

**INVESTIGATION OF THE TRAIN SCHEDULE AND HEADWAY
FOR MASS RAPID TRANSIT**

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**INVESTIGATION OF THE TRAIN SCHEDULE AND HEADWAY
FOR MASS RAPID TRANSIT**

By

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ABSTRACT

INVESTIGATION OF THE TRAIN SCHEDULE AND HEADWAY FOR MASS RAPID TRANSIT

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On 17 July 2017, 31 stations of Mass Rapid Transit Kajang Line (MRT KGL) were fully operated. In just two years, the ridership of the KGL is about to exceed the ridership of the Ampang LRT Line which has been operated for 23 years. With the increase of the ridership, it may cause congestion in the platform and the uncertainty of train schedule and headway. Hence, it is important to design an optimal train timetable including train dwell time to avoid the service disruption caused by congestion. The KGL train model is simulated using the ETAP software, The optimized train schedule from the KGL is used as a parameter for the simulation. The performance of the train model is evaluated. The results shows that more trains quantity and short headway can minimize the passenger congestion at the platform because no passenger needs to wait for a long time for the train arrival, especially at the end-to-end stations.

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APPROVAL SHEET

This project entitled “**INVESTIGATION OF THE TRAIN SCHEDULE AND HEADWAY FOR MASS RAPID TRANSIT**” was prepared by NUR ADIBAH BINTI ABDUL WAHAB and submitted as partial fulfillment of the requirements for the degree of Master of Engineering Electrical at Universiti Tunku Abdul Rahman.

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SUBMISSION OF PROJECT

It is hereby certified that **NUR ADIBAH BINTI ABDUL WAHAB** (ID No: **20UEM00240**) has completed this project entitled “INVESTIGATION OF THE TRAIN SCHEDULE AND HEADWAY FOR MASS RAPID TRANSIT” under the supervision of Dr. Chua Kein Huat (Supervisor) from the Department of Electrical and Electronic Engineering, Lee Kong Chian Faculty of Engineering and Science, Lee Kong Chian Faculty of Engineering and Science.

I understand that University will upload softcopy of my project in PDF format into UTAR Institutional Repository, which may be made accessible to UTAR community and the public.

Yours truly,



(Nur Adibah binti Abdul Wahab)

DECLARATION

I (NUR ADIBAH) hereby declare that the project is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UTAR or other institutions.



(NUR ADIBAH BINTI ABDUL WAHAB)

Date: 25/4/2022

TABLE OF CONTENTS

	Page
ABSTRACT	iii
ACKNOWLEDGEMENTS	iv
APPROVAL SHEET	v
SUBMISSION SHEET	vi
SUBMISSION OF PROJECT	vi
DECLARATION	vii
TABLE OF CONTENTS	viii
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATION	xi
CHAPTER 1 Introduction	1
1.1 Research objectives	2
1.2 Scope of research	3
1.3 Project organization	3
CHAPTER 2 Literature Review	5
2.1 Passenger Demand	5
2.2 Passenger Flow	6
2.3 Dwell Time	7
2.4 Reason for Timetable Optimization	7
CHAPTER 3 Methodology	10
3.1 Introduction	10
3.2 Passenger Ridership for KVMRT Kajang Line	12
3.3 MRT Headway/Timetable	15
3.4 ETAP Software	18
CHAPTER 4 Results and Discussions	22
CHAPTER 5 Conclusion	40
LIST OF REFERENCES	41
APPENDICES	43

LIST OF TABLES

	Page
Table 1.1 The cumulative ridership in LRT and MRT.....	2
Table 3.1 Ridership in Weekend and Weekday in July 2017.....	13
Table 3.2 The current train headway/timetable in MRT KGL.....	15
Table 3.3 Train travel time between stations.....	16
Table 3.4 The distance of PYL station.....	19
Table 3.5 Parameter data.....	20
Table 4.1 Train Schedule for T1 up.....	23
Table 4.2 Train Schedule for T2 up.....	24
Table 4.3 Train Schedule for T3 up.....	25
Table 4.4 Train Schedule for T4 up.....	26
Table 4.5 Train Schedule for T5 up.....	27
Table 4.6 Train Schedule for T1 down.....	29
Table 4.7 Train Schedule for T2 down.....	30
Table 4.8 Train Schedule for T3 down.....	31
Table 4.9 Train Schedule for T4 down.....	32
Table 4.10 Train Schedule for T5 down.....	33
Table 4.11 Combined train schedule.....	39

LIST OF FIGURES

	Page
Figure 3.1 Composition of train dwell time	12
Figure 3.2 Passenger Ridership in July 2017	14
Figure 3.3 The Klang Valley integrated transit map	18
Figure 3.4 The PYL traction schematic diagram.....	20
Figure 3.5 Traction Study Case	21
Figure 3.6 eTrax Editor – Headway Configuration	21
Figure 4.1 T1 with 4min headway (up)	23
Figure 4.2 T2 with 4min headway (up)	24
Figure 4.3 T3 with 4min headway (up)	25
Figure 4.4 T4 with 4min headway (up)	26
Figure 4.5 T5 with 4min headway (up)	27
Figure 4.6 T1 with 4min headway (down)	28
Figure 4.7 T2 with 4min headway (down)	29
Figure 4.8 T3 with 4min headway (down)	30
Figure 4.9 T4 with 4min headway (down)	31
Figure 4.10 T5 with 4min headway (down)	32
Figure 4.11 The speed limit configuration	33
Figure 4.12 Combine graph for train up when headway 4min.....	34
Figure 4.13 Combine graph for train down when headway 4min.	35
Figure 4.14 Combine graph for train up when headway 4 min.	36
Figure 4.15 Combine graph for train down when headway 7min.	36
Figure 4.16 Combine graph for train down when headway 10min.	37
Figure 4.17 Combine graph for train up when headway 30 min.	37
Figure 4.18 Combined train schedule	39

LIST OF ABBREVIATION

AFC	Automatic Fare Collection
AFCS	Automatic Fare Collection System
KGL	Kajang Line
KVMRT	Klang Valley Mass Rapid Transit
LRT	Light Rail Transit
MCO	Movement Control Order
MRT	Mass Rapid Transit
NB	Northbound
OD	Origin and Destination
PYL	Putrajaya Line
SB	Southbound

CHAPTER 1

Introduction

Rail transit plays an important role in reducing road congestion and environmental pollution. However, train operations are often distributed by various internal and external factors during the daily operation that contributes to the failure to meet the passenger requirement. Normally, passengers may make several transfers between different lines to reach their destination. In the case of the train timetables between different lines being independent, it will cause an inconveniency to the passengers' transfer and transfer waiting time will be longer due to no train on the other line for them to board to reach the destination. Without implementing passenger inflow control in the rail transit system, it tends to result in many passengers being stranded at the platform during peak hours which lead to the potential threat to both the passengers (e.g., lack of safety, low level of comfort, delays, and inefficient travels) and operating agencies (e.g., unreliable service and uneven capacity utilization).

In Malaysia, railway trans are consisting of heavy rail (including commuter rail), light rapid transit (LRT), mass rapid transit (MRT), monorail, airport rail links, and funicular railway lines. The proposed of this thesis is to develop and optimize the train schedule and headway to mitigate the passenger congestion in Mass Rapid Transit while using the real operation data of the Klang Valley Mass Rapid Transit (KVMRT) Kajang Line.

The full phase MRT Kajang Line consists of 31 stations that were opened on 17 July 2017 that served passengers between Sungai Buloh to Kajang. In just two years after its opening, the ridership of MRT Kajang Line (KGL) is about to exceed the 23 years old Ampang LRT Line. Based on the data provided by the MRT Operator known as Prasarana Sdn Bhd, the average of KVMRT riders recorded is 208,000 riders while the Ampang LRT line

recorded 209,000 riders in July as shown in Table 1.1. Even though, the higher ridership contributes to the increase of service revenue. With the increase of the ridership in a specific period, it may promote congestion in the platform and the instability of the railway system i.e the train schedule and headway.

Hence, the most important factors in the operation and management of rail transit networks are how to design optimized train timetables including train dwell time. At the same time considering the punctuality and reliability of high-speed railways.

Table 1.1 The cumulative ridership in LRT and MRT

Description	Period	Average daily ridership (workday)
Kelana Jaya LRT line	July 16	250,000
	July 17	276,000
	July 18	298,000
	July 19	326,000
Ampang LRT line (plus Sri Petaling)	July 16	186,000
	July 17	180,000
	July 18	192,000
	July 19	209,000
Sungai Buloh – Kajang Line (MRT KGL)	Aug 17	131,000
	Aug 18	170,000
	Aug 19	208,000

1.1 Research objectives

The objectives of this research work are as follow:

1. To investigate the passenger traffic for MRT.
2. To develop the train model using ETAP software.
3. To evaluate the performance of the train model developed.

1.2 Scope of research

Passenger congestion frequently occurs during the peak hour from 7.00 am to 9.00 am and 5.00 pm to 7.00 pm during the weekdays. The movement of the passenger is due to passenger travel to/from between home and working place. The consequence of the huge movement of the passenger in the specific time frame causes congestion at the transfer station or known as the interchange station. Moreover, the ineffective of the train schedule and headway also contribute to the congestion of the passenger. For example, the frequency of the train is not properly configured to cater for the increase of the passenger and the dwell time of the train is too long for the station that is less occupied.

First, the scope of the research is to analyse the link between passenger demand, passenger flow, and dwell time with the train schedule or headway. Second, to develop a train model using the optimised timetable real operation data and investigate the passenger congestion in Mass Rapid Transit

1.3 Project organization

The structure of the project is organized as follows:

Chapter 2 represents the literature review of the thesis. In this chapter, the objective of the thesis is compared with the existing literature review. The passenger flow, passenger demand, and dwell time are identified as the factors that affect the performance of the train timetable.

In Chapter 3, the method of the problem will be explained by explaining in detail the root cause of the factor and how to develop the train timetable using the ETAP software.

Chapter 4 provides the simulation result from ETAP software based on the train number and multiple train headway. This chapter also discusses how the number of trains, train speed, and station distance influence the timetable.

Finally, the conclusion will be discussed in Chapter 5 with the direction for future research

CHAPTER 2

Literature Review

Train timetable or train schedule is important for the railway transit system. With the well-designed synchronization of the train timetable, passengers can make a smooth transfer without waiting a long time at the platform. An experiment has been conducted by (Soza-Parra, Raveau and Muñoz, 2021) to investigate the impact of the waiting time and passenger density on the irregular headway. Several scenarios are generated based on the characteristic of speed, frequency, headway regularity, average demand including the punctual behaviour and crowding aversion as parameters to the Hybrid Discrete Choice Model. It results that the characteristic specified in the experiment cannot be ignored to evaluate the system's reliability.

With the irregular or inefficient train timetable, it will impact the system's reliability. However, several factors contribute to the efficiency of the train timetable such as train accidents, the presence of stranger objects on the track which causes the occurrence of emergency breaks, the train lost communication with the control centre, dwell time, and passenger behaviour (i.e., passenger demand and passenger flow). Several studies have been conducted in the past few years on train timetable optimization focused on passenger demand, passenger flow, and dwell time.

2.1 Passenger Demand

The timetable and the stop plan of the train are determined by the passenger demand (the number of passengers traveling between an origin and destination station). (Qi, Cacchiani and Yang, 2018) proposed an Integer Linear Programming (ILP) model for Robust Train Timetabling and Stop Planning (RTTSP). The target of RTTSP is to minimize the sum of train travel

times by satisfying the passenger demand and to respect constraints on the minimum dwelling and running times of the trains, on the maximum train capacity, and headway times between consecutive trains departures or arrivals at the stations. The proposed method into the Wuhan-Guangzhou high-speed railway corridor shows that the robust solution can reduce the unsatisfied passenger demand by about five times.

Investigation done by (Qi et al., 2018) has consider the passenger demands over each origin and destination(OD) pair on a high-speed railway corridor into the joint optimization model for train schedules, train stop planning, and passengers distributing. Based on the computation result, the generated train stop plan and timetable, the passenger distribution plan is further optimized to minimize the total travel time of all the passengers for a sample railway corridor and the Wuhan–Guangzhou high-speed railway corridor.

2.2 Passenger Flow

An over-crowded of passengers at the platform at the specified time especially during the peak hours will attempt a large number of passengers to be left stranded and low comfort to passengers. (Jiang et al., 2019) has proposed a coordination optimization scheme for Urban Rail Transit (URT) line in Shanghai. With the basic principle of the Q-learning approach, it results in minimizing the value of passengers stranded along the whole line by coordinating the passenger inflow control and rescheduling of the train timetable.

Moreover, a collaborative optimization method which was reformulated into Mixed Integer Linear Programming (MILP) model was proposed by (Liu, Li and Yang, 2020) for metro train scheduling and train connections with passenger control strategy on a bi-directional metro-line. In the proposal, the passenger flow control, train headway, passenger load along the metro line, the turnaround operations, and the entering/exiting depot operations are considered simultaneously but not sensitive to uncertain passenger demand. It results that the number of train service connections

and the crowding inside stations and carriages with the proper passenger flow control strategy can be evidently balanced, and thereby the operation efficiency and safety of the metro lines are effectively improved.

2.3 Dwell Time

The travel of the passenger during the peak hour contributes to the critical congestion at the station. Dwell time is unpredictable due to the dependency on the volume of alighting and boarding passengers and at the same time affects the train schedule and headway. This best practice of dwell time is to separate between peak and off-peak hours. Due to the lack of real-time passenger demand, (Dewei Li^{1*}, 2016) had proposed the k-nearest neighbour model without relying on the passenger data to estimate the dwell times at short-stops for real-time scheduling. It concludes that the estimation of dwell times at shortstop stations is possible without passenger data with an estimation error of the dwell time during peak hours is 6.2-8.8s and the corresponding accuracy is from 85.5% to 88.5%. However, the author suggested future work by adding the passenger demand to improve the accuracy.

2.4 Reason for Timetable Optimization

The author (Zhou et al., 2020) has designed two heuristic algorithms to search for the robust optimization approach for the timetable optimization problem based on the minimum number of waiting for passengers and minimax regret value from the analysis of the conducted passenger scenario in Beijing Metro Yizhuang Line. The result is illustrated from the 20 new scenarios showed the relative regret value of the robust timetable is less than 15% than its current timetable.

In (Wang et al., 2015), nonlinear programming sequential quadratic programming and genetic algorithms are used to solve the train scheduling problem. Three events which are departure events, arrival events, and passenger arrival rates changes events including the passenger transfer process

and passenger flow at transfer stations have been used as a model for the algorithms. It results that the performance of the non-fixed headway train schedule obtained by the Sequential Quadratic Programming (SQP) method is also better than the traditional fixed-headway train schedule. However, the total time of the SQP method is much higher than that of the fixed-headway approach.

The proposed of optimization train timetable done by (Wang, Li and Cao, 2020) has demonstrated that the minimize of passenger total waiting time and the number of passengers who fail to transfer using the mixed-integer programming model (CPLEX, GA and GWO) is better than the actual timetable of the Shenyang rail transit network. It results that the non-transfer passenger waiting time, transfer passenger waiting time at origin stations, transfer waiting time, and the number of passengers who fail to transfer are decreased by 3.7%, 1.9%, 26.3%, and 8.6% respectively.

With the rescheduling of the timetable can improve the operational efficiency of the high-speed railway system with disturbance uncertainties. A real-time optimization rescheduling strategy using a scenario-based chance-constrained model predictive control (SC-MPC) algorithm is designed by (Zhang et al., 2021) based on the case study of the Beijing-Shanghai high-speed railway line. The scenario involves the arrival times, departure times, arrival orders, departure orders, and dwelling plans. The simulation results show that the train delays can be effectively reduced by the proposed strategy and the rescheduling timetable has good robustness.

For multiple railway transit systems, it is important to have a synchronization timetable between all lines. A study has been conducted by (Guo et al., 2017) that focuses on the timetable optimization problem in the transitional period between the peak and off-peak hours during the changes of train headway and varies in passenger demand. By using a real-world case study in Beijing metro network and travel demand, a mixed-integer nonlinear programming model (i.e., Particle Swarm Optimization and Simulated Annealing (PSO-SA) was proposed. It results that the Computational results

demonstrate the effectiveness of adjusting train timetables and the applicability of the developed approach to real-world metro networks.

CHAPTER 3

Methodology

3.1 Introduction

There are differences between the train timetable and train headway. Train timetable is defined as the time for the train to stop at the station is set by the operator. For example, during the peak hour, the train timetable is scheduled to run every 4 min, from 7 am to 9 am with the schedule of 7.00 am, 7.04 am, 7.08 am, 7.12 am, and so on. Meanwhile, train headway is where the train is controlled automatically by the system. The train is automatically adjusted the train distance with others based on the headway setting. The more train in the mainline, the easier it is to catch up with the headway (Hasegawa et al., 2014).

In developing the train timetable and headway, the passenger flow, passenger demand and dwell time need to be considered in the study. The pattern of the passenger flow and demand can be identified by using the data collected by the Automatic Fare Collection System (AFCS). Moreover, the situation when and where the passenger travel can be defined using the card transaction data that consist of Origin and Destination (OD) and transaction time.

When the passenger presents their card at the ticket gate, the reader will read and validate the card. If the card is valid, the flap of the ticket gate will open to allow the passenger to enter the ticket gate. While else, if the card is invalid the passenger will be blocked from entering the ticket gate. In both situations, the card information is recorded and collected in the AFCS. However, to calculate the passenger ridership, only the card information with the open ticket gate behaviour will be counted by the intelligence of AFCS.

Moreover, the waiting time, transfer time, and vehicle time with the existing train timetable/headway can be identified from the card transaction data. However, in Malaysia, the AFCS for one railway service does not have interconnection with the other railway service. Therefore, for the passenger that performs the station transfer, the card transaction will appear as an incomplete transaction where there might be a missing card check-in, or a missing card check out. Anyhow, if the railway service is operated by the same operator, the complete transfer data can be obtained by the manual table of the OD and do data the mix match based on the card serial number. For example, since the operator for LRT, monorail and MRT is the same which is Prasarana, they capable to do data reconciliation as they have access to those three AFC servers.

Next is dwell time. Dwell time is referring to the time taken by the train to stop at the station. From door open until the door closed as shown in

Figure 3.1 Composition of train dwell time. Source by (Dewei Li1*, 2016)

. The dwell time will somehow impact the train timetable and headway. For example, the longer the dwell time, the long train takes to complete the travel of the whole line since the same train will be used to run for the next travel. Thus, to used train headway, it is more encouraged to use multiple numbers of trains for the daily operation to catch up with the setting headway. Moreover, the factors that affect the selection of the dwell time are accidents in the track, train loss communication with the control centre, and passenger congestion at the platform and station type.

Unfortunately, adjustment of the dwell time is mostly caused by passenger congestion. This congestion frequently occurs during the peak hour from 7.00 am to 9.00 am and 5.00 pm to 7.00 pm during the weekdays. During that time, the dwell time is set to be higher than usual. In default, the dwell time is 26 seconds for the intermediate station, 30 seconds for the terminus station (end station), and 40 seconds for the interchange station (transfer station).

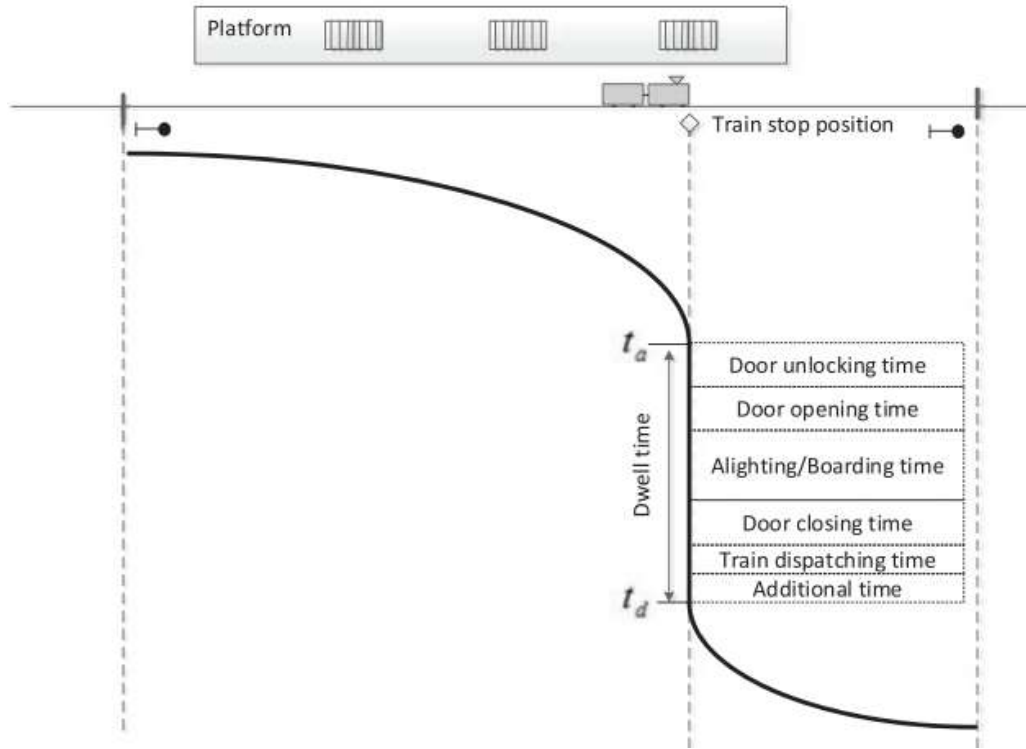


Figure 3.1 Composition of train dwell time. Source by (Dewei Li^{1*}, 2016)

3.2 Passenger Ridership for KVMRT Kajang Line

As of July 2021, the MRT Kajang Line consists of 31 stations with 7 transfer stations and 24 bidirectional stations. The transfer stations consist of Sungai Buloh, Muzium Negara, Pasar Seni, Bukit Bintang, Merdeka, Maluri, and Kajang stations. Most of the stations have interchange/transfer lines with the LRT/Monorail except for Kajang and Sungai Buloh stations which with KTM lines.

Interchange or transfer stations seem to contribute more passenger ridership. This is proved by Table 3.1 and Figure 3.2 where the highest passenger ridership is shown at Bukit Bintang station, followed by Muzium Negara and Sungai Buloh Station. Moreover, the number of ridership is higher during the weekdays compared to the weekends because, people are likely actively doing any activities during weekdays compared to weekends (Feng et al., 2016). For Merdeka station, even though it is an interchange station. Since the station is connected to the LRT Plaza Rakyat, most of the passenger flow and ridership is captured by the LRT Plaza Rakyat and caused the passenger

flow at Merdeka is lower in ridership. This is because the ridership is calculated from based on the passenger data at ticket gate when exiting the station.

Table 3.1 Ridership in Weekend and Weekday in July 2017.

Station Name	Total Passenger Quantity in month	Total ridership over weekday	Total ridership over weekend
Sungai Buloh	206057	151108	54949
Kampung Selamat	31202	22881	8321
Kwasa Damansara	13497	9898	3599
Kwasa Sentral	89592	65701	23891
Kota Damansara	143948	105562	38386
Surian	121620	89188	32432
Mutiara Damansara	182342	133717	48625
Bandar Utama	153038	112228	40810
Taman Tun Dr. Ismail	121243	88912	32331
Phileo Damansara	74812	54862	19950
Pusat Bandar Damansara	118331	86776	31555
Semantan	117022	85816	31206
Muzium Negara	228148	167309	60839
Pasar Seni	113787	83444	30343
Merdeka	44749	32816	11933
Bukit Bintang	492388	361085	131303
Tun Razak Exchange	45220	33161	12059

Cochrane	116406	85364	31042
Maluri	149024	109284	39740
Taman Pertama	50590	37099	13491
Taman Midah	74423	54577	19846
Taman Mutiara	116348	85322	31026
Taman Connaught	71520	52448	19072
Taman Suntex	75256	55188	20068
Sri Raya	57076	41856	15220
Bandar Tun Hussein Onn	76595	56170	20425
Batu 11 Cheras	72393	53088	19305
Bukit Dukong	70889	51985	18904
Sungai Jernih	70282	51540	18742
Stadium Kajang	196646	144207	52439
Kajang	173359	127130	46229

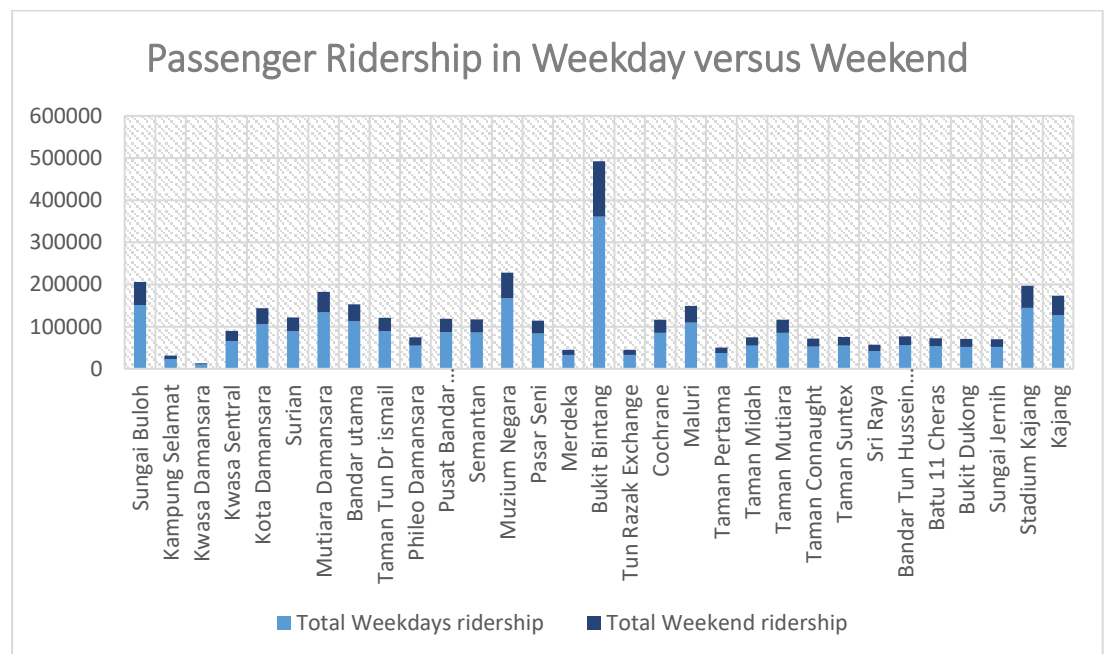


Figure 3.2 Passenger Ridership in July 2017

3.3 MRT Headway/Timetable

Table 3.2 shows the current train headway/timetable in MRT KGL. The table is tabulated based on the before the Covid 19 pandemic happen and during the pandemic occurred. The table shows that during the first Movement Control Order in March 2020 to 3rd May 2020, the time taken for the timetable and headway is longer than usual due to the full lockdown is implemented in Malaysia which contribute to the close of all the services. After the first MCO, the schedule seems to be reflected like normal service since some of the services were allowed to be operated.

