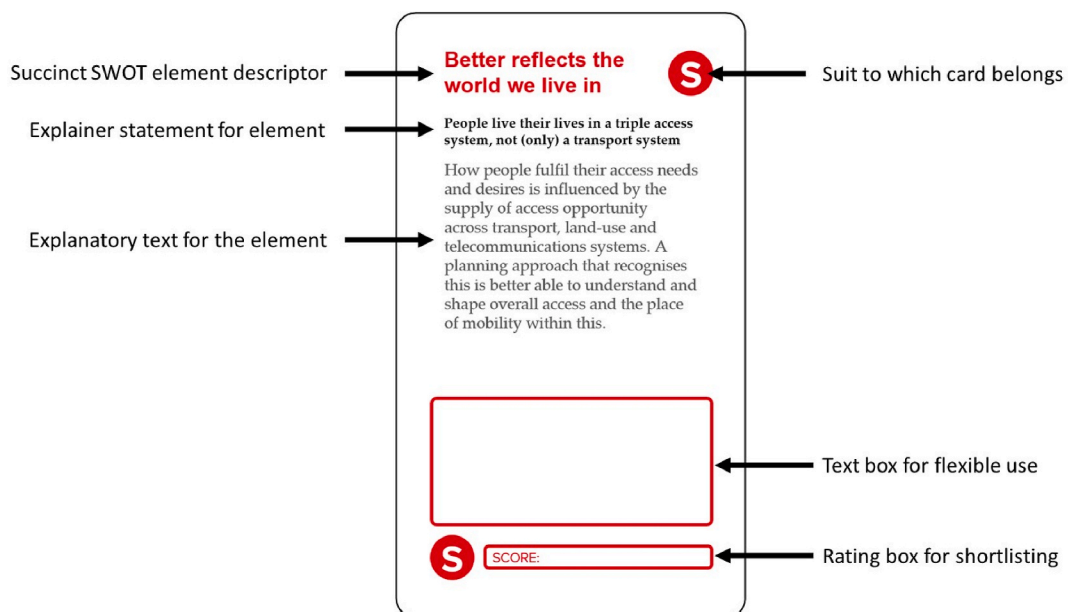

Fig. 1. Example playing card (from the application to TAP) with design layout explained.

- *Good tempo* - Ensuring the game is playable within a suitable period of time (such as the 60- or 90-min session available in a conference programme or in a wider workshop) and also offers an engaging tempo to retain participants' focus and thinking skills (Bloom, 1956).
- *Flexible* – Lending itself to game-play flexibility, involvement of multiple teams, and being sufficiently self-contained not to need – ultimately - to rely upon the game designers' presence to be played.
- *Outcome-focused* - Providing an entertaining means to examine and weigh up the relative importance of different SWOT elements, with the opportunity for players to explore how they might respond to them in practice, providing a good link between the expected learning outcome and the positive engagement with the game-based learning environment (Arnab et al., 2015).

With each SWOT element as a playing card, the format of each card in the resulting game design is as shown in Fig. 1.

The intention is to provide players with different levels of detail for each SWOT element. This allows them to flexibly engage with SWOT elements according to the stage in the game, their familiarity with the element, the time available to them, and how closely they wish to weigh up the relative importance of the card.

The cards, once designed and populated with text, are professionally printed as multiple (duplicate) decks of quality waxed cards, allowing them to be written on by players using dry marker pens (which can then be easily cleaned for re-use after a game play).

3.2.2. Game mechanics

The game is designed as a series of stages (see Fig. 2). It is intended that each deck of cards is used by a team of four players (though the game can work with three or five players). There are three roles needed (separate to the players themselves) for guiding the players through the game: (i) the *salesperson* – who introduces them to the alternative approach in question; (ii) the *croupier* – who guides them through the main game play stages; and (iii) the *boss* (to whom the teams of players are reporting their views about the alternative approach at the end of game play).

Stage 1 – A slide presentation lasting a few minutes is given to participants at the start of the game which introduces them to the alternative approach in question (this is the 'sales pitch' from the salesperson). This presentation also explains the overall purpose of the game. The alternative approach is portrayed as a 'product' on offer to participants. This portrayal and related language in the game is intended as part of the fun and engagement. It also draws attention to participants that while the salesperson may be wishing to sell them something, they are not obliged to buy it. Their goal is to critically examine 40 'product review' cards (the pre-defined SWOT elements). As a team of players, they must shortlist what they consider to be the five most important product reviews that in turn inform their decision on whether *or not* to recommend to the boss that the alternative approach is 'bought'. Participants are reminded to listen carefully to the presentation, as the effectiveness of the rest of the game depends upon them understanding what is presented.

Stage 2 - The deck of cards is shuffled and each player is dealt five cards. Each player in turn discards what they consider to be their least important card (in terms of judging the merits of the alternative approach in question) and picks up a new card (from the remaining cards or from the cards that have been discarded). As a card is discarded, the player concerned is encouraged to briefly explain why they consider this card less important than other cards. Discarded cards are spread out so players can review whether or not to recover one of these cards on their turn (thereby inviting review, discussion and challenge between players). Turn taking continues until all the cards have been considered (or until the allotted time for the stage has run out). At the end of this stage the discarded (and any unused) cards are removed such that 20 of the original 40 cards remain in play.

Stage 3 – Players may feel they have in mind a strength, weakness, opportunity or threat that they have not seen reflected in the deck of cards. Blank 'joker' cards are therefore available and at the start of this stage, players are invited (if they wish) to replace one of the five cards in their hand with a newly written card of their own. Players are then asked to use their marker pens to rank the five cards in their hand from most important to least important. The ranked cards from all players are subsequently arranged together on the playing surface. Cards are grouped in the four suits (S, W, O and T) and arranged from highest ranked to lowest ranked. The team of players is then tasked with reducing the remaining 20 cards down to the five most important cards overall. Players take turns to remove a card while discussion amongst the players about the process and decisions takes place. Players are encouraged (but not obliged) to try and retain at least one card from each suit as part of their shortlisting of cards. This is intended to help ensure that there is some balanced assessment of the pros and cons of the alternative approach in question. At the end of this stage each player has a chance to rescue a discarded card if they wish (but to do so they must discard one of the other remaining cards). This provides for a final round of challenge among players concerning prioritisation of SWOT elements.

Stage 4 – This stage represents decision time – 'are we buying?'. Players have a short discussion based upon their group's remaining five cards to weigh up whether *or not* the alternative approach is to be recommended to their boss for adoption. Each player (without other players seeing) then uses their decision card to vote 'yes' or 'no'. The decision cards are then laid on the playing surface. The remaining five SWOT cards and the decision cards provide the game outcome in terms of advice to the boss. Beyond this stage are discretionary stages (depending upon the game-play setting and time available).

Stage 5 – If multiple teams of participants have played simultaneously (e.g. in a workshop session) then the game outcome from each team is shared with the wider group offering an opportunity to compare and contrast the outcomes and related reasoning.

