PRACTICUM FINAL REPORT  
TRAFFIC ENGINEERING  
<<COURSE CODE>>

# COVER PAGE

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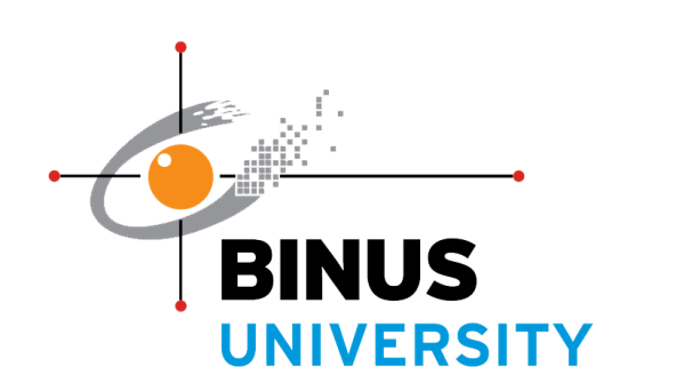
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CIVIL ENGINEERING STUDY PROGRAM

FACULTY OF ENGINEERING

BINUS UNIVERSITY

JAKARTA

2023/2024

PRACTICUM FINAL REPORT  
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# APPROVAL SHEET

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# PREFACE

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Jakarta, dd mmmm yyyy

Group <<\_>> / <<CLASS>>

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# LIST OF NOTATIONS

*a* = notation (unit)

*b* = notation (unit)

*k* = notation (unit)

*L*1 = notation (unit)

*L*2 = notation (unit)

*U*in = notation (unit)

*U*out = notation (unit)

*n* = notation (unit)

*x* = notation (unit)

# TRAFFIC VOLUME STUDY

## OBJECTIVE

The objective of the traffic volume studies practicum are:

1. To determine the volume of vehicles on the road based on vehicle categorization;
2. To calculate the total number of passengers and passenger car units (PCU);
3. To determine the car's peak hour factor.

## BASIC THEORY

Increased mobility necessitates transportation facilities and infrastructure that are appropriate, safe, comfortable, and economical for society. Increased per capita income enables society to own a vehicle such as a motorcycle or a car as a personal means. Traffic volume and speed are two traffic metrics that are related to noise level analysis. The number of cars traveling through a location, a place on a highway, a certain lane, or the direction of a highway within a given time interval is defined as traffic volume. Distance divided by time equals speed. Time is divided into two types: time travel and movement time. Because it is deep, motion time is reduced journey time the length of the delay. Speed is often measured in seconds, whereas distance is measured in meters (Zulkipli, 2017).

The amount of traffic flow can be acquired via traffic analysis in the form of traffic volume, which is based on surveys and future traffic volume forecasts. The planning traffic study takes the form of planned daily traffic volume. According to the Decree of the Director General (KEPDIRJEN) of Bina Marga (2012), traffic growth factors are based on historical growth data or correlation formularies with other valid growth factors; if these are not available, the estimated traffic growth factors can be used as follows:

1. Arterial and urban highways with 5% increase from 2011 to 2020 and 4% growth from 2021 to 2030;
2. Rural roads with a 3.5% increase from 2011 to 2020 and a 2.5% increase from 2021 to 2030 (Wahab et al., 2015).

### PASSANGER CAR UNIT

The Passenger Car Unit (PCU) is a popular method for converting heterogeneous traffic volume into homogenous traffic volume. PCU is defined as "the measure of relative interaction between a vehicle and a traffic stream in comparison to a standard passenger car under a given set of roadway and traffic conditions." PCU estimation is necessary for each vehicle type present in the traffic stream in order to construct and analyze the operation of various traffic facilities and to manage traffic regulation and control. The use of appropriate PCU for distinct vehicle categories will result in accurate measurement of homogeneous traffic volume in mixed traffic situations, which is important for providing the acceptable level of service.

Furthermore, improper PCU implementation may result in an unforeseen congestion scenario. Many academics thought of PCU as a static figure, but a substantial volume of study, particularly in the last two decades, demonstrated how it varies with changes in traffic, road geometry, and other factors (Sharma & Biswas, 2021).

Calculation of equation to determine the passenger car unit is as following:

*PCU = n* × **(1.1****)**

Notes:

*PCU* = Passenger Car Unit;

*n* = Volume of vehicle;

= Coefficient of passenger car unit.

The table below shows the passenger car unit coefficient for the various types of transportation:

**Table 1.1 Coefficient of Passenger Car Unit**

|  |  |  |
| --- | --- | --- |
| **Type of Vehicles** | **Public Roadway** | **Urban District** |
| Car | 1 | 1 |
| Motorcycle | 0.5 – 1 | 0.2 – 0.5 |
| Ligth truck (2 axles) | 3 | 2 |
| Heavy truck (>2 axles) | 4 | 3 |

### PASSENGER VOLUME

Passenger volume often refers to the quantity of individuals using a particular mode of transportation, vehicle, or location over a set period of time. It is a crucial indicator used to evaluate the effectiveness and capacity of transportation systems.

**Table 1.2 Coefficient of Passenger Volume Factor**

|  |  |
| --- | --- |
| **Type of Vehicles** | **Passenger Volume Factor** |
| Car | 3 |
| Motorcycle | 2 |
| Light truck (2 axles) | 2 |
| Heavy truck (>2 axles) | 2 |

Calculation of equation to determine the passenger volume is as following:

= *n* ×

Notes:

= Passenger volume;

*n* = Volume of vehicle;

= Coefficient of passenger volume.

### PEAK HOUR FACTOR

Peak hour factor (PHF) is a critical indicator used to quantify traffic conditions on a particular route or transportation network during the busiest or most congested hour(s) of the day. It serves as a gauge for traffic congestion and provides information on both the intensity of the problem and the effectiveness of the transportation system during peak hours.

Calculation of equation to determine the peak hour factor is as following:

*PHF =*

Notes:

*PHF* = Passenger Car Unit;

= Volume of vehicle;

= Coefficient of passenger car unit.

## TOOLS

The following equipment is required to conduct this experiment:

1. Stopwatch;
2. Tally counter:
3. Form;
4. Stationery.

|  |  |  |
| --- | --- | --- |
| Figure 1.1 Stopwatch | Figure 1.2 Tally Counter | Figure 1.3 Form |
|  |  |  |

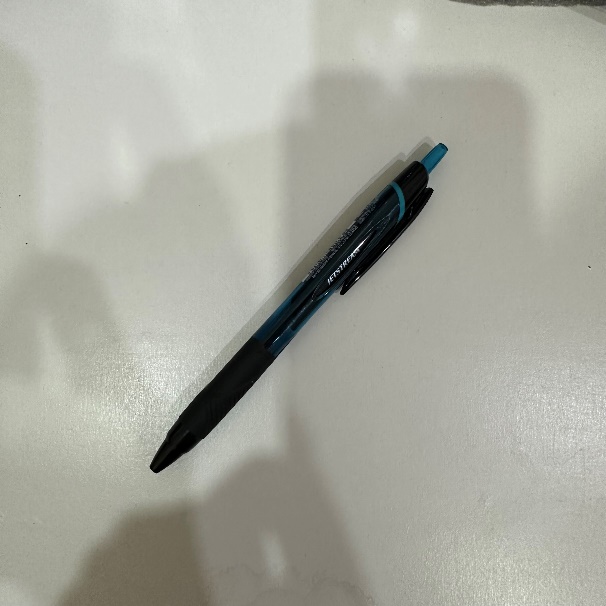


Figure 1.4 Stationery

## PROCEDURE

The following is the procedure to conduct the experiment:

* 1. Specify the location, preferably it should have a clear view of the traffic with an observable inbound and outbound lane. It should also be safe for the observer such as pedestrian bridge that is located above the lane/road;

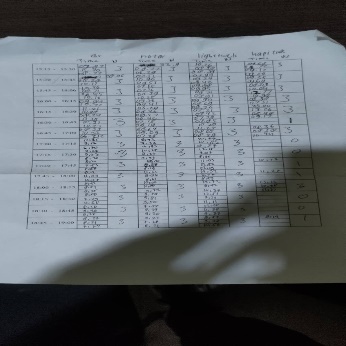


* 1. Categorize the vehicles into 4 types: passenger cars, motorcycles, light trucks, and heavy trucks;



* 1. The experiment is conducted for 12 hours with time period of 15 minutes (refer to the experimental data form) to obtain traffic volume, total passenger, and total passenger car unit for each time period (morning, noon, and afternoon);



* 1. Once the traffic volume is recorded for each period, refer to Table 1.1 to obtain the passenger car unit and Table 1.2 to obtain the passenger volume.
  2. 