Table 3.3 represents the duration of the train travel for MRT KGL from one station to the next station from northbound (NB) to southbound (SB). NB means the train moving toward Sungai Buloh station while SB means the train moving toward Kajang station. The duration is based on the train timetable set by the operator without considering a dwell time. Usually, in MRT KGL the dwell time is set between 16 to 30 seconds depending on the passenger crowd at the platform.

Table 3.2 The current train headway/timetable in MRT KGL.

Situation	Duration / Date	Week	Headway/ Timetable	Remarks
Non-Covid	1/1/2020 - 24/3/20	Weekdays	Timetable	Peak Hour: 4 mins AM Non-peak: 7 mins PM Off-peak: 8 mins
		Weekends	Timetable	9 mins
Covid (PKP/PKPB etc)	25/3/20- 3/5/20 (PKP)	Weekdays	Headway	Peak Hour: 10 mins Non-peak: 30 mins *no service between 1000H-1700H*
		Weekends	Headway	30 mins *no service between 1000H-1700H*

	4/5/2020 (PKPB)	Weekdays	Headway	Peak Hour: 4 mins AM Non-peak: 8mins PM Off-peak: 9 mins
		Weekends	Timetable	9 mins
	1/1/2021- 12/1/21	Weekdays	Timetable	Peak Hour: 4 mins AM Non-peak: 7 mins PM Off-peak: 8 mins
		Weekends	Timetable	9 mins
	13/1/2021- 12/1/21 (PKP 2.0 13/1/21)	Weekdays	Timetable	Peak Hour: 4 mins AM Non-peak: 7 mins PM Off-peak: 8 mins
		Weekends	Timetable	9 mins

Table 3.3 Train travel time between stations.

Station Name	Station Type	Distance between Next Station (km) SB	Duration (min)	Distance between Next Station (km) NB	Duration (min)
Sungai Buloh	Interchange	0	0	1.32	0
Kampung Selamat	Normal	1.32	2	2.73	6
Kwasa Damansara	Normal	2.72	6	1.13	6
Kwasa Sentral	Normal	1.13	6	2.94	6
Kota Damansara	Normal	2.94	5	1.69	5
Surian	Normal	1.69	6	1.96	5
Mutiara Damansara	Normal	1.96	5	1.58	5
Bandar Utama	Normal	1.58	5	1.83	5
Taman Tun Dr ismail	Normal	1.83	5	1.51	6

Phileo Damansara	Normal	1.51	5	3.05	6
Pusat Bandar Damansara	Normal	3.05	6	1.04	6
Semantan	Normal	1.04	6	3.30	7
Muzium Negara	Interchange	3.30	6	1.25	4
Pasar Seni	Interchange	1.18	6	0.68	4
Merdeka	Interchange	0.74	4	1.26	5
Bukit Bintang	Interchange	1.26	4	1.43	4
Tun Razak Exchange	Normal	1.43	5	1.02	4
Cochrane	Normal	1.11	4	1.17	5
Maluri	Interchange	1.17	3	1.69	5
Taman Pertama	Normal	1.69	5	1.06	4
Taman Midah	Normal	0.95	5	1.68	5
Taman Mutiara	Normal	1.79	4	1.52	5
Taman Connaught	Normal	1.43	4	2.31	5
Taman Suntex	Normal	2.31	5	1.56	4
Sri Raya	Normal	1.56	5	1.64	4
Bandar Tun Hussein Onn	Normal	1.64	4	0.73	4
Batu 11 Cheras	Normal	0.73	4	1.89	6
Bukit Dukong	Normal	1.89	4	3.30	5
Sungai Jernih	Normal	3.30	6	0.83	4
Stadium Kajang	Normal	0.83	5	1.53	2
Kajang	Interchange	1.53	4	0	0

3.4 ETAP Software

With the introduction of the new line of MRT, known as PYL. Some of the KGL stations have been migrated to PYL such as Kwasa Damansara, Kampung Selamat, Sungai Buloh, and Tun Razak Exchange Stations. The migrated mean previously the station belongs to KGL in terms of operation and revenue collection, but later will be changed to PYL. Figure 3.3 shows the whole rail integrated line map in Klang Valley. The KGL is represented by Green Line while PYL represents by Yellow Line.

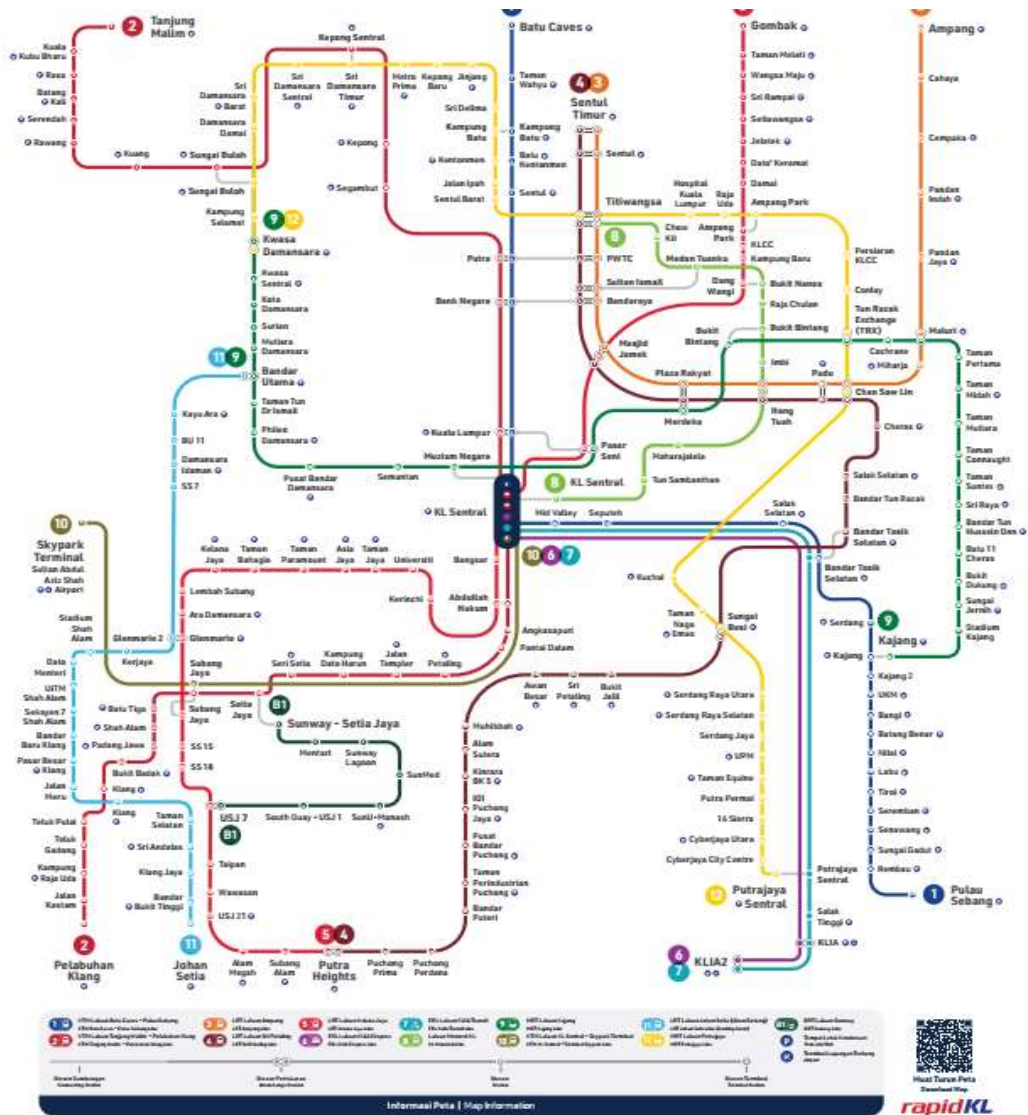


Figure 3.3 The Klang Valley integrated transit map

ETAP is the Global Market and Technology Leader of power system solutions. It is the most comprehensive and integrated model-driven solution. In this section, the train model is developed using the ETAP software. The train model is based on the PYL traction power system. The purpose of the model is to evaluate the optimization of the KGL timetable in Table 3.2 into the PYL traction power system. Table 3.4 shows the distance of the PYL station. Compared to the 15 stations in Table 3.3 and Table 3.4, the KGL seems to have a long station distance compared to PYL.

In Table 3.4, the distance of the station is different when considering the reading of the station from southbound and northbound. For example, Kepong Sentral. When the station is read toward northbound (to Damansara Damai), the distance between Kepong Sentral to Sri Damansara East is 1.522km. Meanwhile, when the station is read toward southbound (to Kampung Baru North), the distance between Sri Damansara East to Kepong Sentral is 1.376 km. This distance is different due to track alignment and structure.

Table 3.4 The distance of PYL station.

Station Name	Station Type	Distance between Next Station (km) to Kampung Baru North	Distance between Next Station (km) from Kampung Baru North
Damansara Damai	Normal	0	1.757
Sri Damansara West	Normal	1.761	1.519
Sri Damansara East	Normal	1.522	1.376
Kepong Sentral	Interchange	1.379	1.694
Metro Prima	Normal	1.693	0.944
Kepong Baru	Normal	0.932	0.926
Jinjang	Normal	0.928	1.142
Sri Delima	Normal	1.134	1.187
Kampung Batu	Normal	1.178	1.291
Kentonmen	Interchange	1.284	0.728
Jalan Ipoh	Normal	0.730	1.331
Sentul West	Normal	1.341	1.413
Titivangsa	Normal	1.425	0.630
Hospital Kuala Lumpur	Normal	0.617	1.350
Kampung Baru North	Normal	1.351	0

The train model is shown in Figure 3.4 The PYL traction schematic diagram with the parameter configured shown in Figure 3.6.

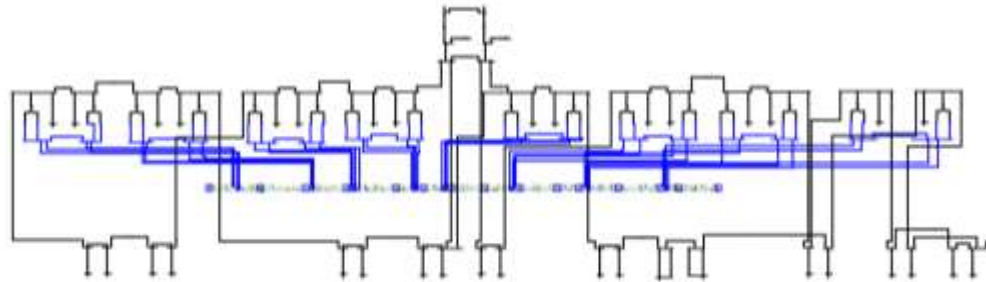


Figure 3.4 The PYL traction schematic diagram

The parameter is configured based on the different number of trains and headway in Table 3.5. The reason for the several numbers of trains is to catch up with the headway.

Table 3.5 Parameter data

Train number	Headway (min)
5, 10, 15 and 20	4
	7
	8
	9
	10
	30

Before performing the simulation, the Scheduled ID and parameters are set in ETAP as shown Figure 3.5 and Figure 3.6.

CHAPTER 4

Results and Discussions

For this project, the train model is run at a specified time during peak hours 7 am to 9 am. The reason for the time selection is due to system limitation to have multiple time frames in one day. Hence it is impossible to run several headways in one day. After running the train model based on the several test cases in Table 3.5 into Figure 3.5. The simulation results and graphs are shown in this chapter. Train up or Southbound mean the train from Damansara Damai to Kampung Baru North Station, while train down means train from Kampung Baru North to Damansara Damai station.

Figure 4.1 until Figure 4.5 show the graphs when the train model is simulated using 5 trains in 4 minutes. From the simulation, a total 5 number of trains will start the journey from the Damansara Damai to Kampung Baru North Station by taking turns based on the headway of 4min. The first train will start the trip at 7.00 am followed by the second train at 7.04 am until the fifth train at 7.16 am.

Table 4.1 Train Schedule for T1 up
Table 4.1 represents the train schedule for Train number 1 (T1) in 4minute headway. For example, in Figure 4.1, the graph pattern is rise and down, due to the speed increasing and decreasing. When T1 starts to depart from Damansara Damai at 7:00:00 am, it will start to accelerate in speed. When the distance of T1 is half from the arrival station, the train starts to decelerate in speed and arrival at Sri Damansara West at 7:01:54 am. This concurs with the data in Table 4.1.

Moreover, the dwell time is represented when the graph is equal to 0 in a few seconds. The time for the train to travel from Damansara Damai station to Kampung Baru North Station takes about 27 min 55sec. Trip in second on the table train schedule represents the difference of the train travel excluding dwell time from one station to the next station. The reading is different for train

up and train down. For example, in Table 4.1, T1 departs from Kepong Baru at 7:10.55AM and departs from the next station Jinjang at 7:12:39 AM. Hence the difference between both times is 104 sec. Since dwell time is not considered as part of the trip, hence the trip is 74sec after 30sec is deducted from a different time.

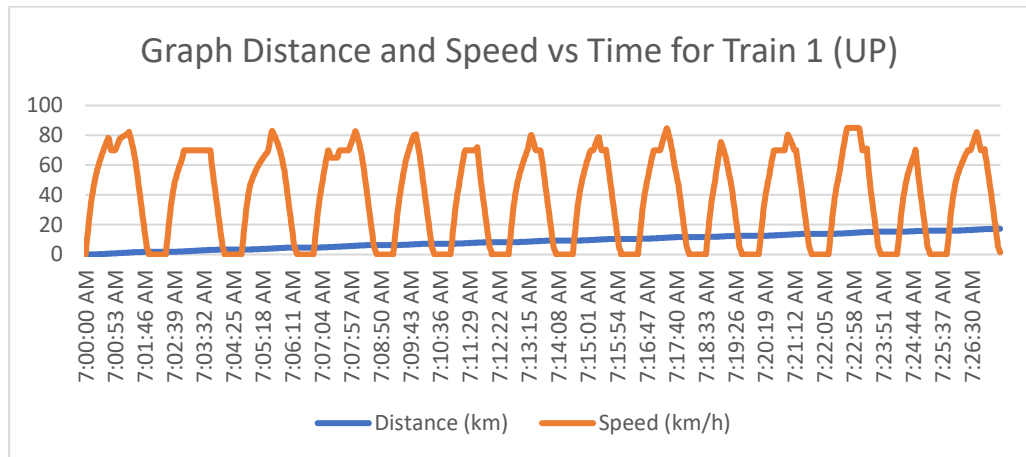


Figure 4.1 T1 with 4min headway (up)

Table 4.1 Train Schedule for T1 up

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell		Trip
					Seconds	Departure	
TrackRoute1	STrainUP_4min	STrain4min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	STrainUP_4min	STrain4min	Sri Damansara West	7:01:54	30	7:02:24	106
TrackRoute1	STrainUP_4min	STrain4min	Sri Damansara East	7:04:10	30	7:04:40	99
TrackRoute1	STrainUP_4min	STrain4min	Kepong Sentral	7:06:19	30	7:06:49	113
TrackRoute1	STrainUP_4min	STrain4min	Metro Prima	7:08:42	30	7:09:12	73
TrackRoute1	STrainUP_4min	STrain4min	Kepong Baru	7:10:25	30	7:10:55	74
TrackRoute1	STrainUP_4min	STrain4min	Jinjang	7:12:09	30	7:12:39	85
TrackRoute1	STrainUP_4min	STrain4min	Sri Delima	7:14:04	30	7:14:34	87
TrackRoute1	STrainUP_4min	STrain4min	Kampung Batu	7:16:01	30	7:16:31	92
TrackRoute1	STrainUP_4min	STrain4min	Kentonmen	7:18:03	30	7:18:33	65
TrackRoute1	STrainUP_4min	STrain4min	Jalan Ipoh	7:19:38	30	7:20:08	95
TrackRoute1	STrainUP_4min	STrain4min	Sentul West	7:21:43	30	7:22:13	93
TrackRoute1	STrainUP_4min	STrain4min	Titivangsa	7:23:46	30	7:24:16	59
TrackRoute1	STrainUP_4min	STrain4min	Hospital Kuala Lumpur	7:25:15	30	7:25:45	96
TrackRoute1	STrainUP_4min	STrain4min	Kampung Baru North	7:27:21	30	7:27:51	0

Table 4.1 Train Schedule for T1 up
 Table 4.2 Train Schedule for T2 up
 represents the train schedule for Train number 2 (T2) in 4minute headway. For example, in Figure 4.2 T2 with 4min headway (up), the graph pattern is rise and down, due to the speed increasing and decreasing. When T2 starts to depart from Damansara Damai at 7:04:00 am, it will start to accelerate in speed. When the distance of T2 is half from the arrival station, the train starts to

decelerate in speed and arrival at Sri Damansara West at 7:05:54 am. This concurs with the data in Table 4.2 Train Schedule for T2 up

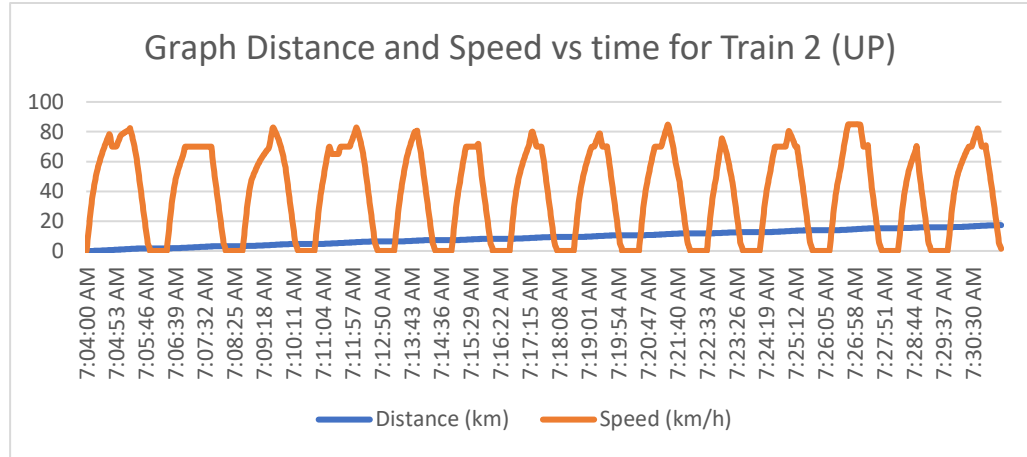


Figure 4.2 T2 with 4min headway (up)

Table 4.2 Train Schedule for T2 up

0							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
					Seconds		Seconds
TrackRoute1	5TrainUP_4min	5Train4min1	Damansara Damai	7:03:30	30	7:04:00	114
TrackRoute1	5TrainUP_4min	5Train4min1	Sri Damansara West	7:05:54	30	7:06:24	106
TrackRoute1	5TrainUP_4min	5Train4min1	Sri Damansara East	7:08:10	30	7:08:40	99
TrackRoute1	5TrainUP_4min	5Train4min1	Kepong Sentral	7:10:19	30	7:10:49	113
TrackRoute1	5TrainUP_4min	5Train4min1	Metro Prima	7:12:42	30	7:13:12	73
TrackRoute1	5TrainUP_4min	5Train4min1	Kepong Baru	7:14:25	30	7:14:55	74
TrackRoute1	5TrainUP_4min	5Train4min1	Jinjang	7:16:09	30	7:16:39	85
TrackRoute1	5TrainUP_4min	5Train4min1	Sri Delima	7:18:04	30	7:18:34	87
TrackRoute1	5TrainUP_4min	5Train4min1	Kampung Batu	7:20:01	30	7:20:31	92
TrackRoute1	5TrainUP_4min	5Train4min1	Kentonmen	7:22:03	30	7:22:33	65
TrackRoute1	5TrainUP_4min	5Train4min1	Jalan Ipoh	7:23:38	30	7:24:08	95
TrackRoute1	5TrainUP_4min	5Train4min1	Sentul West	7:25:43	30	7:26:13	93
TrackRoute1	5TrainUP_4min	5Train4min1	Titivangsa	7:27:46	30	7:28:16	59
TrackRoute1	5TrainUP_4min	5Train4min1	Hospital Kuala Lumpur	7:29:15	30	7:29:45	96
TrackRoute1	5TrainUP_4min	5Train4min1	Kampung Baru North	7:31:21	30	7:31:51	0

Table 4.1 Train Schedule for T1 up Table 4.3 represent the train schedule for Train number 3 (T3) in 4minute headway. For example, in Figure 4.2 T2 with 4min headway (up), the graph pattern is rise and down, due to the speed increasing and decreasing. When T3 starts to depart from Damansara Damai at 7:08:00 am, it will start to accelerate in speed. When the distance of T3 is half from the arrival station, the train starts to decelerate in speed and arrival at Sri Damansara West at 7:09:54 am. This concurs with the data in Table 4.3.

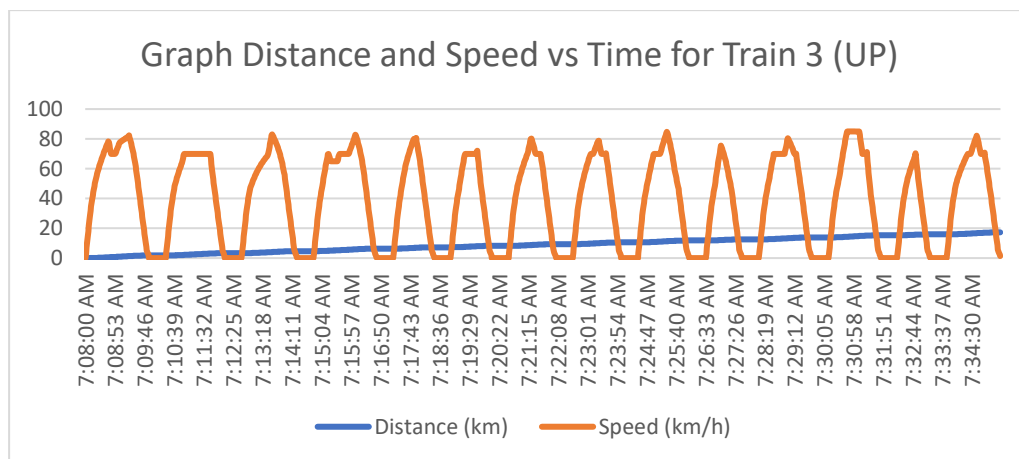


Figure 4.3 T3 with 4min headway (up)

Table 4.3 Train Schedule for T3 up

0							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
					Seconds		Seconds
TrackRoute1	5TrainUP_4min	5Train4min2	Damansara Damai	7:07:30	30	7:08:00	114
TrackRoute1	5TrainUP_4min	5Train4min2	Sri Damansara West	7:09:54	30	7:10:24	106
TrackRoute1	5TrainUP_4min	5Train4min2	Sri Damansara East	7:12:10	30	7:12:40	99
TrackRoute1	5TrainUP_4min	5Train4min2	Kepong Sentral	7:14:19	30	7:14:49	113
TrackRoute1	5TrainUP_4min	5Train4min2	Metro Prima	7:16:42	30	7:17:12	73
TrackRoute1	5TrainUP_4min	5Train4min2	Kepong Baru	7:18:25	30	7:18:55	74
TrackRoute1	5TrainUP_4min	5Train4min2	Jinjang	7:20:09	30	7:20:39	85
TrackRoute1	5TrainUP_4min	5Train4min2	Sri Delima	7:22:04	30	7:22:34	87
TrackRoute1	5TrainUP_4min	5Train4min2	Kampung Batu	7:24:01	30	7:24:31	92
TrackRoute1	5TrainUP_4min	5Train4min2	Kentonmen	7:26:03	30	7:26:33	65
TrackRoute1	5TrainUP_4min	5Train4min2	Jalan Ipoh	7:27:38	30	7:28:08	95
TrackRoute1	5TrainUP_4min	5Train4min2	Sentul West	7:29:43	30	7:30:13	93
TrackRoute1	5TrainUP_4min	5Train4min2	Titivangsa	7:31:46	30	7:32:16	59
TrackRoute1	5TrainUP_4min	5Train4min2	Hospital Kuala Lumpur	7:33:15	30	7:33:45	96
TrackRoute1	5TrainUP_4min	5Train4min2	Kampung Baru North	7:35:21	30	7:35:51	0

Table 4.1 Train Schedule for T1 up Table 4.4 represent the train schedule for Train number 4 (T4) in 4minute headway. For example, in Figure 4.2 T2 with 4min headway (up), the graph pattern is rise and down, due to the speed increasing and decreasing. When T4 starts to depart from Damansara Damai at 7:12:00 am, it will start to accelerate in speed. When the distance of T4 is half from the arrival station, the train starts to decelerate in speed and arrival at Sri Damansara West at 7:13:54 am. This concurs with the data in Table 4.2 Train Schedule for T2 up

