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Exploring the Property Values of Logistics Facilities in the Vicinity of Cape Town International Airport

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1 ABSTRACT

Amid the growing logistics processes, numerous studies analyse the placement of economic activities near airports á la the models of airport-led development. However, to deepen the knowledge on the catchment of airports, further research is required to analyse logistics spaces near airports compared to other logistics clusters in a territory. The paper, therefore, aims to analyse property values of logistics facilities in the vicinity of Cape Town International Airport relative to six other main logistics clusters within the City of Cape Town municipality, South Africa. These clusters are Philippi, Paarden Eiland, Epping, Parow Industrial, Montague Gardens/Milnerton, and Blackheath, wherein 15 randomly identified properties were analysed in each area. The identification of logistics firms in the seven focus areas involved examining company details on Google Maps, and verifying their locations on the company websites. The property details were then searched on the City of Cape Town's cadastral GIS shapefile, which was overlaid on the Google Satellite in QGIS 3.32.0. Three key attributes were captured from the cadastral shapefile and recorded on an Excel spreadsheet: property/land parcel extent, street address, and property number. The latter two attributes were used to extract the 2022 property market values from the City of Cape Town's valuation roll, available on the municipal website. Statistical analysis was then conducted in the IBM's statistical package for social sciences (SPSS), version 29. The results showed that the mean property values in the vicinity of the airport ranked sixth among the seven focus areas, with Montague Gardens/Milnerton having the highest value and Blackheath the lowest. In terms of the range, the airport environs ranked fourth, with Montague Gardens having the widest and Epping the narrowest. Regarding the property value relative to extent, the mean in the vicinity of the airport ranked second, following Paarden Eiland. The findings show that from the perspective of property values, the area near the airport does not significantly stand out compared to other logistics nodes in the municipality. Holding other locational factors constant, it can be argued that logistics firms near the airport could potentially be located in various zones within the broader airport catchment area.

Keywords: Cape Town International Airport, property values, logistics facilities, airport catchment, Planning

2 INTRODUCTION

The relationship between airports and the geographical distribution of economic activities has become a key focus in academic and policy discourse (Mokhele, 2022). This interest is epitomised by the popularity of the normative models of airport-led development, notably the airport city and aerotropolis. Although the airport city encompasses various categories (Conway, 1993), it is largely used to promote urban development in the immediate vicinity of airports (Kasarda, 2009). As the airport city evolves, development is expected to radiate outward, eventually shaping the spatial form of aerotropolis, which could extend for miles beyond the airport (Kasarda & Lindsay, 2011). Policymakers, spatial planners and airport authorities, inter alios, employ these models to market and guide the economic activity mix and spatial form of development that is understood to have a reciprocal relationship with airports.

The significance of airports in the contemporary economy is best understood against the backdrop of logistics processes. The logistics industry, which is a wide-ranging sector encompassing, inter alia, transportation, warehousing, storage, handling, processing, and delivery (Lan, Yang & Huang, 2017), facilitates the flow of goods between points of origin and consumption globally (Verhetsel, 2015). Among the various transport modes used in logistics, air cargo/airfreight is one of the backbones of global trade (Schwarz, 2006). According to the International Air Transport Association (n.d.), air transport accounts for about 35% of the value of global trade, highlighting the crucial role of airports in global supply chains and logistics processes. The airfreight market continues to expand, driven by the rapid growth of e-commerce, and the associated advantages of a timely delivery of goods (Kim & Lee, 2019). The rise of global supply chains and e-commerce has, therefore, contributed to the development of a dynamic logistics estate market worldwide (de Oliveira, Dablanc & Schorung, 2022).

While airport-related literature has traditionally focused on the spatial economic characteristics of the immediate surrounds of airports, covering topics such as logistics sprawl, logistics parks, and the concentration or clustering of logistics facilities (Mokhele, 2022), a growing body of research examines airfreight catchment at different geographical scales (for instance, see Rodrigue, 2003; Hesse, 2010; Mokhele & Mokhele, 2023). To enhance our understanding of the catchment of airports, further research is needed to compare logistics spaces near airports with other logistics zones. The paper, therefore, aims to explore the property values of land used for logistics facilities near Cape Town International Airport compared to other logistics clusters within the City of Cape Town municipality, South Africa. The findings are expected to offer insights for strategically guiding the location of logistics firms within the airport's catchment area.

