

Addressing Load Factor Issues at BIJB Airport: Critical Factors in Mode Selection and Airport Choice

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Abstract

The West Java International Airport (BIJB) Kertajati was designed to alleviate passenger congestion at the Husein Sastranegara Airport in Bandung. Despite its capacity to serve 5.6 million passengers annually, BIJB has experienced low occupancy rates since its inauguration in 2018. This study investigates the factors influencing passengers' decisions to use BIJB Kertajati, focusing on issues such as airfare, baggage fees, limited flight routes, and the airport's accessibility. The research evaluates the impact of the Cisumdawu Toll Road on airport preference and explores demographic factors, including profession, income, and travel purpose. Data was collected via surveys from five key cities in West Java's catchment area, and statistical analysis, including the Chi-Square Test of Independence, was used to assess relationships between variables. Results indicate that fare policies, accessibility, and travel purposes significantly affect airport choice. The study concludes that improving infrastructure, reducing airfares, and increasing flight frequency could enhance BIJB's load factor, making it a more competitive option for travelers in the region.

1. Introduction

Since the administration of President Susilo Bambang Yudhoyono, Indonesia has had plans to build a larger and better airport for West Java, recognizing that the existing airport, Husein Sastranegara Airport in Bandung, could no longer accommodate passenger growth due to its location in Bandung City, where expansion is not feasible to adequately serve passengers. Consequently, the West Java International Airport (BIJB) Kertajati was constructed in Majalengka, West Java, approximately 68 kilometers from Bandung, and was officially inaugurated on May 24, 2018.

BIJB Kertajati has a capacity to serve 5.6 million passengers per year and handle 18 million flights annually. Nearly eight months after its inauguration, several low-cost carriers (LCCs) began to impose baggage fees, whereas passengers were previously allowed to carry baggage up to 20 kg without additional charges. Under the new policy, baggage fees were applied for weights starting at 7 kg. Each passenger, except for infants, was allowed to bring one cabin baggage with a maximum weight of 7 kg and one personal item, such as a laptop bag, baby supplies, reading materials, binoculars, or a lady's handbag, with the maximum cabin baggage size being 40x30x20 cm.

By the end of 2018, domestic flight ticket prices surged, particularly for domestic routes. As a result, the Minister of Tourism, Arief Yahya, stated that domestic tourist visits in the period from January to March 2019 decreased by an average of 30 percent. In 2019, a year after BIJB Kertajati began operations, instead of an increase, the occupancy rate of flight services at the airport dropped. As noted by Arief Budiman, Corporate Secretary of PT. West Java International Airport (BIJB), the occupancy rate of flight services at BIJB plummeted, with an average load factor of 20 percent. This figure is half of the previous year's average load factor, which was between 40-50 percent (Fikri, 2019).

Although BIJB Kertajati was designed to be one of the main aviation hubs in West Java, data shows that the passenger load factor at this airport is relatively low compared to other airports in the same region. Identified reasons include higher domestic airfare prices, baggage fees imposed by low-cost carriers, limited flight routes, and accessibility issues before the opening of the Cisumdawu Toll Road.

This study focuses on analyzing the factors influencing people's preferences for air transportation in Indonesia, particularly in the West Java region associated with West Java International Airport (BIJB) Kertajati. Given that air transport is a vital part of regional and global connectivity, understanding passenger preferences and the factors influencing their decisions is essential for developing more effective airport management strategies and transportation policies.

Several previous studies have explored the relationship between airfare, the number of passengers, and economic variables such as per capita income (Toru, 2012; Szabo et al., 2018; Laik, 2014). However, the results of these studies remain inconsistent. For instance, some studies found that airfares significantly affect the number of passengers, while others showed the opposite (Steen and Sorgard, 2012; Amin, 2013). Moreover, few studies specifically examine the impact of new infrastructure, such as the Cisumdawu Toll Road, on passengers' choices of airports.

This research seeks to fill the gap in the literature by evaluating how ticket prices, airline policies, accessibility, new infrastructure, and demographic and economic characteristics (such as profession, residence, and travel purpose) influence people's decisions to choose BIJB Kertajati or other modes of transport. The study also aims to understand the shift in public preferences before and after the operation of the Cisumdawu Toll Road.

2. Previous Research

Studies on air transport policies, including those on tariffs, cargo costs, and management, have been conducted by various researchers; however, there remains a research gap due to differing and sometimes contradictory findings. Toru (2012) and Szabo et al. (2018) argue that airfares significantly influence the number of flights, while Steen and Sorgard (2012) and Amin (2013) claim that airfares do not significantly affect passenger numbers. In these studies, airfare is considered the cost borne by passengers for using air services, where the variables examined include the number of passengers (pax) and airfare (fare). According to the law of demand in economics, there should be an inverse relationship between these two variables: as prices increase, demand for the goods or services should decrease, which aligns with the findings of Toru (2012).

Aside from pricing issues, Amin points out that several other factors influence passenger numbers according to previous studies. For instance, Castelli et al. (2012) suggest that the number of flights has a significant impact on passenger volume. Kluge et al. (2017), who studied air passengers in Europe, found that per capita income is a significant driver of passenger demand.