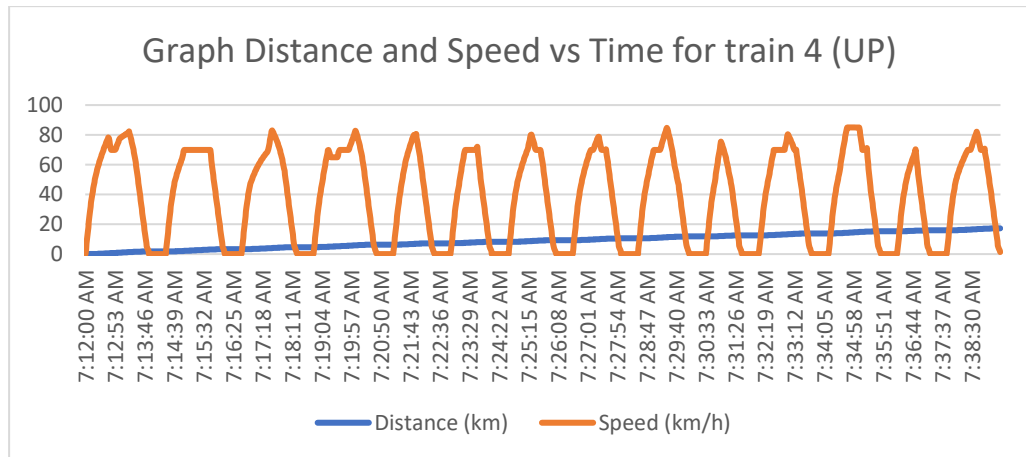


Figure 4.4 T4 with 4min headway (up)

Table 4.4 Train Schedule for T4 up

0							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
					Seconds		Seconds
TrackRoute1	5TrainUP_4min	5train4min3	Damansara Damai	7:11:30	30	7:12:00	114
TrackRoute1	5TrainUP_4min	5train4min3	Sri Damansara West	7:13:54	30	7:14:24	106
TrackRoute1	5TrainUP_4min	5train4min3	Sri Damansara East	7:16:10	30	7:16:40	99
TrackRoute1	5TrainUP_4min	5train4min3	Kepong Sentral	7:18:19	30	7:18:49	113
TrackRoute1	5TrainUP_4min	5train4min3	Metro Prima	7:20:42	30	7:21:12	73
TrackRoute1	5TrainUP_4min	5train4min3	Kepong Baru	7:22:25	30	7:22:55	74
TrackRoute1	5TrainUP_4min	5train4min3	Jinjang	7:24:09	30	7:24:39	85
TrackRoute1	5TrainUP_4min	5train4min3	Sri Delima	7:26:04	30	7:26:34	87
TrackRoute1	5TrainUP_4min	5train4min3	Kampung Batu	7:28:01	30	7:28:31	92
TrackRoute1	5TrainUP_4min	5train4min3	Kentonmen	7:30:03	30	7:30:33	65
TrackRoute1	5TrainUP_4min	5train4min3	Jalan Ipoh	7:31:38	30	7:32:08	95
TrackRoute1	5TrainUP_4min	5train4min3	Sentul West	7:33:43	30	7:34:13	93
TrackRoute1	5TrainUP_4min	5train4min3	Titivangsa	7:35:46	30	7:36:16	59
TrackRoute1	5TrainUP_4min	5train4min3	Hospital Kuala Lumpur	7:37:15	30	7:37:45	96
TrackRoute1	5TrainUP_4min	5train4min3	Kampung Baru North	7:39:21	30	7:39:51	0

Table 4.1 Train Schedule for T1 up Table 4.5 represent the train schedule for Train number 5 (T5) in 4minute headway. For example, in Figure 4.2 T2 with 4min headway (up), the graph pattern is rise and down, due to the speed increasing and decreasing. When T5 starts to depart from Damansara Damai at 7:16:00 am, it will start to accelerate in speed. When the distance of T5 is half from the arrival station, the train starts to decelerate in speed and arrival at Sri Damansara West at 7:17:54 am. This concurs with the data in Table 4.5 Table 4.2 Train Schedule for T2 up

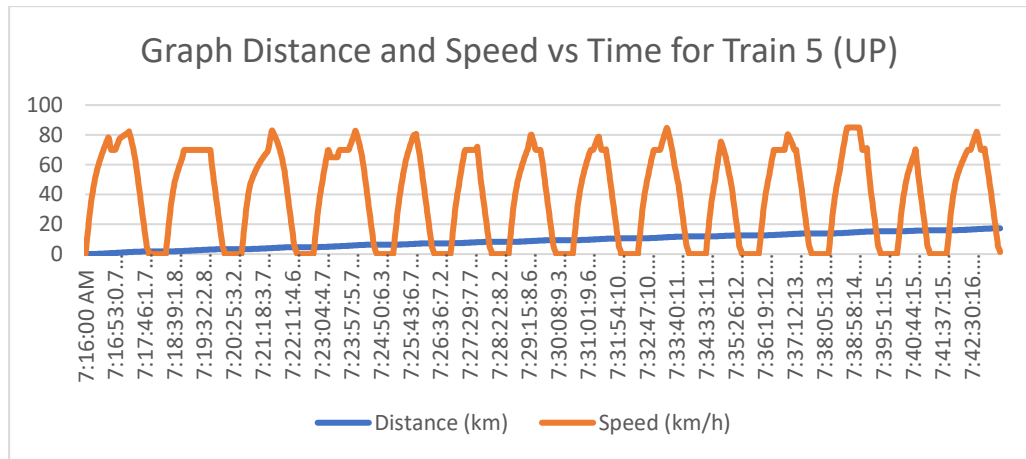


Figure 4.5 T5 with 4min headway (up)

Table 4.5 Train Schedule for T5 up

0							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
				Seconds		Seconds	
TrackRoute1	5TrainUP_4min	5train4min4	Damansara Damai	7:15:30	30	7:16:00	114
TrackRoute1	5TrainUP_4min	5train4min4	Sri Damansara West	7:17:54	30	7:18:24	106
TrackRoute1	5TrainUP_4min	5train4min4	Sri Damansara East	7:20:10	30	7:20:40	99
TrackRoute1	5TrainUP_4min	5train4min4	Kepong Sentral	7:22:19	30	7:22:49	113
TrackRoute1	5TrainUP_4min	5train4min4	Metro Prima	7:24:42	30	7:25:12	73
TrackRoute1	5TrainUP_4min	5train4min4	Kepong Baru	7:26:25	30	7:26:55	74
TrackRoute1	5TrainUP_4min	5train4min4	Jinjang	7:28:09	30	7:28:39	85
TrackRoute1	5TrainUP_4min	5train4min4	Sri Delima	7:30:04	30	7:30:34	87
TrackRoute1	5TrainUP_4min	5train4min4	Kampung Batu	7:32:01	30	7:32:31	92
TrackRoute1	5TrainUP_4min	5train4min4	Kentonmen	7:34:03	30	7:34:33	65
TrackRoute1	5TrainUP_4min	5train4min4	Jalan Ipoh	7:35:38	30	7:36:08	95
TrackRoute1	5TrainUP_4min	5train4min4	Sentul West	7:37:43	30	7:38:13	93
TrackRoute1	5TrainUP_4min	5train4min4	Titivangsa	7:39:46	30	7:40:16	59
TrackRoute1	5TrainUP_4min	5train4min4	Hospital Kuala Lumpur	7:41:15	30	7:41:45	96
TrackRoute1	5TrainUP_4min	5train4min4	Kampung Baru North	7:43:21	30	7:43:51	0

Figure 4.6 until Figure 4.10 show the graphs when the train model is simulated using 5 trains in 4 minutes. From the simulation, a total 5 number of trains will start the journey from the Kampung Baru North to Damansara Damai Station by taking turns based on the headway of 4min. The first train will start the trip at 7.00 am followed by the second train at 7.04 am until the fifth train at 7.16 am.

Table 4.6 represent the train schedule for Train number 1 (T1) in a 4minute headway. For example, in Figure 4.6, the graph pattern is rise and down, due to the speed increasing and decreasing. When T1 starts to depart from Kampung Baru North at 7:00:00 am, it will start to accelerate in speed. When the distance of T1 is half from the arrival station, the train starts to

decelerate in speed and arrival at Hospital Kuala Lumpur at 7:01:37 am. This concurs with the data Table 4.6.

Moreover, the dwell time is represented when the graph is equal to 0 in a few seconds. The time for the train to travel from Kampung Baru North station to Damansara Damai Station takes about 27 min 51 sec. Trip in second on the table train schedule represents the difference of the train travel excluding dwell time from one station to the next station. The reading is different for train up and train down. For example, in Table 4.6, T1 departs from Kepong Baru at 7:17:10 AM and departs from the next station Metro Prima at 7:18:54 AM. Hence the difference between both times is 104 sec. Since dwell time is not considered as part of the trip, hence the trip is 74sec after 30 sec is deducted from a different time.

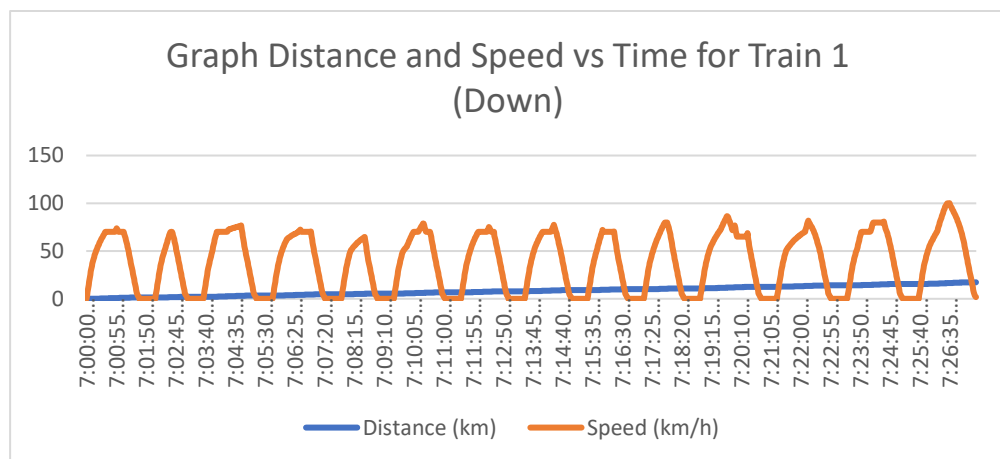


Figure 4.6 T1 with 4min headway (down)

Table 4.6 Train Schedule for T1 down

0							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
					Seconds		Seconds
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Hospital Kuala Lumpur	7:01:37	30	7:02:07	59
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Titiwangsa	7:03:06	30	7:03:36	98
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Sentul West	7:05:14	30	7:05:44	97
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Jalan Ipoh	7:07:21	30	7:07:51	67
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Kentonmen	7:08:58	30	7:09:28	94
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Kampung Batu	7:11:02	30	7:11:32	88
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Sri Delima	7:13:00	30	7:13:30	86
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Jinjang	7:14:56	30	7:15:26	74
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Kepong Baru	7:16:40	30	7:17:10	74
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Metro Prima	7:18:24	30	7:18:54	112
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Kepong Sentral	7:20:46	30	7:21:16	100
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Sri Damansara East	7:22:56	30	7:23:26	102
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Sri Damansara West	7:25:08	30	7:25:38	107
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Damansara Damai	7:27:25	30	7:27:55	0

Table 4.7 represent the train schedule for Train number 2 (T2) in 4minute headway. For example, in Figure 4.7Figure 4.6, the graph pattern is rise and down, due to the speed increasing and decreasing. When T2 starts to depart from Kampung Baru North at 7:04:00 am, it will start to accelerate in speed. When the distance of T2 is half from the arrival station, the train starts to decelerate in speed and arrival at Hospital Kuala Lumpur at 7:05:37 am. This concurs with the data Table 4.7.

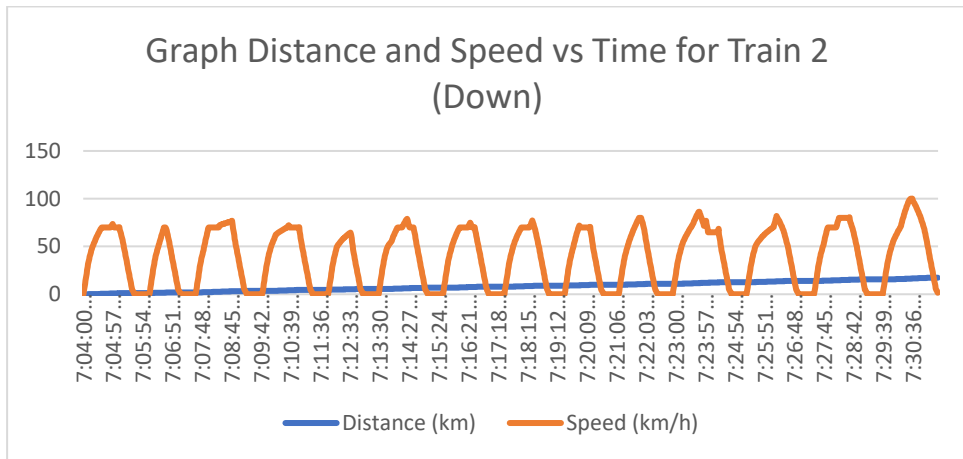


Figure 4.7 T2 with 4min headway (down)

Table 4.7 Train Schedule for T2 down

0							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
					Seconds		Seconds
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Kampung Baru North	7:03:30	30	7:04:00	97
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Hospital Kuala Lumpur	7:05:37	30	7:06:07	59
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Titiwangsa	7:07:06	30	7:07:36	98
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Sentul West	7:09:14	30	7:09:44	97
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Jalan Ipoh	7:11:21	30	7:11:51	67
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Kentonmen	7:12:58	30	7:13:28	94
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Kampung Batu	7:15:02	30	7:15:32	88
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Sri Delima	7:17:00	30	7:17:30	86
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Jinjang	7:18:56	30	7:19:26	74
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Kepong Baru	7:20:40	30	7:21:10	74
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Metro Prima	7:22:24	30	7:22:54	112
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Kepong Sentral	7:24:46	30	7:25:16	100
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Sri Damansara East	7:26:56	30	7:27:26	102
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Sri Damansara West	7:29:08	30	7:29:38	107
TrackRoute2	5TrainDown_4min	5train4min(PH)1	Damansara Damai	7:31:25	30	7:31:55	0

Table 4.8 represent the train schedule for Train number 3 (T3) in 4minute headway. For example, in Figure 4.8Figure 4.6, the graph pattern is rise and down, due to the speed increasing and decreasing. When T3 starts to depart from Kampung Baru North at 7:08:00 am, it will start to accelerate in speed. When the distance of T3 is half from the arrival station, the train starts to decelerate in speed and arrival at Hospital Kuala Lumpur at 7:09:37 am. This concurs with the data Table 4.8.

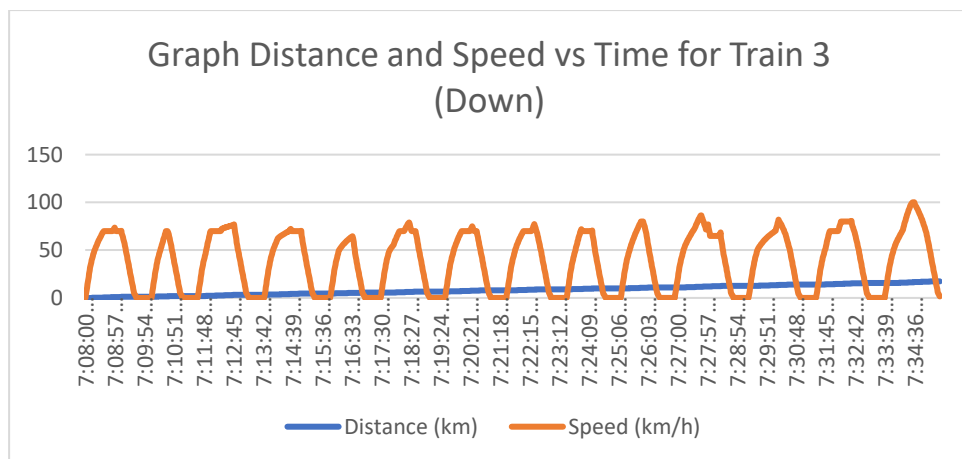


Figure 4.8 T3 with 4min headway (down)

Table 4.8 Train Schedule for T3 down

0							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
					Seconds		Seconds
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Kampung Baru North	7:07:30	30	7:08:00	97
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Hospital Kuala Lumpur	7:09:37	30	7:10:07	59
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Titiwangsa	7:11:06	30	7:11:36	98
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Sentul West	7:13:14	30	7:13:44	97
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Jalan Ipoh	7:15:21	30	7:15:51	67
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Kentonmen	7:16:58	30	7:17:28	94
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Kampung Batu	7:19:02	30	7:19:32	88
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Sri Delima	7:21:00	30	7:21:30	86
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Jinjang	7:22:56	30	7:23:26	74
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Kepong Baru	7:24:40	30	7:25:10	74
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Metro Prima	7:26:24	30	7:26:54	112
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Kepong Sentral	7:28:46	30	7:29:16	100
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Sri Damansara East	7:30:56	30	7:31:26	102
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Sri Damansara West	7:33:08	30	7:33:38	107
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Damansara Damai	7:35:25	30	7:35:55	0

Table 4.9 represent the train schedule for Train number 4 (T4) in 4minute headway. For example, in Figure 4.9Figure 4.6, the graph pattern is rise and down, due to the speed increasing and decreasing. When T4 starts to depart from Kampung Baru North at 7:12:00 am, it will start to accelerate in speed. When the distance of T4 is half from the arrival station, the train starts to decelerate in speed and arrival at Hospital Kuala Lumpur at 7:13:37 am. This concurs with the data Table 4.9.

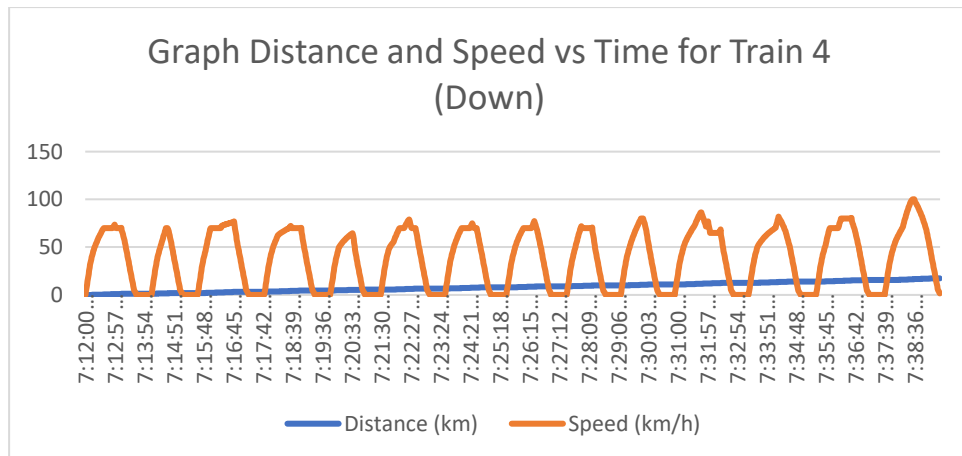


Figure 4.9 T4 with 4min headway (down)

Table 4.9 Train Schedule for T4 down

0							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
					Seconds		Seconds
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Kampung Baru North	7:11:30	30	7:12:00	97
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Hospital Kuala Lumpur	7:13:37	30	7:14:07	59
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Titiwangsa	7:15:06	30	7:15:36	98
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Sentul West	7:17:14	30	7:17:44	97
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Jalan Ipoh	7:19:21	30	7:19:51	67
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Kentonmen	7:20:58	30	7:21:28	94
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Kampung Batu	7:23:02	30	7:23:32	88
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Sri Delima	7:25:00	30	7:25:30	86
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Jinjang	7:26:56	30	7:27:26	74
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Kepong Baru	7:28:40	30	7:29:10	74
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Metro Prima	7:30:24	30	7:30:54	112
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Kepong Sentral	7:32:46	30	7:33:16	100
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Sri Damansara East	7:34:56	30	7:35:26	102
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Sri Damansara West	7:37:08	30	7:37:38	107
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Damansara Damai	7:39:25	30	7:39:55	0

Table 4.10 represent the train schedule for Train number 5 (T5) in 4minute headway. For example, in Figure 4.10Figure 4.6, the graph pattern is rise and down, due to the speed increasing and decreasing. When T5 starts to depart from Kampung Baru North at 7:16:00 am, it will start to accelerate in speed. When the distance of T5 is half from the arrival station, the train starts to decelerate in speed and arrival at Hospital Kuala Lumpur at 7:17:37 am. This concurs with the data Table 4.10.

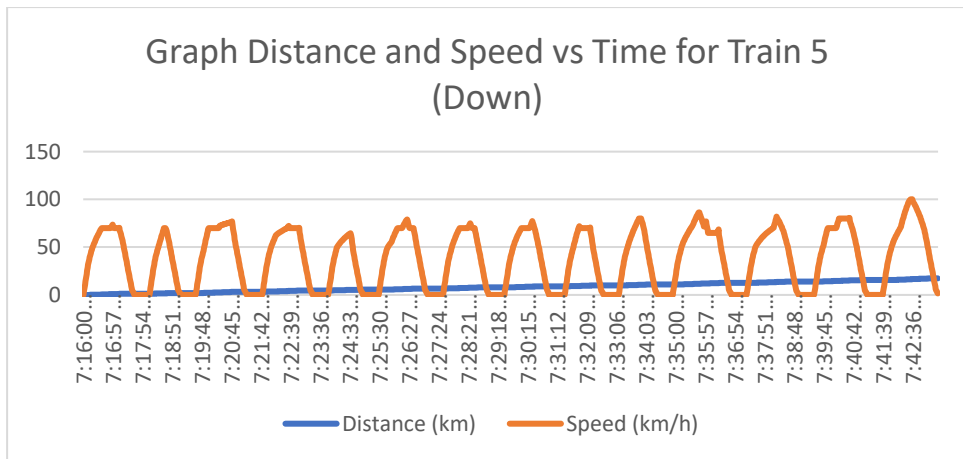


Figure 4.10 T5 with 4min headway (down)

Table 4.10 Train Schedule for T5 down

0							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
					Seconds		Seconds
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Kampung Baru North	7:15:30	30	7:16:00	97
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Hospital Kuala Lumpur	7:17:37	30	7:18:07	59
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Titiwangsa	7:19:06	30	7:19:36	98
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Sentul West	7:21:14	30	7:21:44	97
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Jalan Ipoh	7:23:21	30	7:23:51	67
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Kentonmen	7:24:58	30	7:25:28	94
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Kampung Batu	7:27:02	30	7:27:32	88
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Sri Delima	7:29:00	30	7:29:30	86
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Jinjang	7:30:56	30	7:31:26	74
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Kepong Baru	7:32:40	30	7:33:10	74
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Metro Prima	7:34:24	30	7:34:54	112
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Kepong Sentral	7:36:46	30	7:37:16	100
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Sri Damansara East	7:38:56	30	7:39:26	102
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Sri Damansara West	7:41:08	30	7:41:38	107
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Damansara Damai	7:43:25	30	7:43:55	0

The difference between the time taken for the train to move to/from northbound and southbound is 4sec. This is because the distance between the station is different as explained in Table 3.4. Moreover, it is due to the speed limit configured based on the design requirement as shown in Figure 4.11 The speed limit configuration

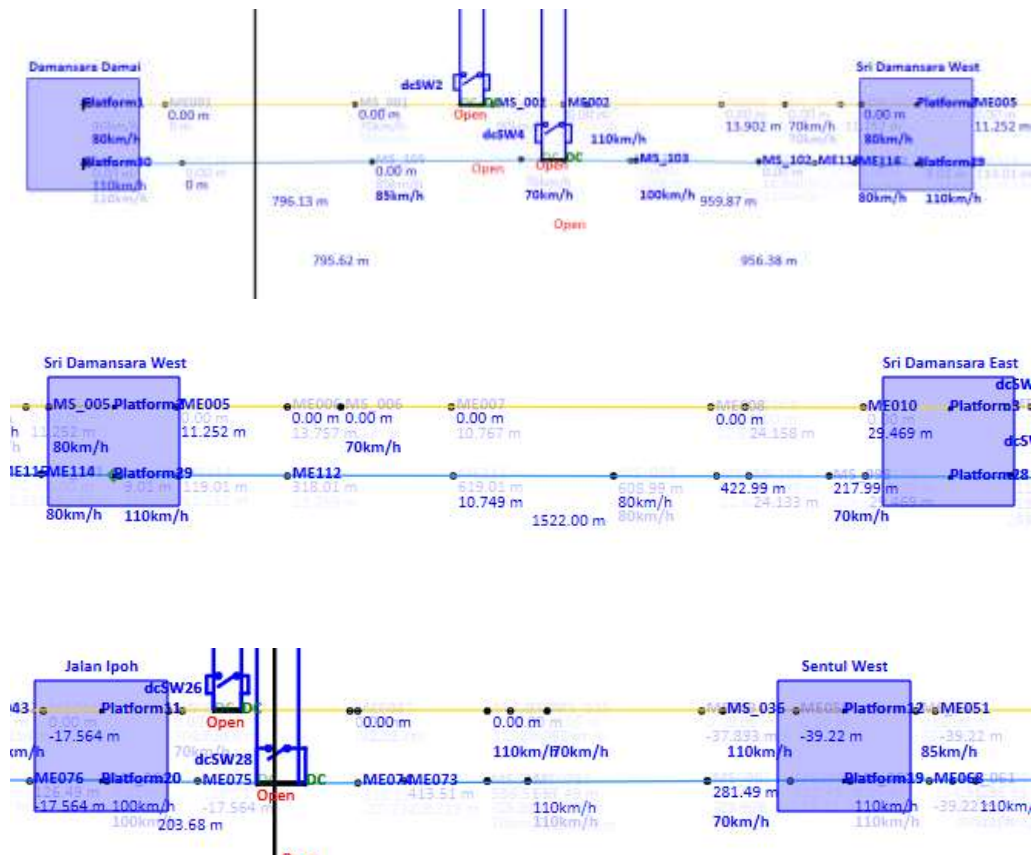


Figure 4.11 The speed limit configuration

Figure 4.12 to Figure 4.17 shows the graph of speed versus time/headway with difference train number and different headway. Figure 4.12 shows the combined all 5 trains up with 4 min headway in one graph. Figure 4.13 shows the combined all 5 trains down with 4 min headway in one graph. Figure 4.14 shows the combined all 15 trains up with 4 min headway in one graph. Figure 4.15 shows the combined all 15 trains down with 7 min headway in one graph. Figure 4.16 shows the combined all 5 trains up with 10 min headway in one graph. Figure 4.17 shows the combined all 20 trains up with 30 min headway in one graph.

