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# A Systematic Review of a City in a City: An Aerotropolitan Perspective

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**Abstract:** The purpose of this research is to demystify literature on aerotropolis using systematic review. Literature on aerial life and aeronautical studies suggests that airports are frequently cited outside urban centres. However, recent events surrounding the growth of aerotropolis contradicts existing realities. In fact, the pull and push factors constitute the life cycle of aerotropolis in urban enclaves. In generating data for this study, Dimensions, an artificial intelligence databank, was adopted, and a hybrid method which combines both VOSviewer and Citespace software was the preferred analytical tool for analysis. Key findings were imperative in establishing certain parameters regarding aerial life, including but not limited to knowledge about the technologies adopted, quality of stakeholders, in addition to existing relationships of urban space, urbanisation, and geography. Furthermore, two recurrent themes were identified, such as the development in ICT, and smart technologies, which corresponds with the multiple potentials that exist for developing sustainable airports, such as eco-innovation, greenovation, and social innovation. This study contributes to the concept of transit-bound tourism, a concept we coined to depict the role tourism can play in transit philosophy and economics.

**Keywords:** aerotropolis; urbanisation; transit-bound tourism; VOSviewer; citespace; technology; new urban extension; transportation; transitional cities; built cities



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## 1. Introduction

Research on aerotropolis is on the rise, but what it entails and how or whether the public and governments accept it, requires extensive enlightenment and dialogue. Despite the enormous opportunities aerotropolis offers to metropolitan urban space, it is continually plagued by negative airport characteristics, such as noise pollution, crash tendencies, and environmental factors and land-use issues at a time where recycling, sustainability, and climate change have taken centre stage in academic discourse.

Aerotropolis is also known by other names, such as aerial life, and airport city. To Kasarda, an aerotropolis involves a metropolitan subregion whose land use, economy, and infrastructure are centred on an airport vivacity [1]. The term aerotropolis can be divided into 'aero' meaning aviation and 'tropolis' meaning metropolis. Philosophically, the study of aerotropolis can be considered or described as the scientific study of airport life within metropolitan cities. Airport cities consist of two main characteristics, airports' logistics and supply chain, aeronautical, multifunctional commercial infrastructure, and multimodal aerial life at the core of aerotropolis. Secondly, clusters of businesses, and corridors associated with developmental feeds and accessibility to airport by locals [2,3].

The aim of this research is to perform a systematic review of literature on aerotropolis and to gauge the nature of research on the growing discipline from a transdisciplinary

perspective. In that, many airports have transcended their nomenclature as mere transportation nodes. Descriptions such as aerotropolis, aerial life, airport city, and airport corridor demonstrate that these nodes have grown to emerge as a kind of urban development [4]. Cities are made up of individuals whose functionality is contingent on interconnected networks, facilities and systems that ease the movement of persons, goods, and services. Kasarda [5] argues that the non-static nature of cities accounts for their revolving and changing trends and dynamics. In this study, we present seven conditionalities, which converge to shape the lifestyle of city dwellers and are defined by Figure 1.

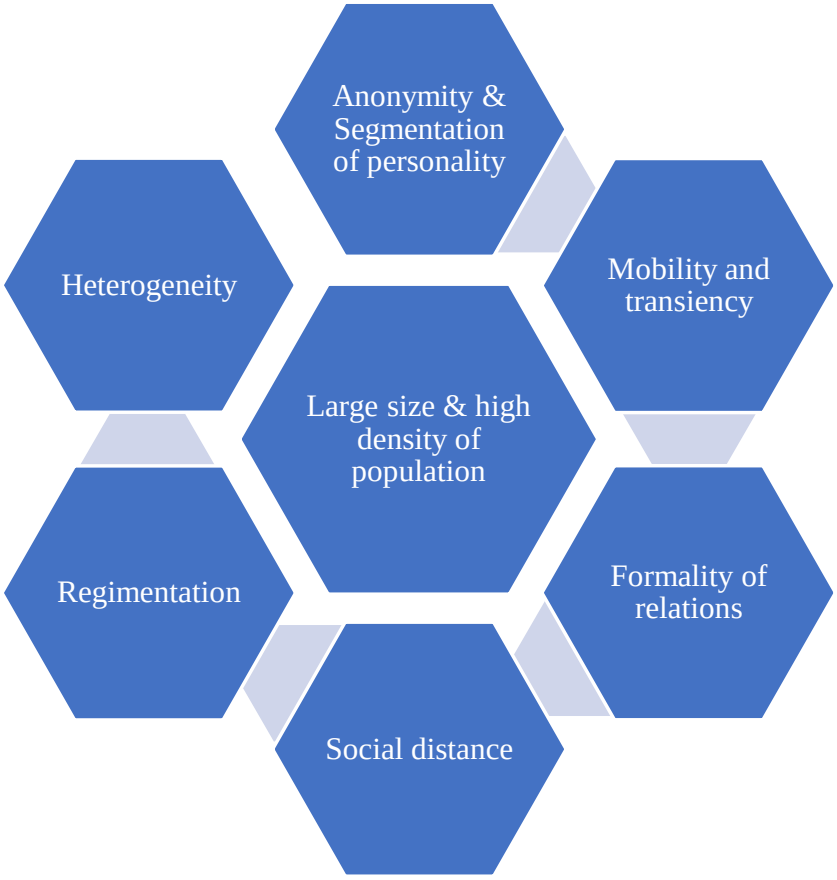


**Figure 1.** Characteristics of urban spaces. Source: Mondal [6].

Cities exhibit distinct roles; even so, many cities exhibit similar characteristics, which includes high density of population, and utilitarian and impersonal social relationships. Diversity and class are also another key determinant of an urban population. Most cities consist of people from different castes, religions, and ethnic enclaves. The heterogenous nature of city life enables entanglement between individuals' affiliation, to affiliations of ethnic origins, occupations, and creeds and classes, and these relationships tend to heighten the sense of belonging in city-life.

City-life is often associated with a high speed of events [7], and furthermore most urban centres in developed countries are clock regulated [8]. Thus, regularity of events and punctuality is a harbinger of urban life. Likewise, city people are physically overcrowded but socially isolated. Due to the social distance preserved by urbanites, city people are often night-dwellers, rather than neighbours. The social life of urbanites is based on association, creed, occupation, or ethnicity, and most relationships lack intimacy [9]. Nonetheless, to maintain a level of mental health in urban living, formal relationships are a convenient and necessary way to maintain mental health, particularly with regimented individuals, who are often secondary groups.

*Transitional or Built Cities*

Some cities are purpose-built, others metamorphosise through a process called urbanisation. Kasarda [10] argues that most aerotropolis development has been organic; however, others have been haphazardly transiting from a mere airport for the transportation of persons and goods, to a community which feeds from the airfields. Likewise, evidence from New South Wales and Dubai suggests that aerotropolis develops in several ways. Either built for purpose (NSW) or through urbanisation processes (Sujalaam Skycity).

Various factors account for the process of urbanisation, with modernisation being a key factor, followed by wars, rates of climate change and global warming, conflicts, and threats to life [11,12].

Urbanisation has been conceived from different prism, nonetheless, most tend to capture similarities, trends and description with little or no dynamics. Charbonneau, Morin [13] perceive urbanisation as a multidimensional technique used to engender urban development, while Elkabir [14] adds that urbanisation is an interdisciplinary field of study, hence the dual perspectives between theory and practice in urbanisation discourse.

Other scholars such as Bai, McPhearson [15], while establishing a linkage between environment and urbanisation, demonstrate that urbanisation is an arm of geography or urban studies concerned with modern social transformation and smart innovation, and is driven by multiplicity of economic, social and environmental variables. As a technique, urbanisation is a measure for gauging how societies have transformed from rural (social, economic, cultural and lifestyle) to urban living (Figure 2).

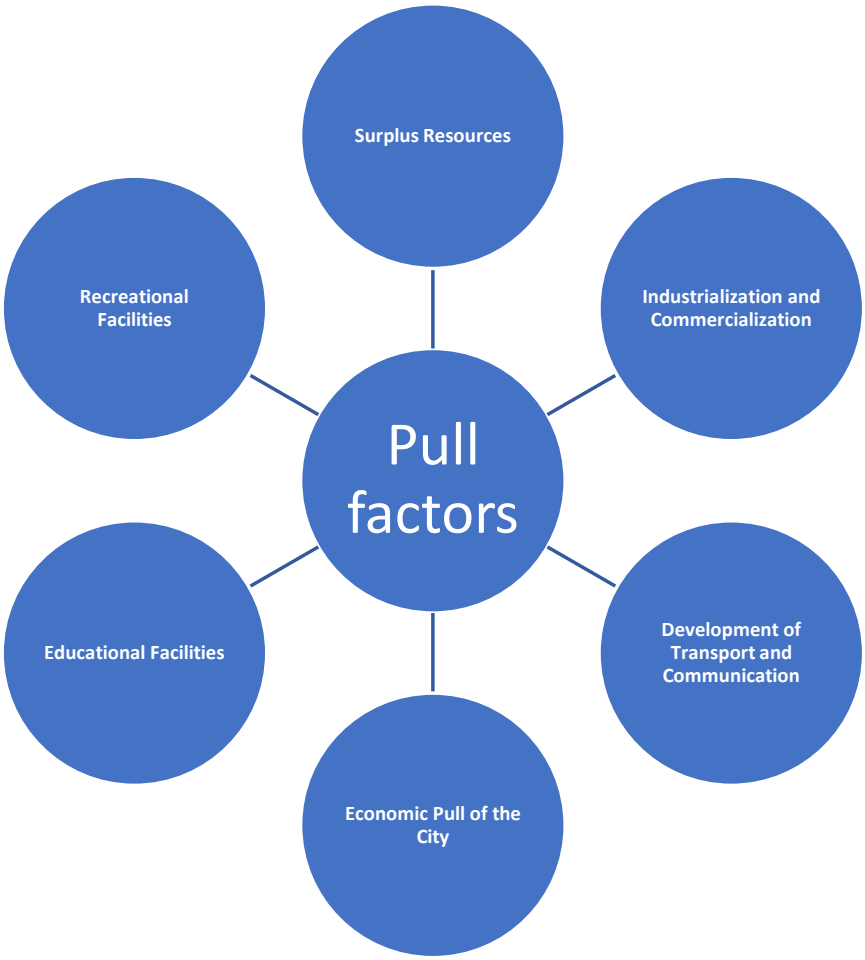


**Figure 2.** Pull factors of modern cities.

The hallmark of physical or structural development is incumbent on the transformation in urban living. Historically, the construction of a city within cities, most times are

demarcated by zones. This includes economic trade zones, military zones, airport zones, community economic zones, and more recently special economic zones, smart cities, and aerotropolis. These are commonly perceived as niche cities within literature. Along with the premise of niche cities, research has demonstrated the existence of various categories of cities formed by some level of class or caste, for example, some cities are associated with those seeking a lower cost of living and safer, more family oriented, cities. Different conditionalities guides the reality of human choices. In this study, we primarily investigate niche cities with reference to aerotropolitan cities, or cities whose functionality is dependent on the existence of an airport [16]. For instance, the primary lifestyle and activities within the military zones in barracks are around the military officials, and their families [17].

