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Preliminary Assessment and Prioritisation of Demand Management Strategies for Reducing Train Overcrowding

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ABSTRACT

Train overcrowding has been associated with psychological stress, adverse health effects, negative behavioural reactions, and spillover effects. However, there is little agreement on the appropriate demand management strategies to deal with the increasing passenger numbers, especially on rail services in Malaysia. To begin addressing this issue, a preliminary study involving 13 participants (Male = 8; Female = 5) from an organisation under the Ministry of Transport, Malaysia focusing on demand management issues and transportation research and development activities was conducted. Participants ranked three sets of demand management strategies (pricing, service quality, and policy) based on their feasibility, effectiveness and cost. Using Kendall's coefficient of concordance (Kendall's W), findings showed a relatively weak, but consistent agreement rate among participants across all strategies on their feasibility, effectiveness and cost. In particular, high priority was placed on four strategies namely, free early bird incentives, discounted early bird or off-peak fares, increasing train frequency, and travel demand management programme, implying their potential applications for peak smoothing in Malaysian urban rail systems. The implications for practice and limitations of this study are discussed. It is suggested that the identified strategies should be targeted for intervention and evaluation to further refine our understanding of sustainable, effective, and cost-efficient ways in addressing current and future train overcrowding issues.

Keywords: Rail, crowding, demand management, peak period, Malaysia

INTRODUCTION

As the demand for rail travel continues to grow, along with traffic congestion, supply constraints, urban sprawl, as well

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as employment and population growth (Gil Sander, Blancas Mendivil, & Westra, 2015), overcrowding of rail services is fast becoming a pressing concern worldwide, including in Malaysia. Current statistics indicate that the total passenger numbers for light rail transit services (that is, LRT Kelana Jaya Line, LRT Ampang Line, KL Monorail, KLIA Ekpress, and KLIA Transit) have increased from 129.9 million in 2006 to 180 million in 2015 while an increase of about 40.5% was observed over the same period for the KTM Komuter service, that is, from 34,975 in 2006 to 49,960 in 2015 (Ministry of Transport Malaysia, 2015; see Appendix 1 for the comparison). Reports have also shown that the main rail lines in Malaysia are functioning at over 140% and 180% of design capacity (Palansamy, 2016; Performance Management and Delivery Unit (PEMANDU), 2010). The notion that passengers are being crammed into trains like cattle or cramped like sardines in a small tin on the trains is also not uncommon elsewhere (Cox, Houdmont, & Griffiths, 2006). These scenarios present a daunting issue for train companies because operating overcrowded trains has been associated with delays in services (Lam, Cheung, & Lam, 1999), injuries to staff and passengers (Turner, Corbett, O'Hara, & White, 2004), as well as a number of negative outcomes such as psychological stress and spillover effects (Mohd Mahudin, 2012), wider health and safety issues (Cox, Houdmont, & Griffiths, 2006), and a vehicle for the spread of illness and disease (Gershon, Qureshi, Barrera, Erwin, & Goldsmith, 2005).

Despite the widely admitted seriousness of this issue, there is no definitive agreement on the appropriate demand management strategies to deal with the increasing passenger numbers. Demand management refers to the collection of operational, administrative, and economic policies designed to ensure that demand for the utilisation of rail transportation resources is kept at a manageable level, especially during peak commuting periods (Online TDM Encyclopedia, 2016). A number of viable strategies have been proposed to address this issue. These include trip suppression, trip redistribution, shifting demand, mode switch, and peak fare pricing (Online TDM Encyclopedia, 2016).

While studies exploring the potential of establishing demand management as a legitimate resource option for crowding mitigation have been conducted elsewhere (for example, in Australia by Henn, Karpouzis, & Sloan, 2010; in the USA by Nelson Nygaard Consulting Associates, 2008; and in the UK by Maunsell, 2007), less attention has been paid to the more immediate concerns in the Malaysian rail industry. This is an important deficit, especially since researchers have observed a connection between demand management strategies and service quality improvements. For instance, in the case of Australia and the United States, Hale and Charles (2009) show how pricing and communication strategies can be effectively used to address peak demand and reduce train overcrowding. As yet, however, little is known about the existence and feasibility of such strategies in Malaysia, other than the observation that train overcrowding is indeed stressful for the commuters and has the potential to spill over into other aspects of their life and work (Mohd Mahudin, 2012).