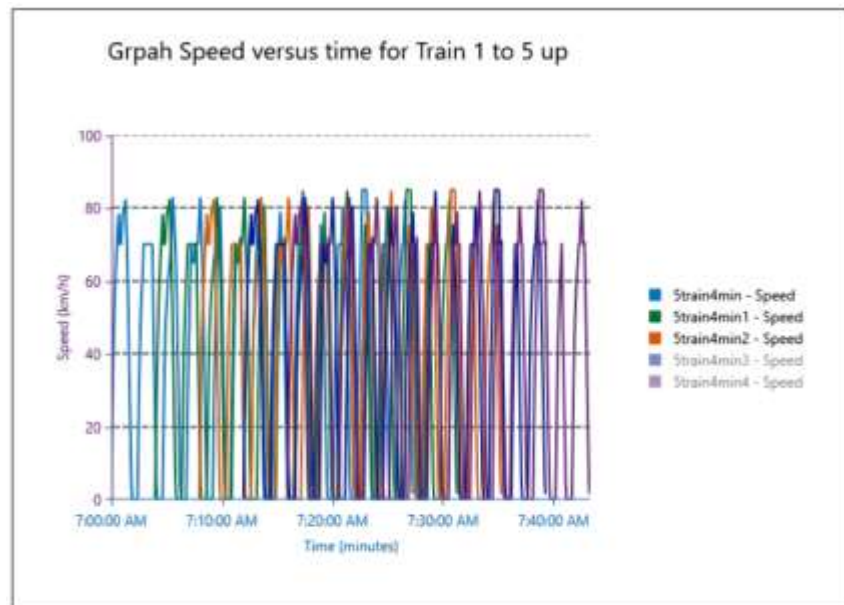


Figure 4.12 Combine graph for train up when headway 4min

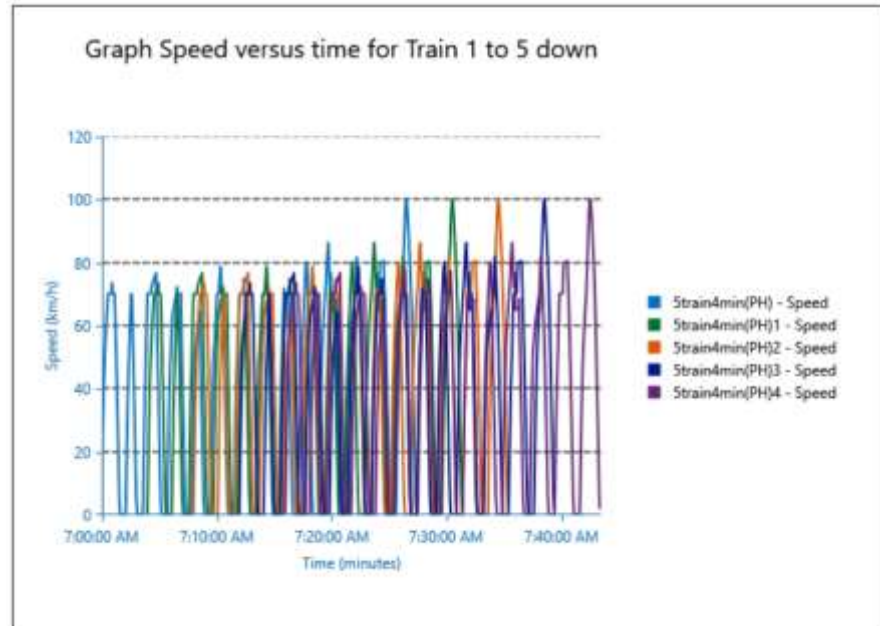


Figure 4.13 Combine graph for train down when headway 4min.

From all the graphs, the pattern of the graph looks very identical for train up with different headway and train down with different headway. This is because the model has been designed to have a fixed speed limit at a specified place. Moreover, the time frame for the graph is 7.00 am to 11.00 am, so any graph beyond the time will not be shown. This is explained by Figure 4.17, where only 8 train graphs were shown instead of 20 trains. Moreover, compare with another graph, the graph in Figure 4.17 is not overlap with another train graph. This is because the time taken for the train to travel from both terminuses (Damansara Damai to Kampung Baru North Stations) is 27min.

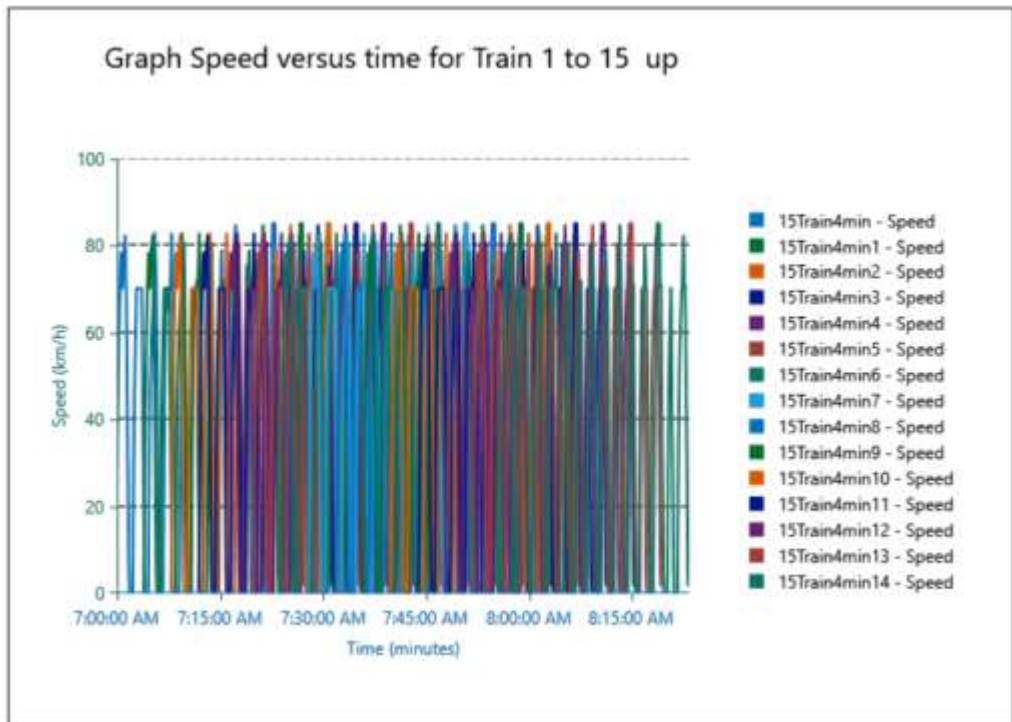


Figure 4.14 Combine graph for train up when headway 4 min.

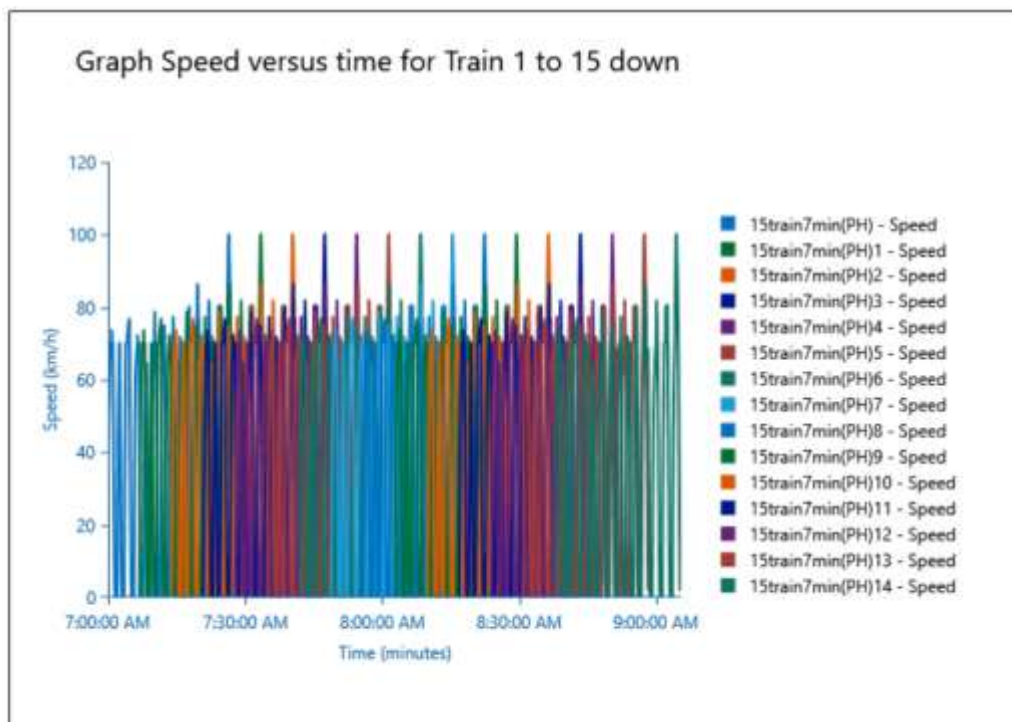


Figure 4.15 Combine graph for train down when headway 7min.

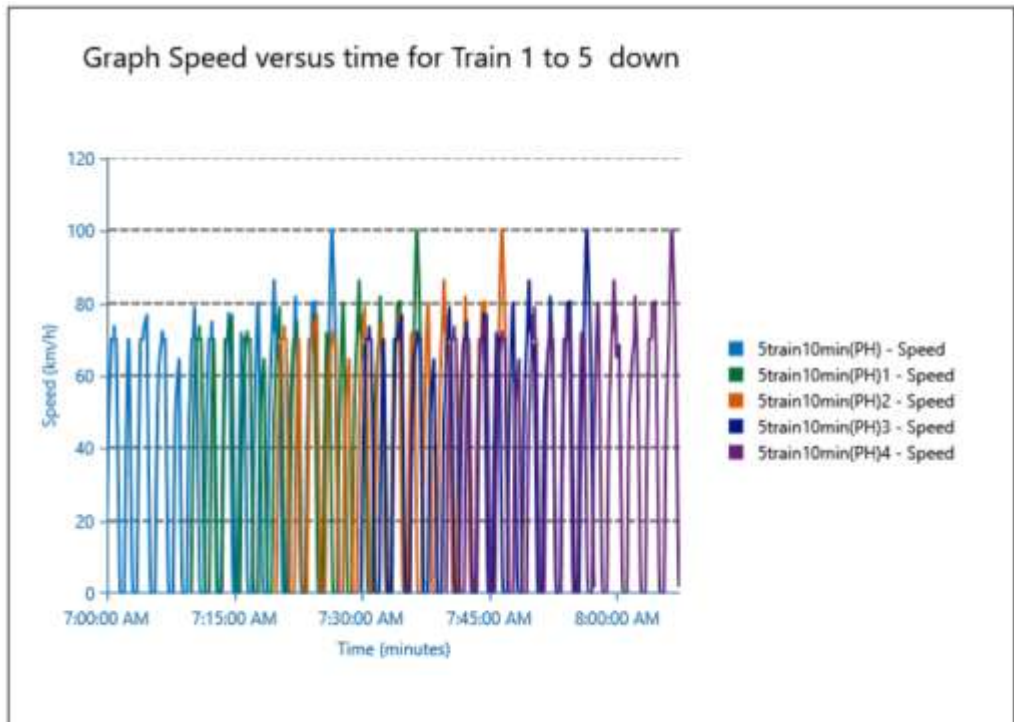


Figure 4.16 Combine graph for train down when headway 10min.

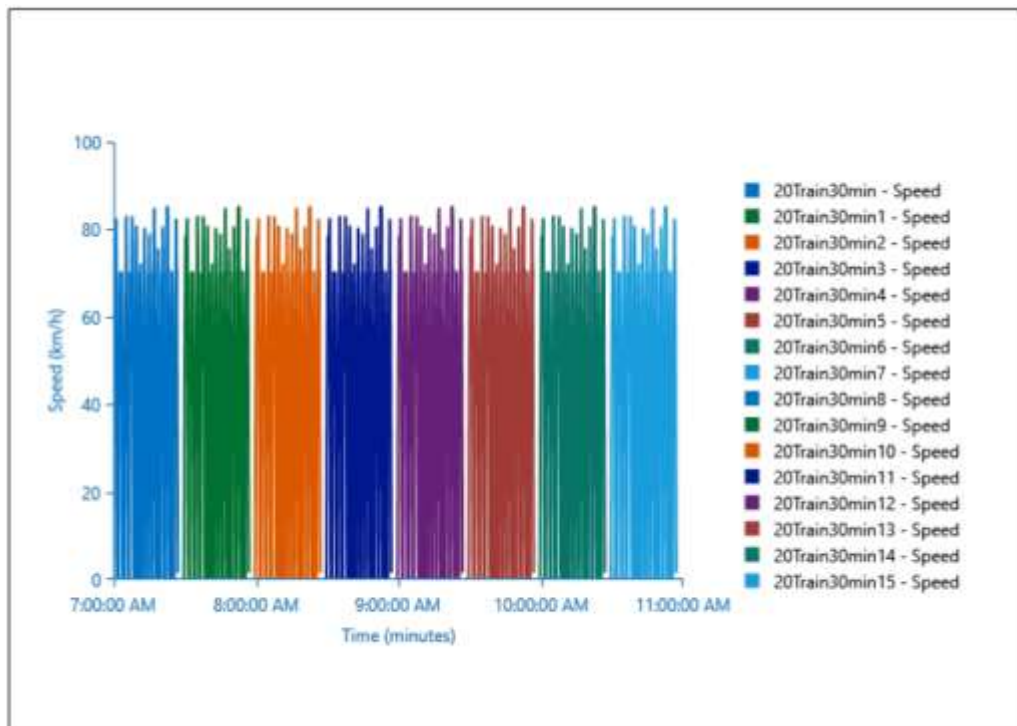


Figure 4.17 Combine graph for train up when headway 30 min.

The combined train schedule is summarized in Figure 4.18 and Table 4.11. Figure 4.18 shows that the number of trains and headway had influenced the train schedule. For train headway is 4min, it requires 1 hour 43 min 51 sec for 20 train to complete the trip from Damansara Damai to Kampung Baru North Stations. While 43 minutes is required for 5 trains to complete the trip. Meanwhile, train headway is 30 min, it requires 5-hour 57 min 51 sec for 20 trains to complete the trip from Damansara Damai to Kampung Baru North Stations. While 2-hour 27 min 51 sec is required for 5 train to complete the trip. The time is calculated starting from the first train moves at 7.00 am until the last train.

Since the train model is simulated in peak hours between 9 am to 11 am. The train with 30 min headway is not suitable to be used during the peak hour, as it will cause passenger congestion at the platform due to long waiting time. It is explained, if only one train is used by the operator to travel between NB and SB, the passenger who waiting at Damansara Damai station needs to wait almost 1 hour until the train returned to Damansara Damai. This is because for the train to travel to NB takes about 27 min while returning from SB takes another 27 min with a total of 56 min.

From Table 4.11 , it is verified that the headway used in Methodology Table 3.2 is the optimized timetable/headway. This is confirmed when the headway selected for 4 min, 7 min, 8 min, and `10 min can be used during peak hours. With more trains and short headway, it will minimize the passenger congested at the platform. Moreover, the table below also shows that all the trains can complete the journey within the peak hour time frame. With the train run at both NB and SB, the schedule is more realistic to be achieved. Since no passenger needs to be waiting for a long time to wait for the train to arrive, especially at the end-to-end station.

Table 4.11 Combined train schedule

		Headway Time					
		4min	7min	8min	9 min	10min	30 min
Train Quantity	5 train up	7:43:51 AM	7:43:51 AM	7:59:51 AM	8:03:51 AM	8:07:51 AM	9:27:51 AM
	5 train down	7:43:55 AM	7:55:55 AM	7:59:55 AM	8:03:55 AM	8:07:55 AM	9:27:55 AM
	10 train up	8:03:51 AM	8:30:51 AM	8:39:51 AM	8:48:51 AM	8:57:51 AM	11:57:51 AM
	10 train down	8:03:55 AM	8:30:55 AM	8:39:55 AM	8:48:55 AM	8:57:55 AM	11:57:55 AM
	15 train up	8:23:51 AM	9:05:51 AM	9:19:51 AM	9:33:51 AM	9:47:51 AM	2:27:51 PM
	15 train down	8:23:55 AM	9:05:55 AM	9:19:55 AM	9:33:55 AM	9:47:55 AM	2:27:55 PM
	20 train up	8:43:51 AM	9:40:51 AM	9:59:51 AM	10:18:51 AM	10:37:51 AM	4:57:51 PM
	20 train down	8:43:55 AM	9:40:55 AM	9:59:55 AM	10:18:55 AM	10:37:55 AM	4:57:55 PM

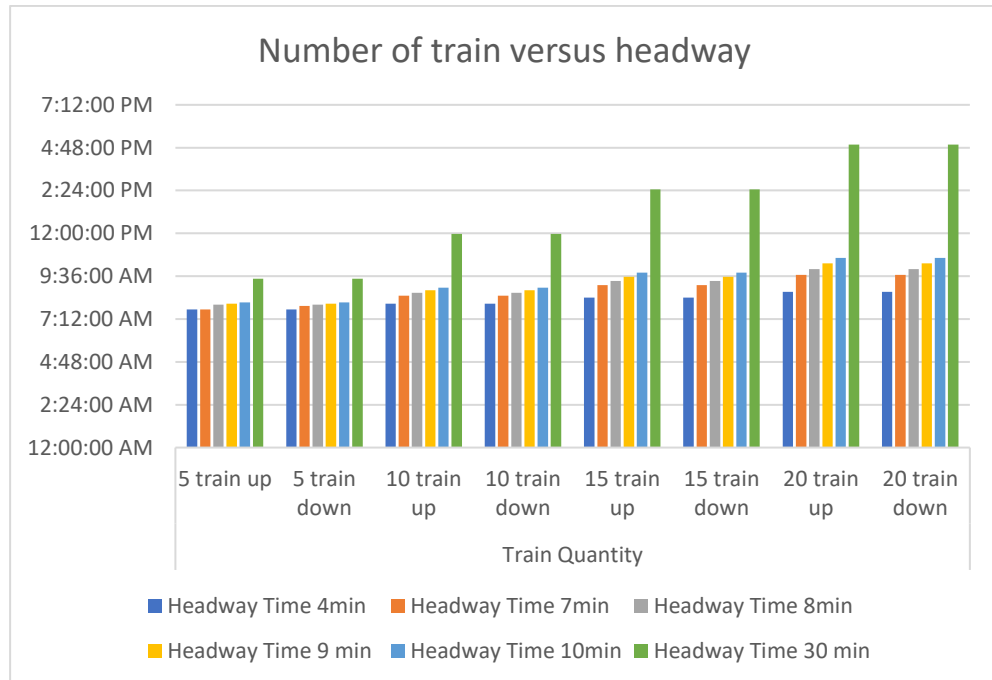


Figure 4.18 Combined train schedule

CHAPTER 5

Conclusion

The ineffective of the train schedule and headway can contribute to the congestion of the passenger for example the improperly configured train frequency, long dwell time, and train number can increase the passenger waiting time. The KGL passenger ridership data in July 2017, shows that interchange station contributes to higher passenger volume compared to the normal station. The optimization timetable from KGL is used as a parameter for the PYL train system. From the ETAP simulation, it concludes that more trains quantity and short headway will minimize the passenger congestion at the platform. Since no passenger needs to be waiting for a long time to wait for the train to arrive, especially at the end-to-end station.

There are some lacks in the ETAP system the system cannot plot 16 graphs into one graph which brought difficulty to see the pattern of all graphs especially that simulation using the same parameter. Moreover, in ETAP it is impossible to set multiple headways with a different time frame for one day. Hence, it is difficult to see the complete timetable for a day. Moreover, due to limitation of the research data such as passenger ridership per hour a day, passenger flow at interchange station, train capacity and track occupied data have limiting the research scope.

Other than the timetable, the simulation can determine the energy conservation of the train which can be studied in the future.

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APPENDICES

A- 1 Train Schedule for 5 train 4 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	5TrainUP_4min	5Train4min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	5TrainUP_4min	5Train4min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	5TrainUP_4min	5Train4min1	Damansara Damai	7:03:30	30	7:04:00	114
TrackRoute1	5TrainUP_4min	5Train4min1	Kampung Baru North	7:31:21	30	7:31:51	0
TrackRoute1	5TrainUP_4min	5Train4min2	Damansara Damai	7:07:30	30	7:08:00	114
TrackRoute1	5TrainUP_4min	5Train4min2	Kampung Baru North	7:35:21	30	7:35:51	0
TrackRoute1	5TrainUP_4min	5Train4min3	Damansara Damai	7:11:30	30	7:12:00	114
TrackRoute1	5TrainUP_4min	5Train4min3	Kampung Baru North	7:39:21	30	7:39:51	0
TrackRoute1	5TrainUP_4min	5Train4min4	Damansara Damai	7:15:30	30	7:16:00	114
TrackRoute1	5TrainUP_4min	5Train4min4	Kampung Baru North	7:43:21	30	7:43:51	0
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	5TrainDown_4min	5Train4min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	5TrainDown_4min	5Train4min(PH)1	Kampung Baru North	7:03:30	30	7:04:00	97
TrackRoute2	5TrainDown_4min	5Train4min(PH)1	Damansara Damai	7:31:25	30	7:31:55	0
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Kampung Baru North	7:07:30	30	7:08:00	97
TrackRoute2	5TrainDown_4min	5Train4min(PH)2	Damansara Damai	7:35:25	30	7:35:55	0
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Kampung Baru North	7:11:30	30	7:12:00	97
TrackRoute2	5TrainDown_4min	5Train4min(PH)3	Damansara Damai	7:39:25	30	7:39:55	0
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Kampung Baru North	7:15:30	30	7:16:00	97
TrackRoute2	5TrainDown_4min	5Train4min(PH)4	Damansara Damai	7:43:25	30	7:43:55	0

A- 2 Train Schedule for 5 train 7 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	5TrainUP_7min	5Train7min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	5TrainUP_7min	5Train7min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	5TrainUP_7min	5Train7min1	Damansara Damai	7:06:30	30	7:07:00	114
TrackRoute1	5TrainUP_7min	5Train7min1	Kampung Baru North	7:34:21	30	7:34:51	0
TrackRoute1	5TrainUP_7min	5Train7min2	Damansara Damai	7:13:30	30	7:14:00	114
TrackRoute1	5TrainUP_7min	5Train7min2	Kampung Baru North	7:41:21	30	7:41:51	0
TrackRoute1	5TrainUP_7min	5Train7min3	Damansara Damai	7:20:30	30	7:21:00	114
TrackRoute1	5TrainUP_7min	5Train7min3	Kampung Baru North	7:48:21	30	7:48:51	0
TrackRoute1	5TrainUP_7min	5Train7min4	Damansara Damai	7:27:30	30	7:28:00	114
TrackRoute1	5TrainUP_7min	5Train7min4	Kampung Baru North	7:55:21	30	7:55:51	0
TrackRoute2	5TrainDown_7min	5Train7min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	5TrainDown_7min	5Train7min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	5TrainDown_7min	5Train7min(PH)1	Kampung Baru North	7:06:30	30	7:07:00	97
TrackRoute2	5TrainDown_7min	5Train7min(PH)1	Damansara Damai	7:34:25	30	7:34:55	0
TrackRoute2	5TrainDown_7min	5Train7min(PH)2	Kampung Baru North	7:13:30	30	7:14:00	97
TrackRoute2	5TrainDown_7min	5Train7min(PH)2	Damansara Damai	7:41:25	30	7:41:55	0
TrackRoute2	5TrainDown_7min	5Train7min(PH)3	Kampung Baru North	7:20:30	30	7:21:00	97
TrackRoute2	5TrainDown_7min	5Train7min(PH)3	Damansara Damai	7:48:25	30	7:48:55	0
TrackRoute2	5TrainDown_7min	5Train7min(PH)4	Kampung Baru North	7:27:30	30	7:28:00	97
TrackRoute2	5TrainDown_7min	5Train7min(PH)4	Damansara Damai	7:55:25	30	7:55:55	0

A- 3 Train Schedule for 5 train 8 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	5TrainUP_8min	5Train8min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	5TrainUP_8min	5Train8min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	5TrainUP_8min	5Train8min1	Damansara Damai	7:07:30	30	7:08:00	114
TrackRoute1	5TrainUP_8min	5Train8min1	Kampung Baru North	7:35:21	30	7:35:51	0
TrackRoute1	5TrainUP_8min	5Train8min2	Damansara Damai	7:15:30	30	7:16:00	114
TrackRoute1	5TrainUP_8min	5Train8min2	Kampung Baru North	7:43:21	30	7:43:51	0
TrackRoute1	5TrainUP_8min	5Train8min3	Damansara Damai	7:23:30	30	7:24:00	114
TrackRoute1	5TrainUP_8min	5Train8min3	Kampung Baru North	7:51:21	30	7:51:51	0
TrackRoute1	5TrainUP_8min	5Train8min4	Damansara Damai	7:31:30	30	7:32:00	114
TrackRoute1	5TrainUP_8min	5Train8min4	Kampung Baru North	7:59:21	30	7:59:51	0
TrackRoute2	5TrainDown_8min	5Train8min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	5TrainDown_8min	5Train8min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	5TrainDown_8min	5Train8min(PH)1	Kampung Baru North	7:07:30	30	7:08:00	97
TrackRoute2	5TrainDown_8min	5Train8min(PH)1	Damansara Damai	7:35:25	30	7:35:55	0
TrackRoute2	5TrainDown_8min	5Train8min(PH)2	Kampung Baru North	7:15:30	30	7:16:00	97
TrackRoute2	5TrainDown_8min	5Train8min(PH)2	Damansara Damai	7:43:25	30	7:43:55	0
TrackRoute2	5TrainDown_8min	5Train8min(PH)3	Kampung Baru North	7:23:30	30	7:24:00	97
TrackRoute2	5TrainDown_8min	5Train8min(PH)3	Damansara Damai	7:51:25	30	7:51:55	0
TrackRoute2	5TrainDown_8min	5Train8min(PH)4	Kampung Baru North	7:31:30	30	7:32:00	97
TrackRoute2	5TrainDown_8min	5Train8min(PH)4	Damansara Damai	7:59:25	30	7:59:55	0