The concepts underlying the aerotropolis are not necessarily new, but how these niche cities aim for sustainability and or to bring about smart technologies, makes the practices in aerotropolis novel. Hence, the purpose of this research is to synthesise research on aerotropolises and provide a trajectory for understanding the aerotropolis and its dynamics, while engendering sustainability in smart cities. Furthermore, elements of aerial life should enable planners and governments to make better informed decisions on aerial life.

In many respects, the airport is fast becoming a city. Express News Service [18] noted that an aerotropolis is a method of urban transformation with an airfield city at the core of its economic activities, with links to aviation-related businesses, and with a community of individuals clustered around it. Businesses and individuals that use the airport do so for diverse reasons.

Airports are no longer exclusively for an elite [5], instead they offer a more open and friendly atmosphere for all passengers. Within the decade, there is increasingly unrestricted access in the airport, as more airport management provide luxurious lifestyle retail options for their customers, such as malls, bookstores, eateries, duty free goods and services, boutiques, and several retail services, including entertainment areas for adults and children, as well as cultural and relaxation areas. Adapting to the speed of digitalisation require adaptive skills and tendencies to accommodate change, and the abilities of managers to effectively manage change. Thus, there is a need to advance studies on the social, environmental, structural, and political ways, in which, artificial intelligence will shape and transform airport cities. However, this places more burden on scholars and practitioners engaged in construction management, built environment, and students of urban studies and planning, because of the recent trends in the adoption of smart technologies in the advancement of transport, telecommunication, digital footprint, and privacy laws among others.

The availability of land, transport networks, accommodation facilities, commercial and recreational activities are the drivers of airport cities constitute some of the pull factors for aerotropolis. Pull factors are drivers of growth and development within a system. Simply put they are factors that attract migrants to a city or location. There are several pull factors that cause guests to stay or residents to live in airport cities. Figure 3 depicts the essential factors. Within the combinations of the core five factors: commercial sectors, passengers, cargo traffic, landside business development, and non-aeronautical revenue. Others within the subdimension of these five may include: duty-free shops, restaurants, cultural and entertainment attractiveness, hotels and accommodation, bank and currency exchange services, free trade zones, golf courses, and factory outlets, and family and personal services such as healthcare lean towards one or a combination of these five factors. These five drivers for aerotropolis are germane for the sustainability of the sector.

For instance, while passengers and cargo traffic may be considered the major driving force, without non-aeronautical and the availability of land, airport cities would hardly become a reality.

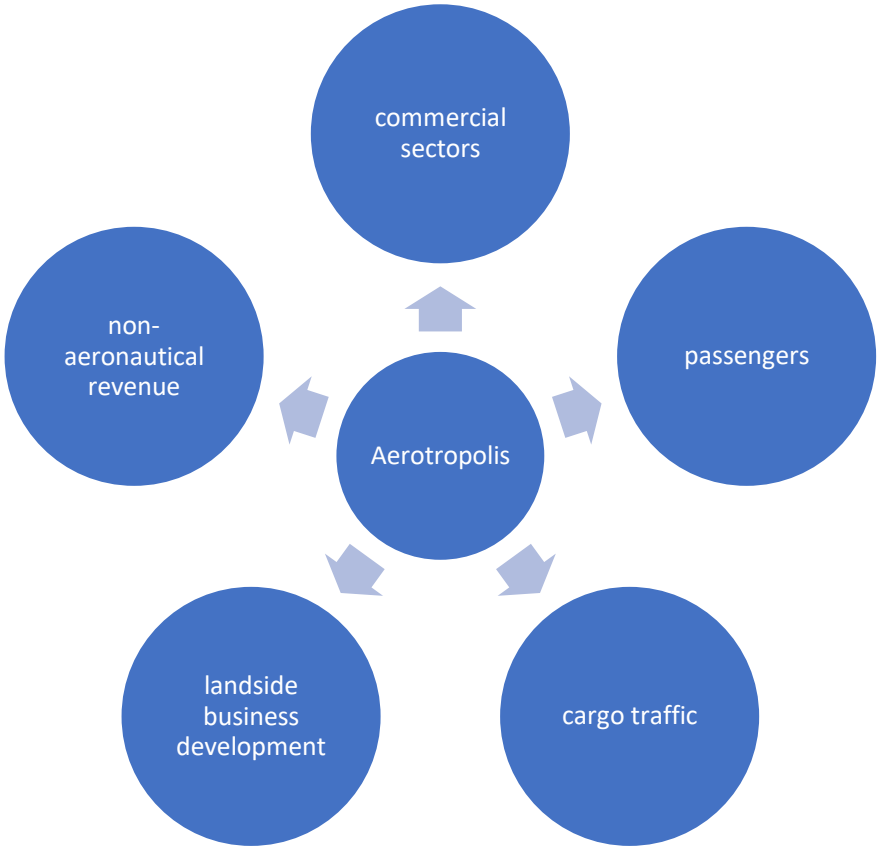


**Figure 3.** Pull factors.

Despite the advantages of the aerotropolis, airport cities continue to face several encumbrances due to environmental concerns which many consider germane. Chief among them is both the amount of land and the investment required for constructing an airport city, when existing cities are still struggling to be productive [19]. Other factors are noise pollution, which might lead to an increase in deafness, and the degradation of arable farmlands. Advocates that argue against the construction of an airport city include issues of high-resolution internet speed and access, the rising cost of jet fuel, the increase in greenhouse emission owing to airport-linked development, and the need for revolving innovation in the airport city [20]. However, some of these challenges are either universal to cities globally, or have been taken care of, such as sustainable aviation fuels, which reduce the carbon footprint of such developments [21].

## 2. Materials and Methods

This paper employed a multi-technique approach to systematically integrate literature on aerotropolis. We did this by identifying and establishing relationships, trends, and pragmatic elements in furthering the discourse of aerial life. To begin, we present scientific procedures and rationales for systematic literature reviews (SPAR-4-SLR) that guides the researchers' protocol for data collection that provides justification for both the inclusion and exclusion criteria (Figure 4). Figure 4 has three parts: the first deals with the notion of assemblage, the assembling stage has three critical parameters for creating an understanding of aerotropolis, which includes identifying, acquisition, and search periods. The section demonstrated how data was solicited, and the nature of data collected. It also shows that the total data from Dimensions for aerotropolis was 1461 documents.

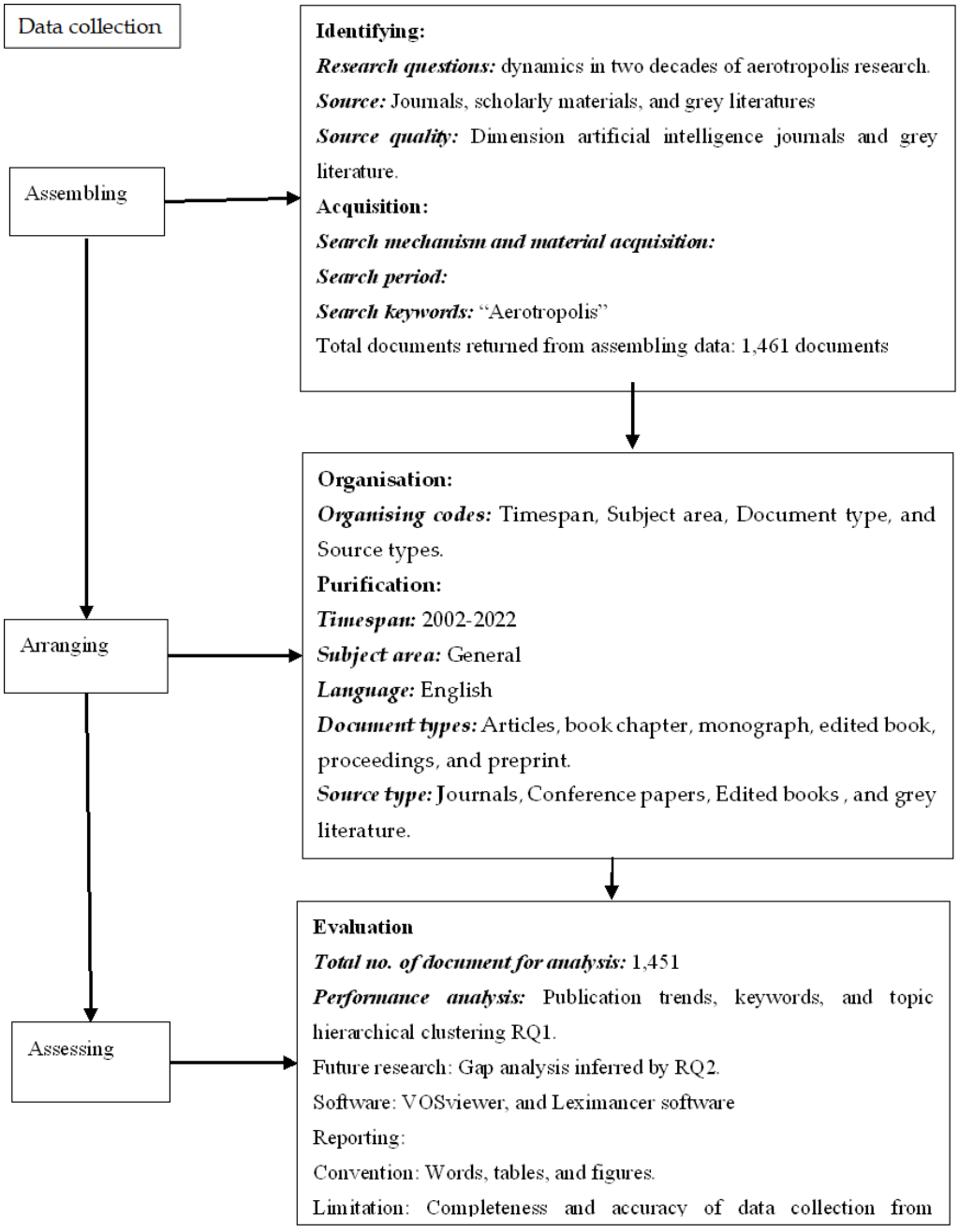


**Figure 4.** Protocol for reviewing Aerotropolis using SPAR-4-SLR procedure.

Stage two provides evidence for how the data assembled are arranged; the arranging phase involves, organization, and purification. For the purposes of generating a trend, and purification to ensure that the sources of the data collected are verifiable and reliable. In crosschecking existing databases and assessing existing datasets, the number of aerotropolis documents in the third stage was reduced from 1461 to 1451, and so the entire number of documents used for the analysis was 1451.