## PRACTICUM RESULT

The data and analysis for Traffic Volume Study practicum are discussed in section 1.5.1 and 1.5.2..

### PRACTICUM DATA

This section contain the collected Traffic Volume Study practicum data.

Direction 1 :Kebon Jeruk – Kelapa Dua

Direction 2 :Kelapa Dua – Kebon Jeruk

Table 1.1 Vehicle Data from Kebon Jeruk – Kelapa Dua

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Unit** | | | |
| **Car** | **Motorcycle** | **Light Truck** | **Heavy Truck** |
| 07:00 - 07.15 | 139 | 614 | 10 | 5 |
| 07:15 - 07:30 | 175 | 677 | 7 | 3 |
| 07:30 - 07:45 | 113 | 767 | 14 | 5 |
| 07:45 - 08:00 | 158 | 810 | 13 | 2 |
| 08:00 - 08:15 | 179 | 727 | 22 | 8 |
| 08:15 - 08:30 | 180 | 813 | 9 | 7 |
| 08:30 - 08:45 | 186 | 786 | 10 | 5 |
| 08:45 - 09:00 | 220 | 717 | 21 | 2 |
| 09:00 - 09:15 | 248 | 766 | 17 | 5 |
| 09:15 - 09:30 | 252 | 742 | 11 | 7 |
| 09:30 - 09:45 | 208 | 713 | 15 | 15 |
| 09:45 - 10:00 | 250 | 733 | 12 | 9 |
| 10:00 - 10:15 | 303 | 808 | 12 | 6 |
| 10:15 - 10:30 | 295 | 791 | 16 | 9 |
| 10:30 - 10:45 | 295 | 720 | 12 | 6 |
| 10:45 - 11:00 | 341 | 724 | 19 | 2 |
| 11:00 - 11:15 | 320 | 779 | 17 | 6 |
| 11:15 - 11:30 | 355 | 795 | 15 | 4 |
| 11:30 - 11:45 | 341 | 748 | 16 | 10 |
| 11:45 - 12:00 | 331 | 690 | 10 | 4 |
| 12:00 - 12:15 | 369 | 640 | 12 | 5 |
| 12:15 - 12:30 | 293 | 723 | 14 | 3 |
| 12:30 - 12:45 | 393 | 730 | 14 | 4 |
| 12:45 - 13:00 | 374 | 700 | 21 | 2 |
| 13:00 - 13:15 | 380 | 665 | 15 | 4 |
| 13:15 - 13:30 | 338 | 709 | 12 | 7 |
| 13:30 - 13:45 | 285 | 698 | 16 | 6 |
| 13:45 - 14:00 | 295 | 790 | 14 | 4 |
| 14:00 - 14:15 | 325 | 620 | 15 | 3 |
| 14:15 - 14:30 | 372 | 725 | 18 | 6 |
| 14:30 - 14:45 | 342 | 760 | 20 | 5 |
| 14:45 - 15:00 | 335 | 724 | 15 | 7 |
| 15:00 - 15:15 | 294 | 794 | 11 | 4 |

Table 1.1 Vehicle Data from Kebon Jeruk – Kelapa Dua (Continued)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Unit** | | | |
| **Car** | **Motorcycle** | **Light Truck** | **Heavy Truck** |
| 15:15 - 15:30 | 274 | 793 | 18 | 11 |
| 15:30 - 15:45 | 320 | 822 | 14 | 7 |
| 15:45 - 16:00 | 303 | 850 | 16 | 5 |
| 16:00 - 16:15 | 292 | 903 | 10 | 12 |
| 16:15 - 16:30 | 293 | 935 | 13 | 6 |
| 16:30 - 16:45 | 312 | 922 | 20 | 3 |
| 16:45 - 17:00 | 317 | 956 | 16 | 4 |
| 17:00 - 17:15 | 263 | 905 | 17 | 2 |
| 17:15 - 17:30 | 303 | 987 | 14 | 0 |
| 17:30 - 17:45 | 310 | 892 | 21 | 7 |
| 17:45 - 18:00 | 235 | 844 | 16 | 0 |
| 18:00 - 18:15 | 274 | 641 | 11 | 6 |
| 18:15 - 18:30 | 240 | 826 | 13 | 4 |
| 18:30 - 18:45 | 288 | 895 | 20 | 2 |
| 18:45 - 19:00 | 269 | 876 | 17 | 1 |

Table 1.1 shows the vehicle (car, motorcycle, light truck and heavy truck) volume from Kebon Jeruk to Kelapa Dua at 07.00 until 19.00.

Figure 1.1 Graph of Vehicle Volume from Kebon Jeruk to Kelapa Dua

Figure 1.1 shows the graph of the relation between time period and vehicle volume from Kebon Jeruk to Kelapa Dua. The graph shows that the largest volume of vehicles passing this road are motorbikes, then cars. Meanwhile, light and heavy trucks have a volume difference that is not too significant.

Table 1.2 Vehicle Data from Kelapa Dua – Kebon Jeruk

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Unit** | | | |
| **Car** | **Motorcycle** | **Light Truck** | **Heavy Truck** |
| 07:00 - 07.15 | 120 | 547 | 7 | 2 |
| 07:15 - 07:30 | 131 | 615 | 7 | 3 |
| 07:30 - 07:45 | 104 | 694 | 12 | 6 |
| 07:45 - 08:00 | 120 | 727 | 13 | 3 |
| 08:00 - 08:15 | 127 | 709 | 16 | 6 |
| 08:15 - 08:30 | 147 | 780 | 12 | 6 |
| 08:30 - 08:45 | 156 | 790 | 17 | 9 |
| 08:45 - 09:00 | 182 | 767 | 7 | 5 |
| 09:00 - 09:15 | 204 | 668 | 2 | 4 |
| 09:15 - 09:30 | 194 | 800 | 17 | 4 |
| 09:30 - 09:45 | 263 | 751 | 17 | 5 |
| 09:45 - 10:00 | 278 | 723 | 15 | 11 |
| 10:00 - 10:15 | 246 | 735 | 11 | 7 |
| 10:15 - 10:30 | 270 | 745 | 16 | 4 |
| 10:30 - 10:45 | 255 | 711 | 23 | 5 |
| 10:45 - 11:00 | 270 | 700 | 18 | 7 |
| 11:00 - 11:15 | 286 | 765 | 14 | 7 |
| 11:15 - 11:30 | 257 | 810 | 6 | 6 |
| 11:30 - 11:45 | 255 | 740 | 21 | 2 |
| 11:45 - 12:00 | 266 | 702 | 15 | 2 |
| 12:00 - 12:15 | 259 | 690 | 9 | 4 |
| 12:15 - 12:30 | 245 | 712 | 13 | 4 |
| 12:30 - 12:45 | 230 | 807 | 21 | 6 |
| 12:45 - 13:00 | 318 | 828 | 18 | 1 |
| 13:00 - 13:15 | 305 | 851 | 26 | 6 |
| 13:15 - 13:30 | 302 | 926 | 12 | 5 |
| 13:30 - 13:45 | 318 | 897 | 17 | 4 |
| 13:45 - 14:00 | 300 | 819 | 10 | 5 |
| 14:00 - 14:15 | 295 | 815 | 24 | 4 |
| 14:15 - 14:30 | 282 | 809 | 15 | 4 |
| 14:30 - 14:45 | 274 | 835 | 17 | 7 |
| 14:45 - 15:00 | 300 | 745 | 14 | 6 |
| 15:00 - 15:15 | 281 | 781 | 10 | 6 |
| 15:15 - 15:30 | 312 | 816 | 15 | 6 |
| 15:30 - 15:45 | 282 | 999 | 14 | 5 |
| 15:45 - 16:00 | 283 | 963 | 14 | 5 |
| 16:00 - 16:15 | 298 | 1140 | 14 | 8 |
| 16:15 - 16:30 | 315 | 1192 | 15 | 4 |
| 16:30 - 16:45 | 308 | 1270 | 10 | 1 |
| 16:45 - 17:00 | 326 | 1312 | 16 | 5 |
| 17:00 - 17:15 | 331 | 750 | 14 | 0 |
| 17:15 - 17:30 | 411 | 743 | 16 | 0 |
| 17:30 - 17:45 | 425 | 920 | 18 | 1 |
| 17:45 - 18:00 | 348 | 937 | 14 | 1 |
| 18:00 - 18:15 | 319 | 916 | 18 | 3 |