A- 4 Train Schedule for 5 train 9 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	5TrainUP_9min	5Train9min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	5TrainUP_9min	5Train9min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	5TrainUP_9min	5Train9min1	Damansara Damai	7:08:30	30	7:09:00	114
TrackRoute1	5TrainUP_9min	5Train9min1	Kampung Baru North	7:36:21	30	7:36:51	0
TrackRoute1	5TrainUP_9min	5Train9min2	Damansara Damai	7:17:30	30	7:18:00	114
TrackRoute1	5TrainUP_9min	5Train9min2	Kampung Baru North	7:45:21	30	7:45:51	0
TrackRoute1	5TrainUP_9min	5Train9min3	Damansara Damai	7:26:30	30	7:27:00	114
TrackRoute1	5TrainUP_9min	5Train9min3	Kampung Baru North	7:54:21	30	7:54:51	0
TrackRoute1	5TrainUP_9min	5Train9min4	Damansara Damai	7:35:30	30	7:36:00	114
TrackRoute1	5TrainUP_9min	5Train9min4	Kampung Baru North	8:03:21	30	8:03:51	0
TrackRoute2	5TrainDown_9min	5Train9min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	5TrainDown_9min	5Train9min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	5TrainDown_9min	5Train9min(PH)1	Kampung Baru North	7:08:30	30	7:09:00	97
TrackRoute2	5TrainDown_9min	5Train9min(PH)1	Damansara Damai	7:36:25	30	7:36:55	0
TrackRoute2	5TrainDown_9min	5Train9min(PH)2	Kampung Baru North	7:17:30	30	7:18:00	97
TrackRoute2	5TrainDown_9min	5Train9min(PH)2	Damansara Damai	7:45:25	30	7:45:55	0
TrackRoute2	5TrainDown_9min	5Train9min(PH)3	Kampung Baru North	7:26:30	30	7:27:00	97
TrackRoute2	5TrainDown_9min	5Train9min(PH)3	Damansara Damai	7:54:25	30	7:54:55	0
TrackRoute2	5TrainDown_9min	5Train9min(PH)4	Kampung Baru North	7:35:30	30	7:36:00	97
TrackRoute2	5TrainDown_9min	5Train9min(PH)4	Damansara Damai	8:03:25	30	8:03:55	0

A- 5 Train Schedule for 5 train 10 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	5TrainUP_10min	5Train10min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	5TrainUP_10min	5Train10min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	5TrainUP_10min	5Train10min1	Damansara Damai	7:09:30	30	7:10:00	114
TrackRoute1	5TrainUP_10min	5Train10min1	Kampung Baru North	7:37:21	30	7:37:51	0
TrackRoute1	5TrainUP_10min	5Train10min2	Damansara Damai	7:19:30	30	7:20:00	114
TrackRoute1	5TrainUP_10min	5Train10min2	Kampung Baru North	7:47:21	30	7:47:51	0
TrackRoute1	5TrainUP_10min	5Train10min3	Damansara Damai	7:29:30	30	7:30:00	114
TrackRoute1	5TrainUP_10min	5Train10min3	Kampung Baru North	7:57:21	30	7:57:51	0
TrackRoute1	5TrainUP_10min	5Train10min4	Damansara Damai	7:39:30	30	7:40:00	114
TrackRoute1	5TrainUP_10min	5Train10min4	Kampung Baru North	8:07:21	30	8:07:51	0
TrackRoute2	5TrainDown_10min	5Train10min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	5TrainDown_10min	5Train10min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	5TrainDown_10min	5Train10min(PH)1	Kampung Baru North	7:09:30	30	7:10:00	97
TrackRoute2	5TrainDown_10min	5Train10min(PH)1	Damansara Damai	7:37:25	30	7:37:55	0
TrackRoute2	5TrainDown_10min	5Train10min(PH)2	Kampung Baru North	7:19:30	30	7:20:00	97
TrackRoute2	5TrainDown_10min	5Train10min(PH)2	Damansara Damai	7:47:25	30	7:47:55	0
TrackRoute2	5TrainDown_10min	5Train10min(PH)3	Kampung Baru North	7:29:30	30	7:30:00	97
TrackRoute2	5TrainDown_10min	5Train10min(PH)3	Damansara Damai	7:57:25	30	7:57:55	0
TrackRoute2	5TrainDown_10min	5Train10min(PH)4	Kampung Baru North	7:39:30	30	7:40:00	97
TrackRoute2	5TrainDown_10min	5Train10min(PH)4	Damansara Damai	8:07:25	30	8:07:55	0

A- 6 Train Schedule for 5 train 30 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	5TrainUP_30min	5Train30min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	5TrainUP_30min	5Train30min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	5TrainUP_30min	5Train30min1	Damansara Damai	7:29:30	30	7:30:00	114
TrackRoute1	5TrainUP_30min	5Train30min1	Kampung Baru North	7:57:21	30	7:57:51	0
TrackRoute1	5TrainUP_30min	5Train30min2	Damansara Damai	7:59:30	30	8:00:00	114
TrackRoute1	5TrainUP_30min	5Train30min2	Kampung Baru North	8:27:21	30	8:27:51	0
TrackRoute1	5TrainUP_30min	5Train30min3	Damansara Damai	8:29:30	30	8:30:00	114
TrackRoute1	5TrainUP_30min	5Train30min3	Kampung Baru North	8:57:21	30	8:57:51	0
TrackRoute1	5TrainUP_30min	5Train30min4	Damansara Damai	8:59:30	30	9:00:00	114
TrackRoute1	5TrainUP_30min	5Train30min4	Kampung Baru North	9:27:21	30	9:27:51	0
TrackRoute2	5TrainDown_30min	5Train30min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	5TrainDown_30min	5Train30min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	5TrainDown_30min	5Train30min(PH)1	Kampung Baru North	7:29:30	30	7:30:00	97
TrackRoute2	5TrainDown_30min	5Train30min(PH)1	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	5TrainDown_30min	5Train30min(PH)2	Kampung Baru North	7:59:30	30	8:00:00	97
TrackRoute2	5TrainDown_30min	5Train30min(PH)2	Damansara Damai	8:27:25	30	8:27:55	0
TrackRoute2	5TrainDown_30min	5Train30min(PH)3	Kampung Baru North	8:29:30	30	8:30:00	97
TrackRoute2	5TrainDown_30min	5Train30min(PH)3	Damansara Damai	8:57:25	30	8:57:55	0
TrackRoute2	5TrainDown_30min	5Train30min(PH)4	Kampung Baru North	8:59:30	30	9:00:00	97
TrackRoute2	5TrainDown_30min	5Train30min(PH)4	Damansara Damai	9:27:25	30	9:27:55	0

A- 7 Train Schedule for 10 train 4 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	10TrainUP_4min	10Train4min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	10TrainUP_4min	10Train4min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	10TrainUP_4min	10Train4min1	Damansara Damai	7:03:30	30	7:04:00	114
TrackRoute1	10TrainUP_4min	10Train4min1	Kampung Baru North	7:31:21	30	7:31:51	0
TrackRoute1	10TrainUP_4min	10Train4min2	Damansara Damai	7:07:30	30	7:08:00	114
TrackRoute1	10TrainUP_4min	10Train4min2	Kampung Baru North	7:35:21	30	7:35:51	0
TrackRoute1	10TrainUP_4min	10Train4min3	Damansara Damai	7:11:30	30	7:12:00	114
TrackRoute1	10TrainUP_4min	10Train4min3	Kampung Baru North	7:39:21	30	7:39:51	0
TrackRoute1	10TrainUP_4min	10Train4min4	Damansara Damai	7:15:30	30	7:16:00	114
TrackRoute1	10TrainUP_4min	10Train4min4	Kampung Baru North	7:43:21	30	7:43:51	0
TrackRoute1	10TrainUP_4min	10Train4min5	Damansara Damai	7:19:30	30	7:20:00	114
TrackRoute1	10TrainUP_4min	10Train4min5	Kampung Baru North	7:47:21	30	7:47:51	0
TrackRoute1	10TrainUP_4min	10Train4min6	Damansara Damai	7:23:30	30	7:24:00	114
TrackRoute1	10TrainUP_4min	10Train4min6	Kampung Baru North	7:51:21	30	7:51:51	0
TrackRoute1	10TrainUP_4min	10Train4min7	Damansara Damai	7:27:30	30	7:28:00	114
TrackRoute1	10TrainUP_4min	10Train4min7	Kampung Baru North	7:55:21	30	7:55:51	0
TrackRoute1	10TrainUP_4min	10Train4min8	Damansara Damai	7:31:30	30	7:32:00	114
TrackRoute1	10TrainUP_4min	10Train4min8	Kampung Baru North	7:59:21	30	7:59:51	0
TrackRoute1	10TrainUP_4min	10Train4min9	Damansara Damai	7:35:30	30	7:36:00	114
TrackRoute1	10TrainUP_4min	10Train4min9	Kampung Baru North	8:03:21	30	8:03:51	0
TrackRoute2	10TrainDown_4min	10Train4min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	10TrainDown_4min	10Train4min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	10TrainDown_4min	10Train4min(PH)1	Kampung Baru North	7:03:30	30	7:04:00	97
TrackRoute2	10TrainDown_4min	10Train4min(PH)1	Damansara Damai	7:31:25	30	7:31:55	0
TrackRoute2	10TrainDown_4min	10Train4min(PH)2	Kampung Baru North	7:07:30	30	7:08:00	97
TrackRoute2	10TrainDown_4min	10Train4min(PH)2	Damansara Damai	7:35:25	30	7:35:55	0
TrackRoute2	10TrainDown_4min	10Train4min(PH)3	Kampung Baru North	7:11:30	30	7:12:00	97
TrackRoute2	10TrainDown_4min	10Train4min(PH)3	Damansara Damai	7:39:25	30	7:39:55	0
TrackRoute2	10TrainDown_4min	10Train4min(PH)4	Kampung Baru North	7:15:30	30	7:16:00	97
TrackRoute2	10TrainDown_4min	10Train4min(PH)4	Damansara Damai	7:43:25	30	7:43:55	0
TrackRoute2	10TrainDown_4min	10Train4min(PH)5	Kampung Baru North	7:19:30	30	7:20:00	97
TrackRoute2	10TrainDown_4min	10Train4min(PH)5	Damansara Damai	7:47:25	30	7:47:55	0
TrackRoute2	10TrainDown_4min	10Train4min(PH)6	Kampung Baru North	7:23:30	30	7:24:00	97
TrackRoute2	10TrainDown_4min	10Train4min(PH)6	Damansara Damai	7:51:25	30	7:51:55	0
TrackRoute2	10TrainDown_4min	10Train4min(PH)7	Kampung Baru North	7:27:30	30	7:28:00	97
TrackRoute2	10TrainDown_4min	10Train4min(PH)7	Damansara Damai	7:55:25	30	7:55:55	0
TrackRoute2	10TrainDown_4min	10Train4min(PH)8	Kampung Baru North	7:31:30	30	7:32:00	97
TrackRoute2	10TrainDown_4min	10Train4min(PH)8	Damansara Damai	7:59:25	30	7:59:55	0
TrackRoute2	10TrainDown_4min	10Train4min(PH)9	Kampung Baru North	7:35:30	30	7:36:00	97
TrackRoute2	10TrainDown_4min	10Train4min(PH)9	Damansara Damai	8:03:25	30	8:03:55	0

A- 8 Train Schedule for 10 train 7 min headway.

Train Schedule Results								
Train Schedule Information				Trip Information				
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip	
TrackRoute1	10TrainUP_7min	10Train7min	Damansara Damai	6:59:30	30	7:00:00	114	
TrackRoute1	10TrainUP_7min	10Train7min	Kampung Baru North	7:27:21	30	7:27:51	0	
TrackRoute1	10TrainUP_7min	10Train7min1	Damansara Damai	7:06:30	30	7:07:00	114	
TrackRoute1	10TrainUP_7min	10Train7min1	Kampung Baru North	7:34:21	30	7:34:51	0	
TrackRoute1	10TrainUP_7min	10Train7min2	Damansara Damai	7:13:30	30	7:14:00	114	
TrackRoute1	10TrainUP_7min	10Train7min2	Kampung Baru North	7:41:21	30	7:41:51	0	
TrackRoute1	10TrainUP_7min	10Train7min3	Damansara Damai	7:20:30	30	7:21:00	114	
TrackRoute1	10TrainUP_7min	10Train7min3	Kampung Baru North	7:48:21	30	7:48:51	0	
TrackRoute1	10TrainUP_7min	10Train7min4	Damansara Damai	7:27:30	30	7:28:00	114	
TrackRoute1	10TrainUP_7min	10Train7min4	Kampung Baru North	7:55:21	30	7:55:51	0	
TrackRoute1	10TrainUP_7min	10Train7min5	Damansara Damai	7:34:30	30	7:35:00	114	
TrackRoute1	10TrainUP_7min	10Train7min5	Kampung Baru North	8:02:21	30	8:02:51	0	
TrackRoute1	10TrainUP_7min	10Train7min6	Damansara Damai	7:41:30	30	7:42:00	114	
TrackRoute1	10TrainUP_7min	10Train7min6	Kampung Baru North	8:09:21	30	8:09:51	0	
TrackRoute1	10TrainUP_7min	10Train7min7	Damansara Damai	7:48:30	30	7:49:00	114	
TrackRoute1	10TrainUP_7min	10Train7min7	Kampung Baru North	8:16:21	30	8:16:51	0	
TrackRoute1	10TrainUP_7min	10Train7min8	Damansara Damai	7:55:30	30	7:56:00	114	
TrackRoute1	10TrainUP_7min	10Train7min8	Kampung Baru North	8:23:21	30	8:23:51	0	
TrackRoute1	10TrainUP_7min	10Train7min9	Damansara Damai	8:02:30	30	8:03:00	114	
TrackRoute1	10TrainUP_7min	10Train7min9	Kampung Baru North	8:30:21	30	8:30:51	0	
TrackRoute2	10TrainDown_7min	10train7min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97	
TrackRoute2	10TrainDown_7min	10train7min(PH)	Damansara Damai	7:27:25	30	7:27:55	0	
TrackRoute2	10TrainDown_7min	10train7min(PH)1	Kampung Baru North	7:06:30	30	7:07:00	97	
TrackRoute2	10TrainDown_7min	10train7min(PH)1	Damansara Damai	7:34:25	30	7:34:55	0	
TrackRoute2	10TrainDown_7min	10train7min(PH)2	Kampung Baru North	7:13:30	30	7:14:00	97	
TrackRoute2	10TrainDown_7min	10train7min(PH)2	Damansara Damai	7:41:25	30	7:41:55	0	
TrackRoute2	10TrainDown_7min	10train7min(PH)3	Kampung Baru North	7:20:30	30	7:21:00	97	
TrackRoute2	10TrainDown_7min	10train7min(PH)3	Damansara Damai	7:48:25	30	7:48:55	0	
TrackRoute2	10TrainDown_7min	10train7min(PH)4	Kampung Baru North	7:27:30	30	7:28:00	97	
TrackRoute2	10TrainDown_7min	10train7min(PH)4	Damansara Damai	7:55:25	30	7:55:55	0	
TrackRoute2	10TrainDown_7min	10train7min(PH)5	Kampung Baru North	7:34:30	30	7:35:00	97	
TrackRoute2	10TrainDown_7min	10train7min(PH)5	Damansara Damai	8:02:25	30	8:02:55	0	
TrackRoute2	10TrainDown_7min	10train7min(PH)6	Kampung Baru North	7:41:30	30	7:42:00	97	
TrackRoute2	10TrainDown_7min	10train7min(PH)6	Damansara Damai	8:09:25	30	8:09:55	0	
TrackRoute2	10TrainDown_7min	10train7min(PH)7	Kampung Baru North	7:48:30	30	7:49:00	97	
TrackRoute2	10TrainDown_7min	10train7min(PH)7	Damansara Damai	8:16:25	30	8:16:55	0	
TrackRoute2	10TrainDown_7min	10train7min(PH)8	Kampung Baru North	7:55:30	30	7:56:00	97	
TrackRoute2	10TrainDown_7min	10train7min(PH)8	Damansara Damai	8:23:25	30	8:23:55	0	
TrackRoute2	10TrainDown_7min	10train7min(PH)9	Kampung Baru North	8:02:30	30	8:03:00	97	
TrackRoute2	10TrainDown_7min	10train7min(PH)9	Damansara Damai	8:30:25	30	8:30:55	0	

A- 9 Train Schedule for 10 train 8 min headway.

Train Schedule Results								
Train Schedule Information				Trip Information				
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip	
TrackRoute1	10TrainUP_8min	10Train8min	Damansara Damai	6:59:30	30	7:00:00	114	
TrackRoute1	10TrainUP_8min	10Train8min	Kampung Baru North	7:27:21	30	7:27:51	0	
TrackRoute1	10TrainUP_8min	10Train8min1	Damansara Damai	7:07:30	30	7:08:00	114	
TrackRoute1	10TrainUP_8min	10Train8min1	Kampung Baru North	7:35:21	30	7:35:51	0	
TrackRoute1	10TrainUP_8min	10Train8min2	Damansara Damai	7:15:30	30	7:16:00	114	
TrackRoute1	10TrainUP_8min	10Train8min2	Kampung Baru North	7:43:21	30	7:43:51	0	
TrackRoute1	10TrainUP_8min	10Train8min3	Damansara Damai	7:23:30	30	7:24:00	114	
TrackRoute1	10TrainUP_8min	10Train8min3	Kampung Baru North	7:51:21	30	7:51:51	0	
TrackRoute1	10TrainUP_8min	10Train8min4	Damansara Damai	7:31:30	30	7:32:00	114	
TrackRoute1	10TrainUP_8min	10Train8min4	Kampung Baru North	7:59:21	30	7:59:51	0	
TrackRoute1	10TrainUP_8min	10Train8min5	Damansara Damai	7:39:30	30	7:40:00	114	
TrackRoute1	10TrainUP_8min	10Train8min5	Kampung Baru North	8:07:21	30	8:07:51	0	
TrackRoute1	10TrainUP_8min	10Train8min6	Damansara Damai	7:47:30	30	7:48:00	114	
TrackRoute1	10TrainUP_8min	10Train8min6	Kampung Baru North	8:15:21	30	8:15:51	0	
TrackRoute1	10TrainUP_8min	10Train8min7	Damansara Damai	7:55:30	30	7:56:00	114	
TrackRoute1	10TrainUP_8min	10Train8min7	Kampung Baru North	8:23:21	30	8:23:51	0	
TrackRoute1	10TrainUP_8min	10Train8min8	Damansara Damai	8:03:30	30	8:04:00	114	
TrackRoute1	10TrainUP_8min	10Train8min8	Kampung Baru North	8:31:21	30	8:31:51	0	
TrackRoute1	10TrainUP_8min	10Train8min9	Damansara Damai	8:11:30	30	8:12:00	114	
TrackRoute1	10TrainUP_8min	10Train8min9	Kampung Baru North	8:39:21	30	8:39:51	0	
TrackRoute2	10TrainDown_8min	10train8min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97	
TrackRoute2	10TrainDown_8min	10train8min(PH)	Damansara Damai	7:27:25	30	7:27:55	0	
TrackRoute2	10TrainDown_8min	10train8min(PH)1	Kampung Baru North	7:07:30	30	7:08:00	97	
TrackRoute2	10TrainDown_8min	10train8min(PH)1	Damansara Damai	7:35:25	30	7:35:55	0	
TrackRoute2	10TrainDown_8min	10train8min(PH)2	Kampung Baru North	7:15:30	30	7:16:00	97	
TrackRoute2	10TrainDown_8min	10train8min(PH)2	Damansara Damai	7:43:25	30	7:43:55	0	
TrackRoute2	10TrainDown_8min	10train8min(PH)3	Kampung Baru North	7:23:30	30	7:24:00	97	
TrackRoute2	10TrainDown_8min	10train8min(PH)3	Damansara Damai	7:51:25	30	7:51:55	0	
TrackRoute2	10TrainDown_8min	10train8min(PH)4	Kampung Baru North	7:31:30	30	7:32:00	97	
TrackRoute2	10TrainDown_8min	10train8min(PH)4	Damansara Damai	7:59:25	30	7:59:55	0	
TrackRoute2	10TrainDown_8min	10train8min(PH)5	Kampung Baru North	7:39:30	30	7:40:00	97	
TrackRoute2	10TrainDown_8min	10train8min(PH)5	Damansara Damai	8:07:25	30	8:07:55	0	
TrackRoute2	10TrainDown_8min	10train8min(PH)6	Kampung Baru North	7:47:30	30	7:48:00	97	
TrackRoute2	10TrainDown_8min	10train8min(PH)6	Damansara Damai	8:15:25	30	8:15:55	0	
TrackRoute2	10TrainDown_8min	10train8min(PH)7	Kampung Baru North	7:55:30	30	7:56:00	97	
TrackRoute2	10TrainDown_8min	10train8min(PH)7	Damansara Damai	8:23:25	30	8:23:55	0	
TrackRoute2	10TrainDown_8min	10train8min(PH)8	Kampung Baru North	8:03:30	30	8:04:00	97	
TrackRoute2	10TrainDown_8min	10train8min(PH)8	Damansara Damai	8:31:25	30	8:31:55	0	
TrackRoute2	10TrainDown_8min	10train8min(PH)9	Kampung Baru North	8:11:30	30	8:12:00	97	
TrackRoute2	10TrainDown_8min	10train8min(PH)9	Damansara Damai	8:39:25	30	8:39:55	0	

A- 10 Train Schedule for 10 train 9 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	10TrainUP_9min	10Train9min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	10TrainUP_9min	10Train9min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	10TrainUP_9min	10Train9min1	Damansara Damai	7:08:30	30	7:09:00	114
TrackRoute1	10TrainUP_9min	10Train9min1	Kampung Baru North	7:36:21	30	7:36:51	0
TrackRoute1	10TrainUP_9min	10Train9min2	Damansara Damai	7:17:30	30	7:18:00	114
TrackRoute1	10TrainUP_9min	10Train9min2	Kampung Baru North	7:45:21	30	7:45:51	0
TrackRoute1	10TrainUP_9min	10Train9min3	Damansara Damai	7:26:30	30	7:27:00	114
TrackRoute1	10TrainUP_9min	10Train9min3	Kampung Baru North	7:54:21	30	7:54:51	0
TrackRoute1	10TrainUP_9min	10Train9min4	Damansara Damai	7:35:30	30	7:36:00	114
TrackRoute1	10TrainUP_9min	10Train9min4	Kampung Baru North	8:03:21	30	8:03:51	0
TrackRoute1	10TrainUP_9min	10Train9min5	Damansara Damai	7:44:30	30	7:45:00	114
TrackRoute1	10TrainUP_9min	10Train9min5	Kampung Baru North	8:12:21	30	8:12:51	0
TrackRoute1	10TrainUP_9min	10Train9min6	Damansara Damai	7:53:30	30	7:54:00	114
TrackRoute1	10TrainUP_9min	10Train9min6	Kampung Baru North	8:21:21	30	8:21:51	0
TrackRoute1	10TrainUP_9min	10Train9min7	Damansara Damai	8:02:30	30	8:03:00	114
TrackRoute1	10TrainUP_9min	10Train9min7	Kampung Baru North	8:30:21	30	8:30:51	0
TrackRoute1	10TrainUP_9min	10Train9min8	Damansara Damai	8:11:30	30	8:12:00	114
TrackRoute1	10TrainUP_9min	10Train9min8	Kampung Baru North	8:39:21	30	8:39:51	0
TrackRoute1	10TrainUP_9min	10Train9min9	Damansara Damai	8:20:30	30	8:21:00	114
TrackRoute1	10TrainUP_9min	10Train9min9	Kampung Baru North	8:48:21	30	8:48:51	0
TrackRoute2	10TrainDown_9min	10Train9min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	10TrainDown_9min	10Train9min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	10TrainDown_9min	10Train9min(PH)1	Kampung Baru North	7:08:30	30	7:09:00	97
TrackRoute2	10TrainDown_9min	10Train9min(PH)1	Damansara Damai	7:36:25	30	7:36:55	0
TrackRoute2	10TrainDown_9min	10Train9min(PH)2	Kampung Baru North	7:17:30	30	7:18:00	97
TrackRoute2	10TrainDown_9min	10Train9min(PH)2	Damansara Damai	7:45:25	30	7:45:55	0
TrackRoute2	10TrainDown_9min	10Train9min(PH)3	Kampung Baru North	7:26:30	30	7:27:00	97
TrackRoute2	10TrainDown_9min	10Train9min(PH)3	Damansara Damai	7:54:25	30	7:54:55	0
TrackRoute2	10TrainDown_9min	10Train9min(PH)4	Kampung Baru North	7:35:30	30	7:36:00	97
TrackRoute2	10TrainDown_9min	10Train9min(PH)4	Damansara Damai	8:03:25	30	8:03:55	0
TrackRoute2	10TrainDown_9min	10Train9min(PH)5	Kampung Baru North	7:44:30	30	7:45:00	97
TrackRoute2	10TrainDown_9min	10Train9min(PH)5	Damansara Damai	8:12:25	30	8:12:55	0
TrackRoute2	10TrainDown_9min	10Train9min(PH)6	Kampung Baru North	7:53:30	30	7:54:00	97
TrackRoute2	10TrainDown_9min	10Train9min(PH)6	Damansara Damai	8:21:25	30	8:21:55	0
TrackRoute2	10TrainDown_9min	10Train9min(PH)7	Kampung Baru North	8:02:30	30	8:03:00	97
TrackRoute2	10TrainDown_9min	10Train9min(PH)7	Damansara Damai	8:30:25	30	8:30:55	0
TrackRoute2	10TrainDown_9min	10Train9min(PH)8	Kampung Baru North	8:11:30	30	8:12:00	97
TrackRoute2	10TrainDown_9min	10Train9min(PH)8	Damansara Damai	8:39:25	30	8:39:55	0
TrackRoute2	10TrainDown_9min	10Train9min(PH)9	Kampung Baru North	8:20:30	30	8:21:00	97
TrackRoute2	10TrainDown_9min	10Train9min(PH)9	Damansara Damai	8:48:25	30	8:48:55	0