3 LITERATURE REVIEW

To contextualise the discussion on the property market values of land used for logistics facilities near the airport compared to other logistics nodes in the City of Cape Town municipality, this section reviews the literature on the real estate valuation methods, and the factors that influence the location of logistics firms.

3.1 Factors influencing the location choice of logistics firms

Identifying and analysing factors that influence the location of logistics facilities is essential for developing appropriate logistics-related land-use planning policies, strategies and guidelines (Sakai, Beziat & Heitz, 2020). As noted by Verhetsel et al. (2015), the location choices of logistics firms are influenced by a wide array of factors, including land availability and affordability, availability and quality of transport infrastructure, the level of economic development, the availability of labour, and land-use planning.

As the relationship between transport and the placement of logistics firms has been extensively examined in the literature (e.g. Heitz & Dablanc, 2015; Kang, 2018), the paper focuses specifically on the aspect of land affordability. The literature suggests that, due to the limited supply of land for development in the urban core, logistics facility development shifts toward peripheral areas where land is more readily available (Yang et al., 2022). At a micro level, land price plays a crucial role in location decisions, driving logistics development away from dense urban centres (Heitz et al., 2018). Unlike office and retail developments, it is argued that logistics firms can only afford smaller land rents (Verhetsel et al., 2015). As a result, Heitz et al. (2018) observe that logistics operators or their real estate investors search for areas with cheaper land/rent, typically at the periphery of urban areas. Fernández, Caralt & Valcarce (2023) emphasise that peripheral nodes near airports, for instance, consequently attract space-intensive activities such as warehousing.

Several studies have empirically analysed the connection between the location of warehouses and land value or rent. In the study exploring, among others, the hypothesis that the placement of warehouses is closely related to the land value of logistics facilities, de Oliveira, Dablanc and Schorung (2022) found a statistically significant evidence that the location of warehouses and average rent prices were dependent. In the Sao Paulo Metropolitan Region, Brazil, zones with the highest number of warehouses were those with the lowest real estate values (Guerin et al., 2021). In another Brazilian study, de Oliveira et al. (2022) found land cost to be one of the critical factors influencing warehouse location decisions in Belo Horizonte.

The paper intends to empirically test the foregoing literature's assertion that land values are relatively lower in the vicinity of airports, a factor attracting the development of space-intensive logistics facilities like warehouses.

3.2 Real estate valuation methods

The value of land is influenced by various factors, including physical, economic, social, environmental, and legal considerations (Bencure et al., 2019). Dale et al. (2002) as cited in Thontteh (2013) expounded that the factors affecting a property's financial worth include location, size, condition, the type of construction, the type and security of tenure, permitted land use, and the state of the economy. Additionally, the dynamics of demand and supply play a crucial role, showing that the equilibrium between demand and supply, along with the purchasing power, influences property values (Demetriou, 2016).

Land valuation is the process of estimating the value of land, which can be expressed in relative or absolute terms (Bencure et al., 2019). The process is intended to provide an unbiased assessment of a property to establish its value (Kartikasari et al., 2023, cited in Wentzel & van der Merwe, 2024). Valuation exercises

can be performed manually or through automated techniques. The latter involve collecting market values that serve as a sample, which are then calibrated to develop a valuation model for a given area (Bencure et al., 2016).

Mass valuation techniques have been widely adopted in various countries, either as components of land administration systems or as part of fiscal systems that utilise land cadastre data for taxation and other purposes (UNECE, 2001; Wang & Li, 2019). Consequently, mass valuation models form part of a property attribute system, such as a cadastre or land registry, which is used for various land management purposes (Grover, 2016).

Mass valuation is a systematic assessment of a large number of properties performed on a certain date utilising uniform procedures and statistical analyses, which is in contrast to individual valuations, which focus on determining the value of individual properties (UNECE, 2001). Therefore, mass valuations are utilised when a large number of properties have to be valued simultaneously on a single date. As alluded to above, this approach relies on standardised procedures, common sets of data, usually derived from a property attribute system, and statistical models of the relationship between value and property attributes. These involve estimating the relationship between the market price (the dependent variable) and the varied characteristics of properties that influence the price (Grover, 2016).