## 3. Results

In furtherance to the protocol (Figure 4), an astrometric analysis of the number of publications per year between 2008 and 2022 was conducted (see Figure 5) [22]. The overview of the publication between 2008 and 2022 demonstrated that the number of publications has witnessed a steady growth in publication year on year; however, aerotropolis literature witnessed a decline between 2014 and 2016, and in 2018. Literature publication on

aerotropolis reached its height in 2020 with over 250 research publications. Nonetheless, literature on aerotropolis have not received favourable publication between 2021 and 2022.

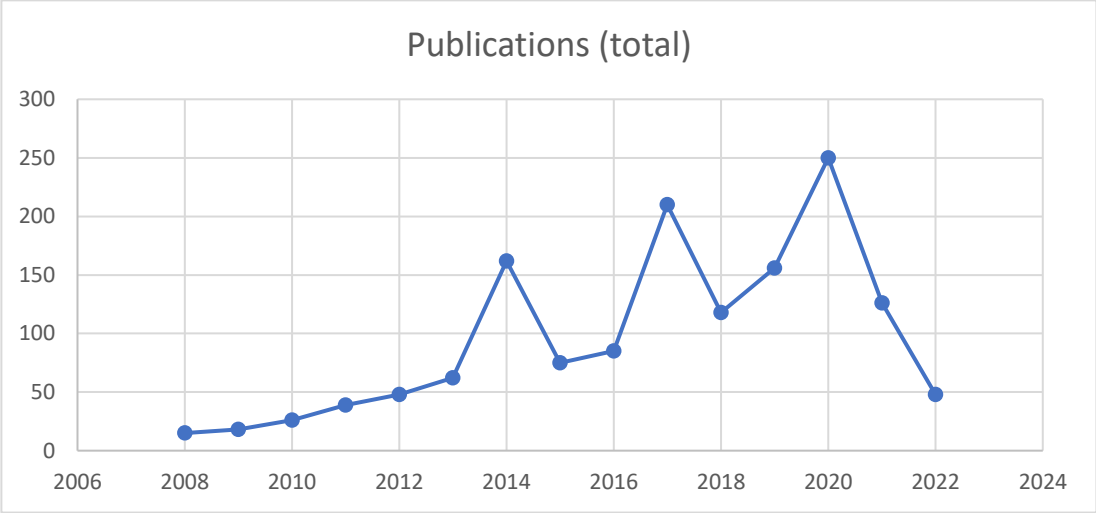


**Figure 5.** Overview of the publication (2008–2022).

There are five main countries that have contributed to the growth of publication on aerotropolis, in no order, they include, China, Australia, United States of America, South Africa, and the United Kingdom. Figure 6 depicted a timeline of publications per country. It shows that while America was at the centre of cutting-edge research on aerotropolis, between 2020 and 2022 China has emerged the dominant publisher, and leader of the new school of aerotropolis. This may be linked to what Kasarda reported earlier as the unfavorability of airport cities in city-life in America, because of its negative historical antecedents.

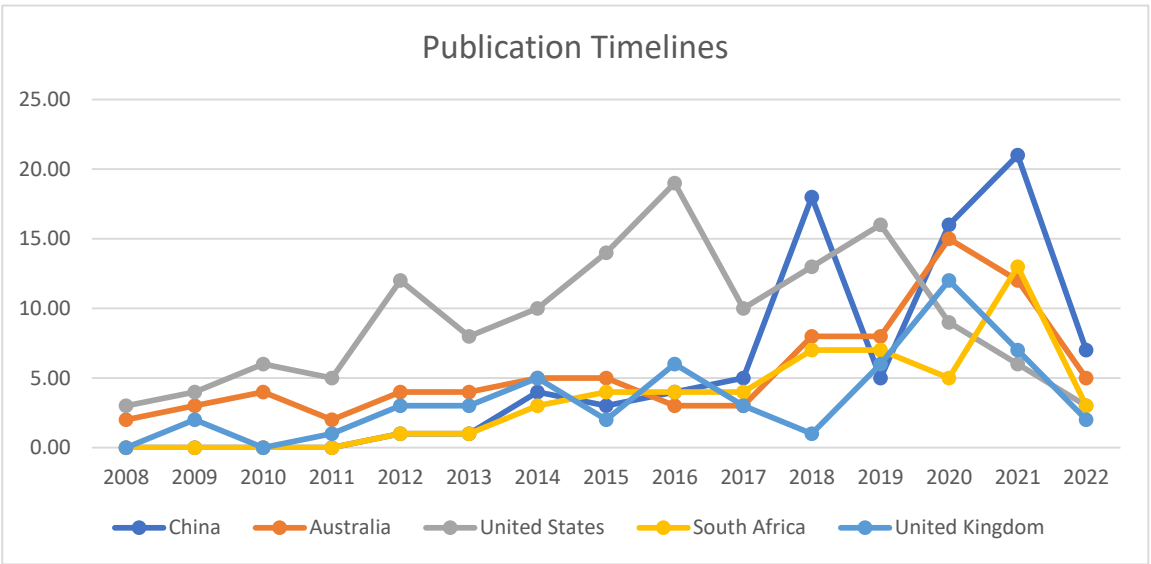


**Figure 6.** Top country's publication timelines (2008–2022).

Figure 7 demonstrated the geography spread of research on aerotropolis. Arguing that distribution and publications on aerotropolis has reached a thousand count since the introduction of the concept. Chief among its contributors and advocates for aerotropolis tend to match with top countries times, as demonstrated in Figure 6.

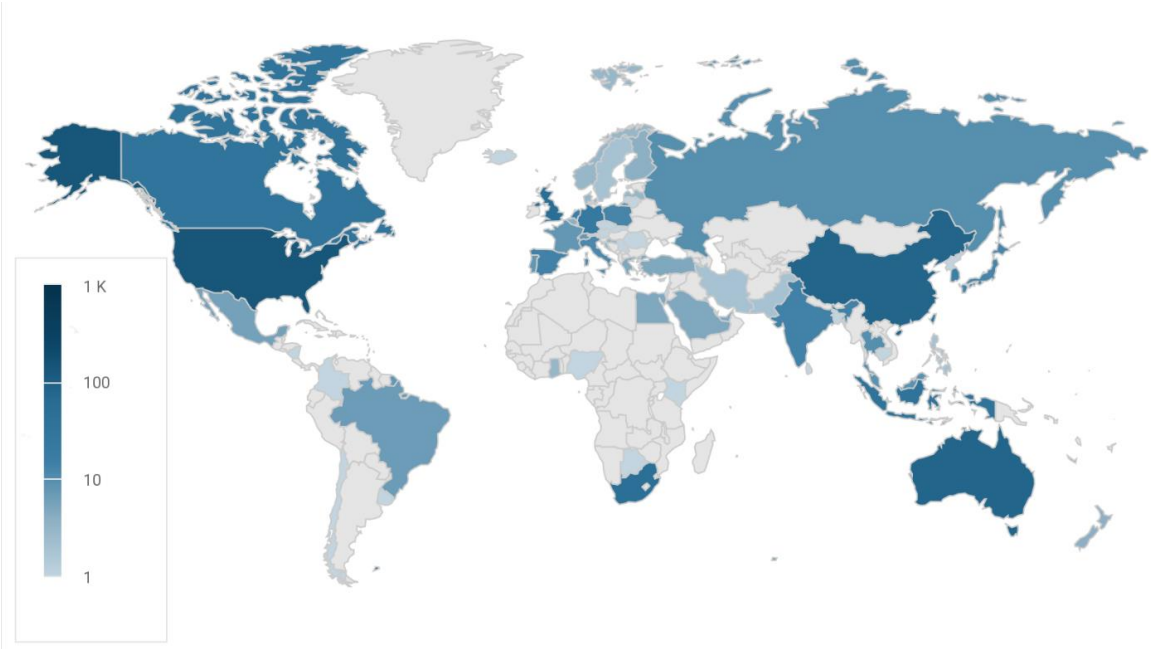


**Figure 7.** Demographic distribution of publishers and number of publications.

From Figure 8, the VOSviewer analytical tool was employed to analyse the research output. Within the VOSviewer network, expression of impact is noted by the size and colour of the bubble. A glossary of countries' distribution and interaction (Figure 8) demonstrates that the bigger bubbles include the United States, Australia, China, and United Kingdom, nonetheless, contributions from Indonesia, and Kuwait appear to be much impactful, despite having smaller bubbles.