A- 11 Train Schedule for 10 train 10 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	10TrainUP_10min	10Train10min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	10TrainUP_10min	10Train10min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	10TrainUP_10min	10Train10min1	Damansara Damai	7:09:30	30	7:10:00	114
TrackRoute1	10TrainUP_10min	10Train10min1	Kampung Baru North	7:37:21	30	7:37:51	0
TrackRoute1	10TrainUP_10min	10Train10min2	Damansara Damai	7:19:30	30	7:20:00	114
TrackRoute1	10TrainUP_10min	10Train10min2	Kampung Baru North	7:47:21	30	7:47:51	0
TrackRoute1	10TrainUP_10min	10Train10min3	Damansara Damai	7:29:30	30	7:30:00	114
TrackRoute1	10TrainUP_10min	10Train10min3	Kampung Baru North	7:57:21	30	7:57:51	0
TrackRoute1	10TrainUP_10min	10Train10min4	Damansara Damai	7:39:30	30	7:40:00	114
TrackRoute1	10TrainUP_10min	10Train10min4	Kampung Baru North	8:07:21	30	8:07:51	0
TrackRoute1	10TrainUP_10min	10Train10min5	Damansara Damai	7:49:30	30	7:50:00	114
TrackRoute1	10TrainUP_10min	10Train10min5	Kampung Baru North	8:17:21	30	8:17:51	0
TrackRoute1	10TrainUP_10min	10Train10min6	Damansara Damai	7:59:30	30	8:00:00	114
TrackRoute1	10TrainUP_10min	10Train10min6	Kampung Baru North	8:27:21	30	8:27:51	0
TrackRoute1	10TrainUP_10min	10Train10min7	Damansara Damai	8:09:30	30	8:10:00	114
TrackRoute1	10TrainUP_10min	10Train10min7	Kampung Baru North	8:37:21	30	8:37:51	0
TrackRoute1	10TrainUP_10min	10Train10min8	Damansara Damai	8:19:30	30	8:20:00	114
TrackRoute1	10TrainUP_10min	10Train10min8	Kampung Baru North	8:47:21	30	8:47:51	0
TrackRoute1	10TrainUP_10min	10Train10min9	Damansara Damai	8:29:30	30	8:30:00	114
TrackRoute1	10TrainUP_10min	10Train10min9	Kampung Baru North	8:57:21	30	8:57:51	0
TrackRoute2	10TrainDown_10min	10Train10min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	10TrainDown_10min	10Train10min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	10TrainDown_10min	10Train10min(PH)1	Kampung Baru North	7:09:30	30	7:10:00	97
TrackRoute2	10TrainDown_10min	10Train10min(PH)1	Damansara Damai	7:37:25	30	7:37:55	0
TrackRoute2	10TrainDown_10min	10Train10min(PH)2	Kampung Baru North	7:19:30	30	7:20:00	97
TrackRoute2	10TrainDown_10min	10Train10min(PH)2	Damansara Damai	7:47:25	30	7:47:55	0
TrackRoute2	10TrainDown_10min	10Train10min(PH)3	Kampung Baru North	7:29:30	30	7:30:00	97
TrackRoute2	10TrainDown_10min	10Train10min(PH)3	Damansara Damai	7:57:25	30	7:57:55	0
TrackRoute2	10TrainDown_10min	10Train10min(PH)4	Kampung Baru North	7:39:30	30	7:40:00	97
TrackRoute2	10TrainDown_10min	10Train10min(PH)4	Damansara Damai	8:07:25	30	8:07:55	0
TrackRoute2	10TrainDown_10min	10Train10min(PH)5	Kampung Baru North	7:49:30	30	7:50:00	97
TrackRoute2	10TrainDown_10min	10Train10min(PH)5	Damansara Damai	8:17:25	30	8:17:55	0
TrackRoute2	10TrainDown_10min	10Train10min(PH)6	Kampung Baru North	7:59:30	30	8:00:00	97
TrackRoute2	10TrainDown_10min	10Train10min(PH)6	Damansara Damai	8:27:25	30	8:27:55	0
TrackRoute2	10TrainDown_10min	10Train10min(PH)7	Kampung Baru North	8:09:30	30	8:10:00	97
TrackRoute2	10TrainDown_10min	10Train10min(PH)7	Damansara Damai	8:37:25	30	8:37:55	0
TrackRoute2	10TrainDown_10min	10Train10min(PH)8	Kampung Baru North	8:19:30	30	8:20:00	97
TrackRoute2	10TrainDown_10min	10Train10min(PH)8	Damansara Damai	8:47:25	30	8:47:55	0
TrackRoute2	10TrainDown_10min	10Train10min(PH)9	Kampung Baru North	8:29:30	30	8:30:00	97
TrackRoute2	10TrainDown_10min	10Train10min(PH)9	Damansara Damai	8:57:25	30	8:57:55	0

A- 12 Train Schedule for 10 train 30 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	10TrainUP_30min	10Train30min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	10TrainUP_30min	10Train30min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	10TrainUP_30min	10Train30min1	Damansara Damai	7:29:30	30	7:30:00	114
TrackRoute1	10TrainUP_30min	10Train30min1	Kampung Baru North	7:57:21	30	7:57:51	0
TrackRoute1	10TrainUP_30min	10Train30min2	Damansara Damai	7:59:30	30	8:00:00	114
TrackRoute1	10TrainUP_30min	10Train30min2	Kampung Baru North	8:27:21	30	8:27:51	0
TrackRoute1	10TrainUP_30min	10Train30min3	Damansara Damai	8:29:30	30	8:30:00	114
TrackRoute1	10TrainUP_30min	10Train30min3	Kampung Baru North	8:57:21	30	8:57:51	0
TrackRoute1	10TrainUP_30min	10Train30min4	Damansara Damai	8:59:30	30	9:00:00	114
TrackRoute1	10TrainUP_30min	10Train30min4	Kampung Baru North	9:27:21	30	9:27:51	0
TrackRoute1	10TrainUP_30min	10Train30min5	Damansara Damai	9:29:30	30	9:30:00	114
TrackRoute1	10TrainUP_30min	10Train30min5	Kampung Baru North	9:57:21	30	9:57:51	0
TrackRoute1	10TrainUP_30min	10Train30min6	Damansara Damai	9:59:30	30	10:00:00	114
TrackRoute1	10TrainUP_30min	10Train30min6	Kampung Baru North	10:27:21	30	10:27:51	0
TrackRoute1	10TrainUP_30min	10Train30min7	Damansara Damai	10:29:30	30	10:30:00	114
TrackRoute1	10TrainUP_30min	10Train30min7	Kampung Baru North	10:57:21	30	10:57:51	0
TrackRoute1	10TrainUP_30min	10Train30min8	Damansara Damai	10:59:30	30	11:00:00	114
TrackRoute1	10TrainUP_30min	10Train30min8	Kampung Baru North	11:27:21	30	11:27:51	0
TrackRoute1	10TrainUP_30min	10Train30min9	Damansara Damai	11:29:30	30	11:30:00	114
TrackRoute1	10TrainUP_30min	10Train30min9	Kampung Baru North	11:57:21	30	11:57:51	0
TrackRoute2	10TrainDown_30min	10train30min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	10TrainDown_30min	10train30min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	10TrainDown_30min	10train30min(PH)1	Kampung Baru North	7:29:30	30	7:30:00	97
TrackRoute2	10TrainDown_30min	10train30min(PH)1	Damansara Damai	7:57:25	30	7:57:55	0
TrackRoute2	10TrainDown_30min	10train30min(PH)2	Kampung Baru North	7:59:30	30	8:00:00	97
TrackRoute2	10TrainDown_30min	10train30min(PH)2	Damansara Damai	8:27:25	30	8:27:55	0
TrackRoute2	10TrainDown_30min	10train30min(PH)3	Kampung Baru North	8:29:30	30	8:30:00	97
TrackRoute2	10TrainDown_30min	10train30min(PH)3	Damansara Damai	8:57:25	30	8:57:55	0
TrackRoute2	10TrainDown_30min	10train30min(PH)4	Kampung Baru North	8:59:30	30	9:00:00	97
TrackRoute2	10TrainDown_30min	10train30min(PH)4	Damansara Damai	9:27:25	30	9:27:55	0
TrackRoute2	10TrainDown_30min	10train30min(PH)5	Kampung Baru North	9:29:30	30	9:30:00	97
TrackRoute2	10TrainDown_30min	10train30min(PH)5	Damansara Damai	9:57:25	30	9:57:55	0
TrackRoute2	10TrainDown_30min	10train30min(PH)6	Kampung Baru North	9:59:30	30	10:00:00	97
TrackRoute2	10TrainDown_30min	10train30min(PH)6	Damansara Damai	10:27:25	30	10:27:55	0
TrackRoute2	10TrainDown_30min	10train30min(PH)7	Kampung Baru North	10:29:30	30	10:30:00	97
TrackRoute2	10TrainDown_30min	10train30min(PH)7	Damansara Damai	10:57:25	30	10:57:55	0
TrackRoute2	10TrainDown_30min	10train30min(PH)8	Kampung Baru North	10:59:30	30	11:00:00	97
TrackRoute2	10TrainDown_30min	10train30min(PH)8	Damansara Damai	11:27:25	30	11:27:55	0
TrackRoute2	10TrainDown_30min	10train30min(PH)9	Kampung Baru North	11:29:30	30	11:30:00	97
TrackRoute2	10TrainDown_30min	10train30min(PH)9	Damansara Damai	11:57:25	30	11:57:55	0

A- 13 Train Schedule for 15 train 4 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	15TrainUP_4min	15Train4min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	15TrainUP_4min	15Train4min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	15TrainUP_4min	15Train4min1	Damansara Damai	7:03:30	30	7:04:00	114
TrackRoute1	15TrainUP_4min	15Train4min1	Kampung Baru North	7:31:21	30	7:31:51	0
TrackRoute1	15TrainUP_4min	15Train4min2	Damansara Damai	7:07:30	30	7:08:00	114
TrackRoute1	15TrainUP_4min	15Train4min2	Kampung Baru North	7:35:21	30	7:35:51	0
TrackRoute1	15TrainUP_4min	15Train4min3	Damansara Damai	7:11:30	30	7:12:00	114
TrackRoute1	15TrainUP_4min	15Train4min3	Kampung Baru North	7:39:21	30	7:39:51	0
TrackRoute1	15TrainUP_4min	15Train4min4	Damansara Damai	7:15:30	30	7:16:00	114
TrackRoute1	15TrainUP_4min	15Train4min4	Kampung Baru North	7:43:21	30	7:43:51	0
TrackRoute1	15TrainUP_4min	15Train4min5	Damansara Damai	7:19:30	30	7:20:00	114
TrackRoute1	15TrainUP_4min	15Train4min5	Kampung Baru North	7:47:21	30	7:47:51	0
TrackRoute1	15TrainUP_4min	15Train4min6	Damansara Damai	7:23:30	30	7:24:00	114
TrackRoute1	15TrainUP_4min	15Train4min6	Kampung Baru North	7:51:21	30	7:51:51	0
TrackRoute1	15TrainUP_4min	15Train4min7	Damansara Damai	7:27:30	30	7:28:00	114
TrackRoute1	15TrainUP_4min	15Train4min7	Kampung Baru North	7:55:21	30	7:55:51	0
TrackRoute1	15TrainUP_4min	15Train4min8	Damansara Damai	7:31:30	30	7:32:00	114
TrackRoute1	15TrainUP_4min	15Train4min8	Kampung Baru North	7:59:21	30	7:59:51	0
TrackRoute1	15TrainUP_4min	15Train4min9	Damansara Damai	7:35:30	30	7:36:00	114
TrackRoute1	15TrainUP_4min	15Train4min9	Kampung Baru North	8:03:21	30	8:03:51	0
TrackRoute1	15TrainUP_4min	15Train4min10	Damansara Damai	7:39:30	30	7:40:00	114
TrackRoute1	15TrainUP_4min	15Train4min10	Kampung Baru North	8:07:21	30	8:07:51	0
TrackRoute1	15TrainUP_4min	15Train4min11	Damansara Damai	7:43:30	30	7:44:00	114
TrackRoute1	15TrainUP_4min	15Train4min11	Kampung Baru North	8:11:21	30	8:11:51	0
TrackRoute1	15TrainUP_4min	15Train4min12	Damansara Damai	7:47:30	30	7:48:00	114
TrackRoute1	15TrainUP_4min	15Train4min12	Kampung Baru North	8:15:21	30	8:15:51	0
TrackRoute1	15TrainUP_4min	15Train4min13	Damansara Damai	7:51:30	30	7:52:00	114
TrackRoute1	15TrainUP_4min	15Train4min13	Kampung Baru North	8:19:21	30	8:19:51	0
TrackRoute1	15TrainUP_4min	15Train4min14	Damansara Damai	7:55:30	30	7:56:00	114
TrackRoute1	15TrainUP_4min	15Train4min14	Kampung Baru North	8:23:21	30	8:23:51	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)1	Kampung Baru North	7:03:30	30	7:04:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)1	Damansara Damai	7:31:25	30	7:31:55	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)2	Kampung Baru North	7:07:30	30	7:08:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)2	Damansara Damai	7:35:25	30	7:35:55	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)3	Kampung Baru North	7:11:30	30	7:12:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)3	Damansara Damai	7:39:25	30	7:39:55	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)4	Kampung Baru North	7:15:30	30	7:16:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)4	Damansara Damai	7:43:25	30	7:43:55	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)5	Kampung Baru North	7:19:30	30	7:20:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)5	Damansara Damai	7:47:25	30	7:47:55	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)6	Kampung Baru North	7:23:30	30	7:24:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)6	Damansara Damai	7:51:25	30	7:51:55	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)7	Kampung Baru North	7:27:30	30	7:28:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)7	Damansara Damai	7:55:25	30	7:55:55	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)8	Kampung Baru North	7:31:30	30	7:32:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)8	Damansara Damai	7:59:25	30	7:59:55	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)9	Kampung Baru North	7:35:30	30	7:36:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)9	Damansara Damai	8:03:25	30	8:03:55	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)10	Kampung Baru North	7:39:30	30	7:40:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)10	Damansara Damai	8:07:25	30	8:07:55	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)11	Kampung Baru North	7:43:30	30	7:44:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)11	Damansara Damai	8:11:25	30	8:11:55	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)12	Kampung Baru North	7:47:30	30	7:48:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)12	Damansara Damai	8:15:25	30	8:15:55	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)13	Kampung Baru North	7:51:30	30	7:52:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)13	Damansara Damai	8:19:25	30	8:19:55	0
TrackRoute2	15TrainDown_4min	15Train4min(PH)14	Kampung Baru North	7:55:30	30	7:56:00	97
TrackRoute2	15TrainDown_4min	15Train4min(PH)14	Damansara Damai	8:23:25	30	8:23:55	0

A- 14 Train Schedule for 15 train 7 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	15TrainUP_7min	15Train7min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	15TrainUP_7min	15Train7min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	15TrainUP_7min	15Train7min1	Damansara Damai	7:06:30	30	7:07:00	114
TrackRoute1	15TrainUP_7min	15Train7min1	Kampung Baru North	7:34:21	30	7:34:51	0
TrackRoute1	15TrainUP_7min	15Train7min2	Damansara Damai	7:13:30	30	7:14:00	114
TrackRoute1	15TrainUP_7min	15Train7min2	Kampung Baru North	7:41:21	30	7:41:51	0
TrackRoute1	15TrainUP_7min	15Train7min3	Damansara Damai	7:20:30	30	7:21:00	114
TrackRoute1	15TrainUP_7min	15Train7min3	Kampung Baru North	7:48:21	30	7:48:51	0
TrackRoute1	15TrainUP_7min	15Train7min4	Damansara Damai	7:27:30	30	7:28:00	114
TrackRoute1	15TrainUP_7min	15Train7min4	Kampung Baru North	7:55:21	30	7:55:51	0
TrackRoute1	15TrainUP_7min	15Train7min5	Damansara Damai	7:34:30	30	7:35:00	114
TrackRoute1	15TrainUP_7min	15Train7min5	Kampung Baru North	8:02:21	30	8:02:51	0
TrackRoute1	15TrainUP_7min	15Train7min6	Damansara Damai	7:41:30	30	7:42:00	114
TrackRoute1	15TrainUP_7min	15Train7min6	Kampung Baru North	8:09:21	30	8:09:51	0
TrackRoute1	15TrainUP_7min	15Train7min7	Damansara Damai	7:48:30	30	7:49:00	114
TrackRoute1	15TrainUP_7min	15Train7min7	Kampung Baru North	8:16:21	30	8:16:51	0
TrackRoute1	15TrainUP_7min	15Train7min8	Damansara Damai	7:55:30	30	7:56:00	114
TrackRoute1	15TrainUP_7min	15Train7min8	Kampung Baru North	8:23:21	30	8:23:51	0
TrackRoute1	15TrainUP_7min	15Train7min9	Damansara Damai	8:02:30	30	8:03:00	114
TrackRoute1	15TrainUP_7min	15Train7min9	Kampung Baru North	8:30:21	30	8:30:51	0
TrackRoute1	15TrainUP_7min	15Train7min10	Damansara Damai	8:09:30	30	8:10:00	114
TrackRoute1	15TrainUP_7min	15Train7min10	Kampung Baru North	8:37:21	30	8:37:51	0
TrackRoute1	15TrainUP_7min	15Train7min11	Damansara Damai	8:16:30	30	8:17:00	114
TrackRoute1	15TrainUP_7min	15Train7min11	Kampung Baru North	8:44:21	30	8:44:51	0
TrackRoute1	15TrainUP_7min	15Train7min12	Damansara Damai	8:23:30	30	8:24:00	114
TrackRoute1	15TrainUP_7min	15Train7min12	Kampung Baru North	8:51:21	30	8:51:51	0
TrackRoute1	15TrainUP_7min	15Train7min13	Damansara Damai	8:30:30	30	8:31:00	114
TrackRoute1	15TrainUP_7min	15Train7min13	Kampung Baru North	8:58:21	30	8:58:51	0
TrackRoute1	15TrainUP_7min	15Train7min14	Damansara Damai	8:37:30	30	8:38:00	114
TrackRoute1	15TrainUP_7min	15Train7min14	Kampung Baru North	9:05:21	30	9:05:51	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)1	Kampung Baru North	7:06:30	30	7:07:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)1	Damansara Damai	7:34:25	30	7:34:55	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)2	Kampung Baru North	7:13:30	30	7:14:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)2	Damansara Damai	7:41:25	30	7:41:55	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)3	Kampung Baru North	7:20:30	30	7:21:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)3	Damansara Damai	7:48:25	30	7:48:55	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)4	Kampung Baru North	7:27:30	30	7:28:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)4	Damansara Damai	7:55:25	30	7:55:55	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)5	Kampung Baru North	7:34:30	30	7:35:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)5	Damansara Damai	8:02:25	30	8:02:55	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)6	Kampung Baru North	7:41:30	30	7:42:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)6	Damansara Damai	8:09:25	30	8:09:55	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)7	Kampung Baru North	7:48:30	30	7:49:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)7	Damansara Damai	8:16:25	30	8:16:55	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)8	Kampung Baru North	7:55:30	30	7:56:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)8	Damansara Damai	8:23:25	30	8:23:55	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)9	Kampung Baru North	8:02:30	30	8:03:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)9	Damansara Damai	8:30:25	30	8:30:55	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)10	Kampung Baru North	8:09:30	30	8:10:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)10	Damansara Damai	8:37:25	30	8:37:55	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)11	Kampung Baru North	8:16:30	30	8:17:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)11	Damansara Damai	8:44:25	30	8:44:55	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)12	Kampung Baru North	8:23:30	30	8:24:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)12	Damansara Damai	8:51:25	30	8:51:55	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)13	Kampung Baru North	8:30:30	30	8:31:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)13	Damansara Damai	8:58:25	30	8:58:55	0
TrackRoute2	15TrainDown_7min	15Train7min(PH)14	Kampung Baru North	8:37:30	30	8:38:00	97
TrackRoute2	15TrainDown_7min	15Train7min(PH)14	Damansara Damai	9:05:25	30	9:05:55	0

A- 15 Train Schedule for 15 train 8 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	15TrainUP_8min	15Train8min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	15TrainUP_8min	15Train8min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	15TrainUP_8min	15Train8min1	Damansara Damai	7:07:30	30	7:08:00	114
TrackRoute1	15TrainUP_8min	15Train8min1	Kampung Baru North	7:35:21	30	7:35:51	0
TrackRoute1	15TrainUP_8min	15Train8min2	Damansara Damai	7:15:30	30	7:16:00	114
TrackRoute1	15TrainUP_8min	15Train8min2	Kampung Baru North	7:43:21	30	7:43:51	0
TrackRoute1	15TrainUP_8min	15Train8min3	Damansara Damai	7:23:30	30	7:24:00	114
TrackRoute1	15TrainUP_8min	15Train8min3	Kampung Baru North	7:51:21	30	7:51:51	0
TrackRoute1	15TrainUP_8min	15Train8min4	Damansara Damai	7:31:30	30	7:32:00	114
TrackRoute1	15TrainUP_8min	15Train8min4	Kampung Baru North	7:59:21	30	7:59:51	0
TrackRoute1	15TrainUP_8min	15Train8min5	Damansara Damai	7:39:30	30	7:40:00	114
TrackRoute1	15TrainUP_8min	15Train8min5	Kampung Baru North	8:07:21	30	8:07:51	0
TrackRoute1	15TrainUP_8min	15Train8min6	Damansara Damai	7:47:30	30	7:48:00	114
TrackRoute1	15TrainUP_8min	15Train8min6	Kampung Baru North	8:15:21	30	8:15:51	0
TrackRoute1	15TrainUP_8min	15Train8min7	Damansara Damai	7:55:30	30	7:56:00	114
TrackRoute1	15TrainUP_8min	15Train8min7	Kampung Baru North	8:23:21	30	8:23:51	0
TrackRoute1	15TrainUP_8min	15Train8min8	Damansara Damai	8:03:30	30	8:04:00	114
TrackRoute1	15TrainUP_8min	15Train8min8	Kampung Baru North	8:31:21	30	8:31:51	0
TrackRoute1	15TrainUP_8min	15Train8min9	Damansara Damai	8:11:30	30	8:12:00	114
TrackRoute1	15TrainUP_8min	15Train8min9	Kampung Baru North	8:39:21	30	8:39:51	0
TrackRoute1	15TrainUP_8min	15Train8min10	Damansara Damai	8:19:30	30	8:20:00	114
TrackRoute1	15TrainUP_8min	15Train8min10	Kampung Baru North	8:47:21	30	8:47:51	0
TrackRoute1	15TrainUP_8min	15Train8min11	Damansara Damai	8:27:30	30	8:28:00	114
TrackRoute1	15TrainUP_8min	15Train8min11	Kampung Baru North	8:55:21	30	8:55:51	0
TrackRoute1	15TrainUP_8min	15Train8min12	Damansara Damai	8:35:30	30	8:36:00	114
TrackRoute1	15TrainUP_8min	15Train8min12	Kampung Baru North	9:03:21	30	9:03:51	0
TrackRoute1	15TrainUP_8min	15Train8min13	Damansara Damai	8:43:30	30	8:44:00	114
TrackRoute1	15TrainUP_8min	15Train8min13	Kampung Baru North	9:11:21	30	9:11:51	0
TrackRoute1	15TrainUP_8min	15Train8min14	Damansara Damai	8:51:30	30	8:52:00	114
TrackRoute1	15TrainUP_8min	15Train8min14	Kampung Baru North	9:19:21	30	9:19:51	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)1	Kampung Baru North	7:07:30	30	7:08:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)1	Damansara Damai	7:35:25	30	7:35:55	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)2	Kampung Baru North	7:15:30	30	7:16:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)2	Damansara Damai	7:43:25	30	7:43:55	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)3	Kampung Baru North	7:23:30	30	7:24:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)3	Damansara Damai	7:51:25	30	7:51:55	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)4	Kampung Baru North	7:31:30	30	7:32:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)4	Damansara Damai	7:59:25	30	7:59:55	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)5	Kampung Baru North	7:39:30	30	7:40:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)5	Damansara Damai	8:07:25	30	8:07:55	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)6	Kampung Baru North	7:47:30	30	7:48:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)6	Damansara Damai	8:15:25	30	8:15:55	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)7	Kampung Baru North	7:55:30	30	7:56:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)7	Damansara Damai	8:23:25	30	8:23:55	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)8	Kampung Baru North	8:03:30	30	8:04:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)8	Damansara Damai	8:31:25	30	8:31:55	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)9	Kampung Baru North	8:11:30	30	8:12:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)9	Damansara Damai	8:39:25	30	8:39:55	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)10	Kampung Baru North	8:19:30	30	8:20:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)10	Damansara Damai	8:47:25	30	8:47:55	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)11	Kampung Baru North	8:27:30	30	8:28:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)11	Damansara Damai	8:55:25	30	8:55:55	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)12	Kampung Baru North	8:35:30	30	8:36:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)12	Damansara Damai	9:03:25	30	9:03:55	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)13	Kampung Baru North	8:43:30	30	8:44:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)13	Damansara Damai	9:11:25	30	9:11:55	0
TrackRoute2	15TrainDown_8min	15Train8min(PH)14	Kampung Baru North	8:51:30	30	8:52:00	97
TrackRoute2	15TrainDown_8min	15Train8min(PH)14	Damansara Damai	9:19:25	30	9:19:55	0