Table 1.2 Vehicle Data from Kelapa Dua – Kebon Jeruk (Continued)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Unit** | | | |
| **Car** | **Motorcycle** | **Light Truck** | **Heavy Truck** |
| 18:15 - 18:30 | 273 | 884 | 11 | 0 |
| 18:30 - 18:45 | 268 | 731 | 14 | 0 |
| 18:45 - 19:00 | 243 | 672 | 10 | 1 |

Table 1.2 shows the vehicle (car, motorcycle, light truck and heavy truck) volume from Kelapa Dua to Kebon Jeruk at 07.00 until 19.00.

Figure 1.2 Graph of Vehicle Volume from Kebon Jeruk to Kelapa Dua

Figure 1.2 shows the graph of the relation between time period and vehicle volume from Kelapa Dua to Kebon Jeruk. The graph shows that the largest volume of vehicles passing this road are motorbikes, then cars. Meanwhile, light and heavy trucks have a volume difference that is not too significant.

### ANALYSIS

The following section contains the additional practicum data and analysis for Traffic Volume Study practicum.

Table 1.3 Passenger Car Unit Calculation of Kebon Jeruk – Kelapa Dua

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Unit** | | | |
| **Car** | **Motorcycle** | **Light Truck** | **Heavy Truck** |
| 07:00 - 07.15 | 139 | 307 | 20 | 15 |
| 07:15 - 07:30 | 175 | 338.5 | 14 | 9 |
| 07:30 - 07:45 | 113 | 383.5 | 28 | 15 |
| 07:45 - 08:00 | 158 | 405 | 26 | 6 |
| 08:00 - 08:15 | 179 | 363.5 | 44 | 24 |
| 08:15 - 08:30 | 180 | 406.5 | 18 | 21 |
| 08:30 - 08:45 | 186 | 393 | 20 | 15 |
| 08:45 - 09:00 | 220 | 358.5 | 42 | 6 |
| 09:00 - 09:15 | 248 | 383 | 34 | 15 |
| 09:15 - 09:30 | 252 | 371 | 22 | 21 |
| 09:30 - 09:45 | 208 | 356.5 | 30 | 45 |
| 09:45 - 10:00 | 250 | 366.5 | 24 | 27 |
| 10:00 - 10:15 | 303 | 404 | 24 | 18 |
| 10:15 - 10:30 | 295 | 395.5 | 32 | 27 |
| 10:30 - 10:45 | 295 | 360 | 24 | 18 |
| 10:45 - 11:00 | 341 | 362 | 38 | 6 |
| 11:00 - 11:15 | 320 | 389.5 | 34 | 18 |
| 11:15 - 11:30 | 355 | 397.5 | 30 | 12 |
| 11:30 - 11:45 | 341 | 374 | 32 | 30 |
| 11:45 - 12:00 | 331 | 345 | 20 | 12 |
| 12:00 - 12:15 | 369 | 320 | 24 | 15 |
| 12:15 - 12:30 | 293 | 361.5 | 28 | 9 |
| 12:30 - 12:45 | 393 | 365 | 28 | 12 |
| 12:45 - 13:00 | 374 | 350 | 42 | 6 |
| 13:00 - 13:15 | 380 | 332.5 | 30 | 12 |
| 13:15 - 13:30 | 338 | 354.5 | 24 | 21 |
| 13:30 - 13:45 | 285 | 349 | 32 | 18 |
| 13:45 - 14:00 | 295 | 395 | 28 | 12 |
| 14:00 - 14:15 | 325 | 310 | 30 | 9 |
| 14:15 - 14:30 | 372 | 362.5 | 36 | 18 |
| 14:30 - 14:45 | 342 | 380 | 40 | 15 |
| 14:45 - 15:00 | 335 | 362 | 30 | 21 |
| 15:00 - 15:15 | 294 | 397 | 22 | 12 |
| 15:15 - 15:30 | 274 | 396.5 | 36 | 33 |
| 15:30 - 15:45 | 320 | 411 | 28 | 21 |
| 15:45 - 16:00 | 303 | 425 | 32 | 15 |
| 16:00 - 16:15 | 292 | 451.5 | 20 | 36 |
| 16:15 - 16:30 | 293 | 467.5 | 26 | 18 |
| 16:30 - 16:45 | 312 | 461 | 40 | 9 |
| 16:45 - 17:00 | 317 | 478 | 32 | 12 |

Table 1.3 Passenger Car Unit Calculation of Kebon Jeruk – Kelapa Dua (Continued)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Unit** | | | |
| **Car** | **Motorcycle** | **Light Truck** | **Heavy Truck** |
| 17:00 - 17:15 | 263 | 452.5 | 34 | 6 |
| 17:15 - 17:30 | 303 | 493.5 | 28 | 0 |
| 17:30 - 17:45 | 310 | 446 | 42 | 21 |
| 17:45 - 18:00 | 235 | 422 | 32 | 0 |
| 18:00 - 18:15 | 274 | 320.5 | 22 | 18 |
| 18:15 - 18:30 | 240 | 413 | 26 | 12 |
| 18:30 - 18:45 | 288 | 447.5 | 40 | 6 |
| 18:45 - 19:00 | 269 | 438 | 34 | 3 |

The passenger car unit (*PCU*) calculation for motorcycle from 07.00 – 07.15 time period data can be obtained through the following equation.