Stage 6 – If time is available, players are encouraged to engage in post-game reflections and discussion regarding: (i) what they thought of the card game itself; and (ii) what they thought about the merits and prospects of the alternative approach in question.
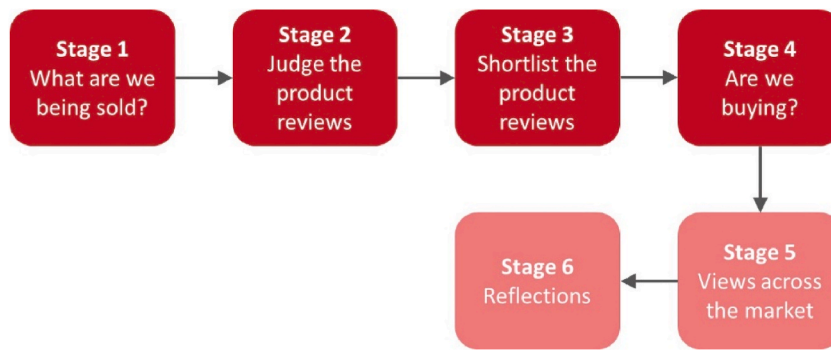
Fig. 2. Overview of game play stages.

4. Triple Access Planning

Having set out the SWOT in a Box methodology, the paper now introduces the specific case of an alternative approach to established practice that we have applied it to – TAP.

4.1. Transport planning orthodoxy and evolution

4.1.1. Transport planning as a discipline

As a formally recognised profession, transport planning is relatively new – the UK-based Transport Planning Society was established in 1997 (while the Institution of Civil Engineers was founded in 1818) and the (now Chartered) Transport Planning Professional qualification was launched in 2008. The profession and practice of transport planning continue to evolve. Banister noted over 20 years ago that "[t]ransport planning has undergone radical change in the last forty years, and it is now barely recognizable from its origins in the highway-building movement and its concerns over increasing the capacity of the system to meet the expected levels of demand" (Banister, 2001: 9). An evolution in philosophy and principles has placed growing emphasis on moving away from serving movement of private cars to supporting movement of people (Lyons, 2004). Transport planning today is seen as "understanding the link between transport and land use, in particular the future shape of our towns and cities, and the activities which people want to undertake to meet quality of life objectives".[4]

Transport planning is closely related to, but not synonymous with, transport policy. Rodrigue (2020) distinguishes between the transport policy goal of effective decision making concerning resource allocation, and the transport planning goal of supporting and implementing this. Together they represent system intervention that influences its future.

4.1.2. Predict and provide as an established paradigm

Transport planning and policy have been historically rooted in a 'predict and provide' paradigm in which car traffic has been the primary focus, to the detriment of public health (Banister, 2008) in terms of poor air quality and carbon dioxide emissions, dominance of movement space for motorised vehicles over dwell space for people, and decline in physical activity (Nieuwenhuijsen, 2020). In its simplest representation, predict and provide has been epitomised by the practice of predicting future levels of traffic growth and providing enough road capacity to accommodate that growth. "The paradigm implicitly assumes that travel demand is an external phenomenon that cannot, or should not, be modified by proactive measures" (ITF, 2021: 43). Practices within the paradigm have been found to be strongly path dependent and deficient in accounting for the realities of how supply and demand affect one another (Vigar, 2017).

While the shortcomings of predict and provide have been recognised for decades (Owens, 1995; Goulden et al., 2014), this paradigm has long been in place and embodies systems, procedures, skills, norms and vested interests that collectively are difficult to challenge and create strong inertia (Marsden and McDonald, 2019; Lyons and Marsden, 2019; Witzell, 2020). Goulden et al. (2014) consider how 'predict and provide' was abandoned by the UK Government in its 1998 White Paper to then be followed by only a questionable commitment to travel demand management leading to a re-emergence of predict and provide, albeit not only car-centric. The conceptual appeal of managing demand rather than accommodating it has proved politically challenging to put into practice.

4.1.3. Evolution of transport planning

Transport planning continues to evolve and respond to changing policy context. While transport planning is not only focused on urban areas, there have been efforts in Europe to evolve urban transport planning with reference now to 'sustainable urban mobility planning'. EU Guidelines on Sustainable Urban Mobility Plans (SUMPs) define a SUMP as: "a strategic plan designed to satisfy the mobility needs of people and businesses in cities and their surroundings for a better quality of life" (Rupprecht Consult, 2019: 9). May

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[4] https://tps.org.uk/profession/careers.

(2015) and Rupprecht Consult (2019) highlight the differences between traditional transport planning and sustainable urban mobility planning, including: the longer-term, vision-oriented nature of sustainable urban mobility planning; its primary objectives of accessibility and quality of life (instead of traffic flow, capacity and speed); a more participatory and transparent approach; and its shift in favour of measures to encourage public transport, walking and cycling. Allied to such developments has been the approach known as Avoid-Shift-Improve which focuses on the demand side of transport: *avoiding* the need for motorised travel where possible; *shifting* travel that does take place to more environmentally friendly modes; and *improving* the efficiency/sustainability of motorised travel (Bongardt et al., 2019).

4.2. An alternative approach

4.2.1. Decide and provide as an alternative paradigm and triple access planning as an alternative approach

In 2014, work undertaken by the New Zealand Ministry of Transport led to the proposition of a contrasting alternative paradigm to predict and provide called 'decide and provide' (Lyons and Davidson, 2016).[5] This thinking joined the ongoing evolutionary development of transport planning and the challenge to the predict and provide paradigm.

Notably, within this vision-led rather than forecast-led approach, decide and provide has two important distinguishing features, namely the need to consider the *Triple Access System* (see Fig. 3) and the need to *accommodate uncertainty* in developing a plan to realise a future decided-upon vision. The Triple Access System highlights that transport planning is fundamentally about enabling people to access what they need in their lives (jobs, goods, services, opportunities, and social encounters). While such access can be achieved through physical (motorised) mobility it can also be achieved through better spatial proximity (and active travel) *and* through digital connectivity: triple access.

It follows that if the focus of planning moves from considering the transport system to considering the triple access system then instead of 'transport planning', the term 'Triple Access Planning' (TAP) becomes appropriate for this alternative approach (see Lyons, 2021). TAP sits within the decide and provide paradigm while transport planning sits (or at least has sat) within the predict and provide paradigm.

Table 1 provides a simplified comparison of the two paradigms. Decide and provide is vision-led rather than forecast-led. It focuses upon access rather than (only) mobility. It recognises that focusing upon changing supply of means of access (including transport) can support and also shape the nature of demand. Importantly, the paradigm openly considers uncertainty about the future to improve the robustness of decision making associated with and arising from the planning process. Inherently, decide and provide is more proactive than reactive (reflective of stronger rather than weaker planning). Such change in emphasis, with more attention to access, shaping of the built environment and the prospect of reduced reliance on motorised mobility, points to opportunities to better address quality of life in relation to physical, mental, social and economic wellbeing (Lee and Sener, 2016).