One reason for the current state of the field is that existing research is generally restricted to individual country case studies with a limited comparison of different cases or over time. Besides, some of the identifiable strategies suggested in previous work are mainly in the early stages and only at discussion level among the rail stakeholders in the localised areas. As a result, there is little information about the feasibility, effectiveness, or cost-effectiveness of these demand management strategies in the Malaysian setting. The questions of what measures would be most effective in mitigating train overcrowding and whether they are feasible in administrative terms are of theoretical and substantive importance. To address these questions, the current study focuses on one broad area of contention: a preliminary exploration of stakeholders' perspectives on the feasibility, effectiveness, and cost of demand management strategies for reducing train overcrowding in Malaysia. However, before proceeding with the study, it is sensible to discuss the existing rail demand management strategies that have been reported in the literature. Hence, this discussion is presented in the next section.

Existing Rail Demand Management Strategies

Increasing the capacity and decreasing the demand are the two common strategies for balancing the mismatch between demand and capacity (Henn, Karpouzis, & Sloan, 2010). Capacity enhancement strategies, such as adding more train coaches, building new rail infrastructures, constructing new rail lines, or redesigning existing infrastructures, are usually investment intensive and require long time frames. Furthermore, these strategies may not be feasible in several situations due to geographical, environmental, socio-economical, or political issues associated with such large projects. On the other hand, demand management strategies that aimed at distributing the peak period demand to before and after the critical period have the potential to improve the demand-capacity balance over a medium to a short period with relatively less investment. As a result of renegotiating the demand distribution, a general flattening of the travel demand profile across a broader period is obtained (Holyoak & Chang, 2006).

Other types of demand management strategies have also been discussed in the literature. For example, Henn, Karpouzis, and Sloan (2010) identified five broad categories of strategies in their review that examined how peak demand is addressed in Australian urban rail systems. Of these categories, the financial and pricing strategies, which vary from peak fare pricing, station-specific surcharges, and fare pass programmes to market rate parking pricing and peak parking pricing, are regarded as easy to implement, but politically unpopular, hence mixed success was reported. On the other hand, service delivery strategies, such as improving service frequency as well as enhancing wayfinding and passenger flow mechanisms, have the potential for peak smoothing and expansion of rail capacity but need careful consideration for implementation as they involve considerable cost (Henn, Karpouzis, & Sloan, 2010). Another two categories of strategies, which are reducing the underlying need for the service (for example, land use and transit oriented development policies) and changing the way needs are met (such as promotion of integrated transport policy framework) are deemed as essential strategies with longer term spatial impact. However, rail operators have limited control over these policies as it is challenging to foster coordination and cooperation with non-transport organisations and other competing transport mechanisms (Henn, Karpouzis, & Sloan, 2010). Finally, education, particularly dissemination of information about peak fares and crowding levels, has strong potential to shift passenger behaviours by making them aware of crowding conditions or alternative transport or route options (Henn, Karpouzis, & Sloan, 2010).

Although these strategies are useful individually, Henn, Karpouzis, and Sloan (2010) suggest that two criteria should be placed for maximum impact. First, instead of applying the strategies singly, a combination of strategies tailored to the particular circumstances of each urban area is a better way to manage congestion. For example, combining fare and pricing strategies with office hour flexibility campaigns and employer incentives and disincentives would be able to address the range of factors contributing to train overcrowding. Second, the strategies need to be customised according to context. This is because it is possible that strategies that work effectively in one situation may fail in another. One such example is by Cervero (1990) who reported that geographically targeted free fare programmes have been more successful than system wide free fare programmes. Other studies that investigated rail demand management such as Nelson Nygaard Consulting Associates (2008) in the US and Maunsell (2007) in the UK also reported similar strategies. Therefore, based on the past studies, it is evident that various demand management strategies are available and practised at a range of scales.

Nevertheless, within the Malaysia's context, policies and strategies relating to rail demand management and passenger load remain a grey area. For example, neither the Railways Act 1991 nor the Land Public Transport Act 2010 contained specific policies associated with the maximum allowable passenger load or guidelines on how to manage congestion in carriages and at railway stations. In particular, the Railways Act 1991 just states that the Minister who is in-charged with the responsibility for railways "shall only grant his approval for the opening of a railway after he has received a written report from an engineer appointed by the Director General that (a) he has made a careful inspection of the railway; (b) the weight of rails, strength of bridges, general structural character of the works, and the size of and maximum gross load upon the axles of any rolling-stock are such as have been prescribed by any regulations made under these Acts; and (c) in his opinion the opening of the railway will not cause any danger to the passengers or any damage to the goods to be carried thereon" (p. 26-27).