1. *PCU*

;

Figure 1.3 Graph of Passenger Car Unit from Kebon Jeruk to Kelapa Dua

Table 1.4 Passenger Car Unit Calculation Kelapa Dua – Kebon Jeruk

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Unit** | | | |
| **Car** | **Motorcycle** | **Light Truck** | **Heavy Truck** |
| 07:00 - 07.15 | 120 | 273.5 | 14 | 6 |
| 07:15 - 07:30 | 131 | 307.5 | 14 | 9 |
| 07:30 - 07:45 | 104 | 347 | 24 | 18 |
| 07:45 - 08:00 | 120 | 363.5 | 26 | 9 |
| 08:00 - 08:15 | 127 | 354.5 | 32 | 18 |
| 08:15 - 08:30 | 147 | 390 | 24 | 18 |
| 08:30 - 08:45 | 156 | 395 | 34 | 27 |
| 08:45 - 09:00 | 182 | 383.5 | 14 | 15 |
| 09:00 - 09:15 | 204 | 334 | 4 | 12 |
| 09:15 - 09:30 | 194 | 400 | 34 | 12 |
| 09:30 - 09:45 | 263 | 375.5 | 34 | 15 |
| 09:45 - 10:00 | 278 | 361.5 | 30 | 33 |
| 10:00 - 10:15 | 246 | 367.5 | 22 | 21 |
| 10:15 - 10:30 | 270 | 372.5 | 32 | 12 |
| 10:30 - 10:45 | 255 | 355.5 | 46 | 15 |
| 10:45 - 11:00 | 270 | 350 | 36 | 21 |
| 11:00 - 11:15 | 286 | 382.5 | 28 | 21 |
| 11:15 - 11:30 | 257 | 405 | 12 | 18 |
| 11:30 - 11:45 | 255 | 370 | 42 | 6 |
| 11:45 - 12:00 | 266 | 351 | 30 | 6 |
| 12:00 - 12:15 | 259 | 345 | 18 | 12 |
| 12:15 - 12:30 | 245 | 356 | 26 | 12 |
| 12:30 - 12:45 | 230 | 403.5 | 42 | 18 |
| 12:45 - 13:00 | 318 | 414 | 36 | 3 |
| 13:00 - 13:15 | 305 | 425.5 | 52 | 18 |
| 13:15 - 13:30 | 302 | 463 | 24 | 15 |
| 13:30 - 13:45 | 318 | 448.5 | 34 | 12 |
| 13:45 - 14:00 | 300 | 409.5 | 20 | 15 |
| 14:00 - 14:15 | 295 | 407.5 | 48 | 12 |
| 14:15 - 14:30 | 282 | 404.5 | 30 | 12 |
| 14:30 - 14:45 | 274 | 417.5 | 34 | 21 |
| 14:45 - 15:00 | 300 | 372.5 | 28 | 18 |
| 15:00 - 15:15 | 281 | 390.5 | 20 | 18 |
| 15:15 - 15:30 | 312 | 408 | 30 | 18 |
| 15:30 - 15:45 | 282 | 499.5 | 28 | 15 |
| 15:45 - 16:00 | 283 | 481.5 | 28 | 15 |
| 16:00 - 16:15 | 298 | 570 | 28 | 24 |
| 16:15 - 16:30 | 315 | 596 | 30 | 12 |
| 16:30 - 16:45 | 308 | 635 | 20 | 3 |
| 16:45 - 17:00 | 326 | 656 | 32 | 15 |
| 17:00 - 17:15 | 331 | 375 | 28 | 0 |
| 17:15 - 17:30 | 411 | 371.5 | 32 | 0 |
| 17:30 - 17:45 | 425 | 460 | 36 | 3 |
| 17:45 - 18:00 | 348 | 468.5 | 28 | 3 |
| 18:00 - 18:15 | 319 | 458 | 36 | 9 |

Table 1.4 Passenger Car Unit Calculation Kelapa Dua – Kebon Jeruk (Continued)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Unit** | | | |
| **Car** | **Motorcycle** | **Light Truck** | **Heavy Truck** |
| 18:15 - 18:30 | 273 | 442 | 22 | 0 |
| 18:30 - 18:45 | 268 | 365.5 | 28 | 0 |
| 18:45 - 19:00 | 243 | 336 | 20 | 3 |

The passenger car unit (*PCU*) calculation for motorcycle from 07.00 – 07.15 time period data can be obtained through the following equation.

1. *PCU*

.

Figure 1.4 Graph of Passenger Car Unit from Kelapa Dua to Kebon Jeruk

Table 1.5 Passenger Volume Calculation of Kebon Jeruk – Kelapa Dua

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Unit** | | | |
| **Car** | **Motorcycle** | **Light Truck** | **Heavy Truck** |
| 07:00 - 07.15 | 417 | 1228 | 20 | 10 |
| 07:15 - 07:30 | 525 | 1354 | 14 | 6 |
| 07:30 - 07:45 | 339 | 1534 | 28 | 10 |
| 07:45 - 08:00 | 474 | 1620 | 26 | 4 |
| 08:00 - 08:15 | 537 | 1454 | 44 | 16 |
| 08:15 - 08:30 | 540 | 1626 | 18 | 14 |
| 08:30 - 08:45 | 558 | 1572 | 20 | 10 |
| 08:45 - 09:00 | 660 | 1434 | 42 | 4 |
| 09:00 - 09:15 | 744 | 1532 | 34 | 10 |
| 09:15 - 09:30 | 756 | 1484 | 22 | 14 |
| 09:30 - 09:45 | 624 | 1426 | 30 | 30 |
| 09:45 - 10:00 | 750 | 1466 | 24 | 18 |
| 10:00 - 10:15 | 909 | 1616 | 24 | 12 |
| 10:15 - 10:30 | 885 | 1582 | 32 | 18 |
| 10:30 - 10:45 | 885 | 1440 | 24 | 12 |
| 10:45 - 11:00 | 1023 | 1448 | 38 | 4 |
| 11:00 - 11:15 | 960 | 1558 | 34 | 12 |
| 11:15 - 11:30 | 1065 | 1590 | 30 | 8 |
| 11:30 - 11:45 | 1023 | 1496 | 32 | 20 |
| 11:45 - 12:00 | 993 | 1380 | 20 | 8 |
| 12:00 - 12:15 | 1107 | 1280 | 24 | 10 |
| 12:15 - 12:30 | 879 | 1446 | 28 | 6 |
| 12:30 - 12:45 | 1179 | 1460 | 28 | 8 |
| 12:45 - 13:00 | 1122 | 1400 | 42 | 4 |
| 13:00 - 13:15 | 1140 | 1330 | 30 | 8 |
| 13:15 - 13:30 | 1014 | 1418 | 24 | 14 |
| 13:30 - 13:45 | 855 | 1396 | 32 | 12 |
| 13:45 - 14:00 | 885 | 1580 | 28 | 8 |
| 14:00 - 14:15 | 975 | 1240 | 30 | 6 |
| 14:15 - 14:30 | 1116 | 1450 | 36 | 12 |
| 14:30 - 14:45 | 1026 | 1520 | 40 | 10 |
| 14:45 - 15:00 | 1005 | 1448 | 30 | 14 |
| 15:00 - 15:15 | 882 | 1588 | 22 | 8 |
| 15:15 - 15:30 | 822 | 1586 | 36 | 22 |
| 15:30 - 15:45 | 960 | 1644 | 28 | 14 |
| 15:45 - 16:00 | 909 | 1700 | 32 | 10 |
| 16:00 - 16:15 | 876 | 1806 | 20 | 24 |
| 16:15 - 16:30 | 879 | 1870 | 26 | 12 |
| 16:30 - 16:45 | 936 | 1844 | 40 | 6 |
| 16:45 - 17:00 | 951 | 1912 | 32 | 8 |
| 17:00 - 17:15 | 789 | 1810 | 34 | 4 |
| 17:15 - 17:30 | 909 | 1974 | 28 | 0 |
| 17:30 - 17:45 | 930 | 1784 | 42 | 14 |
| 17:45 - 18:00 | 705 | 1688 | 32 | 0 |
| 18:00 - 18:15 | 822 | 1282 | 22 | 12 |

Table 1.5 Passenger Volume Calculation of Kebon Jeruk – Kelapa Dua (Continued)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Unit** | | | |
| **Car** | **Motorcycle** | **Light Truck** | **Heavy Truck** |
| 18:15 - 18:30 | 720 | 1652 | 26 | 8 |
| 18:30 - 18:45 | 864 | 1790 | 40 | 4 |
| 18:45 - 19:00 | 807 | 1752 | 34 | 2 |

The passenger volume calculation (*V*p) calculation for motorcycle from 07.00 – 07.15 time period data can be obtained through the following equation.