Peetawan (2017), in a case study on Thai Airlines, identifies variables that positively affect flight occupancy, such as a decrease in aircraft accident rates, the presence of airline associations, and a reduction in revenue per passenger kilometer (RPK). Laik (2014) states that the growth in passenger numbers can be achieved by increasing flight frequency or aircraft size (capacity). However, in their study, Laik et al. do not link passenger growth with ticket prices. They also note that air passengers have grown rapidly at an annual rate of about 6 percent in terms of passenger load worldwide. The global transportation industry, especially in Asia, faces significant challenges in handling passenger volumes due to economic growth, even though most flights have already reached 80-90 percent capacity. IATA's mid-year report in 2018 reveals that robust global economic growth has significantly driven air traffic growth (IATA, 2018). Thus, airports in Indonesia, including BIJB Kertajati, should be facing similar challenges.

Although some researchers have presented conflicting results regarding the relationship between ticket prices and occupancy, Suryadi (2014) found that a 10 percent increase in airfare would lead to a total inflation increase of 0.77 percent, with a direct impact of 0.76 percent and an indirect impact of 0.01 percent.

In 2016, Kriel and Walters studied passenger choices between two airports: Lanseria International Airport in Gauteng Province, which serves as an alternative to Tambo International Airport, the main international airport in South Africa. Their findings indicate that passengers prefer the closer airport, even if it is smaller. When two airports are located near each other in a metropolitan area, passengers consider travel time as a critical factor in their airport choice.

Research by Stoenescu, Gheorge, and Sebea (2016) in Romania on several airports yielded results consistent with those of Kriel and Walters. In Romania, passengers choose airports based on accessibility, regardless of whether the airport is located inside or outside the city.

Meanwhile, Paliska et al. (2016) examined three airports—Ljubljana Jože Pučnik Airport (LJU), Venice Marco Polo Airport (VCE), and Trieste Pietro Savorgnan di Brazza Airport (TRS)—and found that travel time to the airport is the most critical factor for passengers when choosing an airport for all types of travel (work or tourism, international or domestic routes). Although access time is more prominent for work-related travel, it still plays a crucial role in airport selection. The study also suggests that airport choice is more complex for passengers in border areas than for those in non-border regions.

Parella and Design (2013) in their book "Understanding Airline and Passenger Choice in Multi-Airport Regions" state that researchers and practitioners have studied the factors influencing why and how passengers decide which airport to choose when they have several options, Parella and Design highlight two dominant factors that influence passenger choices: the quality of air service (availability, frequency, capacity, and routes) and the price (airfare, taxes, and additional charges). Figure 1 illustrates the steps passengers take in choosing an airport for their travels, according to Parrella and Design (2013).



Fig. 1 Passenger Choice Steps (Parella and Design, 2013)

3. Research Methods

This study involves the development and distribution of questionnaires to respondents from five cities within the catchment area of West Java International Airport (in Bahasa Indonesia named as Bandara Internasional Jawa Barat/BIJB) Kertajati, namely:

1. Subang – Karawang area and its surroundings
2. Indramayu area
3. Cirebon area
4. Tasikmalaya – Sumedang area
5. Bandung area

3.1 Sampling Technique

A stratified random sampling approach was used to ensure the sample represented various key demographics across the five regions. A total of 400 respondents were selected, with an equal number of male and female participants (200 each), divided evenly across four professional categories: students, civil servants, private employees, and state-owned enterprise employees. This approach helped balance the responses based on both profession and gender, allowing for a more comprehensive analysis of preferences regarding airport usage.

The respondents' professions included students, civil servants, private employees, and state-owned enterprise employees. If respondents had multiple occupations, their primary occupation at the time was used for classification, rather than any secondary jobs.

The definitions of each profession were carefully outlined in this study to avoid overlap and confusion during data tabulation, recognizing that many individuals have multiple roles. The definitions used in this study are as follows:

1. Students: Respondents whose primary occupation is studying. The respondents included at least those currently studying at senior high school or equivalent level, with no age restriction. Students who work part-time or have their own business are still categorized as students, not as employees or entrepreneurs.
2. Civil Servants: Respondents who work as civil servants, honorary employees, daily contract workers, and similar roles in ministries, regional governments, city governments, district governments, commissions, and government bodies that are not state-owned enterprises.
3. Private Employees: Respondents who work in private businesses, cooperatives, whether small, medium, or large, as well as those employed by individuals (not as part of a company).
4. BUMN Employees: Respondents who work for state-owned enterprises (in Bahasa Indonesia: Badan Usaha Milik Negara/BUMN).

Respondents were asked about their willingness to use air transport or other modes of transportation for various travel purposes, such as work, recreation with 1-3 people, recreation with more than 3 people, educational trips, and business purposes. The destination city was not specified in the questions, but it was clarified that the destination was reachable by private car, inter-city inter-province bus, and train.

Respondents were also asked about their airport choices and the reasons behind their preferences, including travel time and distance from the regional capital, ease of access to transportation to and from the airport, the grandeur and modernity of the airport, the availability of flight schedules, cheaper ticket prices, and the attractiveness of Jakarta as the capital, which remains a significant factor for most residents when choosing an airport in the capital. Additionally, they were asked about the impact of the Cisumdawu Toll Road on their airport choices.

After understanding the respondents' preferences for air travel for various purposes and their choice of airports, data was statistically processed using the Chi-Square Independence Test to examine whether there is a relationship between two variables, each with two or more categories. According to Cohen (1988), to determine the effect size for the Chi-Square Independence Test, Cramer's V should be used. The effect sizes are classified as small, medium, and large, with values of .10, .30, and .50, respectively. This measure of effect size is applicable only to variables with a minimum of two categories.