A- 16 Train Schedule for 15 train 9 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	15TrainUP_9min	15Train9min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	15TrainUP_9min	15Train9min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	15TrainUP_9min	15Train9min1	Damansara Damai	7:08:30	30	7:09:00	114
TrackRoute1	15TrainUP_9min	15Train9min1	Kampung Baru North	7:36:21	30	7:36:51	0
TrackRoute1	15TrainUP_9min	15Train9min2	Damansara Damai	7:17:30	30	7:18:00	114
TrackRoute1	15TrainUP_9min	15Train9min2	Kampung Baru North	7:45:21	30	7:45:51	0
TrackRoute1	15TrainUP_9min	15Train9min3	Damansara Damai	7:26:30	30	7:27:00	114
TrackRoute1	15TrainUP_9min	15Train9min3	Kampung Baru North	7:54:21	30	7:54:51	0
TrackRoute1	15TrainUP_9min	15Train9min4	Damansara Damai	7:35:30	30	7:36:00	114
TrackRoute1	15TrainUP_9min	15Train9min4	Kampung Baru North	8:03:21	30	8:03:51	0
TrackRoute1	15TrainUP_9min	15Train9min5	Damansara Damai	7:44:30	30	7:45:00	114
TrackRoute1	15TrainUP_9min	15Train9min5	Kampung Baru North	8:12:21	30	8:12:51	0
TrackRoute1	15TrainUP_9min	15Train9min6	Damansara Damai	7:53:30	30	7:54:00	114
TrackRoute1	15TrainUP_9min	15Train9min6	Kampung Baru North	8:21:21	30	8:21:51	0
TrackRoute1	15TrainUP_9min	15Train9min7	Damansara Damai	8:02:30	30	8:03:00	114
TrackRoute1	15TrainUP_9min	15Train9min7	Kampung Baru North	8:30:21	30	8:30:51	0
TrackRoute1	15TrainUP_9min	15Train9min8	Damansara Damai	8:11:30	30	8:12:00	114
TrackRoute1	15TrainUP_9min	15Train9min8	Kampung Baru North	8:39:21	30	8:39:51	0
TrackRoute1	15TrainUP_9min	15Train9min9	Damansara Damai	8:20:30	30	8:21:00	114
TrackRoute1	15TrainUP_9min	15Train9min9	Kampung Baru North	8:48:21	30	8:48:51	0
TrackRoute1	15TrainUP_9min	15Train9min10	Damansara Damai	8:29:30	30	8:30:00	114
TrackRoute1	15TrainUP_9min	15Train9min10	Kampung Baru North	8:57:21	30	8:57:51	0
TrackRoute1	15TrainUP_9min	15Train9min11	Damansara Damai	8:38:30	30	8:39:00	114
TrackRoute1	15TrainUP_9min	15Train9min11	Kampung Baru North	9:06:21	30	9:06:51	0
TrackRoute1	15TrainUP_9min	15Train9min12	Damansara Damai	8:47:30	30	8:48:00	114
TrackRoute1	15TrainUP_9min	15Train9min12	Kampung Baru North	9:15:21	30	9:15:51	0
TrackRoute1	15TrainUP_9min	15Train9min13	Damansara Damai	8:56:30	30	8:57:00	114
TrackRoute1	15TrainUP_9min	15Train9min13	Kampung Baru North	9:24:21	30	9:24:51	0
TrackRoute1	15TrainUP_9min	15Train9min14	Damansara Damai	9:05:30	30	9:06:00	114
TrackRoute1	15TrainUP_9min	15Train9min14	Kampung Baru North	9:33:21	30	9:33:51	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)1	Kampung Baru North	7:08:30	30	7:09:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)1	Damansara Damai	7:36:25	30	7:36:55	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)2	Kampung Baru North	7:17:30	30	7:18:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)2	Damansara Damai	7:45:25	30	7:45:55	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)3	Kampung Baru North	7:26:30	30	7:27:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)3	Damansara Damai	7:54:25	30	7:54:55	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)4	Kampung Baru North	7:35:30	30	7:36:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)4	Damansara Damai	8:03:25	30	8:03:55	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)5	Kampung Baru North	7:44:30	30	7:45:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)5	Damansara Damai	8:12:25	30	8:12:55	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)6	Kampung Baru North	7:53:30	30	7:54:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)6	Damansara Damai	8:21:25	30	8:21:55	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)7	Kampung Baru North	8:02:30	30	8:03:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)7	Damansara Damai	8:30:25	30	8:30:55	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)8	Kampung Baru North	8:11:30	30	8:12:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)8	Damansara Damai	8:39:25	30	8:39:55	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)9	Kampung Baru North	8:20:30	30	8:21:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)9	Damansara Damai	8:48:25	30	8:48:55	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)10	Kampung Baru North	8:29:30	30	8:30:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)10	Damansara Damai	8:57:25	30	8:57:55	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)11	Kampung Baru North	8:38:30	30	8:39:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)11	Damansara Damai	9:06:25	30	9:06:55	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)12	Kampung Baru North	8:47:30	30	8:48:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)12	Damansara Damai	9:15:25	30	9:15:55	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)13	Kampung Baru North	8:56:30	30	8:57:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)13	Damansara Damai	9:24:25	30	9:24:55	0
TrackRoute2	15TrainDown_9min	15Train9min(PH)14	Kampung Baru North	9:05:30	30	9:06:00	97
TrackRoute2	15TrainDown_9min	15Train9min(PH)14	Damansara Damai	9:33:25	30	9:33:55	0

A- 17Train Schedule for 15 train 10 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	15TrainUP_10min	15Train10min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	15TrainUP_10min	15Train10min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	15TrainUP_10min	15Train10min1	Damansara Damai	7:09:30	30	7:10:00	114
TrackRoute1	15TrainUP_10min	15Train10min1	Kampung Baru North	7:37:21	30	7:37:51	0
TrackRoute1	15TrainUP_10min	15Train10min2	Damansara Damai	7:19:30	30	7:20:00	114
TrackRoute1	15TrainUP_10min	15Train10min2	Kampung Baru North	7:47:21	30	7:47:51	0
TrackRoute1	15TrainUP_10min	15Train10min3	Damansara Damai	7:29:30	30	7:30:00	114
TrackRoute1	15TrainUP_10min	15Train10min3	Kampung Baru North	7:57:21	30	7:57:51	0
TrackRoute1	15TrainUP_10min	15Train10min4	Damansara Damai	7:39:30	30	7:40:00	114
TrackRoute1	15TrainUP_10min	15Train10min4	Kampung Baru North	8:07:21	30	8:07:51	0
TrackRoute1	15TrainUP_10min	15Train10min5	Damansara Damai	7:49:30	30	7:50:00	114
TrackRoute1	15TrainUP_10min	15Train10min5	Kampung Baru North	8:17:21	30	8:17:51	0
TrackRoute1	15TrainUP_10min	15Train10min6	Damansara Damai	7:59:30	30	8:00:00	114
TrackRoute1	15TrainUP_10min	15Train10min6	Kampung Baru North	8:27:21	30	8:27:51	0
TrackRoute1	15TrainUP_10min	15Train10min7	Damansara Damai	8:09:30	30	8:10:00	114
TrackRoute1	15TrainUP_10min	15Train10min7	Kampung Baru North	8:37:21	30	8:37:51	0
TrackRoute1	15TrainUP_10min	15Train10min8	Damansara Damai	8:19:30	30	8:20:00	114
TrackRoute1	15TrainUP_10min	15Train10min8	Kampung Baru North	8:47:21	30	8:47:51	0
TrackRoute1	15TrainUP_10min	15Train10min9	Damansara Damai	8:29:30	30	8:30:00	114
TrackRoute1	15TrainUP_10min	15Train10min9	Kampung Baru North	8:57:21	30	8:57:51	0
TrackRoute1	15TrainUP_10min	15Train10min10	Damansara Damai	8:39:30	30	8:40:00	114
TrackRoute1	15TrainUP_10min	15Train10min10	Kampung Baru North	9:07:21	30	9:07:51	0
TrackRoute1	15TrainUP_10min	15Train10min11	Damansara Damai	8:49:30	30	8:50:00	114
TrackRoute1	15TrainUP_10min	15Train10min11	Kampung Baru North	9:17:21	30	9:17:51	0
TrackRoute1	15TrainUP_10min	15Train10min12	Damansara Damai	8:59:30	30	9:00:00	114
TrackRoute1	15TrainUP_10min	15Train10min12	Kampung Baru North	9:27:21	30	9:27:51	0
TrackRoute1	15TrainUP_10min	15Train10min13	Damansara Damai	9:09:30	30	9:10:00	114
TrackRoute1	15TrainUP_10min	15Train10min13	Kampung Baru North	9:37:21	30	9:37:51	0
TrackRoute1	15TrainUP_10min	15Train10min14	Damansara Damai	9:19:30	30	9:20:00	114
TrackRoute1	15TrainUP_10min	15Train10min14	Kampung Baru North	9:47:21	30	9:47:51	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)1	Kampung Baru North	7:09:30	30	7:10:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)1	Damansara Damai	7:37:25	30	7:37:55	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)2	Kampung Baru North	7:19:30	30	7:20:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)2	Damansara Damai	7:47:25	30	7:47:55	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)3	Kampung Baru North	7:29:30	30	7:30:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)3	Damansara Damai	7:57:25	30	7:57:55	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)4	Kampung Baru North	7:39:30	30	7:40:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)4	Damansara Damai	8:07:25	30	8:07:55	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)5	Kampung Baru North	7:49:30	30	7:50:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)5	Damansara Damai	8:17:25	30	8:17:55	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)6	Kampung Baru North	7:59:30	30	8:00:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)6	Damansara Damai	8:27:25	30	8:27:55	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)7	Kampung Baru North	8:09:30	30	8:10:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)7	Damansara Damai	8:37:25	30	8:37:55	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)8	Kampung Baru North	8:19:30	30	8:20:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)8	Damansara Damai	8:47:25	30	8:47:55	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)9	Kampung Baru North	8:29:30	30	8:30:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)9	Damansara Damai	8:57:25	30	8:57:55	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)10	Kampung Baru North	8:39:30	30	8:40:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)10	Damansara Damai	9:07:25	30	9:07:55	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)11	Kampung Baru North	8:49:30	30	8:50:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)11	Damansara Damai	9:17:25	30	9:17:55	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)12	Kampung Baru North	8:59:30	30	9:00:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)12	Damansara Damai	9:27:25	30	9:27:55	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)13	Kampung Baru North	9:09:30	30	9:10:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)13	Damansara Damai	9:37:25	30	9:37:55	0
TrackRoute2	15TrainDown_10min	15Train10min(PH)14	Kampung Baru North	9:19:30	30	9:20:00	97
TrackRoute2	15TrainDown_10min	15Train10min(PH)14	Damansara Damai	9:47:25	30	9:47:55	0

A- 18Train Schedule for 15 train 30 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	15TrainUP_30min	15Train30min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	15TrainUP_30min	15Train30min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	15TrainUP_30min	15Train30min1	Damansara Damai	7:29:30	30	7:30:00	114
TrackRoute1	15TrainUP_30min	15Train30min1	Kampung Baru North	7:57:21	30	7:57:51	0
TrackRoute1	15TrainUP_30min	15Train30min2	Damansara Damai	7:59:30	30	8:00:00	114
TrackRoute1	15TrainUP_30min	15Train30min2	Kampung Baru North	8:27:21	30	8:27:51	0
TrackRoute1	15TrainUP_30min	15Train30min3	Damansara Damai	8:29:30	30	8:30:00	114
TrackRoute1	15TrainUP_30min	15Train30min3	Kampung Baru North	8:57:21	30	8:57:51	0
TrackRoute1	15TrainUP_30min	15Train30min4	Damansara Damai	8:59:30	30	9:00:00	114
TrackRoute1	15TrainUP_30min	15Train30min4	Kampung Baru North	9:27:21	30	9:27:51	0
TrackRoute1	15TrainUP_30min	15Train30min5	Damansara Damai	9:29:30	30	9:30:00	114
TrackRoute1	15TrainUP_30min	15Train30min5	Kampung Baru North	9:57:21	30	9:57:51	0
TrackRoute1	15TrainUP_30min	15Train30min6	Damansara Damai	9:59:30	30	10:00:00	114
TrackRoute1	15TrainUP_30min	15Train30min6	Kampung Baru North	10:27:21	30	10:27:51	0
TrackRoute1	15TrainUP_30min	15Train30min7	Damansara Damai	10:29:30	30	10:30:00	114
TrackRoute1	15TrainUP_30min	15Train30min7	Kampung Baru North	10:57:21	30	10:57:51	0
TrackRoute1	15TrainUP_30min	15Train30min8	Damansara Damai	10:59:30	30	11:00:00	114
TrackRoute1	15TrainUP_30min	15Train30min8	Kampung Baru North	11:27:21	30	11:27:51	0
TrackRoute1	15TrainUP_30min	15Train30min9	Damansara Damai	11:29:30	30	11:30:00	114
TrackRoute1	15TrainUP_30min	15Train30min9	Kampung Baru North	11:57:21	30	11:57:51	0
TrackRoute1	15TrainUP_30min	15Train30min10	Damansara Damai	11:59:30	30	12:00:00	114
TrackRoute1	15TrainUP_30min	15Train30min10	Kampung Baru North	12:27:21	30	12:27:51	0
TrackRoute1	15TrainUP_30min	15Train30min11	Damansara Damai	12:29:30	30	12:30:00	114
TrackRoute1	15TrainUP_30min	15Train30min11	Kampung Baru North	12:57:21	30	12:57:51	0
TrackRoute1	15TrainUP_30min	15Train30min12	Damansara Damai	12:59:30	30	13:00:00	114
TrackRoute1	15TrainUP_30min	15Train30min12	Kampung Baru North	13:27:21	30	13:27:51	0
TrackRoute1	15TrainUP_30min	15Train30min13	Damansara Damai	13:29:30	30	13:30:00	114
TrackRoute1	15TrainUP_30min	15Train30min13	Kampung Baru North	13:57:21	30	13:57:51	0
TrackRoute1	15TrainUP_30min	15Train30min14	Damansara Damai	13:59:30	30	14:00:00	114
TrackRoute1	15TrainUP_30min	15Train30min14	Kampung Baru North	14:27:21	30	14:27:51	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)1	Kampung Baru North	7:29:30	30	7:30:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)1	Damansara Damai	7:57:25	30	7:57:55	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)2	Kampung Baru North	7:59:30	30	8:00:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)2	Damansara Damai	8:27:25	30	8:27:55	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)3	Kampung Baru North	8:29:30	30	8:30:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)3	Damansara Damai	8:57:25	30	8:57:55	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)4	Kampung Baru North	8:59:30	30	9:00:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)4	Damansara Damai	9:27:25	30	9:27:55	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)5	Kampung Baru North	9:29:30	30	9:30:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)5	Damansara Damai	9:57:25	30	9:57:55	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)6	Kampung Baru North	9:59:30	30	10:00:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)6	Damansara Damai	10:27:25	30	10:27:55	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)7	Kampung Baru North	10:29:30	30	10:30:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)7	Damansara Damai	10:57:25	30	10:57:55	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)8	Kampung Baru North	10:59:30	30	11:00:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)8	Damansara Damai	11:27:25	30	11:27:55	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)9	Kampung Baru North	11:29:30	30	11:30:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)9	Damansara Damai	11:57:25	30	11:57:55	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)10	Kampung Baru North	11:59:30	30	12:00:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)10	Damansara Damai	12:27:25	30	12:27:55	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)11	Kampung Baru North	12:29:30	30	12:30:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)11	Damansara Damai	12:57:25	30	12:57:55	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)12	Kampung Baru North	12:59:30	30	13:00:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)12	Damansara Damai	13:27:25	30	13:27:55	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)13	Kampung Baru North	13:29:30	30	13:30:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)13	Damansara Damai	13:57:25	30	13:57:55	0
TrackRoute2	15TrainDown_30min	15Train30min(PH)14	Kampung Baru North	13:59:30	30	14:00:00	97
TrackRoute2	15TrainDown_30min	15Train30min(PH)14	Damansara Damai	14:27:25	30	14:27:55	0

A- 19Train Schedule for 20 train 4 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	20TrainUP_4min	20Train4min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	20TrainUP_4min	20Train4min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	20TrainUP_4min	20Train4min1	Damansara Damai	7:03:30	30	7:04:00	114
TrackRoute1	20TrainUP_4min	20Train4min1	Kampung Baru North	7:31:21	30	7:31:51	0
TrackRoute1	20TrainUP_4min	20Train4min2	Damansara Damai	7:07:30	30	7:08:00	114
TrackRoute1	20TrainUP_4min	20Train4min2	Kampung Baru North	7:35:21	30	7:35:51	0
TrackRoute1	20TrainUP_4min	20Train4min3	Damansara Damai	7:11:30	30	7:12:00	114
TrackRoute1	20TrainUP_4min	20Train4min3	Kampung Baru North	7:39:21	30	7:39:51	0
TrackRoute1	20TrainUP_4min	20Train4min4	Damansara Damai	7:15:30	30	7:16:00	114
TrackRoute1	20TrainUP_4min	20Train4min4	Kampung Baru North	7:43:21	30	7:43:51	0
TrackRoute1	20TrainUP_4min	20Train4min5	Damansara Damai	7:19:30	30	7:20:00	114
TrackRoute1	20TrainUP_4min	20Train4min5	Kampung Baru North	7:47:21	30	7:47:51	0
TrackRoute1	20TrainUP_4min	20Train4min6	Damansara Damai	7:23:30	30	7:24:00	114
TrackRoute1	20TrainUP_4min	20Train4min6	Kampung Baru North	7:51:21	30	7:51:51	0
TrackRoute1	20TrainUP_4min	20Train4min7	Damansara Damai	7:27:30	30	7:28:00	114
TrackRoute1	20TrainUP_4min	20Train4min7	Kampung Baru North	7:55:21	30	7:55:51	0
TrackRoute1	20TrainUP_4min	20Train4min8	Damansara Damai	7:31:30	30	7:32:00	114
TrackRoute1	20TrainUP_4min	20Train4min8	Kampung Baru North	7:59:21	30	7:59:51	0
TrackRoute1	20TrainUP_4min	20Train4min9	Damansara Damai	7:35:30	30	7:36:00	114
TrackRoute1	20TrainUP_4min	20Train4min9	Kampung Baru North	8:03:21	30	8:03:51	0
TrackRoute1	20TrainUP_4min	20Train4min10	Damansara Damai	7:39:30	30	7:40:00	114
TrackRoute1	20TrainUP_4min	20Train4min10	Kampung Baru North	8:07:21	30	8:07:51	0
TrackRoute1	20TrainUP_4min	20Train4min11	Damansara Damai	7:43:30	30	7:44:00	114
TrackRoute1	20TrainUP_4min	20Train4min11	Kampung Baru North	8:11:21	30	8:11:51	0
TrackRoute1	20TrainUP_4min	20Train4min12	Damansara Damai	7:47:30	30	7:48:00	114
TrackRoute1	20TrainUP_4min	20Train4min12	Kampung Baru North	8:15:21	30	8:15:51	0
TrackRoute1	20TrainUP_4min	20Train4min13	Damansara Damai	7:51:30	30	7:52:00	114
TrackRoute1	20TrainUP_4min	20Train4min13	Kampung Baru North	8:19:21	30	8:19:51	0
TrackRoute1	20TrainUP_4min	20Train4min14	Damansara Damai	7:55:30	30	7:56:00	114
TrackRoute1	20TrainUP_4min	20Train4min14	Kampung Baru North	8:23:21	30	8:23:51	0
TrackRoute1	20TrainUP_4min	20Train4min15	Damansara Damai	7:59:30	30	8:00:00	114
TrackRoute1	20TrainUP_4min	20Train4min15	Kampung Baru North	8:27:21	30	8:27:51	0
TrackRoute1	20TrainUP_4min	20Train4min16	Damansara Damai	8:03:30	30	8:04:00	114
TrackRoute1	20TrainUP_4min	20Train4min16	Kampung Baru North	8:31:21	30	8:31:51	0
TrackRoute1	20TrainUP_4min	20Train4min17	Damansara Damai	8:07:30	30	8:08:00	114
TrackRoute1	20TrainUP_4min	20Train4min17	Kampung Baru North	8:35:21	30	8:35:51	0
TrackRoute1	20TrainUP_4min	20Train4min18	Damansara Damai	8:11:30	30	8:12:00	114
TrackRoute1	20TrainUP_4min	20Train4min18	Kampung Baru North	8:39:21	30	8:39:51	0
TrackRoute1	20TrainUP_4min	20Train4min19	Damansara Damai	8:15:30	30	8:16:00	114
TrackRoute1	20TrainUP_4min	20Train4min19	Kampung Baru North	8:43:21	30	8:43:51	0
TrackRoute2	20TrainDown_4min	20train4min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)1	Kampung Baru North	7:03:30	30	7:04:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)1	Damansara Damai	7:31:25	30	7:31:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)2	Kampung Baru North	7:07:30	30	7:08:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)2	Damansara Damai	7:35:25	30	7:35:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)3	Kampung Baru North	7:11:30	30	7:12:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)3	Damansara Damai	7:39:25	30	7:39:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)4	Kampung Baru North	7:15:30	30	7:16:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)4	Damansara Damai	7:43:25	30	7:43:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)5	Kampung Baru North	7:19:30	30	7:20:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)5	Damansara Damai	7:47:25	30	7:47:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)6	Kampung Baru North	7:23:30	30	7:24:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)6	Damansara Damai	7:51:25	30	7:51:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)7	Kampung Baru North	7:27:30	30	7:28:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)7	Damansara Damai	7:55:25	30	7:55:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)8	Kampung Baru North	7:31:30	30	7:32:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)8	Damansara Damai	7:59:25	30	7:59:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)9	Kampung Baru North	7:35:30	30	7:36:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)9	Damansara Damai	8:03:25	30	8:03:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)10	Kampung Baru North	7:39:30	30	7:40:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)10	Damansara Damai	8:07:25	30	8:07:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)11	Kampung Baru North	7:43:30	30	7:44:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)11	Damansara Damai	8:11:25	30	8:11:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)12	Kampung Baru North	7:47:30	30	7:48:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)12	Damansara Damai	8:15:25	30	8:15:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)13	Kampung Baru North	7:51:30	30	7:52:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)13	Damansara Damai	8:19:25	30	8:19:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)14	Kampung Baru North	7:55:30	30	7:56:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)14	Damansara Damai	8:23:25	30	8:23:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)15	Kampung Baru North	7:59:30	30	8:00:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)15	Damansara Damai	8:27:25	30	8:27:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)16	Kampung Baru North	8:03:30	30	8:04:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)16	Damansara Damai	8:31:25	30	8:31:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)17	Kampung Baru North	8:07:30	30	8:08:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)17	Damansara Damai	8:35:25	30	8:35:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)18	Kampung Baru North	8:11:30	30	8:12:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)18	Damansara Damai	8:39:25	30	8:39:55	0
TrackRoute2	20TrainDown_4min	20train4min(PH)19	Kampung Baru North	8:15:30	30	8:16:00	97
TrackRoute2	20TrainDown_4min	20train4min(PH)19	Damansara Damai	8:43:25	30	8:43:55	0