1. *V*p

;

Figure 1.5 Graph of Passenger Volume from Kebon Jeruk to Kelapa Dua

Table 1.6 Passenger Volume Calculation of Kelapa Dua - Kebon Jeruk

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Unit** | | | |
| **Car** | **Motorcycle** | **Light Truck** | **Heavy Truck** |
| 07:00 - 07.15 | 360 | 1094 | 14 | 4 |
| 07:15 - 07:30 | 393 | 1230 | 14 | 6 |
| 07:30 - 07:45 | 312 | 1388 | 24 | 12 |
| 07:45 - 08:00 | 360 | 1454 | 26 | 6 |
| 08:00 - 08:15 | 381 | 1418 | 32 | 12 |
| 08:15 - 08:30 | 441 | 1560 | 24 | 12 |
| 08:30 - 08:45 | 468 | 1580 | 34 | 18 |
| 08:45 - 09:00 | 546 | 1534 | 14 | 10 |
| 09:00 - 09:15 | 612 | 1336 | 4 | 8 |
| 09:15 - 09:30 | 582 | 1600 | 34 | 8 |
| 09:30 - 09:45 | 789 | 1502 | 34 | 10 |
| 09:45 - 10:00 | 834 | 1446 | 30 | 22 |
| 10:00 - 10:15 | 738 | 1470 | 22 | 14 |
| 10:15 - 10:30 | 810 | 1490 | 32 | 8 |
| 10:30 - 10:45 | 765 | 1422 | 46 | 10 |
| 10:45 - 11:00 | 810 | 1400 | 36 | 14 |
| 11:00 - 11:15 | 858 | 1530 | 28 | 14 |
| 11:15 - 11:30 | 771 | 1620 | 12 | 12 |
| 11:30 - 11:45 | 765 | 1480 | 42 | 4 |
| 11:45 - 12:00 | 798 | 1404 | 30 | 4 |
| 12:00 - 12:15 | 777 | 1380 | 18 | 8 |
| 12:15 - 12:30 | 735 | 1424 | 26 | 8 |
| 12:30 - 12:45 | 690 | 1614 | 42 | 12 |
| 12:45 - 13:00 | 954 | 1656 | 36 | 2 |
| 13:00 - 13:15 | 915 | 1702 | 52 | 12 |
| 13:15 - 13:30 | 906 | 1852 | 24 | 10 |
| 13:30 - 13:45 | 954 | 1794 | 34 | 8 |
| 13:45 - 14:00 | 900 | 1638 | 20 | 10 |
| 14:00 - 14:15 | 885 | 1630 | 48 | 8 |
| 14:15 - 14:30 | 846 | 1618 | 30 | 8 |
| 14:30 - 14:45 | 822 | 1670 | 34 | 14 |
| 14:45 - 15:00 | 900 | 1490 | 28 | 12 |
| 15:00 - 15:15 | 843 | 1562 | 20 | 12 |
| 15:15 - 15:30 | 936 | 1632 | 30 | 12 |
| 15:30 - 15:45 | 846 | 1998 | 28 | 10 |
| 15:45 - 16:00 | 849 | 1926 | 28 | 10 |
| 16:00 - 16:15 | 894 | 2280 | 28 | 16 |
| 16:15 - 16:30 | 945 | 2384 | 30 | 8 |
| 16:30 - 16:45 | 924 | 2540 | 20 | 2 |
| 16:45 - 17:00 | 978 | 2624 | 32 | 10 |
| 17:00 - 17:15 | 993 | 1500 | 28 | 0 |
| 17:15 - 17:30 | 1233 | 1486 | 32 | 0 |
| 17:30 - 17:45 | 1275 | 1840 | 36 | 2 |
| 17:45 - 18:00 | 1044 | 1874 | 28 | 2 |
| 18:00 - 18:15 | 957 | 1832 | 36 | 6 |

Table 1.6 Passenger Volume Calculation of Kelapa Dua - Kebon Jeruk (Continued)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Unit** | | | |
| **Car** | **Motorcycle** | **Light Truck** | **Heavy Truck** |
| 18:15 - 18:30 | 819 | 1768 | 22 | 0 |
| 18:30 - 18:45 | 804 | 1462 | 28 | 0 |
| 18:45 - 19:00 | 729 | 1344 | 20 | 2 |

The passenger volume calculation (*V*p) calculation for motorcycle from 07.00 – 07.15 time period data can be obtained through the following equation.

1. *V*p

.

Figure 1.6 Graph of Passenger Volume from Kelapa Dua to Kebon Jeruk

Table 1.7 Peak Hour Factor Calculation of Kebon Jeruk – Kelapa Dua

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time Period** | **Total Volume** | | | | **Maximum 15 Minutes Value** | **Peak Hour Factor** |
| **15 Minutes** | | **Hourly** | |
| 07:00 - 07.15 | 768 | 3512 | | 983 | | 0.893 |
| 07:15 - 07:30 | 862 |
| 07:30 - 07:45 | 899 |
| 07:45 - 08:00 | 983 |
| 08:00 - 08:15 | 936 | 3892 | | 1009 | | 0.964 |
| 08:15 - 08:30 | 1009 |
| 08:30 - 08:45 | 987 |
| 08:45 - 09:00 | 960 |
| 09:00 - 09:15 | 1036 | 4003 | | 1036 | | 0.966 |
| 09:15 - 09:30 | 1012 |
| 09:30 - 09:45 | 951 |
| 09:45 - 10:00 | 1004 |
| 10:00 - 10:15 | 1129 | 4359 | | 1129 | | 0.965 |
| 10:15 - 10:30 | 1111 |
| 10:30 - 10:45 | 1033 |
| 10:45 - 11:00 | 1086 |
| 11:00 - 11:15 | 1122 | 4441 | | 1169 | | 0.950 |
| 11:15 - 11:30 | 1169 |
| 11:30 - 11:45 | 1115 |
| 11:45 - 12:00 | 1035 |
| 12:00 - 12:15 | 1026 | 4297 | | 1141 | | 0.941 |
| 12:15 - 12:30 | 1033 |
| 12:30 - 12:45 | 1141 |
| 12:45 - 13:00 | 1097 |
| 13:00 - 13:15 | 1064 | 4238 | | 1103 | | 0.961 |
| 13:15 - 13:30 | 1066 |
| 13:30 - 13:45 | 1005 |
| 13:45 - 14:00 | 1103 |
| 14:00 - 14:15 | 963 | 4292 | | 1127 | | 0.952 |
| 14:15 - 14:30 | 1121 |
| 14:30 - 14:45 | 1127 |
| 14:45 - 15:00 | 1081 |
| 15:00 - 15:15 | 1103 | 4536 | | 1174 | | 0.966 |
| 15:15 - 15:30 | 1096 |
| 15:30 - 15:45 | 1163 |
| 15:45 - 16:00 | 1174 |
| 16:00 - 16:15 | 1217 | 5014 | | 1293 | | 0.969 |
| 16:15 - 16:30 | 1247 |
| 16:30 - 16:45 | 1257 |
| 16:45 - 17:00 | 1293 |

Table 1.7 Peak Hour Factor Calculation of Kebon Jeruk – Kelapa Dua (Continued)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Total Volume** | | **Maximum 15 Minutes Value** | **Peak Hour Factor** |
| **15 Minutes** | **Hourly** |
| 17:00 - 17:15 | 1187 | 4816 | 1304 | 0.923 |
| 17:15 - 17:30 | 1304 |
| 17:30 - 17:45 | 1230 |
| 17:45 - 18:00 | 1095 |
| 18:00 - 18:15 | 932 | 4383 | 1205 | 0.909 |
| 18:15 - 18:30 | 1083 |
| 18:30 - 18:45 | 1205 |
| 18:45 - 19:00 | 1163 |

The total vehicle volume for 15 minutes data can be obtained through the following equation.