4. Result and Discussion

4.1 Respondent Characteristics and Area Insights

A total of 400 respondents were selected from four cities within the catchment area of BIJB Kertajati, excluding Majalengka. It is assumed that residents of Majalengka would naturally choose to fly from BIJB Kertajati, located in Majalengka, if they needed to travel by air and if the airport provided the necessary routes. To address the research questions, the questionnaire was distributed in the surrounding cities, including Karawang to Subang, Indramayu, Cirebon, Bandung, and the areas surrounding Tasikmalaya to Sumedang. The responses from residents of these cities are presented in the following sections.

The respondents consisted of 200 men and 200 women, with 100 people in each profession: students, civil servants (ASN), private employees, and employees of state-owned enterprises (BUMN). The distribution of respondents' residential areas can be seen in the Domicile frequency in table 1.

Table 1 Respondent's Domicile Frequency

Domicile	Frequency
Subang-Karawang	80
Indramayu	80
Cirebon	80
Bandung	80
Sumedang-Tasikmalaya	80
Total	400

Regarding monthly income, respondents were fairly evenly distributed among those earning up to IDR 1,900,000, those earning between IDR 2,000,000 and IDR 4,500,000, and those earning more than IDR 4,500,000.

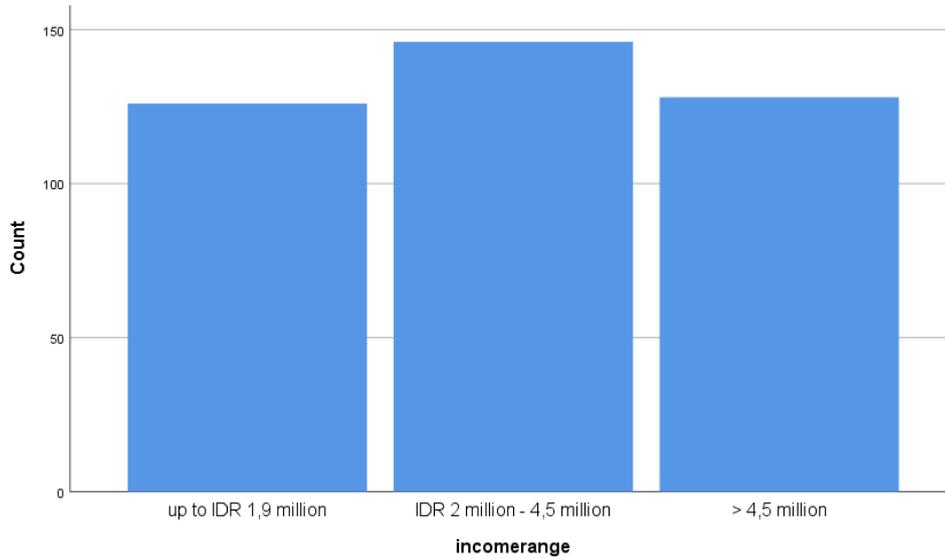


Fig. 2 Respondents' Monthly Income

As this study also aims to determine the preferences of residents in the BIJB Kertajati catchment area for the nearest possible airport (excluding Husein Sastranegara Airport in Bandung), Table 2 shows the distance and travel time to the three airport options before analyzing the results from the respondents' questionnaire answers.

Table 2 Distance and Travel Time to Airports

District	To Soekarno-Hatta International Airport (CGK) Distance (km)	To Halim Perdana Kusuma Airport (HLP) Travel Time (hh)	To West Java International Airport Kertajati (BIJB) Distance (km)
Karawang	96.9	1:53	61.2
Subang	149.8	2:43	117.0
Indramayu	245.5	4:07	212.8
Cirebon	244.0	3:59	211.3
Bandung	176.3	3:37	143.5
Tasikmalaya	285.8	6:17	253.0
Sumedang	226.5	4:13	193.7

Notes:

*Distance from the capital of each district to the airport, data obtained from Google Maps.
Travel time obtained from Google Maps, between 13:00 – 14:12 WIB.*

This information provides insights into the travel preferences and considerations of residents regarding airport selection, factoring in variables such as distance, travel time, and convenience.