As discussed further in the research methods section, the study that the paper reports on was based on the City of Cape Town's market property values, compiled by the municipality through mass valuation processes.

4 STUDY AREA

The study explored the market property value patterns of land used for logistics facilities near Cape Town International Airport (CTIA) compared to selected other industrial/logistics clusters in the City of Cape Town municipality, South Africa. CTIA is the second busiest airport in South Africa, which handled about 10 million passengers during the 2023/2024 financial year (https://www.airports.co.za/airports/cape-town-international-airport/statistics/passenger). The City of Cape Town municipality is also home to the country's second-largest seaport, the Port of Cape Town, positioned approximately 17 km to the north-west of CTIA, an expansive passenger rail infrastructure and roads of regional and national significance.

The analysis focused on the following seven logistics clusters in the City of Cape Town: the airport and its environs (encompassing Airport Industria and Airport City), Philippi, Paarden Eiland, Epping, Parow Industria, Montague Gardens/Milnerton, and Blackheath (Fig. 1). In light of the propensity of logistics firms to locate in industrial areas, these zones represent some of the densest clusters of logistics facilities in the City of Cape Town (Mokhele & Mokhele, 2023; Mokhele & Fisher-Holloway, 2023). From a geographical perspective, the selected nodes are diverse in terms of, among others, proximity to the central business district, the seaport and the airport (Fig. 1).

Regarding the study's reference point of the airport and its environs, it is important to note that during the 1970s and 1980s, the government strategically and actively promoted industrial development in the area (Mokhele, 2017); and by 1993, a growing trend in warehousing and storage facilities had begun to emerge in the vicinity of the airport (Mokhele & Fisher-Holloway, 2024).

5 RESEARCH DESIGN AND METHODS

This section outlines the research design, the units of analysis, as well as the data collection and analysis methods used in the study.

5.1 Research design

The study was based on an exploratory quantitative design to analyse the market values of land used for logistics facilities in the environs of Cape Town International Airport compared to other logistics clusters in the City of Cape Town municipality.

5.2 Units of analysis

The study's units of analysis were the land parcels used for logistics facilities within the selected industrial areas in the City of Cape Town municipality. It should, therefore, be noted that the units of analysis were not

individual logistics buildings, as a single land parcel could accommodate several buildings. The study considered land parcels housing at least one of the following categories of logistics facilities: warehousing, storage, distribution (including shipping container yards), self-storage, courier services, freight forwarding, and recycling depots (a component of reverse logistics).