4.2.2. From theory into practice

Since their conception, there has been a growing international interest in decide and provide and TAP (ITF, 2021).[6] Such interest relates to the need for climate action as well as the need to provide some redress to the domination of the private car over the built environment and its adverse effects on public health and social cohesion. Public health is often under recognised in transport planning with car dominated cities and associated negative impacts (Nieuwenhuijsen, 2020). The majority of public space in many cities is dedicated to motorised traffic resulting in little presence of green spaces that is detrimental to health (Khreis et al., 2016). Better urban and transport planning can lead to healthier cities (Nieuwenhuijsen, 2020), and it is therefore important to consider how proximity (coupled with active travel), motorised transport and digital connectivity can be integrated to enable more sustainable, accessible, and healthier cities.

There are signs of what *may* have the prospect of being a diffusion of innovation taking place as national, regional and local authorities and organisations, particularly in the UK but also beyond, take an active interest (as innovators and early adopters). Decide and provide was adopted by the sub-national transport body Transport for the North (TfN,2020). Formal planning guidance on decide and provide is now available in the UK (TRICS, 2021) and in 2022 the first local authority in England formally adopted decide and provide in place of predict and provide.[7] TAP has already appealed to some authorities that are considering it in their strategic planning – for example Transport for West Midlands in England (TfWM, 2021) and City of Goldcoast in Australia (City of Goldcoast, 2022). TAP features in the Swedish Transport Administration's national handbook for strategic transport planning (Sandberg and Wärnhjelm, 2022) and there is explicit inclusion of TAP in new Scottish local development planning guidance (Scottish Government, 2023).

Adding impetus to this, in 2021 the pan-European project 'Triple Access Planning for Uncertain Futures' began with a focus on further understanding what TAP has to offer and how it could be made more accessible to planning practitioners. An important consideration is whether the wider world of practice has, or could have, an appetite for TAP as an alternative approach and how this can be explored. This brings us to the application of the SWOT in a Box methodology to TAP.

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[5] See also Dales (2013) who, as far as we are aware, first used the phrase 'decide and provide'.
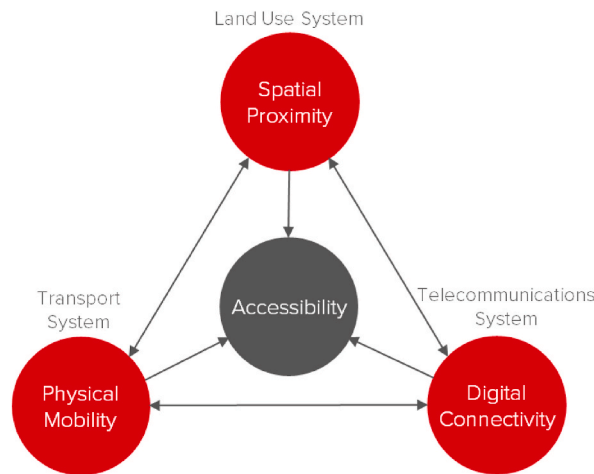[6] A 'community of practice' on LinkedIn set up by the lead author in 2022 has around 300 members - https://www.linkedin.com/groups/12661045/.
[7] https://news.oxfordshire.gov.uk/new-transport-planning-approach-approved/.

Fig. 3. The triple access system (reproduced from Fig. 1 in Lyons and Davidson, 2016).

Table 1
Alternative planning paradigms.

Predict and provide	Decide and provide
Forecast a most likely mobility future	Decide on a preferred accessibility future
Demand-led supply	Supply-led demand
Conceals uncertainty	Accommodates uncertainty
Reactive	Proactive
⇒ Transport planning	⇒ Triple access planning

5. Implementation – applying SWOT in a Box to triple access planning

5.1. Developing the deck of cards for TAP-SWOT in a Box

We as the authors of this paper are part of the project above, which involves academic and practitioner partners working together. We have experience of the conceptual and theoretical development but also of early applications of decide and provide and TAP. Early efforts to socialise this alternative approach (Lyons, 2016) revealed overwhelmingly strong support for it – *in principle*. However, in the past few years, many insights have become apparent regarding the potential strengths, weaknesses, opportunities and threats of TAP in terms of its application *in practice*.

The project consortium has been comprised of academics with expertise in: foresight and futures (including handling uncertainty); travel behaviour and travel demand management; goods movement as well as people movement; local transport planning and the development of SUMPs; and organisational and institutional issues in planning. It has also involved national and local transport authorities and transport consultants. With this expertise and focus on TAP we were well placed to develop the deck of cards for use in applying the SWOT in a Box methodology to TAP.

At one of the face-to-face meetings of the consortium (that took place over a period of 48 h in April 2022) where the merits of TAP were being considered, participants were each provided at the start with a blank SWOT grid. They were asked, during the course of the sessions through the meeting and prompted by the discussions taking place, to populate the grid with SWOT elements they considered of relevance. These were collated as shown in Fig. 4.

The results from this exercise provided the basis for the authors subsequently developing a set of SWOT in a Box cards. The lead author drafted the text for the set of 40 cards (in line with the format shown in Fig. 1). The other authors critically reviewed the cards in relation to language accessibility, consistency and usability before the card deck was revised and finalised. The deck's content is set out in Table 2. While the card deck content benefitted from the experience and expertise relating to TAP and transport planning associated with the project, it is important to note that the methodology does not require the deck to be comprehensive and exhaustive in its coverage. Those who play the card game will have their own views on both elements and how they are worded and these are part of the engagement and learning process.

As well as the card deck, a set of slides was prepared for Stage 1 of the game ('What are we being sold?').

5.1.1. Testing the game

Test game sessions of TAP-SWOT in a Box with the card deck were run by the authors – one with transport academics as players and one with transport consultants. This confirmed the suitability of the game format while raising awareness for those delivering the game of issues of tempo. It also informed the finalisation of the facilitation guide for running the game. Multiple copies of the finalised card

Fig. 4. Collated SWOT element suggestions in note form from project members.

deck were then professionally printed.

5.1.2. Applying the game

This paper is informed by 41 individual games of TAP-SWOT in a Box played by different teams of participants. Fig. 5 depicts the promotional image used for the card game as well as an illustration of game play taking place.

Apart from one session with a single game, all other sessions involved multiple teams in simultaneous game plays. Where sessions took place at conferences, participants were self-selecting. Where they took place in organisational settings, participants were invited – for a wider purpose than only playing TAP-SWOT in a Box. The sessions that have taken place are as follows (* denotes sessions where feedback forms were used): the 2022 annual Transport Practitioners Meeting in London in the UK (eight game plays in a workshop session)*; the 2022 European Transport Conference in Milan in Italy (eight game plays in a workshop session)*; the annual 2023 Centre for Transport & Society Symposium at UWE Bristol in the UK (five game plays in a workshop session); five UK game plays in transport consultancy Mott MacDonald*; four game plays in Transport Scotland (national transport authority)*; and sessions in each of three local transport authorities - Cheshire West and Chester Council (England), Somerset Council (England) and Aberdeen City Council (Scotland)* – totalling 11 game plays (we have facilitated each of these game sessions).