A similar vagueness is also noted concerning the implementation of other types of rail demand management. Apart from giving a 50% discount on the fare to those who commute between 6:00 a.m. to 7:00 a.m. (Anand, 2016) and purchasing new trains in stages (Palansamy, 2016), other efforts to reduce peak hour congestion and manage the peak demand have been less reported to date. This raises the question of whether rail stakeholders are adequately aware and know about the strategies that are viable for the longer run. Therefore, what is lacking in the literature are investigations into what is perceived as demand management strategies in Malaysia and to what extent is the consensus on their feasibility, effectiveness, and cost within the rail industry in the country. An overview of demand management strategies, which warrants further investigation in addressing Malaysia's urban rail issues, is thus required. As a start, the current research attempts to address this gap by conducting an exploratory study on how stakeholders perceive and prioritise the demand.

METHOD

Study Design and Participants

Because the current study is a preliminary work and exploratory in nature, purposive sample of stakeholders from the rail industry was selected. More specifically, 13 participants (Male = 8; Female = 5) from an organisation under the Ministry of Transport, Malaysia participated in this study; the criterion for their selection was that they are transport professionals and experts who are directly involved in demand management issues and transportation research and development activities. The use of this criterion in this study is consistent with the wider literature, which suggests that stakeholders are those organisations who are likely to affect and be affected by the demand management issues - these may include transport professionals, rail operators, and regulatory authorities.

Measures

A list of potential demand management strategies in rail industry along with their descriptions was generated from the review of past studies. Eight broad categories of approaches for managing peak demand were identified - these include pricing approaches, service quality approaches, management-based approaches, policy approaches, educational approaches, communication approaches, engineering-design approaches, and infrastructure-based approaches. These approaches were further categorised into three groups of strategies: pricing, service quality, and policy, which then formed the final strategies to be ranked by the participants in the survey. Consequently, the final survey items consisted of six strategies related to pricing, ten strategies about service quality, and six strategies associated with policy.

Procedure

Each participant was contacted via e-mail and face-to-face meeting, in which they were provided with an explanation of the purpose of the study, its procedure, and the details of the questionnaire. After the permission to conduct the study was granted, participants were asked to rank the items for each of the identified strategies listed in the questionnaire by order of what they believe to be "most" to "least" based on their feasibility, effectiveness, and cost. For pricing and policy strategies, these values were ranked using a scoring system that ranged from 1 to 6 (1, being most preferred, 6, being least preferred). Meanwhile, for service quality strategies, these values were ranked using a scoring system, ranging from 1 to 10 (1, being most preferred, 10, being least preferred). In providing their ratings, participants were asked to focus on the specific demand management strategies in rail industry, particularly the light rail transit and commuter services.

Data Analysis

In each group of strategies, the one that received the highest ranking (1 = most preferred) is regarded as the most prioritised strategy for managing peak demand and overcrowding. The ranked strategies obtained were examined in terms of their feasibility, effectiveness, and cost, with the level of agreement among the raters determined using Kendall's coefficient of concordance (Kendall's *W*). This statistic is recognised as the best metric for measuring non-parametric rankings (Okoli & Pawlowski, 2004). Kendall's *W* ranges from 0 (no agreement) to 1 (*Full Agreement*) (Kendall & Gibbons 1990). In this study, Kendall's *W* values are interpreted using a guideline set by Schmidt (1997) (see Table 1).

Table 1
Kendall's value interpretation (Schmidt, 1997)

W	Interpretation	Confidence in Rankings
0.1	Very weak agreement	None
0.3	Weak agreement	Low
0.5	Moderate agreement	Fair
0.7	Strong agreement	High
0.9	Unusually strong agreement	Very high

RESULTS

From Table 2 on feasibility, it can be seen that Kendall's *W* values for pricing and service quality strategies are 0.216 and 0.213 respectively, which suggest weak agreement among the participants. Kendall's *W* also shows very weak agreement among participants in the policy strategies (0.092).