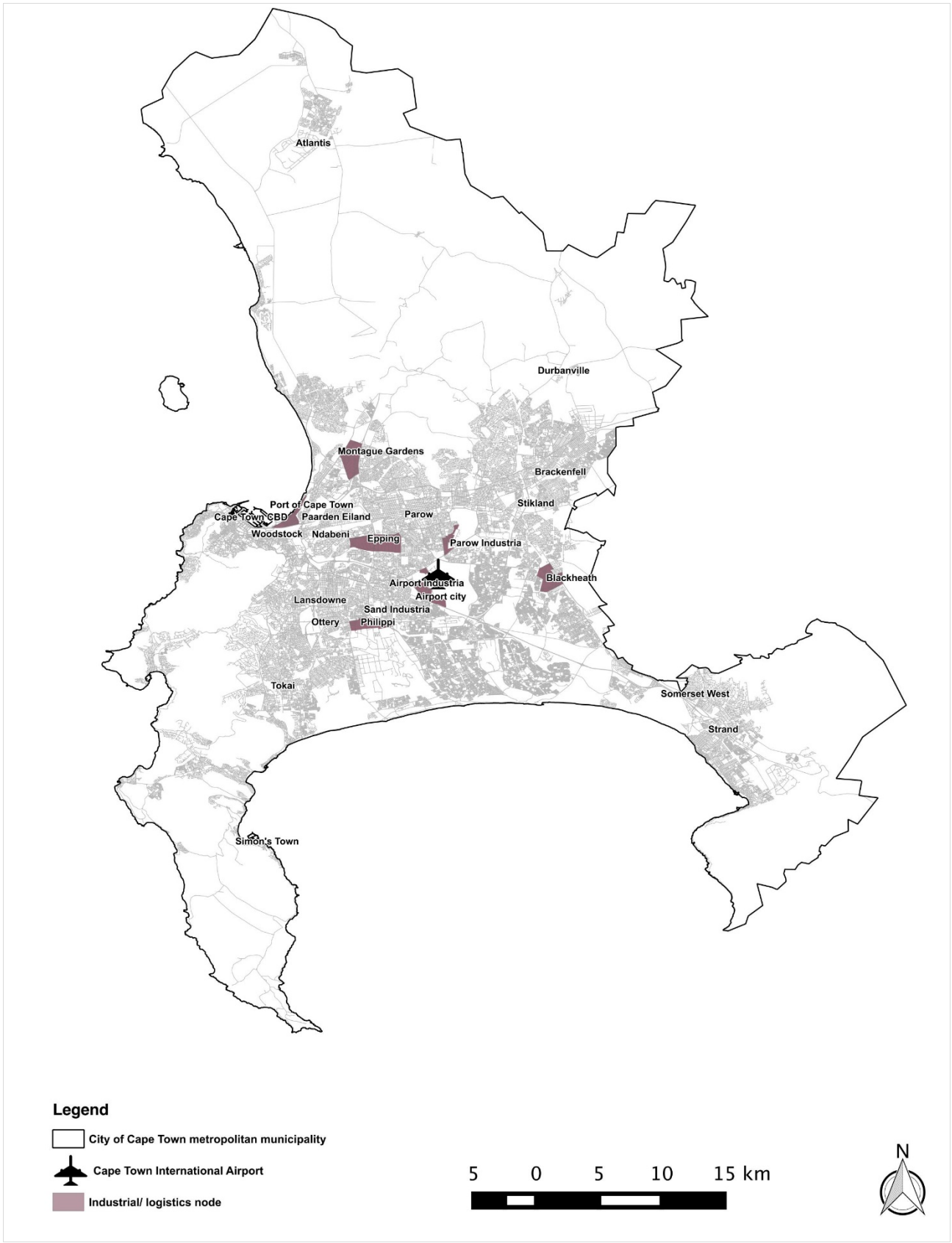

Fig. 1: The location of Cape Town International Airport relative to other selected industrial/logistics clusters.

5.3 Data collection methods

According to Heitz, Launay and Beziat (2017), a growing body of research highlights the acute lack of geo-spatial data on urban freight, resulting in a lack of a dedicated and accurate database on the geography of logistics firms (Heitz et al., 2018). Due to this lack of secondary information accurate at a land parcel level, alternative approaches were, à la Heitz, Launay and Beziat (2017), Heitz et al. (2018), and Mokhele (2018), employed to identify the applicable land parcels in preparation for the analysis of the property market value patterns. The identification of logistics firms involved examining the applicable company details on Google Maps, viewing the company names on the signage in Street View, and verifying their locations on the respective business websites where available. Per Heitz, Launay and Beziat (2017), several visual indicators were also important in identifying and validating logistics infrastructure and buildings like warehouses, terminals, and shipping container yards. These indicators included the shape and size of the building, large parking and manoeuvring areas for trucks (Heitz, Launay & Beziat, 2017), row buildings typical of the traditional self-storage facilities, and a rectangular shape and distinctly small size of shipping containers.

A total of 15 land parcels used for logistics facilities were randomly identified in each node per the process above. For comparability purposes, it was decided to analyse the same number of properties across the seven industrial/logistics zones. All in all, 105 land parcels housing logistics facilities were identified. It is intended that this exploratory study provides a foundation for the development of a geo-spatial dataset of logistics facilities in the City of Cape Town municipality, which can be continuously updated.

The unique property details of each identified land parcel were searched on the City of Cape Town's cadastral GIS shapefile, which was overlaid on Google Satellite in QGIS 3.32.0. Three key attributes were obtained from the cadastral shapefile and recorded on an Excel spreadsheet: land parcel extent (in m2), street address, and property number. The data for each logistics node was recorded on a separate tab in the spreadsheet.