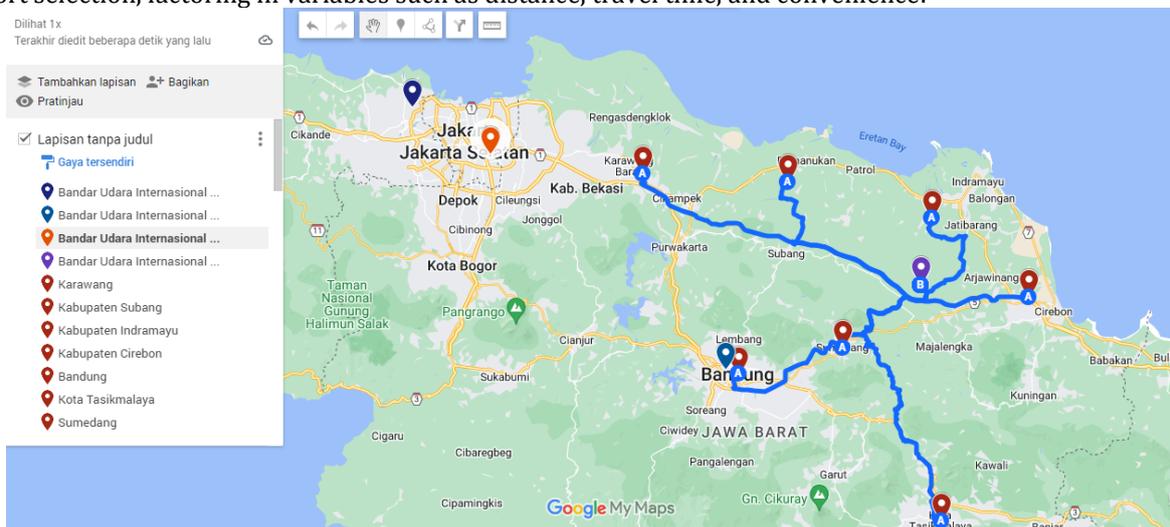


Fig. 3 Airports and Studied Cities Location (mymap)

The image is a map of the western part of Java, Indonesia, focusing on various cities and their proximity to several airports. The map highlights three major airports:

1. Bandar Udara Internasional Soekarno-Hatta (Soekarno-Hatta International Airport) located near Jakarta, represented by a dark blue pin.
2. Bandar Udara Internasional Halim Perdanakusuma (Halim Perdanakusuma International Airport) also near Jakarta, marked with an orange pin.
3. Bandar Udara Internasional Jawa Barat Kertajati (West Java International Airport or BIJB Kertajati) located in Majalengka, shown with a blue pin.

Additionally, the map indicates several key cities and regions within West Java, including:

- Karawang
- Subang
- Indramayu
- Cirebon
- Bandung
- Tasikmalaya
- Sumedang

The map also shows the road network connecting these cities to the three airports, highlighting potential routes travelers might use. The markers and lines on the map help visualize the travel distances to each airport from these regions.

4.2 Willingness to Use Air Travel

The significant increase in domestic flight ticket prices in late 2019, coupled with the implementation of paid baggage policies by several low-cost carriers (LCCs), has led to domestic airfares on certain routes exceeding those of international flights. This situation has affected the preferences of Indonesians regarding air travel as a mode of transportation for intercity travel. The survey results from this study confirm that the majority of people now prefer other modes of transportation, such as buses, trains, or private vehicles, particularly for journeys that remain accessible without flying. It should be noted that inter-island travel is outside the scope of this study and would require further investigation.

The decision to choose a mode of transportation depends on various factors, primarily the purpose of the journey, such as work, business, education, or recreation. Additionally, factors such as who bears the cost of travel and the overall expenses incurred significantly influence this decision. For example, an employee sent on an out-of-town assignment by their company is likely to choose air travel due to its time and energy efficiency, especially if the cost is covered by the employer. Conversely, entrepreneurs may consider additional variables, such as the stability and profitability of their business, the distance to the destination, and the number of staff that needs to be transported. A small or new business owner is more inclined to choose modes of transportation other than air travel, particularly if the travel expenses must be borne personally or involve multiple individuals.

Recreational travel also presents different decision dynamics. For instance, families with many members will take into account the ages of the children, household income levels, and the number of family members participating in the trip. Therefore, further research is needed to understand the factors underlying individual decisions to choose air travel or other modes of transportation.

This study finds that air travel is currently not a popular choice among the Indonesian population, regardless of the travel purpose, be it work, business, education, or recreation. This finding is somewhat surprising, particularly for business trips where airfare is generally covered by the employer.

Although respondents' interest in using air travel is relatively low, the study also highlights the motivations behind the decision to use this mode. As shown in Figure 4, work-related travel emerges as the primary factor driving the use of air travel, followed by travel for educational purposes. Additionally, recreational trips involving more than three people are more likely to use air travel compared to recreational trips involving 1-3 people. This graph illustrates a significant gap between the willingness to use air travel and other transportation modes across all surveyed regions, which geographically constitute the catchment area of West Java International Airport (BIJB) Kertajati. This data aligns with the low passenger numbers at the airport.

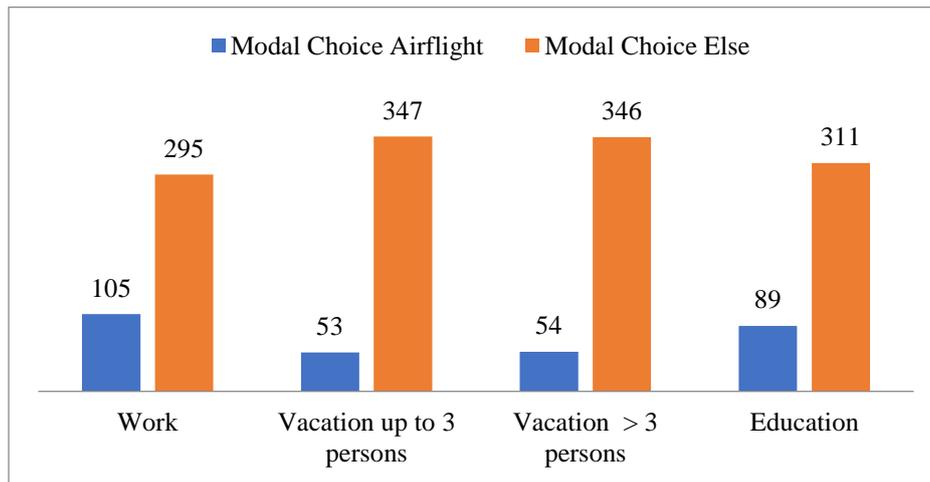


Fig. 4 Travel Purpose and Decisions to Use Flight

To identify the regions with the highest willingness to use air travel, Figure 5 illustrates the comparison of willingness levels by area. Indramayu emerges as the region with the highest willingness to use air travel, compared to Cirebon, Subang-Karawang, and Bandung. Meanwhile, the Sumedang-Tasikmalaya region exhibits the lowest willingness to use air travel across various types of journeys.