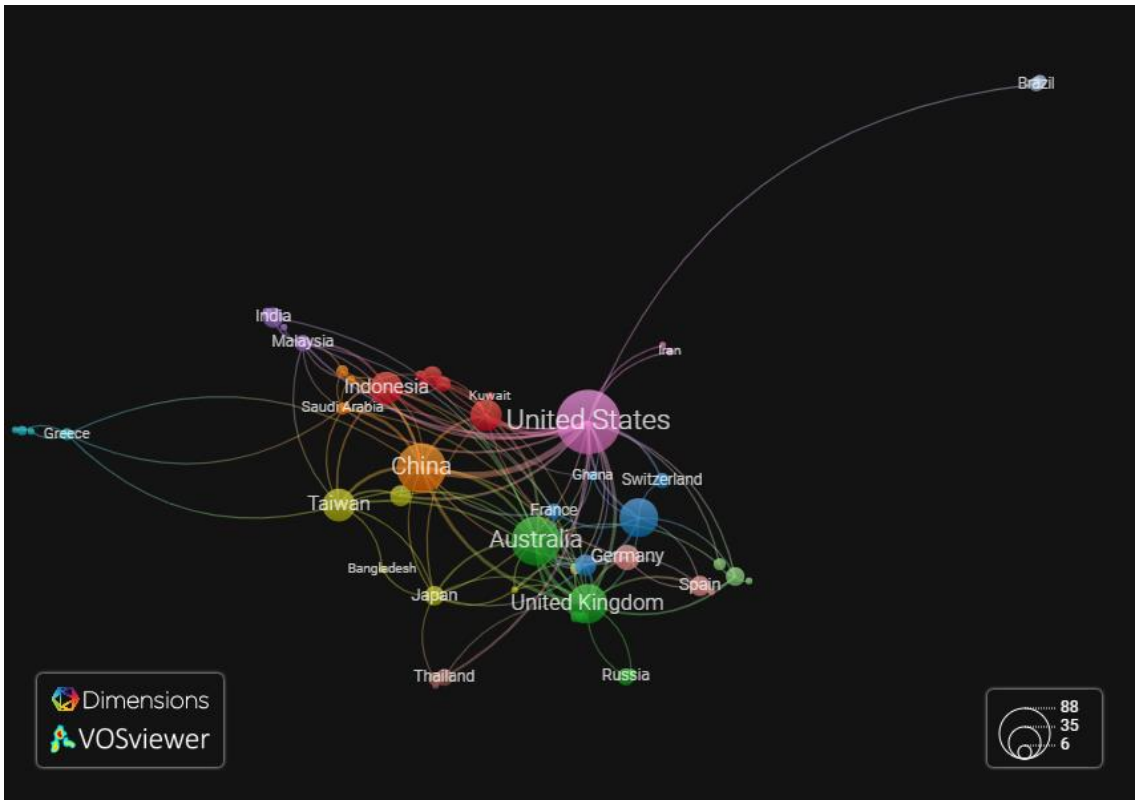


**Figure 8.** Countries interaction and distribution.

Figure 9 introduces the findings to discussions on funders. Funders are critical segment of research and research outcomes. Several research funded by multinationals have led to favourable outcomes for the funder. Hence, the funders are key partakers in the decision and outcome of the researchers' report. Hence, research sponsored by private in many causes tend to lean with the funder. In this study, the main functions are government departments and ministries, including national institutes, and as it shows, the Chinese are major stakeholders in aerotropolis research, hence the rise and the shift in the discourse (see Figure 6).

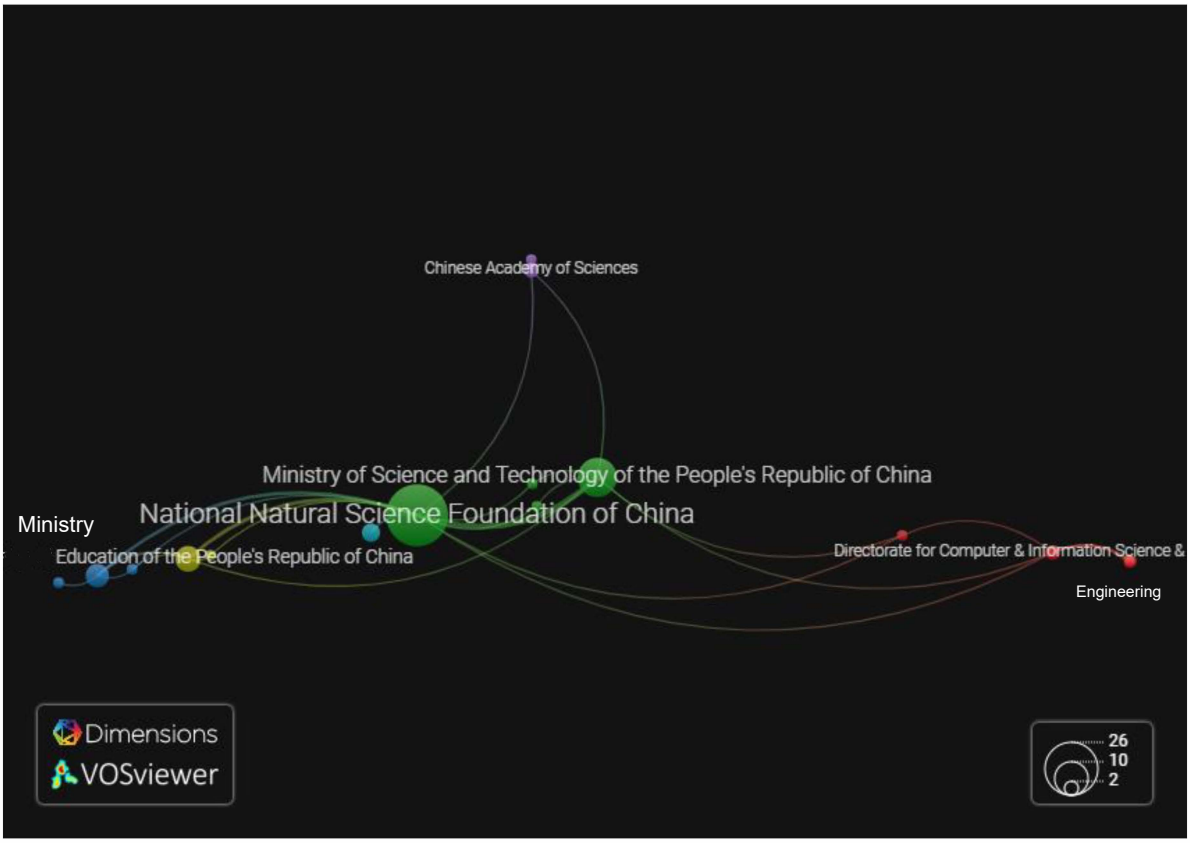


**Figure 9.** Funders distribution by departments.

*Funders*

Figure 10 breaks down the funding bodies, and categorises the departments, ministries, and institutes within regions. To give a sense as to the region where fundings for aerotropolis can be readily available, and from what organisations, researchers can easily assess these funds. The top ten funding organisations for aerotropolis are outlined herein, and the region funded is stipulated against the funding department, ministries, or institute. The result demonstrates that China has the highest funding agents, however, much of this research funded by China is given to researchers in Australia and America; nonetheless, the European Commission tends to show a lack of sponsorship within the top 15, while the Australian Research Council only fund research in Australia.

Globally, there are over a hundred publishing firms. However, we limit the numbers of publishers to the most prolific thirteen publishers, which includes Elsevier, MDPI, Taylor & Francis, Springer, Hindawi, SAGE Publications, ASCE, IEEE, Wiley, ACS, Emerald, John Hopkins University Press, and PLoS (see Figure 11). We further peer reviewed these thirteen publishers with the ten most funded agencies for the study of aerotropolis. Our results demonstrate that funders from the NNSFC tend to publish more of their research output in Elsevier, before considering MDPI as an alternative. Nonetheless, MDPI is favoured by

researchers funded by MOST, although, Elsevier is the preferred choice for aerotropolis funded outputs in general.

However, when the dataset was broken further to understand the source of impact, not necessarily regarding the publishers with the most publication, but the journals with the most publication and impact on aerotropolis study. Our findings demonstrates that journals within Urban Studies are more prevalent in accepting research outputs in aerial life. After urban journals, geography, transportation, environment, and sustainability journals comes in distance second. However, for the journals with the most publications, as appeared in red (see Figure 12). Urban Policy and Research, Australian Planner, Urban Forum, Local Economy, and Journal of Urban Affairs are performing better in terms of publications concerning aerotropolis discourse.