The street addresses and property numbers were then used to extract the 2022 property market values from the City of Cape Town's valuation roll, available on the municipal website. The website makes provision for the values to be searched using either the unique property reference, sectional title, street address, and erf (property/parcel) number. The latter was primarily used in the study, and triangulated with the street address information. The property value information was extracted in December 2024. At the time of the study, the 2022 property market value data (as at 01 July 2022) were the latest available information for the City of Cape Town municipality. The City of Cape Town utilises a computer-assisted mass appraisal (CAMA) system to generate property values across the municipality (City of Cape Town, 2024) (also refer to the literature review section).

5.4 Data analysis methods

The information for the airport environs and other six industrial/logistics clusters (including the name of the applicable industrial area, property/land parcel extent, and market value) were collated into a single spreadsheet and loaded to IBM's statistical package for social sciences (SPSS), version 29, for analysis. Basic statistical analysis was then conducted to identify property market value similarities and differences between the area in the vicinity of the airport and other key logistics nodes in the City of Cape Town municipality.

6 RESULTS

This section presents the results of the statistical analysis conducted to compare the environs of Cape Town International Airport with selected other logistics clusters.

6.1 Descriptive statistics

The results showed that the mean property values of land used for logistics facilities in the vicinity of the airport (at R37 965 333) ranked sixth among the seven logistics clusters analysed. The mean property values were highest in Montague Gardens/Milnerton at R128 286 666, followed by Parow Industria, Philippi, Paarden Eiland, Epping, and the airport environs. Blackheath had the lowest mean of R33 464 133. In terms of the range, the land used for logistics facilities near the airport ranked fourth, with Montague Gardens having the widest range of approximately R706 million, followed by Philippi, Parow Industria, Blackheath,

and Paarden Eiland. Like the relatively low mean property values, Epping had the narrowest range of R101 300 000 (Table 1).

A land parcel with the highest market value in 2022, at R712 million, was situated in the Montague Gardens/Milnerton area, followed by properties in Philippi, airport environs, Parow Industria, Blackheath, and Paarden Eiland. Epping had the lowest maximum value of R1.08 million. The 2022 standard deviation for the zone near the airport and other six logistics clusters show that the figures ranged significantly above and below the mean values, implying the moderate to high variability of the market property values of land housing logistics facilities across the municipality.

		Airport environs	Blackheath	Epping	Montague Gardens/Milnerton	Paarden Eiland	Parow Industria	Philippi
N	Valid	15	15	15	15	15	15	15
	Missing	0	0	0	0	0	0	0
Mean		37 965 333.33	33 464 133.33	51 620 000.00	128 286 666.67	54 111 000.00	63 033 333.33	59 013 333.33
Median		16 700 000.00	16 800 000.00	38 700 000.00	41 200 000.00	19 350 000.00	62 500 000.00	23 000 000.00
Std. Deviation		70 407 442.978	41 784 874.013	34 767 908.027	182 056 972.506	55 914 306.890	53 345 326.033	84 977 685.026
Range		280 700 000	161 000 000	101 300 000	706 100 000	150 730 000	200 500 000	305 000 000
Minimum		3 300 000	2 800 000	7 100 000	5 900 000	4 670 000	5 500 000	5 000 000
Maximum		284 000 000	163 800 000	108 400 000	712 000 000	155 400 000	206 000 000	310 000 000

Table 1: Statistical patterns of the values of land used for logistics activities. Values are in South African Rand (ZAR).

6.2 Average market property values

To gain a more meaningful and disaggregated understanding of the property values, it was essential to analyse them in relation to the extent of each land parcel. Regarding the property value relative to extent, the mean values in the vicinity of the airport ranked second, following Paarden Eiland. Notably, Paarden Eiland had three land parcels with top average values relative to extend i.e. R9 507/m², R9 206/m² and R7 656/m², with a land parcel near the airport following at R5 960/m2. A land parcel with the lowest average value, at R509/m², was in Blackheath.