1. Total Volume for 15 Minutes Car + Motorcycle + Light Truck + Heavy Truck

139 + 614 + 0 + 5

;

The total vehicle volume for 60 minutes data can be obtained through the following equation.

1. Total Volume for 15 Minutes Total Volume for Every 15 Minutes until 1 Hour

768 + 862 + 899 + 983

;

The peak hour factor (*PHF*) data can be obtained through the following equation.

1. *PHF*

.

Based on table 1.7, the peak hour factor graph can be drawn as below.

Figure 1.7 Peak Hour Factor Graph for Kebon Jeruk – Kelapa Dua

The graph above shows that for Kebon Jeruk – Kelapa Dua direction, the highest peak hour are at 09:00 -10:00 and 16:00 – 17:00.

Table 1.8 Peak Hour Factor Calculation of Kelapa Dua – Kebon Jeruk

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time Period** | **Total Volume** | | | | **Maximum 15 Minutes Value** | **Peak Hour Factor** |
| **15 Minutes** | | **Hourly** | |
| 07:00 - 07.15 | 676 | 3111 | | 863 | | 0.901 |
| 07:15 - 07:30 | 756 |
| 07:30 - 07:45 | 816 |
| 07:45 - 08:00 | 863 |
| 08:00 - 08:15 | 858 | 3736 | | 972 | | 0.961 |
| 08:15 - 08:30 | 945 |
| 08:30 - 08:45 | 972 |
| 08:45 - 09:00 | 961 |
| 09:00 - 09:15 | 878 | 3956 | | 1036 | | 0.955 |
| 09:15 - 09:30 | 1015 |
| 09:30 - 09:45 | 1036 |
| 09:45 - 10:00 | 1027 |
| 10:00 - 10:15 | 999 | 4023 | | 1035 | | 0.972 |
| 10:15 - 10:30 | 1035 |
| 10:30 - 10:45 | 994 |
| 10:45 - 11:00 | 995 |
| 11:00 - 11:15 | 1072 | 4154 | | 1079 | | 0.962 |
| 11:15 - 11:30 | 1079 |
| 11:30 - 11:45 | 1018 |
| 11:45 - 12:00 | 985 |
| 12:00 - 12:15 | 962 | 4165 | | 1165 | | 0.894 |
| 12:15 - 12:30 | 974 |
| 12:30 - 12:45 | 1064 |
| 12:45 - 13:00 | 1165 |
| 13:00 - 13:15 | 1188 | 4803 | | 1245 | | 0.964 |
| 13:15 - 13:30 | 1245 |
| 13:30 - 13:45 | 1236 |
| 13:45 - 14:00 | 1134 |
| 14:00 - 14:15 | 1138 | 4446 | | 1138 | | 0.977 |
| 14:15 - 14:30 | 1110 |
| 14:30 - 14:45 | 1133 |
| 14:45 - 15:00 | 1065 |
| 15:00 - 15:15 | 1078 | 4792 | | 1300 | | 0.922 |
| 15:15 - 15:30 | 1149 |
| 15:30 - 15:45 | 1300 |
| 15:45 - 16:00 | 1265 |
| 16:00 - 16:15 | 1460 | 6234 | | 1659 | | 0.939 |
| 16:15 - 16:30 | 1526 |
| 16:30 - 16:45 | 1589 |
| 16:45 - 17:00 | 1659 |

Table 1.8 Peak Hour Factor Calculation of Kelapa Dua – Kebon Jeruk (Continued)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Total Volume** | | **Maximum 15 Minutes Value** | **Peak Hour Factor** |
| **15 Minutes** | **Hourly** |
| 17:00 - 17:15 | 1095 | 4929 | 1364 | 0.903 |
| 17:15 - 17:30 | 1170 |
| 17:30 - 17:45 | 1364 |
| 17:45 - 18:00 | 1300 |
| 18:00 - 18:15 | 1256 | 4363 | 1256 | 0.868 |
| 18:15 - 18:30 | 1168 |
| 18:30 - 18:45 | 1013 |
| 18:45 - 19:00 | 926 |

The total vehicle volume for 15 minutes data can be obtained through the following equation.

1. Total Volume for 15 Minutes Car + Motorcycle + Light Truck + Heavy Truck

120 + 547 + 7 + 2

;

The total vehicle volume for 60 minutes data can be obtained through the following equation.

1. Total Volume for 15 Minutes Total Volume for Every 15 Minutes until 1 Hour

676 + 756 + 816 + 863

;

The peak hour factor (*PHF*) data can be obtained through the following equation.

1. *PHF*

.

Based on table 1.8, the peak hour factor graph can be drawn as below.

Figure 1.8 Peak Hour Factor Graph for Kelapa Dua – Kebon Jeruk

The graph above shows that for Kelapa Dua – Kebon Jeruk direction, the highest peak hour are at 10:00 -11:00 and 14:00 – 15:00.

## CONCLUSIONS

Based on data and analysis on Traffic volume practicum, it can be concluded that:

* 1. Kebon Jeruk – Kelapa Dua direction:

1. The maximum vehicle volume for car is 393 units at 12:00 – 12:30, motorcycle is 987 units at 17:15 – 17:30, light truck is 22 units at 08:00 – 08.30, and heavy truck is 15 units at 09:30 – 09:45;
2. The maximum Passanger Car Unit for car is 393 units at 12:00 – 12:30, motorcycle is 493.5 units at 17:15 – 17:30, light truck is 44 units at 08:00 – 08.30, and heavy truck is 45 units at 09:30 – 09:45;
3. The maximum Passanger Volume for car is 1179 units at 12:00 – 12:30, motorcycle is 1974 units at 17:15 – 17:30, light truck is 44 units at 08:00 – 08.30, and heavy truck is 30 units at 09:30 – 09:45;
4. The maximum Peak Hour Factor is 0.969 at 16:00 – 17:00.
   1. Kelapa Dua – Kebon Jeruk direction:
      1. The maximum vehicle volume for car is 425 units at 17:30 – 17:45, motorcycle is 1312 units at 16:45 – 17:00, light truck is 26 units at 13:00 – 13.30, and heavy truck is 11 units at 09:45 – 10:00;
      2. The maximum Passanger Car Unit for car is 425 units at 17:30 – 17:45, motorcycle is 656 units at 16:45 – 17:00, light truck is 52 units at 13:00 – 13.30, and heavy truck is 33 units at 09:45 – 10:00;
      3. The maximum Passenger Volume for car is 1275 units at 17:30 – 17:45, motorcycle is 2624 units at 16:45 – 17:00, light truck is 52 units at 13:00 – 13.30, and heavy truck is 22 units at 09:45 – 10:00;
      4. The maximum Peak Hour Factor is 0.977 at 14:00 – 15:00.

## ERROR FACTORS

The following are error factors when doing Traffic volume practicum:

1. Human error when miscounting passing vehicles due to lack of focus;
2. Human error when changing the time interval in calculating the number of vehicles.

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# TRAFFIC SPEED STUDY

## OBJECTIVE

The objective of traffic speed studies is to determine the time mean speed () and the space mean speed () of vehicles in a specified road section.

## BASIC THEORY

Speed is a crucial indicator of the degree of quality and safety of the road network. Speed is, by definition, the pace at which a vehicle travels a distance in a given amount of time. The terms kilometers per hour (kph) and miles per hour (mph) are commonly used to express speed. The time-mean speed and the space-mean speed are the two primary forms of speed. The length of a road segment is equal to the average travel time of multiple vehicles across this particular sector, multiplied by the space mean speed. The average spot speed of multiple vehicles observed at a particular spot is known as the time-mean speed (spot speed) (Roshandeh et al., 2009).