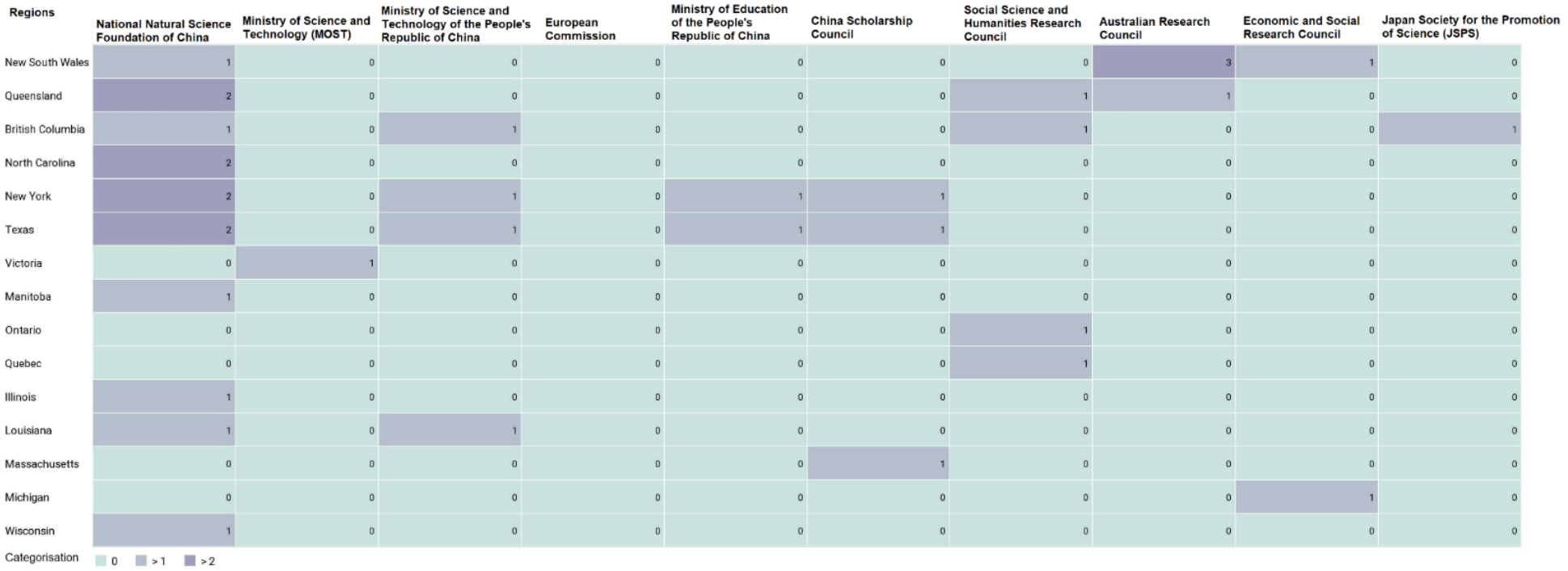


**Figure 10.** Peering Funders Ministry and Regions in Aerotropolis.

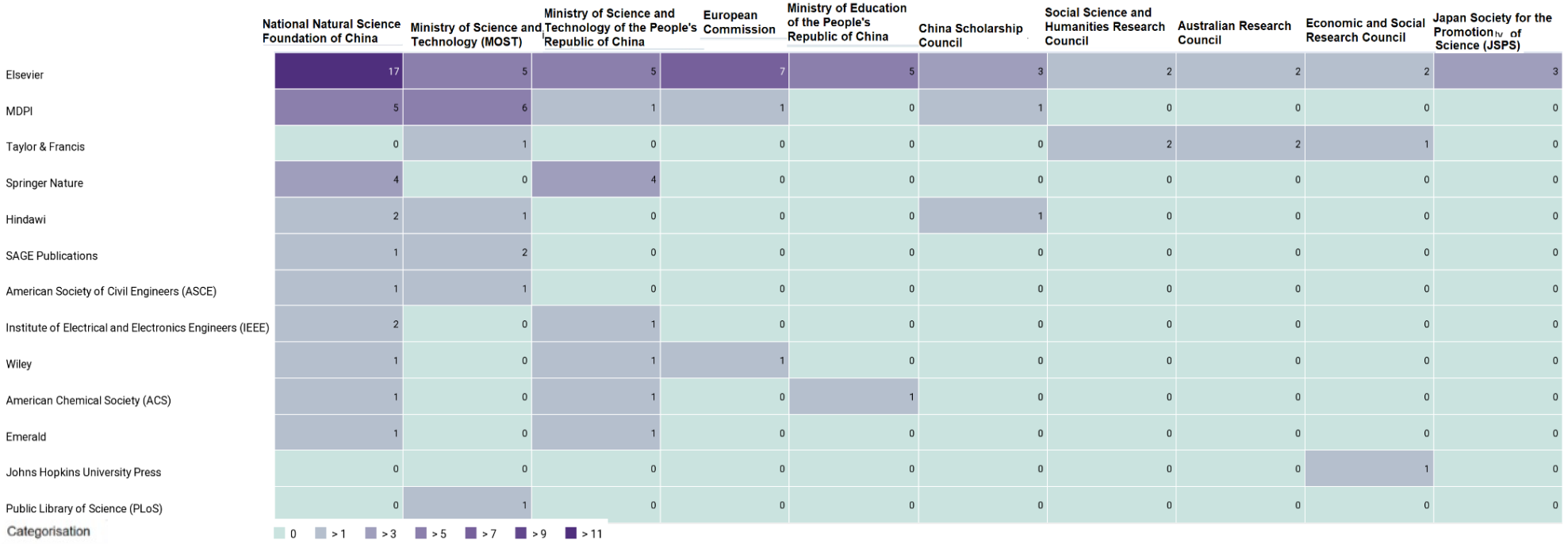


**Figure 11.** Peering Publishers and Funders in Aerotropolis.

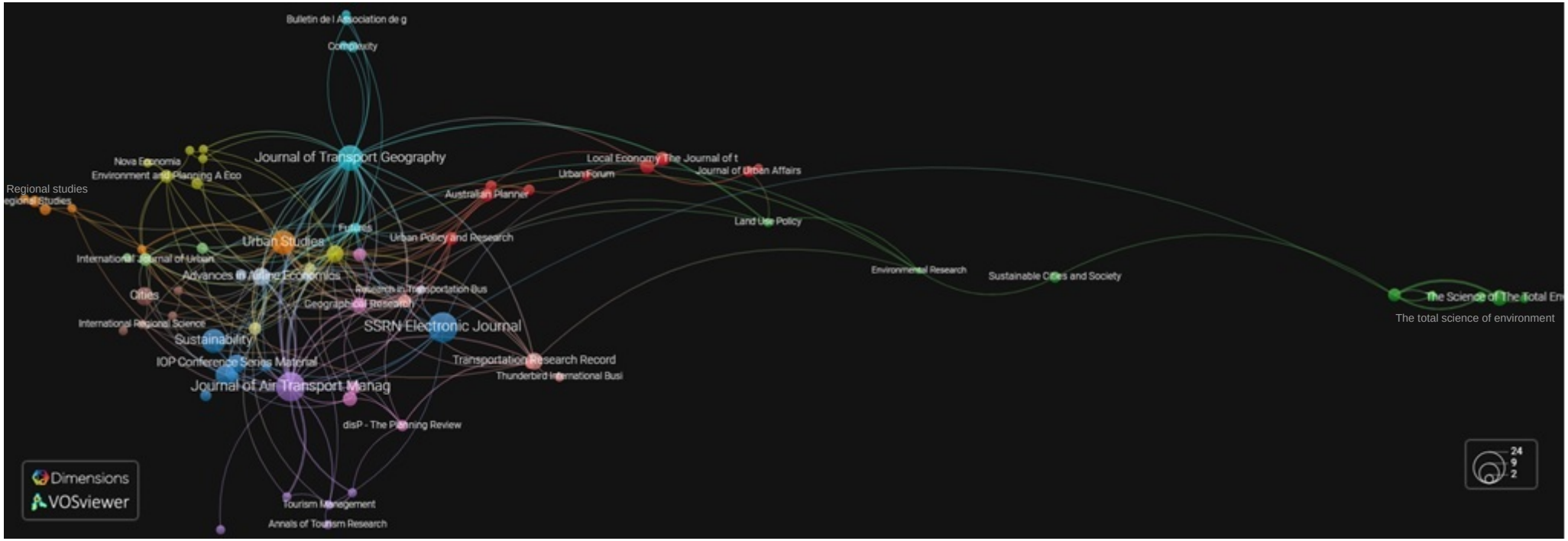


**Figure 12.** Journals publication network.

Within the Field of Research category (see Figure 13) of the Australian and New Zealand Standard Research Classification (ANZSRC), which covers all the research areas in both Australia and New Zealand. Our result shows that despite aerotropolis been conceived as a pure science, the majority of its output has been within the category of Studies in Human Society. Studies in Human Society can be broken into seven disciplines, which includes Anthropology, Criminology, Demography, Human Geography, Policy and Administration, Political Science, Social Work, and Sociology. This confirms the earlier assumption that the research in aerotropolis is dominated by studies in Urban Affairs.

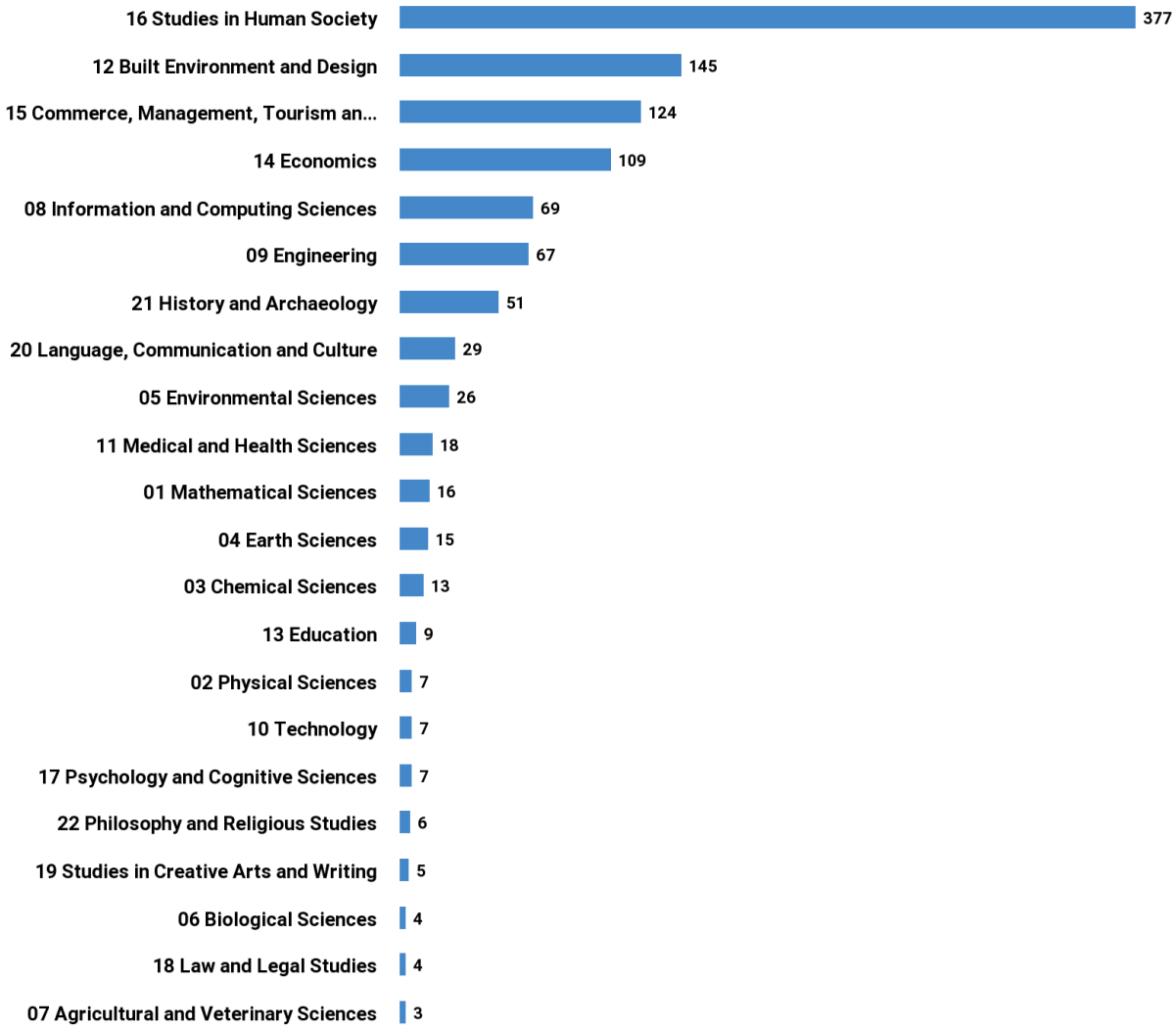


**Figure 13.** Distribution by Field of Research (Dimensions AI).

## 4. Discussion

The idea that a city can exist within a metropolitan city is not a new idea. Several economic zones and military zones existed before the conception of aerotropolis. Such economic zones, such as economic trade zone, military zones, community economic zones, and more recently special economic zone has continued to gain momentum in alleviating poverty and spreading communal prosperity.