Table 2 presents the values of the 15 land parcels analysed in the vicinity of the airport, including the average market value per property extent. Although the highest value was R284 million (Land Parcel 10), the average was R3 509/m2 due to the large extent of the land parcel (Table 2). This expansive business park houses various logistics establishments, including courier companies and storage facilities. The land parcel with the lowest market value near the airport was R598/m2. In terms of the physical extent, this was the second- largest land parcel in the vicinity of the airport.

	Extent (m^2)	Market value (2022)	Average value/m^2 (2022)
Land Parcel 1	30 208	65 400 000	2 165
Land Parcel 2	2 097	6 800 000	3 243
Land Parcel 3	2 836	6 480 000	2 285
Land Parcel 4	2 075	6 300 000	3 036
Land Parcel 5	1 287	5 100 000	3 963
Land Parcel 6	4 454	12 600 000	2 829
Land Parcel 7	1 503	5 100 000	3 393
Land Parcel 8	4 970	16 700 000	3 360
Land Parcel 9	1 054	3 300 000	3 131
Land Parcel 10	80 941	284 000 000	3 509
Land Parcel 11	76 859	46 000 000	598
Land Parcel 12	8 510	38 100 000	4 477
Land Parcel 13	5 668	19 600 000	3 458
Land Parcel 14	10 812	32 000 000	2 960
Land Parcel 15	3 691	22 000 000	5 960

Table 2: Values of land used for logistics near Cape Town International Airport. Values are in South African Rand (ZAR).

7 DISCUSSION

The findings presented in the preceding section show that, in terms of the 2022 market property values, the land used for logistics facilities near Cape Town International Airport did not significantly differ from those in other logistics nodes within the City of Cape Town municipality. This challenges the literature suggesting that land values around airports are significantly lower, a factor attracting space-intensive activities such as warehouses (for instance, refer to Fernández, Caralt & Valcarce, 2023). The placement of logistics firms near

the airport are, therefore, potentially influenced by a combination of other factors beyond merely property values.

These findings show that, holding other locational factors constant, logistics firms near the airport could potentially locate in various zones across the broader airport catchment area. As noted by Mokhele and Mokhele (2023), the possible airfreight catchment of Cape Town International Airport can extend to approximately a 20 km radius of the airport. In light of the findings, the authorities are urged to, in the spatial planning efforts, take cognisance of the potential extent of the catchment, in which airfreight-related firms do not necessarily locate geographically near the airport (Mokhele & Mokhele, 2023).

Two logistics nodes in the City of Cape Town municipality (out of the seven analysed) stood out in terms of the highest land parcel values and average values. A land parcel with the highest market value in 2022 was in Montague Gardens/Milnerton at a staggering R712 million while the highest value near the airport was a relatively lower R284 million. Notably, in the 2000s, Montague Gardens was regarded as the fastest-growing industrial area in the City of Cape Town since 1985 (Mokhele & Fisher-Holloway, 2024). In terms of the average market values, Paarden Eiland, situated near the Port of Cape Town, had the highest average of R9507/m2 compared to the airport environs' highest average of 5960/m2. This provides evidence that Paarden Eiland has maintained a historical trend of relatively high property values. For instance, back in 1996, the area had a prime industrial rental rate that was three percent higher than the municipal average (City of Cape Town municipality, 2002).

8 CONCLUSION

To supplement the literature on the possible logistics catchment of airports, the paper explored the market values of the land used for logistics facilities in the vicinity of Cape Town International Airport compared to other six selected main industrial/logistics clusters in the City of Cape Town municipality, South Africa.

It was found that the patterns of land values near the airport did not significantly stand out, either at the highest or lowest end of the spectrum, compared to the other logistics clusters analysed. Therefore, it can be deduced that the values in the area are not a potential primary centrifugal or centripetal factor, showing that other factors might influence the placement of logistics facilities near the airport. From the perspective of land values, it can therefore be argued that, ceteris paribus, the logistics firms near the airport could locate in various areas within the municipality and vice versa.

A main shortcoming of the study is that it focused solely on market property values in comparing the land used for logistics facilities near the airport with other logistics nodes, and analysed the values for one year, 2022. It is, therefore, recommended that further research be conducted to analyse the market value patterns over time, and to examine additional factors influencing the location of logistics facilities within the catchment area. A more comprehensive analysis could also extend to a sub-regional scale, transcending administrative municipal boundaries.

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