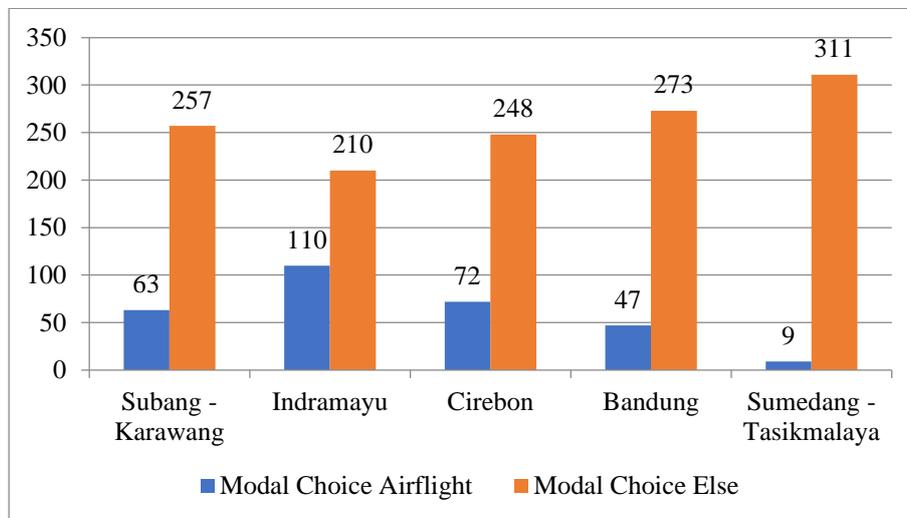


Fig. 5 Willingness to Use Air Travel by Region

This analysis suggests that while there are some motivating factors for using air travel, the level of public willingness is still influenced by economic conditions, the purpose of the journey, and preferences for more economical and flexible transportation modes.

The table 3 presents data on trip motivation and transportation preferences across five regions in West Java, focusing on whether respondents chose to travel by airplane or other modes of transportation (such as buses, trains, or private vehicles). The data is grouped by regency and trip purpose, which includes work, vacations with small (1-3 persons) or large groups (>3 persons), and education.

Table 3 Regional Transportation Preferences Based on Trip Motivation and Mode

Regency	Trip Purpose	Airplane	Others	Total
Subang-Karawang	Working	19	61	80
	Vacation with 1-3 person	11	69	80
	Vacation with > 3 person	17	63	80
	Education	11	69	80
Indramayu	Working	22	58	80

Regency	Trip Purpose	Airplane	Others	Total
	Vacation with 1-3 person	24	56	80
	Vacation with > 3 person	24	56	80
	Education	40	40	80
Cirebon				
	Working	32	48	80
	Vacation with 1-3 person	13	67	80
	Vacation with > 3 person	13	67	80
	Education	14	66	80
Sumedang-Tasikmalaya				
	Working	4	76	80
	Vacation with 1-3 person	0	80	80
	Vacation with > 3 person	0	80	80
	Education	5	75	80
Bandung				
	Working	28	52	80
	Vacation with 1-3 person	0	80	80
	Vacation with > 3 person	0	80	80
	Education	19	61	80

Indramayu appears to have a stronger inclination toward air travel across various trip motivations, especially compared to other regions. This could be due to better access to airports, affordability, or cultural tendencies toward air travel. Sumedang-Tasikmalaya consistently shows the lowest preference for air travel across all categories, indicating potential barriers such as poor connectivity to airports or the higher costs of air travel compared to other regions. In general, air travel is less preferred for vacations, particularly for smaller groups, suggesting that other modes of transportation are perceived as more convenient or affordable for such trips. Cirebon shows a relatively higher preference for air travel for work purposes, indicating that air travel plays a more significant role for business-related travel in this region.

4.3 Statistical Analysis of the Relationship Between Profession and the Decision to Use Air Travel

4.3.1 The Relationship Between Profession and the Decision to Use Air Travel for Business Travel

To examine the relationship between respondents' professions and their choice of transportation mode (air travel or other modes) in the context of business travel, a Chi-Square Test of Independence was conducted using SPSS 25. The hypotheses tested were:

H_0 : There is no relationship between profession and the decision to use air travel or other modes of transportation.

H_a : There is a relationship between profession and the decision to use air travel or other modes of transportation.

Chi-Square Test and Crosstab Results: The following table 4 summarizes the results of the Chi-Square test for the relationship between profession and the decision to use air travel or other transportation modes across various types of trips (business, recreational, and educational).