For TAP-SWOT in a Box, the role of the 'boss' (to whom game players report their views at the end of the game) was defined as the Director of Transport Planning in the organisation their team (imagined it) was in. In one case the actual Director of Transport Planning in the organisation where the game was being played took this role. Otherwise the paper's authors performed all three roles in running the game sessions.

The practice-oriented purpose of the game and its intention to be used in 'real life' settings (as detailed above) meant that game players were not recruited to take part in a research study per se. They were taking part in an activity on the basis that the game appealed to them as professionals and/or it was of relevance to their professional activity. Accordingly, the opportunity to collect data about them and from them was more limited. The overall project secured ethics approval from the University of the West of England's Research Ethics Committee, and participants provided consent before taking part.

6. Results and insights

6.1. Description of the sample

Through inviting participants to fill in a feedback form at the end of game play sessions we were able to collect data about the characteristics of 77 of the 168 players, which are described as follows:

- **Gender** - The response sample includes 26 women and 61 men.

Table 2

The SWOT elements of Triple Access Planning.

Strengths		
Acts as a complement	*The new approach can enhance existing mobility planning*	Triple Access Planning and its handling of uncertainty are not a wholesale substitute for conventional mobility planning. The new approach encourages a rethinking and broadening of planning perspective and promotes the need to stress-test a plan against uncertainty. This helps reframe the mobility planning process at its outset and adds new means of engaging in and applying that process.
Future proof	*Realising a vision involves being able to accommodate uncertainty*	Exposing uncertainty about the future involves developing different possible future contexts – explorative scenarios - to which a plan's implementation may be exposed. Scenario planning allows the plan itself to be devised in a way that its creators can ask "is this part of the plan going to work regardless of what the future has to throw at us?". A policy or measure that in any scenario helps progress towards a vision for a better future is more robust or 'future proof'.
Conceptually appealing	*The new approach resonates with what professionals feel they need*	Many planning professionals would recognise the merit of being vision-led rather than forecast-led, of looking beyond road traffic, and of confronting uncertainty. The portrayal of the Triple Access System within which transport finds its place and role in access is simple and compelling. As such the new approach is conceptually appealing which encourages challenge to conventional mobility planning.
Encourages ambition	*Stronger planning can result from inviting us to dream*	While conventional mobility planning does not prohibit 'thinking big', it can tend towards conservatism and preserving the established form and function of mobility. The new approach more explicitly invites us to explore new possibilities both in terms of what could change and what could be encouraged to change. By better engaging with understanding how the world is changing, could change and needs to change, ambitious vision-led planning is possible.
Better reflects the world we live in	*People live their lives in a triple access system, not (only) a transport system*	How people fulfil their access needs and desires is influenced by the supply of access opportunity across transport, land-use and telecommunications systems. A planning approach that recognises this is better able to understand and shape overall access and the place of mobility within this.
Access at the core	*Society thrives on access, with mobility being only one means to that end*	The functioning of society and the wellbeing of individuals relies upon being able to access people, employment, goods, services and opportunities. Motorised mobility is not synonymous with access. It is a means to an end. Spatial proximity and especially digital connectivity represent other important (complementary) means to that end. Triple Access Planning helps ensure all means are drawn upon to help achieve the end in the most appropriate way.
Helps us to unthink	*By stepping back and helping open our minds new perspective can emerge*	It is easy for conventional thinking in transport planning and analysis to blinker how we perceive the present and how best to take steps to shape the future. By developing new mental models of the present and future of our triple access world it becomes possible to question prior assumptions. It becomes possible to unthink and then rethink the scope of urban mobility planning and reimagine what steps could be taken on a pathway ahead.
Inspires a new generation	*Earlier career planning professionals are motivated and empowered*	As the transport and wider planning profession evolves, new blood and new perspectives come into play. There is substantial recognition of the need to plan differently, not least given the imperatives of addressing climate change. The underlying philosophy of this new approach and the support it provides to reimagine the future creates a flexible and empowering environment within which professionals with new ideas and priorities can flourish.
Considers the art of the possible	*Being encouraged to imagine future change strengthens planning*	Consider how much change has happened in the last 20 years to access. Consider how, where and when you work and play and engage with others. The future is not just more or less of what we have now. The form and qualities of activities and their access is likely to change, perhaps quite substantially. A planning approach that actively encourages exploration of what change might unfold helps better determine how to account for and shape such change.
Encourages diversity of perspective	*Actively thinking beyond the transport system brings new insight and prospects*	The system (or system of systems) of transport and society is a complex one in relation to supply and demand. Mobility planning with only a transport mindset constrains the ability to make sense of the system that planning seeks to shape. A planning approach that considers triple access naturally lends itself to bringing transport, spatial and digital planners and other experts together. Their shared mental model of the present and future can strengthen planning.
Weaknesses		
It doesn't guarantee better outcomes	*What is a better future is subjective and in the hands of those involved*	Within conventional mobility planning it is possible to progress towards a future that for some is desirable. The new approach is intended to offer a process that is more overtly vision-led and broader in outlook through its triple-access view. However, the actors involved in the process are what determines the plan that results. They bring their own values, vested interests and preconceptions. Be careful what you wish for.
Contested territories	*Limited understanding of triple access dynamics produces difference of opinion*	The nature and use of the Triple Access System continues to change and be changed. Research efforts reveal how challenging it is to make sense of the System and how its elements interact. As a result, while the new approach invites an opening of minds to thinking more broadly than only about motorised transport, it may not be possible to achieve a strong shared level of confidence in a particular interpretation of the System.

Table 2 (*continued*)