Table 2
Kendall's W results for feasibility

Category	Item	Mean Rank	Kendall's *W*	df	p
Pricing	Increase peak period fares	3.88	0.216	5	.016
	Free early bird incentives	2.58			
	Discounted early bird or off-peak fares	2.65			
	Surcharges at specific stations	4.35			
	Reduce or restrict parking availability at stations	4.35			
	Employer incentives and disincentives	3.19			
Service Quality	Increase train frequency	3.75	0.213	9	.006
	Increase seating capacity	6.71			
	Redesign standing and seated areas	5.88			
	Enhance passenger flow	6.67			
	Standardise entry and exit protocols	6.33			
	Efficient ticketing systems	4.92			
	Traveller information services	3.92			
	Express services	3.54			
	Provide feeder services and park-and-ride facilities	7.04			
	Build more transport infrastructure	6.25			
Policy	Policy-induced change in travel time	3.58	0.092	5	.311
	Flexible working hours' policy	3.46			
	Land use and population policy	4.31			
	Travel demand management	3.04			
	Policy-driven traffic management systems	3.77			
	Public awareness and educational campaigns	2.85			

Participants also ranked the strategies according to their perceived effectiveness, as shown by the results tabulated in Table 3. Kendall's *W* values obtained are as follows: pricing = 0.129, service quality = 0.243, and policy = 0.098, indicating again less agreement among the participants.

Table 3
Kendall's W results for effectiveness

Category	Item	Mean Rank	Kendall's *W*	df	p
Pricing	Increase peak period fares	3.27	0.129	5	.138
	Free early bird incentives	3.12			
	Discounted early bird or off-peak fares	3.00			
	Surcharges at specific stations	4.15			
	Reduce or restrict parking availability at stations	4.42			
	Employer incentives and disincentives	3.04			
Service Quality	Increase train frequency	3.08	0.243	9	
	Increase seating capacity	4.81			
	Redesign standing and seated areas	6.23			
	Enhance passenger flow	6.50			
	Standardise entry and exit protocols	7.96			
	Efficient ticketing systems	4.50			
	Traveller information services	5.31			
	Express services	5.42			
	Provide feeder services and park-and-ride facilities	6.38			
	Build more transport infrastructure	4.81			
Policy	Policy-induced change in travel time	3.63	0.098	5	.321
	Flexible working hours' policy	3.29			
	Land use and population policy	3.21			
	Travel demand management	3.13			
	Policy-driven traffic management systems	3.21			
	Public awareness and educational campaigns	4.54			

A similar pattern of results was obtained in cost (see Table 4), with Kendall's *W* values of 0.042 for pricing, 0.342 for service quality, and 0.172 for policy.

Table 4
Kendall's W results for cost

Category	Item	Mean Rank	Kendall's *W*	df	p
Pricing	Increase peak period fares	3.92	0.042	5	.746
	Free early bird incentives	3.35			
	Discounted early bird or off-peak fares	3.31			
	Surcharges at specific stations	3.58			
	Reduce or restrict parking availability at stations	3.85			
	Employer incentives and disincentives	3.00			
Service Quality	Increase train frequency	4.65	0.342	9	.001
	Increase seating capacity	4.50			
	Redesign standing and seated areas	4.27			
	Enhance passenger flow	6.15			
	Standardise entry and exit protocols	8.27			
	Efficient ticketing systems	5.69			
	Traveller information services	6.77			
	Express services	7.50			
	Provide feeder services and park-and-ride facilities	4.54			
	Build more transport infrastructure	2.65			
Policy	Policy-induced change in travel time	3.46	0.172	5	.067
	Flexible working hours' policy	4.96			
	Land use and population policy	3.13			
	Travel demand management	3.25			
	Policy-driven traffic management systems	3.21			
	Public awareness and educational campaigns	3.00			

To facilitate easy understanding of participants' level of agreement results, all Kendall's *W* values obtained are summarised in Table 5.

Table 5
Summary of Kendall's W results

Category of Strategies	Kendall's *W*		
	Feasibility	Effectiveness	Cost
Pricing	0.216	0.129	0.042
Service quality	0.213	0.243	0.342
Policy	0.092	0.098	0.172

The rank of all strategies was then tabulated in Table 6. In pricing strategies, free early bird incentives were ranked first for feasibility, but third in effectiveness, and cost. Meanwhile, discounted early bird or off-peak fares were ranked first for effectiveness, but second for feasibility and cost. Employer incentives and disincentives were ranked as most costly, but third in feasibility and effectiveness. In this category, the least feasible strategy but less costly for rail industry is to increase peak period fares whereas the least effective is to reduce or restrict parking availability at stations.