### *4.1. VOSviewe.r*

In the distribution by keyword occurrence index (Figure 14), categorising the frequent terms used in aerotropolis studies, we categorise the themes into five clusters based on colours of the bubble. According to VOSviewer, the bubbles represented in red are the keywords with the highest hits, while green and blue are associated with the colours with

the least hits [23]. Therefore, in analysing the five clusters, we utilized the VOSviewer ranking system as follows: red, yellow, purple, blue, and green.

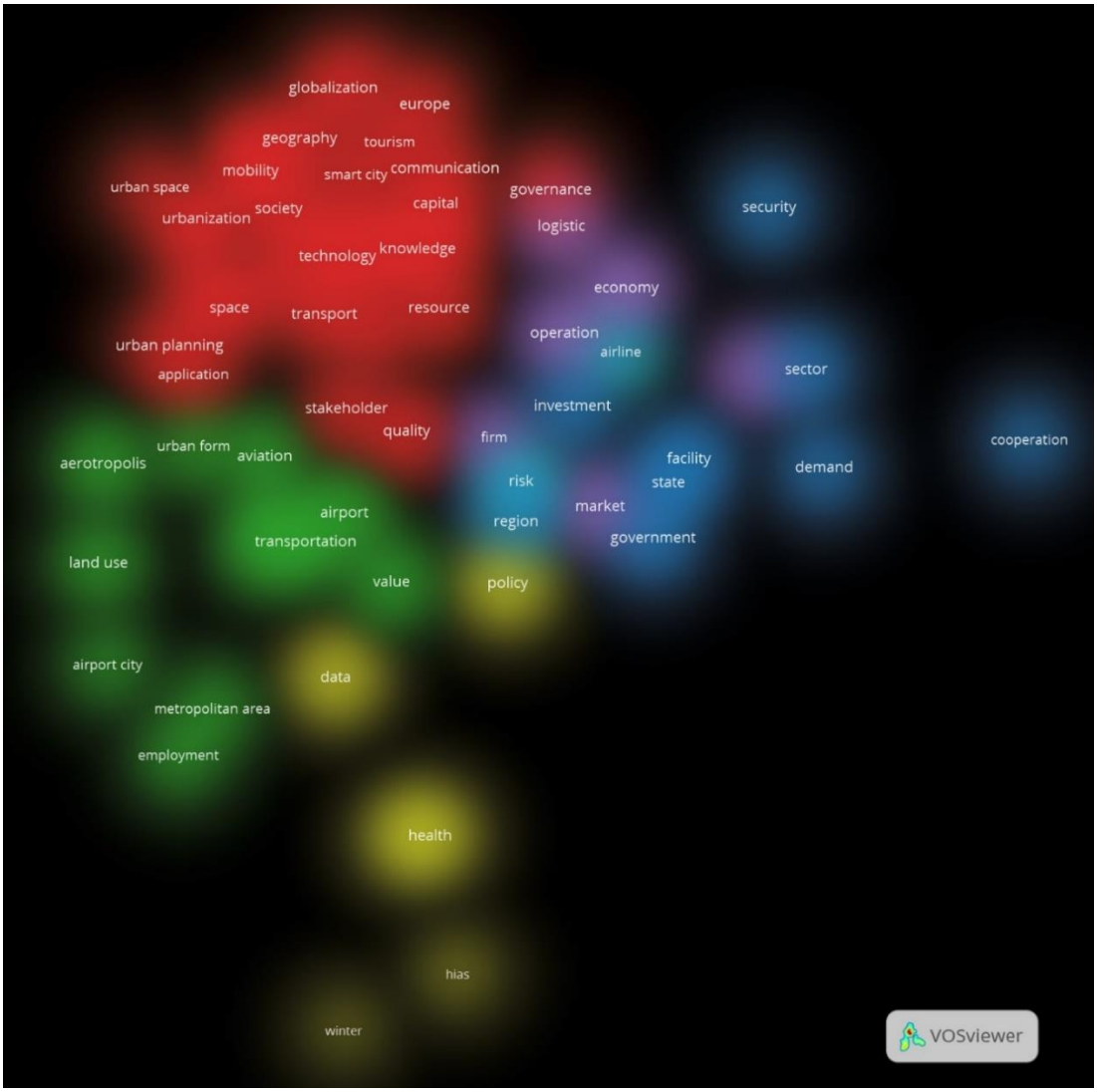


**Figure 14.** Distribution by Keyword Occurrence index.

4.1.1. Cluster 1 (Red)

This cluster integrates several relationships within the red bubbles and its interconnection to other elements, based on the proximity of one bubble to the next and one cluster to another cluster. By association and proximity, we could understand why and how closely related, or loosely associated variables on airport cities are apart or integrated. For instance, the map (Figure 14) established a few trends based on geography, social indicators, and other indications such as environment, administrative and economics.

With reference to geography, the conceptual map shows that discourse on aerotropolis is on the rise in Europe and could be perceived as another means for estimating the global trend for advancing globalisation, since aerotropolis has a resemblance of a 'global village.' Basic notions of globalisation include (i) interconnectivity of cities and regions, (ii) integrating international economies with global production, (iii) media imperialism, (iv) transnational media networks and system exhibiting high sense of global culture, and consumerism as a global village, and (v) global tourism [24]. Within the context of an airport city, Ndlela [25] argues that aerial life encapsulates all forms of globalisation, because airports are natural global meeting place for foreign passengers and locals. To

Ohakawa [26], the global connectivity of enterprise, people, and products worldwide are a reflection of the personal embodiment of aerotropolis. In essence, both Ndlela [25] and Ohakawa [26] establish that globalisation exemplifies certain physical expressions, which is substantially captured by the airport-centric urbanism [10].

From a social perspective, an airport city advances cultural exchanges and cultural transfer which may not be limited to books, apparels, ideas, and idiosyncrasies, but dependent also on mannerism of people. To digress a bit from the core of the research, in arguing for primitiveness' promises, Turner [27] states that cultures tend to learn from one another, and particularly that body marks, such as tattoos and inscriptions are signs of social or cultural identity. However, in some parts of the world, tattoos and certain inscriptions are considered gang affiliated [28]. Social identity, and by extension Tajfel and Turner's social identity theory of psychology, demonstrates that an individual's development is governed by certain predicted intergroup behaviours, societal group status, legitimacy, and mobility [29]. For instance, certain level of inscription or tattoos on individuals in America, may have a consequence on their ability to connect easily to international passengers. However, international passengers will act different to similar inscription of peoples of Maldives, and Samoa decent, due to way the media has socially constructed our realities. If for nothing else, the COVID-19 pandemic has taught the world to rely less on a single source for validating information.

Additionally, airport cities will assist in cost savings for researchers, especially for researchers seeking multiple perspectives in addressing a topic or concern. The character of persons who passes through the airport-centric urbanism also adds to the value of participants, although replication may be difficult, if not impossible, however the nature of movement, and commercial facilities may assist in frequently capturing diverse groups in transition.

Urban air mobility (UAM) leverages novel approaches for linking cities, cargos, passengers, and regions by granting them more possibilities to connect to the world [30]. UAM envisages a sustainable, safe, accessible, and affordable air transportation network for the delivery of goods, passenger mobility, and emergency services traversing urban spaces [31]. Urban space is fundamental in both beautifying and engaging the public in an environmentally friendly manner, through biophilia, greenovation, or sculptures.

Urban spaces are typically outdoor spaces among building, residential, commercial, private, or otherwise, that allows for free flow of communication, social interaction, and transit of people within the city. Although it may appear that most aerotropolis do not have the street corner views. For instance, when we begin to conceive of the airport as a city, for example, it gives a broader viewpoint to overlook the various interlinks (pathways) at terminals as streets. This creates a novel shift in systems thinking for managements of airfield cities. Which is intricate to Lindsay [32] thesis that argues, aerotropolis is described as an airport planned within a city, or broadly depicts the sentiments of Kasarda [10], which positions the airport as revolutionary in the 21st century, shaping global business, connections, networks, systems, and cities, as the development of urban highways in the 20th century, 19th century railroad, and 18th century seaport [33].

#### 4.1.2. Cluster 2 (Yellow)

Five variables are seen in the second most significant discourse on the aerotropolis map (Figure 14). The most important concern here is about health, next is policy and the management of data, followed by humanitarian support, and weather conditions, particularly the winter season. Within urban enclaves, five basic elements guarantee urban functionality, they include schools, healthcare centres, shopping malls, banks, and recreational centres. Securing strategic sites for accommodating future health facilities in aerial settlement is the decision of the planners [34]. However, data management, refugee resettlement and weather are factors that still require further elucidation.

Despite the strategic citing of aerial life, and the possibilities of good cities, certain uncertainties continue to cloud the perspective of aerial life. Particularly the re-emergence

of the coronavirus pandemic that resulted in the closure of virtually all major airports globally. The challenge or question is, how does aerotropolis function in such an era? The answer to this question is twofold; during the times when passenger flights were grounded, cargo flights multiplied, as did prices for shipping containers. Even when every city is shutdown, similar to what transpired during the COVID era, non-aeronautic activities would continue; particularly the postal section, supply chain, and inventory will continue to provide services for thousands of people. Thus, aerial cities can be sustained from other non-aeronautical revenue sources, such as logistics and supply chain, which inadvertently were great winners during the pandemic.

#### 4.1.3. Cluster 3 (Purple)

Firms within logistics and supply chain were great gainers during the pandemic, and their operation never ceased, owing to increasing market demand for home and outdoor goods and services. In establishing a novel or niche market during periods of uncertainty, there must be synergy among firms' operation, the economy, and logistics.