Weaknesses		
It doesn't compute	*Getting people to buy-in to the new approach is not guaranteed*	Whether as decision makers, planners or analysts, not everyone sees the need for a new approach. They may not be convinced that uncertainty about the future is that great. They may have strong faith in a transport-centric approach to mobility planning and believe the existing processes and tools are sufficient. The new approach is predicated on people's buy-in to engaging with it and seeing a need to innovate.
Dependence on more actors	*A greater pool of expertise is needed to capitalise upon what the approach offers*	Conventional mobility planning has been centred upon the transport system with mixed experience of engagement with spatial planning. Even more remote has been any engagement with evolving expertise in digital planning. Added to this is a need for expertise in foresight methods to explore possible futures and how they may be reached. This all points to a need for a greater range of expertise to be involved in the planning process which is harder to find and harness.
Lack of precedents	*Planning authorities taking a lead with a new approach can feel exposed*	While conventional urban mobility planning may not be perfect or may even fall short, there is strength in numbers, strength in conforming with norms of practice and norms of professional, public, political expectation. In contrast, embracing triple access with vision-led appetite, and addressing uncertainty is more novel. The reassurance of others having already tried and tested the approach to good effect is in short supply.
Cognitive overload	*The complexity of present and future triple access is too hard to process*	There are many, many factors at play in making sense of the present day Triple Access System and its use in a diverse society. The complexity is compounded by the challenge of contemplating how and to what extent such factors are important in influencing the future. Being able to process this and draw planning conclusions from it with confidence can be highly demanding if not unmanageable.
Lack of evidence	*How different forms of access are at work is poorly understood*	While evidence on the transport system and its use is integral to transport planning, the picture is less clear in relation to the land-use system and even more so in terms of the telecommunications system and its use. The three systems and how they are used are interconnected and changing (at different rates). Making sense empirically of the Triple Access System is challenging (albeit that the TAS exists and affects transport whether sense is made of it or not).
New skills required	*This planning approach calls for new capabilities and competencies*	Not only does this new planning approach encourage a fresh philosophical perspective on how and why we plan and how we might plan differently, it also demands new skills and processes – and related capabilities and competencies. Being able to co-create a shared triple-access vision, being able to constructively explore uncertainty, and being able to guide more robust decision making are challenging prospects for those unfamiliar with them.
Hard to model	*Representing a more complex system is too resource and time hungry*	Representing supply and demand for physical mobility, spatial proximity and digital connectivity would need further model development, and data may not exist to support this. To then model multiple 'what-if' futures would need more resources and time that could slow the planning process. Triple Access Planning points to the triple access reality of our lives and in this respect can be conceptually very appealing. However, moving from the abstract to the specifics of how to observe, understand and influence triple access demands more than a new philosophy. It can well demand tools and processes, and detailed guidance for their use. The new approach does not 'hand hold' practitioners through its application.

Opportunities		
The need for adaptive capacity	*In the face of system shocks society needs to be adaptive and resilient*	COVID-19 highlighted our collective reliance upon the Triple Access System as a source of resilience within which businesses and individuals could adapt their behaviours. Resilience and adaptive capacity would seem of growing importance. A planning process that is able to actively improve examination of, and changes to, a system comprised of multiple forms of access should be of great appeal.
Responsible planning	*Strong planning is needed that is more than only accountable to due process*	While established planning process and appraisal offer a framework for addressing future mobility, it is no longer sufficient to have demonstrated accountability in following due process. There is a need for planning that helps decision makers to take greater responsibility for charting a course ahead that holds the prospect of achieving meaningful change to help address environmental and social as well as economic concerns. The approach offered more proactively facilitates this.
Moving beyond white male privilege	*In order to better account for a diverse population we must think differently*	The transport system has predominantly been designed by men; in many countries by white, men. Gender, ethnicity and other protected characteristics that reflect the true and diverse makeup of the society that transport and access support have been largely overlooked. Thankfully, this is changing and needs to change. A planning approach that is less rooted in the past and more concerned with engaging diverse voices in the present about preferable futures is key.
COVID-19 exposure	*Greater familiarity with triple access and uncertainty opens people's minds*	The COVID-19 pandemic was a global shock that demonstrated how things can change in unexpected, uncertain ways. Many people shifted significantly from a reliance on physical mobility to a greater reliance on digital connectivity. Professionals and the public alike are more likely to 'get it' now.
Necessity is the mother of invention	*Uncertainty and a climate emergency invite new, bolder ways forward*	Uncertainty becomes an opportunity in the sense that if the future cannot be predicted then we are offered greater invitation to shape it. The climate emergency demands that it is shaped in pursuit of a vision that is different to business as usual and which involves a makeup of access that treads more lightly on the planet. The proactive and

Table 2 (*continued*)

Opportunities		
		participatory nature of the approach lends itself strongly to enabling and helping to justify bolder ways forwards.
Accommodating uncertainty	*Society is in a state of flux with a heightened need to plan for uncertainty*	Once upon a time it may have seemed that 'more of the same' car-dependent planning would suffice in a world where road traffic and economic output seemed to be tightly coupled. Now the world is changing. Decarbonisation demands something different. The digital age may well further transform how we live our lives, but in ways that can be hard to imagine. Being able to explore and account for different possible triple access futures is preferable to (only) forecasting traffic.
'De-car'-bonise	*Triple access offers the prospect of less motorised mobility and emissions*	Alongside economic prosperity and social wellbeing is environmental sustainability and the imperative to urgently address climate change. Giving greater emphasis to spatial proximity and digital connectivity in urban mobility planning can help reduce dependence upon motorised mobility and especially the private car, leading to reduced carbon dioxide emissions while still allowing people to lead their lives socially and economically
Rethinking measures	*Transport measures could have new consequences in a triple access world*	Transport measures within mobility planning have been seen as transport solutions addressing a transport problem. Problems more fundamentally relate to access, and in this respect a triple access lens can increasingly be used to think through the possible consequences of transport measures as part of an urban mobility plan – e.g. road pricing is not just about the choice between car and public transport but may influence the role of spatial proximity and digital connectivity.
Preparing for the worst	*If the need for major change intensifies, forecast-led planning won't do*	It is hard to judge different forms of planning or even their outcomes as right or wrong. Weaker planning that 'goes with the flow' of external forces may seem sufficient. However, in the face of climate change and shifting attitudes and behaviours, the demand for stronger planning that can respond to this may grow. Planning authorities that are engaging with, and growing their proficiency in, the new approach stand to be better placed to respond.
		The adage 'if you do what you've always done you will get what you've always got' is pertinent to mobility planning. Whether as professionals, politicians or as members of the public, there is a wish (albeit not universal) to work with the dynamics of our times to shape a different type of future society that supports diversity and prospers while living within its means and environmental boundaries. A new approach to planning helps free up our minds to embrace new possibilities.

Threats		
Silo mentality	*Joined-up government can often remain elusive making triple access problematic*	Efforts in the past to more strongly embrace access-based planning have proved challenging due to differing perspectives and understandings and the difficulty of bringing these together across different jurisdictions of responsibility. It is rare for mobility, spatial and digital planning to be treated as a combined function. Existing organisational structures may work against being able to fulfil such a function.
Damned by faint praise	*A new approach that doesn't fit someone's agenda is unwelcome*	Stronger planning suggests shaping a more inclusive, fair, environmentally sensitive and prosperous future. This may not fit the narrative of beneficiaries of a present system that serves them well. As a result they may either seek to exert disproportionate influence on a new and participative approach, or they may subtly cast doubt on the credibility of the approach, anxious to preserve the more familiar orthodox approach to planning where their influence is established.
Professional resistance to change	*Those invested in established approaches may be uncomfortable*	Sense of purpose, reputation and security come from achieving a level of proficiency in the application of particular tools, methods and processes. Understandably individuals and organisations have invested in such proficiency associated with established approaches. They may be instinctively reluctant to embrace a new approach that is seen to diminish their return on the investment in skills and experience that they have made.
Lack of appraisal framework	*The planning system continues to expect conformity with approved approaches*	The new approach may be, or be perceived to be, acting outside of the bounds of recognised appraisal practice. By not being able to demonstrate conformity or to effectively offer a convincing alternative appraisal framework, Triple Access Planning, including its treatment of uncertainty, may fail to garner support and endorsement. Without this sense of legitimacy, putting it into practice could be jeopardised.
Other access influencers	*There are multiple influencers of access and this complicates shaping the future*	With recognition of the triple access nature of transport comes a realisation of how many different players are involved in shaping the forms of access available in society. The way employment, shopping and other services are organised in space and time and their functional form all affect access. Digital and transport service providers in the private and public sectors are at play. This makes it challenging to co-ordinate understanding of access in the present and shaping of it in the future.
Hard to understand	*If the concepts are new they may be harder to understand and buy into*	Planners are familiar with urban mobility planning that is forecast-led and transport-focused. They have a confidence in practicing this approach. A new approach requires new understanding which can make it harder to believe in and in turn invest effort in.
A need to quantify	*Analytical rigour often means numbers, and precise numbers at that*	The adage 'if you can't count it, it doesn't count' reminds us that what matters may lie beyond what (big) data and numbers are able to convincingly represent. The concept of 'access' has struggled to be embraced in mobility planning because a unifying definition and means of measuring has proved elusive. Definitions and numbers can only go so far