Table 6
Final rank for all strategies based on feasibility, effectiveness and cost

Category	Item	Final Rank		
		Feasibility	Effectiveness	Cost
Pricing	Increase peak period fares	6	4	6
	Free early bird incentives	1	3	3
	Discounted early bird or off-peak fares	2	1	2
	Surcharges at specific stations	4	5	4
	Reduce or restrict parking availability at stations	4	6	5
	Employer incentives and disincentives	3	2	1
Service Quality	Increase train frequency	2	1	5
	Increase seating capacity	9	3	3
	Redesign standing and seated areas	5	7	2
	Enhance passenger flow	8	9	7
	Standardise entry and exit protocols	7	10	10
	Efficient ticketing systems	4	2	6
	Traveller information services	3	5	8
	Express services	1	6	9
	Provide feeder services and park-and-ride facilities	10	8	4
	Build more transport infrastructure	6	3	1
Policy	Policy-induced change in travel time	4	5	5
	Flexible working hours' policy	3	4	6
	Land use and population policy	6	2	2
	Travel demand management	2	1	4
	Policy-driven traffic management systems	5	2	3
	Public awareness and educational campaigns	1	6	1

For service quality strategies, providing express services was ranked first for feasibility but sixth and ninth for effectiveness and cost respectively. The most effective strategy as perceived by the participants is increase train frequency, which was ranked as second and fifth for feasibility and cost. Building more transport infrastructure was ranked first in cost, sixth in feasibility, and third in effectiveness. Participants rated providing feeder services and park-and-ride facilities as the least feasible strategy and standardising entry and exit protocols to manage crowds as the least effective but least costly.

Finally, in the policy strategies, public awareness and educational campaigns were ranked first in terms of feasibility and cost but last in effectiveness. Meanwhile, travel demand management was ranked first for effectiveness but second and fourth for feasibility and cost respectively. Among the strategies, land use and population policy are the least preferred for feasibility; public awareness and educational campaigns are the least preferred for effectiveness; and flexible working hours' policy was ranked last for cost. To summarise these results, the rank of the most and least preferred strategies is tabulated in Table 7 below.

Table 7
Rank for most and least strategies based on feasibility, effectiveness, and cost

Categories of Strategies	Feasibility		Effectiveness		Cost	
	Most	Least	Most	Least	Most	Least
Pricing	Free early bird incentives	Increase peak period fares	Discounted early bird or off-peak fares	Reduce or restrict parking availability at stations	Employer incentives and disincentives	Increase peak period fares
Service quality	Express services	Feeder services and park-and-ride facilities	Increase train frequency	Standardising entry and exit protocols	More transport infrastructure	Standardising entry and exit protocols
Policy	Public awareness and educational campaigns	Land use and population policy	Travel demand management	Public awareness and educational campaigns	Public awareness and educational campaigns	Flexible working hours' policy

DISCUSSION

In this study, a set of demand management strategies that could address train overcrowding has been examined regarding their feasibility, effectiveness, and cost. More specifically, six strategies related to pricing, ten strategies about service quality, and six strategies associated with policy have been identified from the existing literature and tested using Kendall's *W* coefficient of concordance. The results showed a relatively weak, but consistent agreement rate among participants across all strategies on their feasibility, effectiveness, and cost. This consistency of agreement was particularly observed on four strategies: (1) free early bird incentives, (2) discounted early bird or off-peak fares, (3) increasing train frequency, and (4) travel demand management programme, hence, reinforcing their importance in managing overcrowding issues. It can be seen that the two strategies ranked the highest focus on pricing, which is consistent with previous studies showing that pricing and financial strategies are the most effective way to reduce peak demand (see Hale & Charles, 2009; Liu & Charles, 2013). The third and fourth strategies, which concern service quality improvement and urban transport planning and travel demand management programme also echoed the literature (for example, Hale, 2011; Henn, Karpouzis, & Sloan, 2010) that highlighted the effectiveness of such strategies. These results, therefore, suggest that these four strategies have the most potential for peak smoothing in Malaysian urban rail systems and rail stakeholders are recommended to consider them when making decisions on passenger loading and overcrowding.