#### 4.1.4. Cluster 4 (Blue)

Figure 14 demonstrates several composite relationships, of note is the proximity between region and firm, which seem to be mediated by the risk variable. Similarly, there is a cluster of relationships among investment, airline, operation, and economy that indicates possibilities of an engaging and fulfilling aerial life (see Figure 15). For instance, to fuel the economy, investment is required, and an operational airline or airspace is a guarantee on the return on investment. Other important aspects are subjects of securitisation and cooperation in aerial life, as they both act as moderators and mediators for both the growth and productivity of the economic circle of aerotropolis.

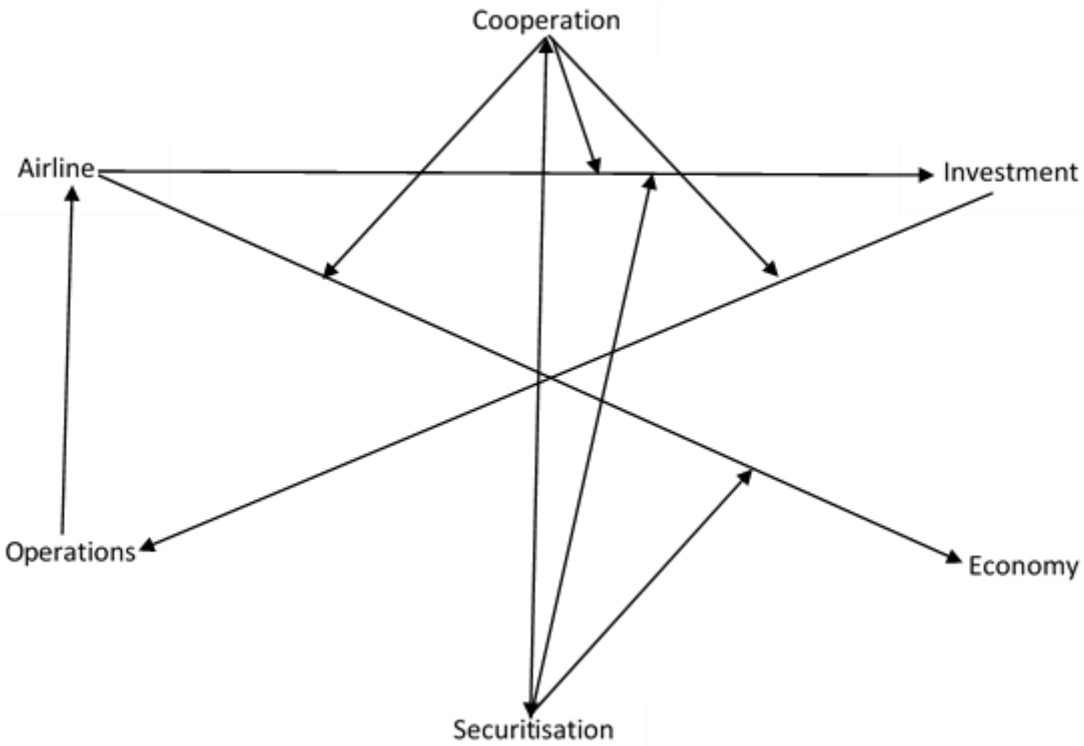


**Figure 15.** Basic requirement for a fulfilling aerial life.

The question of risk is germane in investment management, and investors utilise the nature of uncertainty to leverage for higher return in investment or discountenance outrightly. Figure 14 demonstrates the uniqueness of risks in the concept map. As risk tends to mediate the role of between firm and the region, and the firm and the market,

while the markets function as a mediator for risk, the region, and state facility. Implicit in these connections are that similar to the proverbial philosophical narrative, people tend to choose pleasure over pain. Hence, the lesser the risk the more the clients, the more the risk the less the clients, and a higher equity is given as bonds to investors. For instance, if a firm has a product but cannot get it to the market, the essence of productivity would be frustrated.

#### 4.1.5. Cluster 5 (Green)

Physical forms enable individuals and corporations to decide on where to settle. The term "urban form" or "physical form" theoretically refers to urban morphology, which practically deals with the shape, density, configuration, and size of settlements that makes up the built environment [35]. Theoretically, urban morphology is the study of urban spatial form, with regard to public spaces and assemblage of buildings that make a city [36]. The richness and opportunities of aerotropolis has culminated in equal richness in methods and theories for investigating aerial life [37]. As depicted in Figure 14, urban morphology deals with the value proportion, such as employment and land-use of appropriate location for citing the airport city.

### *4.2. Citespace*

To advance the discourse of aerotropolis beyond establishing a relationship towards building theoretical frameworks, we provide conceptual and practical clarification on the cost and opportunities of embracing aerotropolis. The following ten themes (Figure 16) were extrapolated from Citespace software: aerial life, economic development, satellite cities, local economy, experiencing the city, neo-liberal urban policies, smart urbanism, passenger types, air link, and CMB model. The ten themes were broken into five headings, economics, experience economy, political and administration, technology, and transportation for further discussion.

#### 4.2.1. Economics

The major economic activity of any city is the line-of-life for the sustenance of the city's future. Most cities' economic profile encompasses certain percentages of the manufacturing sector, healthcare and social assistance sector, construction sector, retail trade sector, and education and training sector, which supports inhabitants of that city and its surrounding neighbours.

#### 4.2.2. Aerial Life/Warehousing GDP

The key economic determinants of aerotropolis research or aerial life typically are in proximity with air transport, air cargo, multidimensional symbiosis, restaurants, and air passengers. These determinants form the epicentre of the economic activities of an aerotropolitan city. According to Adey [38], the notion of aerial life juxtaposes or contradicts the reality of how people treat life on the ground. Although there are insinuations that aerial life is limited to cockpit, terminals, and control towers [38]. It must be understood that air travel covers a significant amount of geography and is shaped or routed to transit through a protocol guided via the terminal. Thus, aerial life encompasses but is not limited to air travel, surveillance, forestry, photography, air link, airport rail link, non-aeronautical activities, including the interconnection of global cities, and fosters economic development for regional governments.

Air links and air mobility are made possible by aerial life, and the COVID-19 pandemic demonstrates how impactful aerial life could be. With the global disruption of trade and container shipments increasing the waiting periods of offloading goods because of congestion, businesses incur excess demurrage, which scales up the cost of goods and services (see Figure 17).