Table 4 Relationship between profession and mode choice

Type of Trip	Chi-Square Value	Degree of Freedom (df)	Asymptotic Significance (p-value)	Decision	Conclusion
Business Travel	9.440	3	0.024	H_0 rejected,	Significant relationship between profession and decision to use air

Type of Trip	Chi-Square Value	Degree of Freedom (df)	Asymptotic Significance (p-value)	Decision	Conclusion
				H _a accepted	travel or other transportation modes for business travel.
Recreational (1-3)	35.387	3	0.000	H ₀ rejected, H _a accepted	Significant relationship between profession and decision to use air travel or other modes for recreational trips with 1-3 people.
Recreational (>3)	34.340	3	0.000	H ₀ rejected, H _a accepted	Significant relationship between profession and decision to use air travel or other modes for recreational trips with more than 3 people.
Educational Travel	42.126	3	0.000	H ₀ rejected, H _a accepted	Significant relationship between profession and decision to use air travel or other modes for educational trips.

The crosstab table presents the observed and expected frequencies for each profession category, for example business travel trip purpose, the Chi-Square value of 9.440 with 3 degrees of freedom and a significance level of 0.024 indicates that this value is below the critical threshold of 0.05, leading to the rejection of H₀ and the acceptance of H_a. This means there is a significant relationship between profession and the decision to use air travel or other transportation modes for business travel.

This analysis demonstrates that profession influences an individual's decision to use air travel compared to other modes for business trips. Based on the frequency distribution, employees of state-owned enterprises (37 percent) and government employees (27 percent) have a higher tendency to choose air travel, while private sector employees (21 percent) and working students (20 percent) are less likely to choose air travel, potentially due to cost considerations.

4.3.2 The Relationship Between Profession and the Decision to Use Air Travel for Recreational Travel (1-3 People)

For recreational trips involving 1-3 people, a Chi-Square Test of Independence was also conducted to explore the relationship between profession and choice of transportation mode. The hypotheses tested remain the same as in point (a).

Chi-Square Test and Crosstab Results: The table shows a Chi-Square value of 35.387 with a significance level of 0.000, which is below 0.05. Therefore, H₀ is rejected and H_a is accepted, indicating a significant relationship between profession and the decision to use air travel or other modes for recreational trips with 1-3 people.

Profession also plays a role in the choice of transportation mode for recreational trips. Private sector employees show the highest tendency to use air travel (28 percent), while students do not use air travel at all for recreational trips. This suggests that travel costs are a key consideration for certain groups, such as students, while professionals prefer air travel for time efficiency.

4.3.3 The Relationship Between Profession and the Decision to Use Air Travel for Recreational Travel (>3 People)

For recreational trips with more than 3 people, the Chi-Square test was again used. The hypotheses tested are the same as in the previous points. A Chi-Square value of 34.340 with a significance level of 0.000 indicates a significant relationship between profession and the decision to use air travel for recreational trips with more than 3 people. Profession significantly influences the decision to use air travel in recreational trips involving more than 3 people. Private sector employees and state-owned enterprise employees are more likely to use air travel (25 percent and 21 percent, respectively), while students do not use air travel for this type of trip. Cost considerations and the need for efficiency appear to drive these transportation preferences.

4.3.4 The Relationship Between Profession and the Decision to Use Air Travel for Educational Travel

The Chi-Square test was also applied to evaluate the relationship between profession and transportation mode in educational trips. A Chi-Square value of 42.126 with a significance level of 0.000 shows a significant relationship between profession and the choice to use air travel or other modes in educational travel.

Professionals, especially private sector employees (32 percent) and state-owned enterprise employees (34 percent), more frequently choose air travel for educational trips compared to students, who do not use air travel at all. This suggests that cost considerations (such as company-covered expenses) greatly influence transportation decisions in the context of educational travel.

From the four cases above, the Chi-Square test results show a significant relationship between profession and the choice to use air travel or other transportation modes, whether in business, recreational, or educational travel. These findings illustrate that profession strongly influences transportation decisions, with professions related to formal employment and higher income (such as government or state-owned enterprise employees) being more likely to choose air travel for efficiency, while other groups, such as students, are more cost-conscious in their choices.

4.4 Statistical Analysis of the Relationship Between Profession and Airport Choice Before and After the Operation of the Cisumdawu Toll Road

In this phase of the study, data were collected from 400 respondents; comprising 100 students, 100 civil servants, 100 private employees, and 100 BUMN Employees. Respondents were asked to indicate their airport preferences: Soekarno-Hatta International Airport (CGK), Halim Perdana Kusuma International Airport (PK), or West Java International Airport Kertajati (BIJB), both before and after the Cisumdawu toll road became operational. The hypotheses tested were as follows:

H_0 : There is no significant relationship between profession and airport choice.

H_a : There is a significant relationship between profession and airport choice.

Table 5 Airport Preferences Before and After Cisumdawu Toll Road Operation

Profession	Airport	Before Cisumdawu Toll Road	After Cisumdawu Toll Road
		(N=400)	(N=399)
Student	CGK	58	46
	PK	10	9
	BIJB	32	44
Subtotal		100	99
Civil Servant	CGK	49	29
	PK	17	11
	BIJB	34	60
Subtotal		100	100
Private Employee	CGK	60	44
	PK	23	16
	BIJB	17	40
Subtotal		100	100
BUMN Employees	CGK	73	56
	PK	25	18
	BIJB	2	26
Subtotal		100	100

Note:

CGK: Soekarno-Hatta International Airport

PK: Halim Perdana Kusuma International Airport

BIJB: West Java International Airport Kertajati

The table 5 illustrates the distribution of airport preferences across different professions before and after the operation of the Cisumdawu toll road. The data reveal changes in airport preferences among students, civil servants, private employees, and civil servant.