One unexpected finding was that strategies such as reduction or restriction of parking availability at stations, provision of feeder services and park-and-ride facilities, and standardisation of entry and exit protocols were ranked as less important in mitigating overcrowding issues. It is unclear as to why participants ranked these strategies in this way - this suggests another area of focus for future research. In light of the findings too, rail stakeholders are recommended to pursue a judicious loading policy that not only restricts passenger loading levels to within the current capacity of the rail system but also requires the rail operators to enforce adequate measures to reduce overcrowding and improve punctuality and reliability targets. Such policy initiatives should also include procedures for implementing good practice approaches to crowd management and crowd monitoring on the railways as well as specify appropriate penalties for non-compliance.

Another implication arising from the findings is that there is a need for a feasible and cost-effective, if not cheap, measure for addressing issues associated with peak demand and passenger growth. With an understanding of the financial and management constraints affecting the industry, an integrated approach of cost-effective strategies tailored to the particular circumstances of each rail system seems to offer the best prospect for managing passenger crowding. One way of doing this is to use psychologically targeted strategies that are both cost-effective in managing the growing demand on the rail services and in contributing to improvement in service (Cox, Houdmont, & Griffiths, 2006; Mohd Mahudin, 2012). The potential use of psychological or non-engineering strategies that can effectively mitigate peak demand growth should be further explored.

A preliminary work as the present one is not without its limitations. It is recognised that the main drawback of this study is the small sample size, which renders the weak agreement among the rankings of the participants. It is also likely that the lack of consensus in the rankings occurred because the research area is a largely unexplored domain in Malaysia in which there is no background to provide structure to ensuing works. To overcome this limitation, a larger sample size with more diverse stakeholders is recommended as it may yield stronger agreements among participants. Another future work that can also be done is to conduct an in-depth survey with the stakeholders to (1) explore the justification for their rankings, (2) know whether there are any institutional issues behind such rankings, and (3) understand the barriers associated with the implementation of the strategies from their perspective and their thoughts on how to remove them. Alternatively, conducting a study from the users' perspective would be helpful in identifying feasibility issues and developing comprehensive demand management strategies. Further studies are warranted to explore this possibility.

CONCLUSIONS

To conclude, this research provides preliminary yet valuable information that can inform the literature on the specific strategies that are deemed high priorities in addressing train overcrowding, and, by extension, improving service quality and passenger satisfaction with rail services. In particular, the findings could be instrumental in advocating rail stakeholders and relevant authorities in Malaysia on the importance of managing peak crowding and passenger demand within the rail transport sector. It follows that the identified strategies should be targeted for intervention and evaluation. Confirmation of these results through additional research and assessments are needed to refine the understanding of sustainable, effective, and cost-efficient ways to address current and future train overcrowding issues.

It is important that future studies evaluate the prioritised interventions for their effectiveness in managing passenger demand and peak train crowding. One such study could be a quasi-experimental, longitudinal research that implements and tests the prioritised strategies along the existing rail lines. In this way, the effectiveness of these strategies could be assessed over time. An investigation into strengthening the successful strategies is likewise recommended to be added to the future plan of the research project. This line of work is essential to ensure that the effectiveness of the strategies can be sustained and even enhanced.

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APPENDIX 1

Total Passenger Numbers for Light Rail Transit and Commuter Services from 2006 to 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
KTM Komuter	34,975	36,959	36,557	34,683	34,995	35,510	34,847	43,942	46,957	49,960
Kelana Jaya Line	56,747,136	56,965,258	58,168,337	55,580,190	58,037,633	68,398,561	71,574,675	78,702,931	81,971,322	82,144,674
Ampang Line	49,727,909	52,434,883	51,009,480	49,375,077	51,572,177	53,568,672	56,809,978	60,207,397	63,270,432	62,809,412
KL Monorail	19,322,170	22,197,169	21,765,233	21,021,390	22,108,308	24,200,299	24,435,931	25,437,621	24,303,465	25,067,866
KLIA Ekpress	1,839,226	1,780,384	1,578,706	1,419,827	1,508,734	1,581,476	1,649,410	2,063,419	2,928,302	3,470,710
KLIA Transit	2,369,864	2,449,842	2,508,884	2,441,736	2,626,119	3,238,389	3,713,536	4,374,219	6,310,323	6,496,617

Source: Transport Statistics Malaysia, 2015