Table 2 (*continued*)

Threats		
		in helping us in a meaningful way in planning for the future. Nevertheless if a new approach cannot play the numbers game …
Politics	*Stakes are high for politicians in the face of change and they need legitimacy*	Decision making on policies and investments that shape the future is seldom easy for the politicians involved. They are unlikely to welcome any suggestion of uncertainty bringing into question their judgement. They may wish to assert confidence in more conventional thinking and a belief that primacy of motorised mobility will endure. Conversely a vision-led approach in which uncertainty abounds could be mis-used in service of vested interests.
Lack of headspace	*Planning authorities may lack capacity and resources for planning differently*	Many transport authorities are resource constrained and facing short-term pressures and demands that have been exacerbated significantly by the COVID-19 pandemic. This can make it difficult to prioritise strategic planning for the longer-term. While expectation for onward mobility planning and its delivery will exist, this can already be intellectually and procedurally challenging. Accordingly, it may be difficult to find the capacity and resources to engage in a new approach.
Lack of public buy-in	*Many people see themselves as locked-in to car dependent lifestyles*	Triple Access Planning seeks to better equip society for a sustainable prosperous future by 'putting the private car in its place' in a wide repertoire of forms of access. While this may be the case, the sort of mobility planning it produces may provoke strong resistance from parts of the public who see the way ahead as incompatible with their present-day means of access fulfilment.

Fig. 5. Promotional image of the game and photo example of game play.

- **Age** - Just under half the sample are under 40 years of age.
- **Experience** - In terms of years of experience of transport planning: 26 players have up to five years (including three with none); 30 players have 15 or more years.
- **Employment type** – 31 players are consultants, 24 work for local authorities, 10 work for national authorities, eight are academics; and the remaining four in 'other' roles.
- **TAP familiarity** - In terms of familiarity with TAP before the game session, the sample makeup is as follows: very familiar – 7 players; reasonably familiar – 30 players; a little familiar – 22 players; and not at all familiar – 18 players.

6.2. Game play results

Each time the game was played, photographs were taken of the shortlisted five cards from each team of players (41 teams in total). Of the 40 SWOT cards in each deck, only two were *never* included in the *final* five cards shortlist (Cognitive overload (W) and Damned by faint praise (T)). Half of the 40 cards were included on three or fewer occasions. The ten cards most frequently included in the last five cards as most important in judging TAP are shown in Fig. 6. Stage 2 of the game commonly resulted in a much greater representation of strengths and opportunities than weaknesses and threats. Once the encouragement to retain at least one S, W, O and T in the final five cards was introduced in Stage 3, the relative representation of weaknesses and threats is increased in the sets of the final five cards.

Fig. 6, as a collective high-level assessment of the merits of TAP across all game plays, offers a synoptic depiction of TAP from those professionals who have considered it. Its *strength* is in having access at the core and recognising that people live their lives in a triple access system not (only) a transport system. It is also in encouraging future change to be (re)imagined and from a more diverse perspective than only 'thinking transport'. Its *weakness* is that how different forms of access are at work is poorly understood. Meanwhile TAP has the *opportunity* to better accommodate uncertainty and effectively address decarbonisation in a changing world, thereby being able to practice more responsible planning. The *threat* for TAP comes from the political nature of decision making and matters of judgement, legitimacy and vested interest, as well as the silo mentality that has long plagued pursuit of a more joined-up approach.

The opportunity to create their own 'joker' TAP-SWOT card was used sparingly by players with only 12 such cards across 41 game plays and 168 players. Given the time limitations within the game and size of the cards, details on newly created cards were limited. Several joker cards were interrelated with the pre-specified cards. This may reflect players: (i) not being able to recall all 40 cards when they put forward their own joker card (hence creating overlaps); and (ii) wishing to offer related but addition or more nuanced points.

Across all 41 game plays, only one (from a local authority) resulted in a team decision not to recommend TAP, with one other (from the Transport Practitioners Meeting) undecided. Across all 168 players, 158 voted 'YES – I think our organisation should try and use the Triple Access Planning for Uncertain Futures approach'. Nine voted 'NO – I don't think our organisation should try and use the Triple Access Planning for Uncertain Futures approach' (and one was undecided). For the team that decided NO, their spokesperson indicated that their decision was not unanimous and that the game had generated vigorous debate. They were unanimous that the current transport planning approach was not working but unclear over whether TAP could offer a new way that was workable.

6.3. Feedback and reflections on the serious game

Feedback form respondents were asked to rate their game play experience on a scale from 10 (excellent) to 1 (poor). Of the 77 respondents, three quarters scored eight or above, a fifth scored seven and none scored below five. They were also able to provide written comments concerning their reactions to the serious game approach. The following direct quotes received on the feedback forms reflect the range of points raised overall: "Enjoyable experience and certainly thought provoking" (Transport Executive, council); "Very engaging way to describe a difficult concept" (Principal Analyst, local government); "Brilliant, imaginative and exactly what conferences need" (Behavioural scientist, academia); "Thanks, well presented, enjoyed the role play scenario played by the presenters" (Senior Transport Planner, consultancy); "It would be interesting to involve those that are not transport professionals" (Transport Officer, council); "Great!" (Senior Transport Planner, national government); "Nice time pressure for discussions within groups"
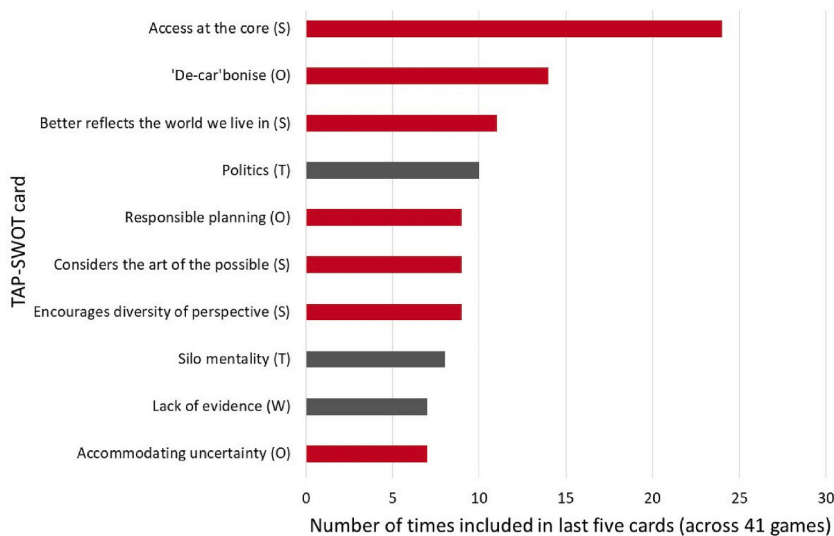