Table 6 Summary of Chi-Square Test Results Before and After Cisumdawu Toll Road Operation

Indicator	Before Cisumdawu Toll Road	After Cisumdawu Toll Road
Pearson Chi-Square Value	43.570	26.201
Likelihood Ratio	53.852	26.926
Linear-by-Linear Association Value	20.007	8.202
Phi Coefficient	0.330	0.256

Table 6 presents the Chi-Square analysis results that evaluate the relationship between profession and airport choice, both before and after the Cisumdawu toll road began operation. Values below 0.05 for Asymptotic Significance indicate a significant relationship between profession and airport choice during both periods.

4.5 Statistical Analysis of the Relationship Between Domicile and Airport Choice

To evaluate the relationship between domicile and airport choice, an analysis was conducted on data from 400 respondents, divided into five groups based on their domicile: Subang-Karawang, Indramayu, Cirebon, Bandung, and Sumedang-Tasikmalaya. Respondents were asked to indicate their preferred airport among Soekarno-Hatta International Airport (CGK), Halim Perdana Kusuma International Airport (PK), and West Java International Airport Kertajati (BIJB).

Table 7 Comparison of Airport Preferences Before and After the Cisumdawu Toll Road Operation Based on Domicile

Domicile	Before Cisumdawu Toll Road	After Cisumdawu Toll Road
Subang-Karawang		
CGK	64	54
PK	16	16
BIJB	0	10
Subtotal	80	80
Indramayu		
CGK	42	40
PK	22	22
BIJB	16	18
Subtotal	80	80
Cirebon		
CGK	41	16
PK	15	9
BIJB	24	54
Subtotal	80	80
Bandung		
CGK	63	51
PK	10	4
BIJB	7	25
Subtotal	80	80
Sumedang-Tasikmalaya		
CGK	30	14
PK	12	3
BIJB	38	63
Subtotal	80	80
Total	400	400

Table 7 illustrates the shift in airport preferences among respondents based on their domicile before and after the operation of the Cisumdawu toll road. The data highlight changes in airport choices across different regions following the new transport infrastructure.

A Chi-Square Test of Independence was applied to test the following hypotheses:

H_0 : There is no significant relationship between domicile and airport choice.

H_a : There is a significant relationship between domicile and airport choice.

Table 8 Chi-Square Test Results Before and After the Cisumdawu Toll Road Operation Based on Domicile

Condition	Chi-Square Value	Degrees of Freedom (df)	Asymptotic Significance (2-sided)	Explanation
Before Cisumdawu Toll Road	75.906	8	0.000	Significant at $\alpha = 0.05$, H_0 rejected, indicating a relationship between domicile and airport choice.
After Cisumdawu Toll Road	128.894	8	0.000	Significant at $\alpha = 0.05$, H_0 rejected, indicating a relationship between domicile and airport choice.

Table 8 presents the results of the Chi-Square test for the relationship between domicile and airport choice before and after the operation of the Cisumdawu toll road. The significance values of less than 0.05 at both time points indicate a significant relationship between domicile and airport preferences, showing that the new infrastructure has influenced respondents' airport choices.

4.6 Discussion

Based on the statistical testing results presented and from previous research, the following key findings address the research questions outlined in this paper:

1. Factors Contributing to the Low Passenger Load Factor at BIJB Kertajati:

- The higher cost of domestic flight tickets compared to international fares, combined with the implementation of paid baggage policies by low-cost carriers, influences public preference for alternative transportation modes such as buses, trains, or private vehicles. This has resulted in lower interest in air travel, particularly for trips that can be easily accessed by other modes.
- Economic factors, travel purposes, and public preference for more affordable and flexible transportation modes have also contributed to the low number of passengers at BIJB Kertajati.
- The findings of this study align with those of Min (2013), who identified that ticket prices, flight frequency, and per capita income significantly affect passenger numbers. This research supports Min's conclusions by showing that the significant rise in domestic ticket prices and the introduction of paid baggage policies have reduced passenger interest in using BIJB Kertajati for domestic flights, which are more expensive than international routes.
- Steen & Sørsgard (2003) highlighted the effects of deregulation on the aviation industry, leading to increased competition and price fluctuations. The findings from the case study of BIJB Kertajati demonstrate that changes in fare policies and the introduction of paid baggage policies by airlines have negatively impacted public preference for air travel, particularly at BIJB Kertajati.
- This research also supports the views of Arieza (2019) and Setyorini (2019), who suggested that duopoly in the aviation industry and fare policies contribute to high ticket prices, which further reduce public interest in flying. The high cost of airfares is identified as one of the primary causes of the low passenger load factor at BIJB Kertajati, as people tend to switch to more economical transportation alternatives.