The average speed of all cars that occupy a road segment for a set amount of time is known as the space mean speed. The harmonic average of speed passing a spot over a period of time exhibits the same behavior. There are various observations that go into estimating space mean speed, including how much time is needed to search for results one at a time. In addition, the distance can be used to determine the speed over a specific distance or stretch of road. Space denotes speed, which is utilized to supply a prior system cross's performance level of efficacy, which is related to delay (Wikrama & Mataram, 2017).

Space Mean Speed is the average speed of all cars using a particular stretch of road at a given moment. As traffic volume rises, the space average speed naturally declines until critical density (maximum volume) is reached. This is the underlying link between volume and speed (Julianto, 2010).

=

=

Notes:

= Time mean speed (m/s);

= Speed of each sample (m/s);

= Space mean speed (m/s);

*n* = Number of samples;

*d* = Distance of observation (m);

*t* = Travel time for each sample at the distance of observation (s).

## TOOLS

The following equipment is required to conduct this survey:

1. Measuring wheel;
2. Stopwatch:
3. Form;
4. Stationery.

|  |  |  |
| --- | --- | --- |
| Figure 2.1 Measuring Wheel | Figure 2.2 Stopwatch | Figure 2.3 Form |
|  | Figure 2.4 Stationery |  |

## PROCEDURE

1. Specify the location, preferably it should have a clear view of the traffic with an observable inbound and outbound lane. It should also be safe for the observer such as pedestrian bridge that is located above the lane/road;



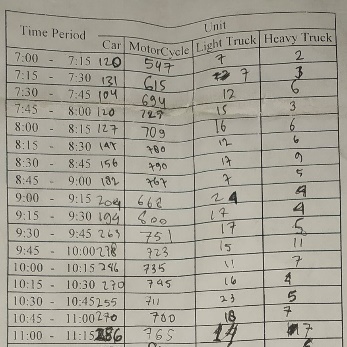
1. Specify two points along the observed lane section which are 100 meters apart from each other;



1. Categorize the vehicles into 4 types: passenger cars, motorcycles, light trucks, and heavy trucks. Record the time taken for each vehicle to pass the 100 m distance for each time period;



1. The experiment is conducted for 12 hours with time period of 15 minutes (refer to the experimental data form) to obtain space mean speed and time mean speed of each time period (morning, noon, and afternoon;



1. Create a graph of the space mean speed and time mean speed for each time period (morning, noon, and afternoon) and create observations for the result.

## PRACTICUM RESULT

The data and analysis for Traffic Speed Study practicum are discussed in section 2.5.1 and 2.5.2..

### PRACTICUM DATA

This section contain the collected Traffic Speed Study practicum data.

Direction 1 :Kebon Jeruk – Kelapa Dua

Direction 2 :Kelapa Dua – Kebon Jeruk

Table 2.1 Speed Data of Kebon Jeruk – Kelapa Dua

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Car** | | | **Motorcycle** | | | **Light Truck** | | | **Heavy Truck** | | |
| **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** |
| 07:00- 07.15 | 6.36 | 3 | 07:00- 07.15 | 6.54 | 3 | 07:00- 07.15 | 7.61 | 3 | 07:00- 07.15 | 8.29 | 3 |
| 6.36 | 7.28 | 7.83 | 9.23 |
| 6.86 | 5.95 | 8.12 | 10.13 |
| 07:15- 07:30 | 6.07 | 3 | 07:15- 07:30 | 5.7 | 3 | 07:15- 07:30 | 7.83 | 3 | 07:15- 07:30 | 10.07 | 3 |
| 6.35 | 6.29 | 9.37 | 7.12 |
| 7.35 | 6.52 | 8.13 | 8.74 |
| 07:30- 07:45 | 9.35 | 3 | 07:30- 07:45 | 9.33 | 3 | 07:30- 07:45 | 9.68 | 3 | 07:30- 07:45 | 9.91 | 3 |
| 8.85 | 6.78 | 8.93 | 8.62 |
| 7.91 | 7.99 | 9.3 | 8.36 |
| 07:45- 08:00 | 9.19 | 3 | 07:45- 08:00 | 7.15 | 3 | 07:45- 08:00 | 8.15 | 3 | 07:45- 08:00 | 11.37 | 2 |
| 7.61 | 9.03 | 7.85 | 10.4 |
| 9.27 | 7.74 | 10.03 |  |
| 08:00- 08:15 | 9.98 | 3 | 08:00- 08:15 | 7.96 | 3 | 08:00- 08:15 | 11.98 | 3 | 08:00- 08:15 | 14.2 | 3 |
| 9.26 | 7.54 | 11.01 | 8.6 |
| 10.48 | 8.31 | 12.2 | 8 |

Table 2.1 Speed Data of Kebon Jeruk – Kelapa Dua (Continued)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Car** | | | **Motorcycle** | | | **Light Truck** | | | **Heavy Truck** | | |
| **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** |
| 08:15- 08:30 | 10.12 | 3 | 08:15- 08:30 | 7.84 | 3 | 08:15- 08:30 | 7.86 | 3 | 08:15- 08:30 | 12.92 | 3 |
| 8.98 | 7.17 | 8.4 | 12.85 |
| 10.02 | 8.45 | 9.99 | 13.12 |
| 08:30- 08:45 | 10.2 | 3 | 08:30- 08:45 | 9.09 | 3 | 08:30- 08:45 | 10.32 | 3 | 08:30- 08:45 | 10.88 | 3 |
| 10.26 | 9.7 | 10.5 | 11.05 |
| 9.26 | 8.73 | 12.04 | 10.54 |
| 08:45- 09:00 | 9.91 | 3 | 08:45- 09:00 | 8.23 | 3 | 08:45- 09:00 | 8.99 | 3 | 08:45- 09:00 | 8.91 | 2 |
| 9.6 | 9.33 | 12.14 | 12.2 |
| 8.47 | 8.4 | 11.92 |  |
| 09:00- 09:15 | 7.86 | 3 | 09:00- 09:15 | 7.41 | 3 | 09:00- 09:15 | 10.75 | 3 | 09:00- 09:15 | 8.97 | 3 |
| 10.04 | 8.54 | 9.8 | 10.64 |
| 9.71 | 8.36 | 9.62 | 10.68 |
| 09:15- 09:30 | 10.98 | 3 | 09:15- 09:30 | 9.16 | 3 | 09:15- 09:30 | 8.12 | 3 | 09:15- 09:30 | 11.26 | 3 |
| 9.83 | 7.8 | 10.34 | 8.83 |
| 8.92 | 8.97 | 10.15 | 11.65 |
| 09:30- 09:45 | 8.79 | 3 | 09:30- 09:45 | 9.22 | 3 | 09:30- 09:45 | 11.3 | 3 | 09:30- 09:45 | 10.78 | 3 |
| 8.9 | 7.94 | 9.9 | 10.83 |
| 8.12 | 10.06 | 9.42 | 9.86 |
| 09:45- 10:00 | 10.29 | 3 | 09:45- 10:00 | 8.93 | 3 | 09:45- 10:00 | 10.47 | 3 | 09:45- 10:00 | 9.24 | 3 |
| 10.13 | 10.51 | 12.34 | 12.44 |
| 10.33 | 9.24 | 10.22 | 9.76 |
| 10:00- 10:15 | 10.21 | 3 | 10:00- 10:15 | 7.58 | 3 | 10:00- 10:15 | 11.66 | 3 | 10:00- 10:15 | 10.78 | 3 |
| 11.46 | 7.87 | 11.95 | 13.07 |
| 8.19 | 8.81 | 8.7 | 10.35 |
| 10:15- 10:30 | 9.69 | 3 | 10:15- 10:30 | 9.1 | 3 | 10:15- 10:30 | 11.47 | 3 | 10:15- 10:30 | 9.87 | 3 |
| 10.03 | 8.23 | 11.21 | 9.631 |
| 8.72 | 8.55 | 10.51 | 13.75 |
| 10:30- 10:45 | 10.89 | 3 | 10:30- 10:45 | 9.59 | 3 | 10:30- 10:45 | 10.04 | 3 | 10:30- 10:45 | 7.6 | 3 |
| 10.93 | 9.57 | 10.46 | 9.64 |
| 8.9 | 7.08 | 9.37 | 9.87 |
| 10:45- 11:00 | 11.78 | 3 | 10:45- 11:00 | 10.61 | 3 | 10:45- 11:00 | 10.75 | 3 | 10:45- 11:00 | 12.05 | 3 |
| 12.78 | 8.36 | 12.03 | 13.1 |
| 10.69 | 7.23 | 8.69 | 12.64 |
| 11:00- 11:15 | 11.23 | 3 | 11:00- 11:15 | 10.28 | 3 | 11:00- 11:15 | 10.62 | 3 | 11:00- 11:15 | 9.85 | 3 |
| 10.11 | 8.6 | 13.41 | 11.45 |
| 10.98 | 7.59 | 9.73 | 10.57 |
| 11:15- 11:30 | 9.12 | 3 | 11:15- 11:30 | 8.64 | 3 | 11:15- 11:30 | 9.29 | 3 | 11:15- 11:30 | 18.46 | 3 |
| 10.15 | 8.62 | 9.8 | 9.27 |
| 10.6 | 10.04 | 10.24 | 10.44 |
| 11:30- 11:45 | 11.64 | 3 | 11:30- 11:45 | 10.87 | 3 | 11:30- 11:45 | 8.92 | 3 | 11:30- 11:45 | 11.34 | 3 |
| 10.35 | 9.2 | 11.25 | 10.35 |
| 9.5 | 9.47 | 12.54 | 10.39 |