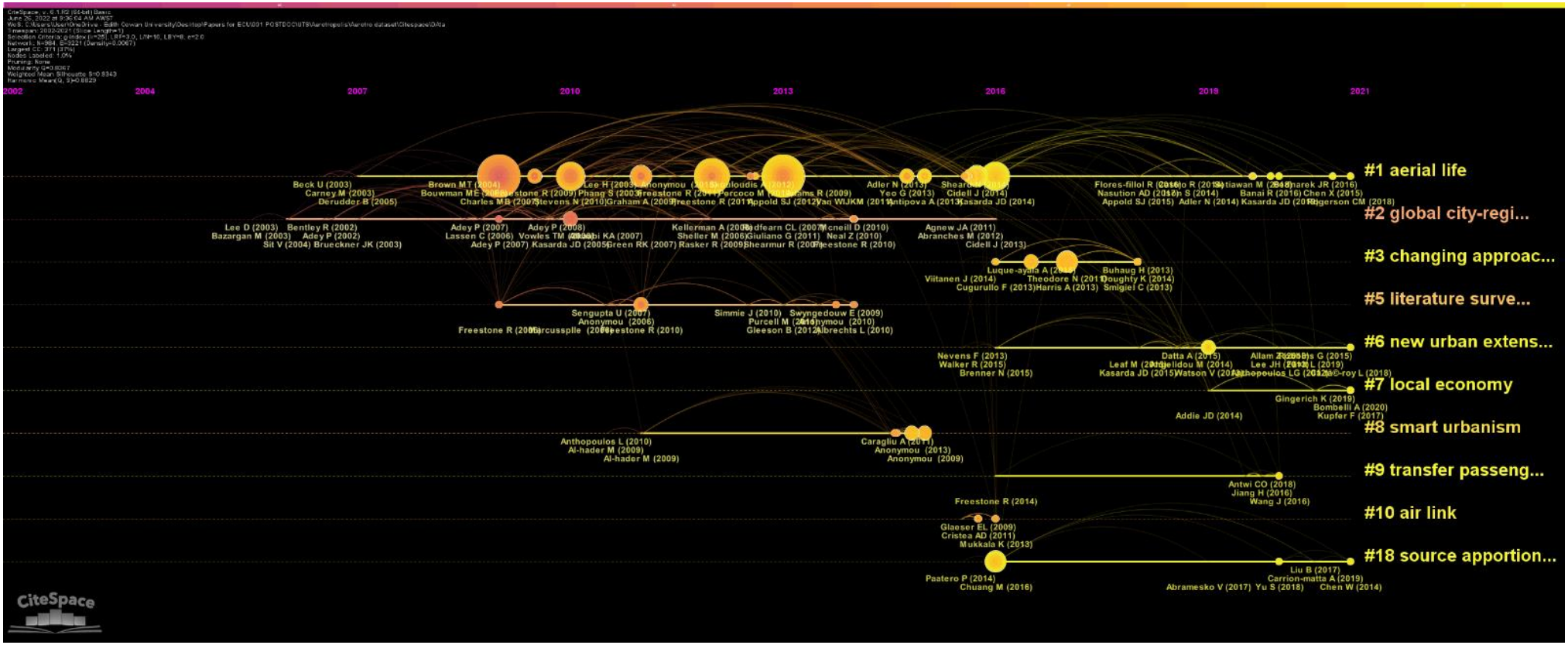


**Figure 16.** Themes emanating from aerotropolis literature using CiteSpace software.

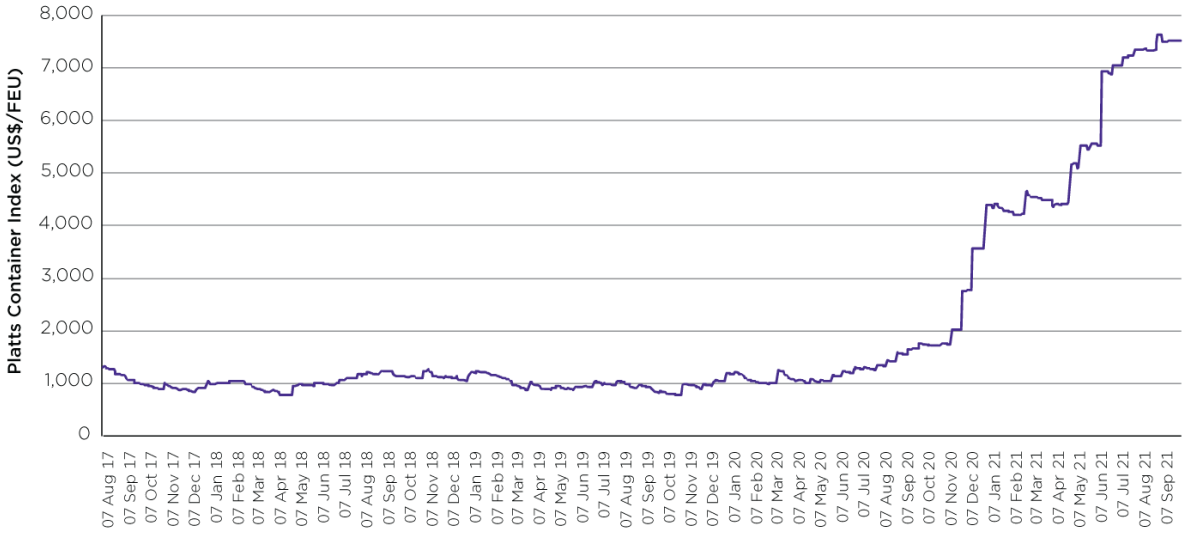


**Figure 17.** S&P Global Platts container index (US$/FEU): August 2017 to September 2021. Source: Elliott [39].

#### 4.2.3. Global City-Region/Economic Development

Traditional cities are interconnected by roads, bridges, railways, sea, and air to engender interconnectedness amongst locals, intrastate and interstates, and nations. For aerial cities, the airport connects is considered the vehicle the drives the interconnection of events. Among several characteristics of aerotropolis is its advancement of globalisation. Aerotropolis also accounts for the growth in global trade and diplomacy. By aerial life connecting people of all kinds, it also advances the discourse of aerotropolis as positioning the airports towards becoming a global village.

The concept of the "global village" was first used by Marshall McLuhan [40], where the global village was described from a media technological viewpoint. Within the urban space of aerotropolis, the global village would describe the interconnectedness of the entire world through the proliferation of the airports. For airport cities to become a global village, the level of security alert and the airport must be threat sensitive, in defence against domestics and international criminals and terrorists. Thus, the deployment of personnel to ensure national security, which includes the defence of sovereign state, citizens, economy, and institutions, and international dialogue are two fundamental tools in shaping urban growth, and since city borrow from one another, urban development, design, and redesign is a by-product of global-city-region continuum or interface.

#### 4.2.4. New Urban Extension/Satellite Cities

Profitable cities enjoy commercial success, and due to the profitability of such cities, these cities continue to extend or expand their geography into surrounding peripherals, thereby creating satellite cities. Urban extension or satellite cities or conditional cities [41] are often smaller cities located adjacent to a principal city. They are neither considered as a subdivisions nor suburbs or what some refer to as a bedroom community [42,43].

Unlike suburbs which are for residential apartments, aerotropolis as a satellite city is built as a global infrastructure with private partnership, due to an increase in middle class. Interestingly, partnership investment between public and the private sector provides the underlying levers for satellite cities [41].

#### 4.2.5. Local Economy/Complex Network Theory

By expanding cities, opportunities tend to spread as jobs are created, and investment which would have otherwise migrated would be locally spent. One of the main reasons for development is the upliftment of the local economy and populace, because development that are driven from the bottom (see bottom-up approach) are much easier to sustain.

Sustainability of a locally driven economy suggests that the term local economy or local economic development often also referred to as community economic development transcend the disciplinary scope of economics. For aerotropolis, the concept of community involves but is not limited to the entire gamut of aerial life, regarding air cargo network, air cargo accessibility, degree centrality values for assessing strength and weakness, and the partakers of the local economy which is not limited to passengers. However, certain encumbrances challenge the airport city, such as unexpected events and targeted attack of persons, airplanes and cargoes constitute threats to aerotropolis. Hence, the need for a dynamic structure evolution in structuring aerial life, for proper functionality of the front-end processor network in anticipating attacks, and in tracking and stopping targeted attacks before they occur.

Aerial life is not limited to the index of the country's development performance, or a gateway to economic and social globalisation [44], but acts as a vehicle for what we recommend as *transit-bound tourism*. Traditionally, there are three major kinds of tourism: domestic tourism, inbound tourism, and outbound tourism [45,46]. Furthermore, literature on tourism marketing established seven service characters which can be demarcated into non-ownership, such as intangibility, heterogeneity, inseparability, and perishability (IHIP), and the central 3 Ps of service marketing, such as people, processes, and physical facilities [47,48]. For instance, using the Changi Airport in Singapore in arguing for *transit-bound tourism,* we demonstrate that Changi aerotropolis meets all the threshold for tourism marketing, and service quality. However, we limit ourselves to sampling three of the seven characters, they include perishability, intangibility, and inseparability. Goods produced are consumed within stipulated timespan and leftovers are recycled. Mood, scenery, food, and chef are sometimes what makes it impossible for passengers' feelings to remain the same. On the issue of inseparability, most aerotropolis products are not meant to be taken home by the consumers but can only be used within the premise of the airport, such as computers, and toys for kids.

Thus, with the opportunity of aerial living to provide passengers with some form of relaxation, experience and a tour, the aerial life without a doubt is a game-changer in travel and urban studies. *Transit-bound tourism* involves the individual spending time and quality time away from home, and experiencing a high sense of relaxation, pleasure, and recreation, while adding value to the local economy by virtue of exploring commercial services at the airport where they are in transit. This value adding is different from the traditional nomenclature of transit or stopover tourism, which typically revolves around an arrangement by the airlines, tourism organisations and airports, with the sole purpose of transiting passengers into stayover tourists [49]. Thus, through *transit-bound tourism* passengers can actually plan a mini-holiday or relaxation, while in transiting at an airport city. For instance, passengers could plan to visit an art gallery, gaming centres, theatres, zoos, or relax in an accommodation and even receive guests without necessarily gaining access to the country. This is revolutionary and the opportunity to bridge such a gap in history has presented itself in the form of aerial life.

#### 4.2.6. Politics and Administration

Legislation governing aerotropolis must be perceived to be accommodation, and the securitisation of persons and the country must be performed with a friendly cheer, and not to appear threatening to passengers or biased based on race. Additionally, an efficient administrative process for application for GST among others must be effective, and through the deployment of technology reduce frisk search. In essence, both the political economy of the airport, and the administrative efficiency tends to improve performance, which socially enhances passengers' recommendation, and revisitation.

#### 4.2.7. Neo-Liberal Urban Policies

The free market as a determinant for economic gain is contingent on the policies adopted by the government, where the airport city is located. However, for airport cities

to flourish, it is imperative that less of government is seen, and more of the private sector push the industry. Although neo-liberalism is anchored on the free market and geared towards capitalism, but with clamour for lesser exploitation, by adapting to an approach toward sustainability, sustainable capitalism is more adequate. In which case employees are advised such as in Tesla to have some equity of the firm. In doing so, employees may no longer see themselves are mere staffs, but co-owners of the organisation.

#### 4.2.8. Technology

For employees and passengers to effectively function, the use of functional and cutting-edge technology cannot be overemphasised. As the world moves towards smart urbanism or the megaproject developments, it is quintessential that we begin the process of understanding how data from transport, energy production and distribution, and air quality will be integrated and used to pull-together the quantum opportunities in the convergence of infrastructure and technology. Mainly because this may indirectly influence the well-being of the citizens in urban spaces, and may lead to more fruitful engagement in their interaction of urban life [50].

#### 4.2.9. Transportation

There are multiple tails to understanding the impact of the transport system in a digital era, and in aerial life. In terms of air travel, an effective transportation network is centrifugal to success of aerial life, much as rail and port terminals initially facilitated movement of travellers frequently. This creates employment for servicing passengers, and provide a spatial attention for unrelated firms [51]. For instance, a collapsed transportation system may disrupt passengers plan of events, and may lead to goods incurring additional cost [51,52]. The need for a multimodal infrastructure for transport creates a challenge for airport cities, despite the ease of access to passengers, retailers, and residents, factors such as coal combustion, positive matrix factorization, biomass burning, straw burning activities, sea salt, carbonaceous aerosols, and vehicular exhaust remain encumbrances exhibited by environmentalist to aerial life. Nevertheless, these challenges are found within every peripheral and metropolitan city. Airport cities can capitalise upon the interconnectedness of modal infrastructure encompassing motorists, pedestrians, transit riders, cyclists, freight carriers, and access for those with disabilities. While ensuring that networks in aerial living are efficient, attractive, and most of all safe for all kinds of passengers, either elderly or physically challenged.

## 5. Conclusions

*Limitations*

This paper is mainly theoretical with practical insights. It is not an economic paper, hence there are no estimation of goods, services, and passengers' mobility at the airport, neither are there estimations on the logistics and supply chain dimension. The study is positioned to bring together discourse in airport city studies, and to advance minimally its sustainability agenda. The core of our argument is that cities are often found within metropolitan cities, and aerial life constitutes one of these developments, which could revolutionise the globe, such as urban highways, railroads, and seaports did in earlier epochs. Our subsequent paper in the series of papers on aerial life will economically analyse the feasibility of the aerotropolis, and the sustainability agenda by applying several case studies and theories.

In conclusion, airport cities are being embraced globally; not merely because of the economics of airport cities, but because of the other social, communal, administrative, and environmental opportunities they could create. Nonetheless, literature related to the aerotropolis lacks a discussion of issues of social capital, social wellbeing, and psychological safety nets and wellbeing of consumers. Hence, further research must estimate or engage with ideas of autonomy, personal growth, environmental mastery, purpose in life, positive relationships, and self-acceptance and smart technologies in aerotropolis.

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## Abbreviations

| | |
|---|---|
| NSW | New South Wales |
| SLR | Systematic Literature Reviews |
| ANZSRC | Australian and New Zealand Standard Research Classification |
| UAM | Urban Air Mobility |
| IHIP | Intangibility, Heterogeneity, Inseparability, and Perishability |

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