Fig. 6. TAP-SWOT cards that most frequently got included in the final five card shortlist of a game.

(Graduate Transport Planner, consultancy); "I would like to try this with local authority planners" (Lecturer, academia); and "I would like to consider using this in teaching" (Senior researcher, academia).

Further insights and reflections are now set out thematically below.

6.3.1. Engagement across different types of actors

Other points of feedback were given orally in the feedback discussions that took place at the end of game play sessions. The value of the game in terms of engagement of, and with, other actors was particularly highlighted. Many (though not all) of the players have been transport planners. The game was seen to naturally lend itself to also reaching other types of actors ("a handy application in terms of communicating the basic principles to public or politicians") or fostering interdisciplinary exchange and learning ("Just talking to people who have different experiences and different views is really useful"). Scope for greater involvement from other constituencies was noted ("I'm not a transport planner so coming at this from a spatial/land use modeller, I think it is important to make sure that this kind of approach gets over into the other disciplines … it would be interesting to see how land use planners would respond to this process"), especially considering the nature of the TAP approach that addresses transport, land use, and telecommunication systems.

6.3.2. Being up against the clock during the game play

The time allowed for the game play was something raised by several participants. Some felt it was *too short* and did not allow enough thinking time and one suggestion was that it could have been played for *much longer* (even up to a day). Related comments referred to the challenge of making sense of all the considerations, for instance "I think some of the differences between the cards are quite nuanced and we needed to get our head around those" and "The number of cards demonstrates how complicated triple access planning is". Others meanwhile felt there was a good tempo and it reflected the pressures of working in their day jobs. For the game plays covered above, the game play time (including any discussion at the end) was between an hour and 90 min. This partly reflects the amount of time available within a conference session or that can be justified in a work environment where busy people are concerned. The game play time can otherwise easily be changed.

6.3.3. Jokers in the pack

Some participants were curious to know whether details of joker cards created across game plays would be shared and whether or not the deck of cards would in future be updated. However, other participants welcomed the opportunity to put forward new cards as part of the game play, such that pursuit of a 'complete' pre-prepared set of SWOT cards was not warranted. In some instances, participants noted the challenge of distinguishing between certain cards. This we consider a reflection of why the limit of 40 cards was decided upon in the creation of the game. The nature of the game, in requiring shortlisting of cards from 40 down to five, also allows players to address any matters of perceived overlap between cards.

6.3.4. Facilitators' observation of game dynamics

What has been apparent across all the game play sessions reported above is the thoughtfulness, engagement, positive energy, and lively and good-spirited exchanges between players. We have observed people feeling under pressure at the start of the game play as they become accustomed to the tasks they face but then tuning in to the nature of the game and gaining in confidence and enthusiasm, with momentum picking up. Genuine discussion and constructive challenge have been commonplace across the game plays and even where instances of disagreement arose, the game play environment and game mechanics offered a way for different perspectives to be shared and for overall conclusions among players to be reached.

6.3.5. Achieving a balanced assessment of TAP's merits

The advocacy-based approach of introducing TAP as the alternative approach under consideration at the start of the game may appear to introduce bias (and as shown in Section 6.1, many of the players had some familiarity (and perhaps affinity) with TAP before the game play session). However, the very intention of the game is to offer players a balanced representation of weaknesses and threats as well as strengths and opportunities and to actively encourage them to draw upon their own experience to pass judgement on the approach and its merits.

The strong encouragement in Stage 2 to retain one of each suit in the shortlisting to five SWOT cards further seeks to ensure a balanced and critical assessment of TAP takes place within the game. The opportunity to create new SWOT cards was, in practice, sparingly used and few players did not recommend considering TAP as an approach. However, the fact that some players have done so, alongside weaknesses and/or threats coming through into the final five cards in all game plays, suggests players have indeed been able to participate in a rounded assessment of TAP as a proposed alternative approach to transport planning.

6.3.6. Ranking versus rating

An issue that has arisen for a significant minority of players across all the sessions is the confusion between ranking and rating cards during the game. The game design asks players to rank cards in their hands from '5' (most important) to '1' (least important). In spite of explaining the rules, some players were not clear whether this was a matter of ranking (each card given a different number between 5 and 1) or rating (each card rated on its own merit, allowing more than one card to be given the same number). Other players instinctively ranked '1' as most important and '5' as least important. In retrospect we acknowledge that this may have been a more intuitive instruction to give players.

6.3.7. Game players and game contexts and caution over generalising

The SWOT in a Box methodology is intended to be a practical and positive contribution to areas of professional practice and for use in engaging individual professionals in shared dialogue with each other. The purpose of the game in this application has not been to establish firmly or in a generalisable way what the merits of TAP are and its overall prospects. We have gained insights on this but these are reflective of the players who have been involved and the particular and varied contexts in which the game was played and may or may not hold true in other contexts. Players have predominantly been self-selecting and may therefore have brought into the game play a more favourable mindset in turn helping to foster the convivial game settings observed. What has been demonstrated through the application of the methodology to TAP – across different settings and combinations of players - is that it does offer a workable and effective way of introducing people, who have chosen to play, to an alternative approach such as TAP by making use of SWOT analysis.

Two of the game play sessions with local authorities have been undertaken as part of embarking on new initiatives within the authorities – one to develop a new local transport plan and another to address a major new development and its related transport requirements. In both cases, the intention has been to take forwards the TAP approach and the serious game has allowed them to critically explore this at the outset. Indeed, we would judge the game to be even more effective when targeted at a specific local authority because teams of players are able to centre upon the particular circumstances associated with that authority in weighing up strengths, weaknesses, opportunity and threats of TAP. In contrast, when played as part of a conference with participants from multiple organisations and places, such common focus in terms of context is not possible and participants may bring varying personal experiences into the game play (as one player noted – "I think it depends on who your boss is … that kinds of tailors how you would choose the cards").

