Passenger Priorities in Low-Cost Carrier Airport Terminals: Evidence from Imam Khomeini International Airport

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Abstract

This study evaluates passenger priorities and determines the optimal Level of Service (LOS) at Imam Khomeini International Airport (IKIA) for Low-Cost Carriers (LCCs). Utilizing a mixed-method approach, quantitative data were gathered from 322 LCC passengers and qualitative pairwise comparisons were collected from 15 aviation experts. The classical Analytic Hierarchy Process (AHP) was applied to evaluate 5 main criteria and 23 sub-criteria using Expert Choice software. Results reveal that "Service Quality and Facilities" (weight = 0.31) is the top priority, followed by "Accessibility and Comfort" (0.24), "Service Cost" (0.20), "Waiting Time and Speed" (0.15), and "Security and Staff Satisfaction" (0.10). Cleanliness (0.093) and Seat Comfort (0.070) emerged as the most critical sub-criteria. The empirical optimal LOS at IKIA Terminal 1 was computed as 3.45 out of 5.00. Descriptive evaluations highlight waiting times at security control (mean satisfaction = 3.15) and staff responsiveness (mean satisfaction = 3.02) as primary operational areas requiring targeted intervention.

Keywords: Low-Cost Carriers (LCCs); Level of Service (LOS); Analytic Hierarchy Process (AHP); Airport Passenger Terminal.

Introduction

The rapid expansion of Low-Cost Carriers (LCCs) has fundamentally transformed global aviation by offering affordable air travel through operational efficiency and unbundled services. In Iran, the growth of LCCs has introduced complexities into airport management, particularly in terminal facility planning. Most Iranian airport terminals were historically designed for Full-Service Carriers (FSCs) providing premium amenities. Applying FSC service models to LCC operations incurs redundant overhead, whereas excessive service reduction degrades user experience and creates congestion. Determining an optimal Level of Service (LOS) specifically tailored to LCC operations is thus a strategic necessity.

In airport landside facilities, LOS encompasses space availability, waiting time, processing speed, cleanliness, and security comfort. For LCCs, optimal LOS does not imply quality maximization but achieving an equitable equilibrium between passenger needs and low operational costs. This research addresses this gap at Imam Khomeini International Airport (IKIA) Terminal 1 by: (1) prioritizing LCC terminal service criteria using classical AHP, (2) computing the empirical optimal LOS score, and (3) identifying key operational areas for terminal performance enhancement.

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Methodology

This research adopted a mixed-method design. Quantitative survey data were gathered from $n = 322$ LCC passengers determined via Cochran [7]'s formula ($N = 2000, z = 1.96, p = 0.5, d = 0.05$). Qualitative pairwise comparisons were obtained from 15 aviation experts (airport operations managers, planners, and ground specialists).

The decision hierarchy comprised 5 main criteria and 23 sub-criteria based on SERVQUAL and airport service literature. Classical AHP (Saaty [23]) was executed using Expert Choice software to derive criteria weights through pair-wise comparison matrices. Consistency Ratios (CR) were validated below the 0.10 threshold. Passenger satisfaction scores (S_i) were measured on a 5-point Likert scale. The overall empirical LOS score was derived using a linear weighted aggregation model.

Results and Discussion

The AHP evaluation yielded acceptable consistency ratios ($CR = 0.07$). "Service Quality and Facilities" ranked highest (weight = 0.31), indicating that LCC passengers prioritize physical comfort and hygiene over low prices. "Accessibility and Comfort" (0.24) and "Service Cost" (0.20) placed second and third. "Waiting Time and Service Speed" (0.15) and "Security and Staff Satisfaction" (0.10) followed. Among sub-criteria, "Cleanliness" (0.093), "Seat Comfort" (0.070), and "Ticket Price Fairness" (0.070) exerted the greatest influence.

Table 1: AHP Weights and Passenger Satisfaction Ratings for Main Criteria

Criterion	AHP Weight (wi)	Satisfaction Score (Si, 1–5)	Rank
Service Quality and Facilities	0.31	3.68	1
Accessibility and Comfort	0.24	3.52	2
Service Cost	0.20	3.42	3
Waiting Time and Service Speed	0.15	3.15	4
Security and Staff Satisfaction	0.10	3.08	5
Overall Optimal LOS	**1.00**	**3.45**	—

The optimal LOS score was calculated using the weighted sum formula:

$$\text{Optimal LOS} = \sum_{i=1}^{5} (w_i \times S_i) = (0.31 \times 3.68) + (0.24 \times 3.52) + (0.20 \times 3.42) + (0.15 \times 3.15) + (0.10 \times 3.08) = 3.45$$

This corrected score (3.45 / 5.00) places current terminal services in a "desirable to moderate" category (69% of maximum capacity perception). Survey findings identified "Waiting Time at Security Control" (mean satisfaction = 3.15) and "Staff Responsiveness" (mean satisfaction = 3.02) as primary operational bottlenecks. Converting these perceived satisfaction indices into objective operational capacity criteria within the framework of Mumayiz [4] will require supplementary studies with real-time operational data.

Conclusion

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This study established an empirical multi-criteria framework to optimize LCC terminal service levels at IKIA. Findings demonstrate that budget passengers prioritize baseline physical comfort and cleanliness over cheap ticket prices. The empirical LOS score of 3.45 indicates satisfactory baseline performance while highlighting critical bottlenecks in security queue processing and staff responsiveness. Immediate recommendations for airport management include deploying automated security lanes, expanding self-check-in kiosks, enforcing transparent fee disclosure, and implementing customer service training.

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