2. Impact of the Cisumdawu Toll Road on the Increase in Passenger Load Factor at BIJB Kertajati:

- The presence of the Cisumdawu Toll Road has the potential to increase passenger preference for BIJB Kertajati. The data shows a rise in the selection of BIJB after the toll road began operation among various professional groups, such as civil servants and state-owned enterprise employees, as well as changes in airport preferences in regions like Cirebon and Sumedang-Tasikmalaya.
- Statistical analysis indicates a significant relationship between the operation of the Cisumdawu Toll Road and airport choice, suggesting that this infrastructure has played a role in enhancing BIJB Kertajati's attractiveness to passengers.
- This is consistent with the findings of Kurnia (2019) and Simorangkir (2019), who revealed that delays in the completion of the Cisumdawu Toll Road hindered access to BIJB Kertajati, resulting in low passenger numbers. This study provides further evidence that, following the toll road's operation, there has been an increase in the selection of BIJB by passengers from various professions and regions. This underscores the importance of accessibility and infrastructure in influencing passengers' decisions when choosing an airport.

3. Influence of Profession, Domicile, and Travel Purpose on Airport Choice:

- **Profession:** A significant relationship exists between profession and the decision to travel by air or other transportation modes. Employees of state-owned enterprises, civil servants, and private sector workers are more likely to choose air travel compared to students, especially for business, leisure, and educational purposes.

- **Domicile:** A significant relationship was found between respondents' domicile and their airport choice, both before and after the Cisumdawu Toll Road began operation. The new infrastructure, such as the toll road, has influenced changes in airport preferences for residents in areas surrounding BIJB Kertajati.

- **Travel Purpose:** The decision to use air travel is influenced by the purpose of the trip, such as work, business, education, or recreation. Business and educational trips tend to favor air travel due to time efficiency, while leisure trips, particularly those involving large families, are more cost-sensitive.

These findings are consistent with the study by Kluge et al. (2017), which demonstrated that factors such as travel costs, journey duration, and trip purpose influence passengers' airport choices. This research further confirms that profession, domicile, and travel purpose (driven by work, business, and education) significantly affect passengers' decisions when selecting an airport, including BIJB Kertajati. For instance, state-owned enterprise employees and civil servants are more likely to choose BIJB after the Cisumdawu Toll Road became operational due to improved accessibility and time efficiency.

5. Conclusions and Suggestions

In summary, the success of BIJB Kertajati Airport largely depends on addressing several key factors that influence passenger preferences. Enhancing passenger satisfaction through competitive ticket pricing, improving accessibility with better infrastructure, and expanding the available flight routes and schedules are crucial steps. As passengers weigh their choices based on both convenience and cost, addressing these aspects will be critical in boosting the airport's load factor. Without proactive measures, the airport risks continuing its struggle with low passenger volumes. Therefore, it is essential to prioritize strategic improvements in both service offerings and airport accessibility to make BIJB a more appealing option for travelers.

1. Ticket Prices and Airline Policies:

The significant increase in domestic airfare prices and the implementation of paid baggage policies by low-cost airlines have led the public to prefer more economical modes of transportation, such as buses, trains, or private vehicles. This shift in preference has reduced the public's interest in using BIJB Kertajati.

2. Accessibility and Infrastructure:

Limited accessibility to BIJB Kertajati, particularly before the operation of the Cisumdawu Toll Road, has been a key factor contributing to the low passenger load factor. Inadequate infrastructure has made the airport less competitive compared to other airports in West Java, such as Soekarno-Hatta.

3. Impact of Profession, Domicile, and Travel Purpose:

The decision to use BIJB is influenced by profession, domicile, and travel purpose. Employees of state-owned enterprises and government agencies are more likely to choose BIJB after improvements in accessibility, highlighting the importance of time efficiency and cost considerations in airport usage decisions.

4. Limited Flight Availability and Routes:

The limited number of flights and routes available at BIJB Kertajati has reduced its appeal. Passengers tend to prefer other airports with a greater number of flights and more flexible travel options.

5.1 Recommendations to Improve the Passenger Load Factor at BIJB Kertajati:

1. Reducing Airfares and Additional Fees:

Airlines operating at BIJB Kertajati should consider lowering airfares and revising paid baggage policies to remain competitive with other modes of transportation. Offering fare incentives and special promotions could help attract more passengers.

2. Infrastructure Development and Accessibility Enhancement:

Continued infrastructure development, including the completion and maintenance of the Cisumdawu Toll Road, is crucial to significantly reduce travel time to BIJB. In addition, an integrated public transportation system, such as free or subsidized shuttle buses, should be established to improve access to the airport.

3. Increasing Flight Routes and Frequency:

Expanding domestic and international routes and increasing flight frequency at BIJB Kertajati would enhance its attractiveness, especially for passengers from West Java and surrounding regions.

4. Promotion and Public Awareness Campaigns:

Launch promotional and educational campaigns to raise awareness about the benefits of using BIJB Kertajati, including its convenience and improved accessibility. These efforts should be conducted through social media, advertisements, and collaborations with local communities.

5. Collaboration with Corporations and Government Agencies:

Encourage partnerships with government agencies and private companies to use BIJB Kertajati as the primary airport for business and official travel. Offering corporate incentives for businesses that choose BIJB could be an effective strategy.

6. Facility and Service Improvements:

Enhance the quality of airport facilities and services, such as lounges, shopping areas, and reliable internet connectivity, to improve the passenger experience and satisfaction.

The implementation of these recommendations is expected to increase the attractiveness of BIJB Kertajati to passengers, enhance the airport's image, and ultimately improve its passenger load factor.

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

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