6.3.8. Limitations

Limitations identified in the course of implementing TAP-SWOT in a Box can be summarised as follows: (i) game play timing did not suit all players; (ii) card deck design has resulted in some apparent overlap, or ambiguity in distinguishing, between certain cards; (iii) the advocacy-based nature of the game design and self-selection of participants may have introduced optimism bias regarding the favourability of TAP seen in the results; and (iv) where players in a team were not all from the same organisation it was more difficult to focus discussion about, and prioritisation of, cards. In each case game players have been able to accommodate such limitations but these are considerations worth noting in subsequent application of the methodology or use of the TAP-SWOT in a Box cards.

7. Evaluation and wider application

The multiple game play sessions have given us confidence in the efficacy of the methodology in relation to our underlying question - How can an approach be designed and used to effectively engage people in a critical examination of TAP? - and in terms of addressing the potential limitations of SWOT analysis, including those identified by Pickton and Wright (1998), noted in Section 2.1. We recognise that the study has not offered a comprehensive attempt to evaluate the methodology as an intervention in terms of pedagogy and how and to what extent in more detail it affects knowledge exchange and views on the alternative approach in question (TAP). Indeed, other participatory methods or variations on the design of the SWOT in a Box card game and its mechanics may further inform more detailed assessment of the methodology set out in this paper. Further examination of wider bodies of literature on engagement methods could also be merited but is beyond the scope of this paper. Nevertheless, we believe SWOT in a Box has been shown in this paper to be a novel and helpful contribution to the repertoire of tools and techniques used for engagement and knowledge exchange.

We have only applied the methodology to the case of TAP. While we believe the methodology to be transferable to other areas of application, we would welcome further work that seeks to apply the methodology elsewhere to test that and gain further insights into the effects of the methodology. Given the natural orientation of TAP towards helping address public health, it may well be that further versions or variations of this card game could pay this even greater attention (and indeed the field of public health is no stranger to use of such techniques (Blakely et al., 2009; Akl et al., 2010; Graafland et al., 2012; Wang et al., 2016; Sipiyaruk et al., 2017).

We would equally welcome others applying variations of the card game mechanics that make use of its deck of cards. A deck of cards is inherently versatile in terms of being able to devise different games that could use the cards. We could readily envisage, for instance, practitioners who take a strong interest in exploring TAP benefitting from moving on from TAP-SWOT in a Box to 'TOWS-SWOT in a Box' whereby they use the cards differently to help consider how strengths and weaknesses *relate to* opportunities and threats.

We have created a 'game pack' for practitioners who wish to run the game face-to-face for themselves without the support of the game creators. This includes the printable cards and the 'sales pitch' presentation for the start of the game (with script or ready-made recording provided). An online version of the game (see Fig. 7) has also been developed. Both versions were made available in the public domain in July 2023 (Lyons et al., 2023) and can be found via the project website: https://www.tapforuncertainty.eu/serious-game/. Public availability of the 40 SWOT elements also allows practitioners to study its merits outside of the serious game environment. In addition, more recently, a TAP handbook for practitioners was made available (https://uwe-repository.worktribe.com/output/11751967).

While it remains to be seen how widely engaged with the now publicly available serious game TAP-SWOT in a Box will be, its availability is timely in the wake of the Covid-19 pandemic. Transport authorities in many parts of the world are reflecting upon how to
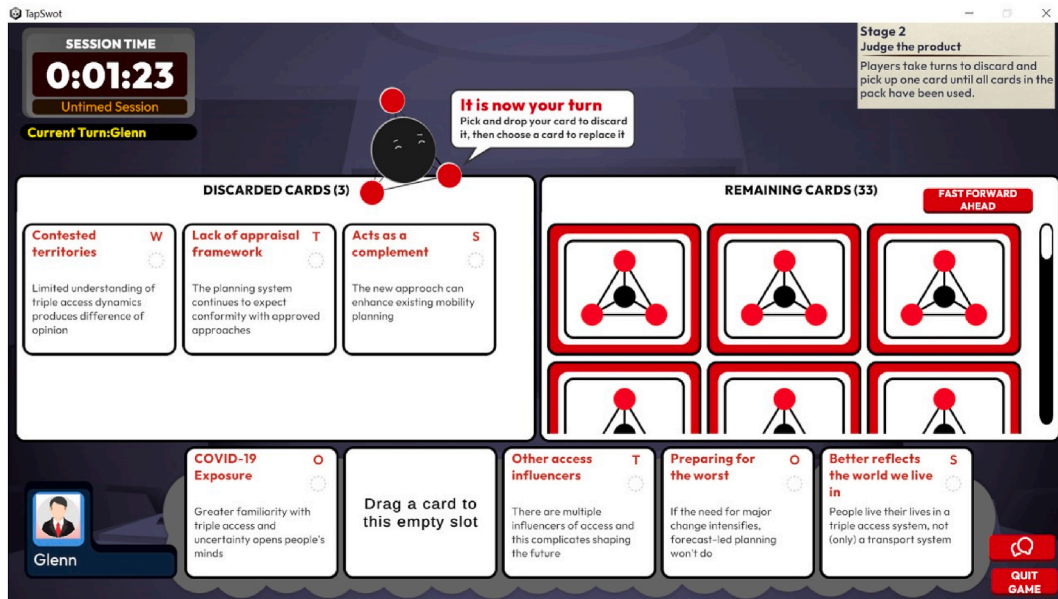
Fig. 7. Screenshot from the digital online version of TAP-SWOT in a Box.

strategically plan in the face of a changing world where the future is uncertain and the imperatives to address the climate emergency (declared as such by many authorities globally[8]) are strong. This points to significant and fundamental change in how transport plays its part in a wider system of access that can support economic and social activity in society in a more sustainable way.

8. Conclusion

Experience from developing and engaging many people in playing TAP-SWOT in a Box indicates that it has value as a methodology. The methodology has two key elements: (i) the game design itself; and (ii) the application-specific content. In the context of this paper, the latter has required having a thorough appreciation of both transport planning and the alternative of triple access planning to be able to prepare a comprehensive set of SWOT elements. The game design, we believe, is readily transferable to other forms of application where an alternative approach merits consideration in a way that calls upon input from multiple individuals to help socialise and critically explore the approach through a SWOT analysis. Creation of a new bespoke set of playing cards would be required alongside a new 'sales pitch' presentation.

As we noted in the Introduction, SWOT in a Box offers an effective tool for shared learning: (i) players learn from the game; (ii) players learn from each other as they exchange experiences and views; and (iii) the game designers can learn from the players playing the game. It generates insights and empirical evidence. It is fun and it is useful. We hope this paper gives others the confidence to consider drawing upon our methodology so that other 'SWOT in a Box' serious games emerge and help deliver positive impact.

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CRediT authorship contribution statement

Glenn Lyons: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization. **Daniela Paddeu:** Writing – review & editing, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Stephen Cragg:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Alicia Wallis:** Writing – review & editing, Methodology, Investigation, Data curation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to

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influence the work reported in this paper.

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