A- 20Train Schedule for 20 train 7 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	20TrainUP_7min	20Train7min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	20TrainUP_7min	20Train7min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	20TrainUP_7min	20Train7min1	Damansara Damai	7:06:30	30	7:07:00	114
TrackRoute1	20TrainUP_7min	20Train7min1	Kampung Baru North	7:34:21	30	7:34:51	0
TrackRoute1	20TrainUP_7min	20Train7min2	Damansara Damai	7:13:30	30	7:14:00	114
TrackRoute1	20TrainUP_7min	20Train7min2	Kampung Baru North	7:41:21	30	7:41:51	0
TrackRoute1	20TrainUP_7min	20Train7min3	Damansara Damai	7:20:30	30	7:21:00	114
TrackRoute1	20TrainUP_7min	20Train7min3	Kampung Baru North	7:48:21	30	7:48:51	0
TrackRoute1	20TrainUP_7min	20Train7min4	Damansara Damai	7:27:30	30	7:28:00	114
TrackRoute1	20TrainUP_7min	20Train7min4	Kampung Baru North	7:55:21	30	7:55:51	0
TrackRoute1	20TrainUP_7min	20Train7min5	Damansara Damai	7:34:30	30	7:35:00	114
TrackRoute1	20TrainUP_7min	20Train7min5	Kampung Baru North	8:02:21	30	8:02:51	0
TrackRoute1	20TrainUP_7min	20Train7min6	Damansara Damai	7:41:30	30	7:42:00	114
TrackRoute1	20TrainUP_7min	20Train7min6	Kampung Baru North	8:09:21	30	8:09:51	0
TrackRoute1	20TrainUP_7min	20Train7min7	Damansara Damai	7:48:30	30	7:49:00	114
TrackRoute1	20TrainUP_7min	20Train7min7	Kampung Baru North	8:16:21	30	8:16:51	0
TrackRoute1	20TrainUP_7min	20Train7min8	Damansara Damai	7:55:30	30	7:56:00	114
TrackRoute1	20TrainUP_7min	20Train7min8	Kampung Baru North	8:23:21	30	8:23:51	0
TrackRoute1	20TrainUP_7min	20Train7min9	Damansara Damai	8:02:30	30	8:03:00	114
TrackRoute1	20TrainUP_7min	20Train7min9	Kampung Baru North	8:30:21	30	8:30:51	0
TrackRoute1	20TrainUP_7min	20Train7min10	Damansara Damai	8:09:30	30	8:10:00	114
TrackRoute1	20TrainUP_7min	20Train7min10	Kampung Baru North	8:37:21	30	8:37:51	0
TrackRoute1	20TrainUP_7min	20Train7min11	Damansara Damai	8:16:30	30	8:17:00	114
TrackRoute1	20TrainUP_7min	20Train7min11	Kampung Baru North	8:44:21	30	8:44:51	0
TrackRoute1	20TrainUP_7min	20Train7min12	Damansara Damai	8:23:30	30	8:24:00	114
TrackRoute1	20TrainUP_7min	20Train7min12	Kampung Baru North	8:51:21	30	8:51:51	0
TrackRoute1	20TrainUP_7min	20Train7min13	Damansara Damai	8:30:30	30	8:31:00	114
TrackRoute1	20TrainUP_7min	20Train7min13	Kampung Baru North	8:58:21	30	8:58:51	0
TrackRoute1	20TrainUP_7min	20Train7min14	Damansara Damai	8:37:30	30	8:38:00	114
TrackRoute1	20TrainUP_7min	20Train7min14	Kampung Baru North	9:05:21	30	9:05:51	0
TrackRoute1	20TrainUP_7min	20Train7min15	Damansara Damai	8:44:30	30	8:45:00	114
TrackRoute1	20TrainUP_7min	20Train7min15	Kampung Baru North	9:12:21	30	9:12:51	0
TrackRoute1	20TrainUP_7min	20Train7min16	Damansara Damai	8:51:30	30	8:52:00	114
TrackRoute1	20TrainUP_7min	20Train7min16	Kampung Baru North	9:19:21	30	9:19:51	0
TrackRoute1	20TrainUP_7min	20Train7min17	Damansara Damai	8:58:30	30	8:59:00	114
TrackRoute1	20TrainUP_7min	20Train7min17	Kampung Baru North	9:26:21	30	9:26:51	0
TrackRoute1	20TrainUP_7min	20Train7min18	Damansara Damai	9:05:30	30	9:06:00	114
TrackRoute1	20TrainUP_7min	20Train7min18	Kampung Baru North	9:33:21	30	9:33:51	0
TrackRoute1	20TrainUP_7min	20Train7min19	Damansara Damai	9:12:30	30	9:13:00	114
TrackRoute1	20TrainUP_7min	20Train7min19	Kampung Baru North	9:40:21	30	9:40:51	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)1	Kampung Baru North	7:06:30	30	7:07:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)1	Damansara Damai	7:34:25	30	7:34:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)2	Kampung Baru North	7:13:30	30	7:14:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)2	Damansara Damai	7:41:25	30	7:41:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)3	Kampung Baru North	7:20:30	30	7:21:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)3	Damansara Damai	7:48:25	30	7:48:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)4	Kampung Baru North	7:27:30	30	7:28:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)4	Damansara Damai	7:55:25	30	7:55:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)5	Kampung Baru North	7:34:30	30	7:35:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)5	Damansara Damai	8:02:25	30	8:02:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)6	Kampung Baru North	7:41:30	30	7:42:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)6	Damansara Damai	8:09:25	30	8:09:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)7	Kampung Baru North	7:48:30	30	7:49:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)7	Damansara Damai	8:16:25	30	8:16:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)8	Kampung Baru North	7:55:30	30	7:56:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)8	Damansara Damai	8:23:25	30	8:23:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)9	Kampung Baru North	8:02:30	30	8:03:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)9	Damansara Damai	8:30:25	30	8:30:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)10	Kampung Baru North	8:09:30	30	8:10:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)10	Damansara Damai	8:37:25	30	8:37:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)11	Kampung Baru North	8:16:30	30	8:17:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)11	Damansara Damai	8:44:25	30	8:44:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)12	Kampung Baru North	8:23:30	30	8:24:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)12	Damansara Damai	8:51:25	30	8:51:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)13	Kampung Baru North	8:30:30	30	8:31:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)13	Damansara Damai	8:58:25	30	8:58:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)14	Kampung Baru North	8:37:30	30	8:38:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)14	Damansara Damai	9:05:25	30	9:05:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)15	Kampung Baru North	8:44:30	30	8:45:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)15	Damansara Damai	9:12:25	30	9:12:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)16	Kampung Baru North	8:51:30	30	8:52:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)16	Damansara Damai	9:19:25	30	9:19:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)17	Kampung Baru North	8:58:30	30	8:59:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)17	Damansara Damai	9:26:25	30	9:26:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)18	Kampung Baru North	9:05:30	30	9:06:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)18	Damansara Damai	9:33:25	30	9:33:55	0
TrackRoute2	20TrainDown_7min	20Train7min(PH)19	Kampung Baru North	9:12:30	30	9:13:00	97
TrackRoute2	20TrainDown_7min	20Train7min(PH)19	Damansara Damai	9:40:25	30	9:40:55	0

A- 21Train Schedule for 20 train 8 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	20TrainUP_8min	20Train8min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	20TrainUP_8min	20Train8min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	20TrainUP_8min	20Train8min1	Damansara Damai	7:07:30	30	7:08:00	114
TrackRoute1	20TrainUP_8min	20Train8min1	Kampung Baru North	7:35:21	30	7:35:51	0
TrackRoute1	20TrainUP_8min	20Train8min2	Damansara Damai	7:15:30	30	7:16:00	114
TrackRoute1	20TrainUP_8min	20Train8min2	Kampung Baru North	7:43:21	30	7:43:51	0
TrackRoute1	20TrainUP_8min	20Train8min3	Damansara Damai	7:23:30	30	7:24:00	114
TrackRoute1	20TrainUP_8min	20Train8min3	Kampung Baru North	7:51:21	30	7:51:51	0
TrackRoute1	20TrainUP_8min	20Train8min4	Damansara Damai	7:31:30	30	7:32:00	114
TrackRoute1	20TrainUP_8min	20Train8min4	Kampung Baru North	7:59:21	30	7:59:51	0
TrackRoute1	20TrainUP_8min	20Train8min5	Damansara Damai	7:39:30	30	7:40:00	114
TrackRoute1	20TrainUP_8min	20Train8min5	Kampung Baru North	8:07:21	30	8:07:51	0
TrackRoute1	20TrainUP_8min	20Train8min6	Damansara Damai	7:47:30	30	7:48:00	114
TrackRoute1	20TrainUP_8min	20Train8min6	Kampung Baru North	8:15:21	30	8:15:51	0
TrackRoute1	20TrainUP_8min	20Train8min7	Damansara Damai	7:55:30	30	7:56:00	114
TrackRoute1	20TrainUP_8min	20Train8min7	Kampung Baru North	8:23:21	30	8:23:51	0
TrackRoute1	20TrainUP_8min	20Train8min8	Damansara Damai	8:03:30	30	8:04:00	114
TrackRoute1	20TrainUP_8min	20Train8min8	Kampung Baru North	8:31:21	30	8:31:51	0
TrackRoute1	20TrainUP_8min	20Train8min9	Damansara Damai	8:11:30	30	8:12:00	114
TrackRoute1	20TrainUP_8min	20Train8min9	Kampung Baru North	8:39:21	30	8:39:51	0
TrackRoute1	20TrainUP_8min	20Train8min10	Damansara Damai	8:19:30	30	8:20:00	114
TrackRoute1	20TrainUP_8min	20Train8min10	Kampung Baru North	8:47:21	30	8:47:51	0
TrackRoute1	20TrainUP_8min	20Train8min11	Damansara Damai	8:27:30	30	8:28:00	114
TrackRoute1	20TrainUP_8min	20Train8min11	Kampung Baru North	8:55:21	30	8:55:51	0
TrackRoute1	20TrainUP_8min	20Train8min12	Damansara Damai	8:35:30	30	8:36:00	114
TrackRoute1	20TrainUP_8min	20Train8min12	Kampung Baru North	9:03:21	30	9:03:51	0
TrackRoute1	20TrainUP_8min	20Train8min13	Damansara Damai	8:43:30	30	8:44:00	114
TrackRoute1	20TrainUP_8min	20Train8min13	Kampung Baru North	9:11:21	30	9:11:51	0
TrackRoute1	20TrainUP_8min	20Train8min14	Damansara Damai	8:51:30	30	8:52:00	114
TrackRoute1	20TrainUP_8min	20Train8min14	Kampung Baru North	9:19:21	30	9:19:51	0
TrackRoute1	20TrainUP_8min	20Train8min15	Damansara Damai	8:59:30	30	9:00:00	114
TrackRoute1	20TrainUP_8min	20Train8min15	Kampung Baru North	9:27:21	30	9:27:51	0
TrackRoute1	20TrainUP_8min	20Train8min16	Damansara Damai	9:07:30	30	9:08:00	114
TrackRoute1	20TrainUP_8min	20Train8min16	Kampung Baru North	9:35:21	30	9:35:51	0
TrackRoute1	20TrainUP_8min	20Train8min17	Damansara Damai	9:15:30	30	9:16:00	114
TrackRoute1	20TrainUP_8min	20Train8min17	Kampung Baru North	9:43:21	30	9:43:51	0
TrackRoute1	20TrainUP_8min	20Train8min18	Damansara Damai	9:23:30	30	9:24:00	114
TrackRoute1	20TrainUP_8min	20Train8min18	Kampung Baru North	9:51:21	30	9:51:51	0
TrackRoute1	20TrainUP_8min	20Train8min19	Damansara Damai	9:31:30	30	9:32:00	114
TrackRoute1	20TrainUP_8min	20Train8min19	Kampung Baru North	9:59:21	30	9:59:51	0
TrackRoute2	20TrainDown_8min	20train8min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)1	Kampung Baru North	7:07:30	30	7:08:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)1	Damansara Damai	7:35:25	30	7:35:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)2	Kampung Baru North	7:15:30	30	7:16:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)2	Damansara Damai	7:43:25	30	7:43:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)3	Kampung Baru North	7:23:30	30	7:24:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)3	Damansara Damai	7:51:25	30	7:51:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)4	Kampung Baru North	7:31:30	30	7:32:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)4	Damansara Damai	7:59:25	30	7:59:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)5	Kampung Baru North	7:39:30	30	7:40:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)5	Damansara Damai	8:07:25	30	8:07:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)6	Kampung Baru North	7:47:30	30	7:48:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)6	Damansara Damai	8:15:25	30	8:15:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)7	Kampung Baru North	7:55:30	30	7:56:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)7	Damansara Damai	8:23:25	30	8:23:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)8	Kampung Baru North	8:03:30	30	8:04:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)8	Damansara Damai	8:31:25	30	8:31:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)9	Kampung Baru North	8:11:30	30	8:12:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)9	Damansara Damai	8:39:25	30	8:39:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)10	Kampung Baru North	8:19:30	30	8:20:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)10	Damansara Damai	8:47:25	30	8:47:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)11	Kampung Baru North	8:27:30	30	8:28:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)11	Damansara Damai	8:55:25	30	8:55:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)12	Kampung Baru North	8:35:30	30	8:36:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)12	Damansara Damai	9:03:25	30	9:03:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)13	Kampung Baru North	8:43:30	30	8:44:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)13	Damansara Damai	9:11:25	30	9:11:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)14	Kampung Baru North	8:51:30	30	8:52:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)14	Damansara Damai	9:19:25	30	9:19:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)15	Kampung Baru North	8:59:30	30	9:00:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)15	Damansara Damai	9:27:25	30	9:27:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)16	Kampung Baru North	9:07:30	30	9:08:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)16	Damansara Damai	9:35:25	30	9:35:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)17	Kampung Baru North	9:15:30	30	9:16:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)17	Damansara Damai	9:43:25	30	9:43:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)18	Kampung Baru North	9:23:30	30	9:24:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)18	Damansara Damai	9:51:25	30	9:51:55	0
TrackRoute2	20TrainDown_8min	20train8min(PH)19	Kampung Baru North	9:31:30	30	9:32:00	97
TrackRoute2	20TrainDown_8min	20train8min(PH)19	Damansara Damai	9:59:25	30	9:59:55	0

A- 22Train Schedule for 20 train 9 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	20TrainUP_9min	20Train9min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	20TrainUP_9min	20Train9min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	20TrainUP_9min	20Train9min1	Damansara Damai	7:08:30	30	7:09:00	114
TrackRoute1	20TrainUP_9min	20Train9min1	Kampung Baru North	7:36:21	30	7:36:51	0
TrackRoute1	20TrainUP_9min	20Train9min2	Damansara Damai	7:17:30	30	7:18:00	114
TrackRoute1	20TrainUP_9min	20Train9min2	Kampung Baru North	7:45:21	30	7:45:51	0
TrackRoute1	20TrainUP_9min	20Train9min3	Damansara Damai	7:26:30	30	7:27:00	114
TrackRoute1	20TrainUP_9min	20Train9min3	Kampung Baru North	7:54:21	30	7:54:51	0
TrackRoute1	20TrainUP_9min	20Train9min4	Damansara Damai	7:35:30	30	7:36:00	114
TrackRoute1	20TrainUP_9min	20Train9min4	Kampung Baru North	8:03:21	30	8:03:51	0
TrackRoute1	20TrainUP_9min	20Train9min5	Damansara Damai	7:44:30	30	7:45:00	114
TrackRoute1	20TrainUP_9min	20Train9min5	Kampung Baru North	8:12:21	30	8:12:51	0
TrackRoute1	20TrainUP_9min	20Train9min6	Damansara Damai	7:53:30	30	7:54:00	114
TrackRoute1	20TrainUP_9min	20Train9min6	Kampung Baru North	8:21:21	30	8:21:51	0
TrackRoute1	20TrainUP_9min	20Train9min7	Damansara Damai	8:02:30	30	8:03:00	114
TrackRoute1	20TrainUP_9min	20Train9min7	Kampung Baru North	8:30:21	30	8:30:51	0
TrackRoute1	20TrainUP_9min	20Train9min8	Damansara Damai	8:11:30	30	8:12:00	114
TrackRoute1	20TrainUP_9min	20Train9min8	Kampung Baru North	8:39:21	30	8:39:51	0
TrackRoute1	20TrainUP_9min	20Train9min9	Damansara Damai	8:20:30	30	8:21:00	114
TrackRoute1	20TrainUP_9min	20Train9min9	Kampung Baru North	8:48:21	30	8:48:51	0
TrackRoute1	20TrainUP_9min	20Train9min10	Damansara Damai	8:29:30	30	8:30:00	114
TrackRoute1	20TrainUP_9min	20Train9min10	Kampung Baru North	8:57:21	30	8:57:51	0
TrackRoute1	20TrainUP_9min	20Train9min11	Damansara Damai	8:38:30	30	8:39:00	114
TrackRoute1	20TrainUP_9min	20Train9min11	Kampung Baru North	9:06:21	30	9:06:51	0
TrackRoute1	20TrainUP_9min	20Train9min12	Damansara Damai	8:47:30	30	8:48:00	114
TrackRoute1	20TrainUP_9min	20Train9min12	Kampung Baru North	9:15:21	30	9:15:51	0
TrackRoute1	20TrainUP_9min	20Train9min13	Damansara Damai	8:56:30	30	8:57:00	114
TrackRoute1	20TrainUP_9min	20Train9min13	Kampung Baru North	9:24:21	30	9:24:51	0
TrackRoute1	20TrainUP_9min	20Train9min14	Damansara Damai	9:05:30	30	9:06:00	114
TrackRoute1	20TrainUP_9min	20Train9min14	Kampung Baru North	9:33:21	30	9:33:51	0
TrackRoute1	20TrainUP_9min	20Train9min15	Damansara Damai	9:14:30	30	9:15:00	114
TrackRoute1	20TrainUP_9min	20Train9min15	Kampung Baru North	9:42:21	30	9:42:51	0
TrackRoute1	20TrainUP_9min	20Train9min16	Damansara Damai	9:23:30	30	9:24:00	114
TrackRoute1	20TrainUP_9min	20Train9min16	Kampung Baru North	9:51:21	30	9:51:51	0
TrackRoute1	20TrainUP_9min	20Train9min17	Damansara Damai	9:32:30	30	9:33:00	114
TrackRoute1	20TrainUP_9min	20Train9min17	Kampung Baru North	10:00:21	30	10:00:51	0
TrackRoute1	20TrainUP_9min	20Train9min18	Damansara Damai	9:41:30	30	9:42:00	114
TrackRoute1	20TrainUP_9min	20Train9min18	Kampung Baru North	10:09:21	30	10:09:51	0
TrackRoute1	20TrainUP_9min	20Train9min19	Damansara Damai	9:50:30	30	9:51:00	114
TrackRoute1	20TrainUP_9min	20Train9min19	Kampung Baru North	10:18:21	30	10:18:51	0
TrackRoute2	20TrainDown_9min	20train9min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)1	Kampung Baru North	7:08:30	30	7:09:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)1	Damansara Damai	7:36:25	30	7:36:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)2	Kampung Baru North	7:17:30	30	7:18:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)2	Damansara Damai	7:45:25	30	7:45:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)3	Kampung Baru North	7:26:30	30	7:27:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)3	Damansara Damai	7:54:25	30	7:54:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)4	Kampung Baru North	7:35:30	30	7:36:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)4	Damansara Damai	8:03:25	30	8:03:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)5	Kampung Baru North	7:44:30	30	7:45:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)5	Damansara Damai	8:12:25	30	8:12:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)6	Kampung Baru North	7:53:30	30	7:54:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)6	Damansara Damai	8:21:25	30	8:21:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)7	Kampung Baru North	8:02:30	30	8:03:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)7	Damansara Damai	8:30:25	30	8:30:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)8	Kampung Baru North	8:11:30	30	8:12:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)8	Damansara Damai	8:39:25	30	8:39:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)9	Kampung Baru North	8:20:30	30	8:21:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)9	Damansara Damai	8:48:25	30	8:48:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)10	Kampung Baru North	8:29:30	30	8:30:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)10	Damansara Damai	8:57:25	30	8:57:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)11	Kampung Baru North	8:38:30	30	8:39:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)11	Damansara Damai	9:06:25	30	9:06:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)12	Kampung Baru North	8:47:30	30	8:48:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)12	Damansara Damai	9:15:25	30	9:15:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)13	Kampung Baru North	8:56:30	30	8:57:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)13	Damansara Damai	9:24:25	30	9:24:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)14	Kampung Baru North	9:05:30	30	9:06:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)14	Damansara Damai	9:33:25	30	9:33:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)15	Kampung Baru North	9:14:30	30	9:15:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)15	Damansara Damai	9:42:25	30	9:42:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)16	Kampung Baru North	9:23:30	30	9:24:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)16	Damansara Damai	9:51:25	30	9:51:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)17	Kampung Baru North	9:32:30	30	9:33:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)17	Damansara Damai	10:00:25	30	10:00:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)18	Kampung Baru North	9:41:30	30	9:42:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)18	Damansara Damai	10:09:25	30	10:09:55	0
TrackRoute2	20TrainDown_9min	20train9min(PH)19	Kampung Baru North	9:50:30	30	9:51:00	97
TrackRoute2	20TrainDown_9min	20train9min(PH)19	Damansara Damai	10:18:25	30	10:18:55	0

A- 24Train Schedule for 20 train 30 min headway.

Train Schedule Results							
Train Schedule Information				Trip Information			
Route ID	Schedule ID	Trip ID	Station Names	Arrival	Dwell	Departure	Trip
TrackRoute1	20TrainUP_30min	20Train30min	Damansara Damai	6:59:30	30	7:00:00	114
TrackRoute1	20TrainUP_30min	20Train30min	Kampung Baru North	7:27:21	30	7:27:51	0
TrackRoute1	20TrainUP_30min	20Train30min1	Damansara Damai	7:29:30	30	7:30:00	114
TrackRoute1	20TrainUP_30min	20Train30min1	Kampung Baru North	7:57:21	30	7:57:51	0
TrackRoute1	20TrainUP_30min	20Train30min2	Damansara Damai	7:59:30	30	8:00:00	114
TrackRoute1	20TrainUP_30min	20Train30min2	Kampung Baru North	8:27:21	30	8:27:51	0
TrackRoute1	20TrainUP_30min	20Train30min3	Damansara Damai	8:29:30	30	8:30:00	114
TrackRoute1	20TrainUP_30min	20Train30min3	Kampung Baru North	8:57:21	30	8:57:51	0
TrackRoute1	20TrainUP_30min	20Train30min4	Damansara Damai	8:59:30	30	9:00:00	114
TrackRoute1	20TrainUP_30min	20Train30min4	Kampung Baru North	9:27:21	30	9:27:51	0
TrackRoute1	20TrainUP_30min	20Train30min5	Damansara Damai	9:29:30	30	9:30:00	114
TrackRoute1	20TrainUP_30min	20Train30min5	Kampung Baru North	9:57:21	30	9:57:51	0
TrackRoute1	20TrainUP_30min	20Train30min6	Damansara Damai	9:59:30	30	10:00:00	114
TrackRoute1	20TrainUP_30min	20Train30min6	Kampung Baru North	10:27:21	30	10:27:51	0
TrackRoute1	20TrainUP_30min	20Train30min7	Damansara Damai	10:29:30	30	10:30:00	114
TrackRoute1	20TrainUP_30min	20Train30min7	Kampung Baru North	10:57:21	30	10:57:51	0
TrackRoute1	20TrainUP_30min	20Train30min8	Damansara Damai	10:59:30	30	11:00:00	114
TrackRoute1	20TrainUP_30min	20Train30min8	Kampung Baru North	11:27:21	30	11:27:51	0
TrackRoute1	20TrainUP_30min	20Train30min9	Damansara Damai	11:29:30	30	11:30:00	114
TrackRoute1	20TrainUP_30min	20Train30min9	Kampung Baru North	11:57:21	30	11:57:51	0
TrackRoute1	20TrainUP_30min	20Train30min10	Damansara Damai	11:59:30	30	12:00:00	114
TrackRoute1	20TrainUP_30min	20Train30min10	Kampung Baru North	12:27:21	30	12:27:51	0
TrackRoute1	20TrainUP_30min	20Train30min11	Damansara Damai	12:29:30	30	12:30:00	114
TrackRoute1	20TrainUP_30min	20Train30min11	Kampung Baru North	12:57:21	30	12:57:51	0
TrackRoute1	20TrainUP_30min	20Train30min12	Damansara Damai	12:59:30	30	13:00:00	114
TrackRoute1	20TrainUP_30min	20Train30min12	Kampung Baru North	13:27:21	30	13:27:51	0
TrackRoute1	20TrainUP_30min	20Train30min13	Damansara Damai	13:29:30	30	13:30:00	114
TrackRoute1	20TrainUP_30min	20Train30min13	Kampung Baru North	13:57:21	30	13:57:51	0
TrackRoute1	20TrainUP_30min	20Train30min14	Damansara Damai	13:59:30	30	14:00:00	114
TrackRoute1	20TrainUP_30min	20Train30min14	Kampung Baru North	14:27:21	30	14:27:51	0
TrackRoute1	20TrainUP_30min	20Train30min15	Damansara Damai	14:29:30	30	14:30:00	114
TrackRoute1	20TrainUP_30min	20Train30min15	Kampung Baru North	14:57:21	30	14:57:51	0
TrackRoute1	20TrainUP_30min	20Train30min16	Damansara Damai	14:59:30	30	15:00:00	114
TrackRoute1	20TrainUP_30min	20Train30min16	Kampung Baru North	15:27:21	30	15:27:51	0
TrackRoute1	20TrainUP_30min	20Train30min17	Damansara Damai	15:29:30	30	15:30:00	114
TrackRoute1	20TrainUP_30min	20Train30min17	Kampung Baru North	15:57:21	30	15:57:51	0
TrackRoute1	20TrainUP_30min	20Train30min18	Damansara Damai	15:59:30	30	16:00:00	114
TrackRoute1	20TrainUP_30min	20Train30min18	Kampung Baru North	16:27:21	30	16:27:51	0
TrackRoute1	20TrainUP_30min	20Train30min19	Damansara Damai	16:29:30	30	16:30:00	114
TrackRoute1	20TrainUP_30min	20Train30min19	Kampung Baru North	16:57:21	30	16:57:51	0
TrackRoute2	20TrainDown_30min	20train30min(PH)	Kampung Baru North	6:59:30	30	7:00:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)	Damansara Damai	7:27:25	30	7:27:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)1	Kampung Baru North	7:29:30	30	7:30:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)1	Damansara Damai	7:57:25	30	7:57:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)2	Kampung Baru North	7:59:30	30	8:00:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)2	Damansara Damai	8:27:25	30	8:27:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)3	Kampung Baru North	8:29:30	30	8:30:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)3	Damansara Damai	8:57:25	30	8:57:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)4	Kampung Baru North	8:59:30	30	9:00:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)4	Damansara Damai	9:27:25	30	9:27:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)5	Kampung Baru North	9:29:30	30	9:30:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)5	Damansara Damai	9:57:25	30	9:57:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)6	Kampung Baru North	9:59:30	30	10:00:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)6	Damansara Damai	10:27:25	30	10:27:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)7	Kampung Baru North	10:29:30	30	10:30:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)7	Damansara Damai	10:57:25	30	10:57:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)8	Kampung Baru North	10:59:30	30	11:00:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)8	Damansara Damai	11:27:25	30	11:27:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)9	Kampung Baru North	11:29:30	30	11:30:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)9	Damansara Damai	11:57:25	30	11:57:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)10	Kampung Baru North	11:59:30	30	12:00:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)10	Damansara Damai	12:27:25	30	12:27:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)11	Kampung Baru North	12:29:30	30	12:30:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)11	Damansara Damai	12:57:25	30	12:57:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)12	Kampung Baru North	12:59:30	30	13:00:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)12	Damansara Damai	13:27:25	30	13:27:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)13	Kampung Baru North	13:29:30	30	13:30:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)13	Damansara Damai	13:57:25	30	13:57:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)14	Kampung Baru North	13:59:30	30	14:00:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)14	Damansara Damai	14:27:25	30	14:27:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)15	Kampung Baru North	14:29:30	30	14:30:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)15	Damansara Damai	14:57:25	30	14:57:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)16	Kampung Baru North	14:59:30	30	15:00:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)16	Damansara Damai	15:27:25	30	15:27:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)17	Kampung Baru North	15:29:30	30	15:30:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)17	Damansara Damai	15:57:25	30	15:57:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)18	Kampung Baru North	15:59:30	30	16:00:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)18	Damansara Damai	16:27:25	30	16:27:55	0
TrackRoute2	20TrainDown_30min	20train30min(PH)19	Kampung Baru North	16:29:30	30	16:30:00	97
TrackRoute2	20TrainDown_30min	20train30min(PH)19	Damansara Damai	16:57:25	30	16:57:55	0