Table 2.1 Speed Data of Kebon Jeruk – Kelapa Dua (Continued)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Car** | | | **Motorcycle** | | | **Light Truck** | | | **Heavy Truck** | | |
| **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** |
| 11:45- 12:00 | 9.24 | 3 | 11:45- 12:00 | 9.22 | 3 | 11:45- 12:00 | 7.67 | 3 | 11:45- 12:00 | 6.9 | 3 |
| 9.12 | 9.34 | 10.22 | 11.11 |
| 10.52 | 9.29 | 7.87 | 8.12 |
| 12:00- 12:15 | 10.75 | 3 | 12:00- 12:15 | 8.17 | 3 | 12:00- 12:15 | 13.07 | 3 | 12:00- 12:15 | 12.31 | 3 |
| 10.52 | 9.32 | 11.32 | 11.25 |
| 11.1 | 8.23 | 13.11 | 11.62 |
| 12:15- 12:30 | 11.8 | 3 | 12:15- 12:30 | 7.97 | 3 | 12:15- 12:30 | 10.9 | 3 | 12:15- 12:30 | 10.45 | 3 |
| 10.39 | 8.69 | 9.57 | 12.87 |
| 8.59 | 8.9 | 9.9 | 9.44 |
| 12:30- 12:45 | 7.65 | 3 | 12:30- 12:45 | 6.37 | 3 | 12:30- 12:45 | 9.22 | 3 | 12:30- 12:45 | 10.87 | 3 |
| 9.62 | 7.1 | 10.74 | 14.81 |
| 7.87 | 9.95 | 9.17 | 9.29 |
| 12:45- 13:00 | 10.24 | 3 | 12:45- 13:00 | 9.44 | 3 | 12:45- 13:00 | 10.89 | 3 | 12:45- 13:00 | 7.05 | 2 |
| 11.39 | 9.47 | 11.82 | 16.64 |
| 12.09 | 7.05 | 11.8 |  |
| 13:00- 13:15 | 9.77 | 3 | 13:00- 13:15 | 8.78 | 3 | 13:00- 13:15 | 8.19 | 3 | 13:00- 13:15 | 10.42 | 3 |
| 10.55 | 8.5 | 10.22 | 12.86 |
| 10.93 | 8.61 | 12.85 | 9.12 |
| 13:15- 13:30 | 12.26 | 3 | 13:15- 13:30 | 8.45 | 3 | 13:15- 13:30 | 8.6 | 3 | 13:15- 13:30 | 11.55 | 3 |
| 11.04 | 9.23 | 7.99 | 10.11 |
| 11.55 | 8.53 | 9.9 | 9.47 |
| 13:30- 13:45 | 12.79 | 3 | 13:30- 13:45 | 7.98 | 3 | 13:30- 13:45 | 11.84 | 3 | 13:30- 13:45 | 15.01 | 3 |
| 10.07 | 8.15 | 13.24 | 16.11 |
| 10.97 | 8.43 | 8.68 | 10.43 |
| 13:45- 14:00 | 10.97 | 3 | 13:45- 14:00 | 8.75 | 3 | 13:45- 14:00 | 10.14 | 3 | 13:45- 14:00 | 10.8 | 3 |
| 9.02 | 7.29 | 11.12 | 13.27 |
| 11.32 | 5.1 | 10.62 | 10.97 |
| 14:00- 14:15 | 12.52 | 3 | 14:00- 14:15 | 9.17 | 3 | 14:00- 14:15 | 10.1 | 3 | 14:00- 14:15 | 12.03 | 3 |
| 12.61 | 10.32 | 8.84 | 10.44 |
| 8.16 | 9.31 | 12.51 | 9.86 |
| 14:15- 14:30 | 12.78 | 3 | 14:15- 14:30 | 8.24 | 3 | 14:15- 14:30 | 10.82 | 3 | 14:15- 14:30 | 9.04 | 3 |
| 10.9 | 10.8 | 12.35 | 14.64 |
| 7.92 | 8.92 | 8.89 | 13.11 |
| 14:30- 14:45 | 10.96 | 3 | 14:30- 14:45 | 11.39 | 3 | 14:30- 14:45 | 10.84 | 3 | 14:30- 14:45 | 11 | 3 |
| 8.78 | 8.32 | 13.43 | 11.24 |
| 10.2 | 8.87 | 12.27 | 10.46 |
| 14:45- 15:00 | 11.1 | 3 | 14:45- 15:00 | 8.8 | 3 | 14:45- 15:00 | 11.45 | 3 | 14:45- 15:00 | 12.31 | 3 |
| 8.87 | 8.51 | 11.67 | 14.64 |
| 10.36 | 11.03 | 10.36 | 10.5 |
| 15:00- 15:15 | 13.31 | 3 | 15:00- 15:15 | 9.29 | 3 | 15:00- 15:15 | 10.79 | 3 | 15:00- 15:15 | 12.22 | 2 |
| 9.4 | 11.64 | 14.22 | 13.47 |
| 10.8 | 9.95 | 15.49 |  |
| 15:15- 15:30 | 13.81 | 3 | 15:15- 15:30 | 11 | 3 | 15:15- 15:30 | 12.89 | 3 | 15:15- 15:30 | 10.4 | 3 |
| 12.15 | 14.91 | 13.94 | 11.4 |
| 13.36 | 9.86 | 12.17 | 12.51 |

Table 2.1 Speed Data of Kebon Jeruk – Kelapa Dua (Continued)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Car** | | | **Motorcycle** | | | **Light Truck** | | | **Heavy Truck** | | |
| **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** |
| 15:30- 15:45 | 11.56 | 3 | 15:30- 15:45 | 15.73 | 3 | 15:30- 15:45 | 11.63 | 3 | 15:30- 15:45 | 11.22 | 3 |
| 11.28 | 10.63 | 13.46 | 11.29 |
| 11.85 | 9.39 | 11.27 | 11.14 |
| 15:45- 16:00 | 17.48 | 3 | 15:45- 16:00 | 11.59 | 3 | 15:45- 16:00 | 15.6 | 3 | 15:45- 16:00 | 16.16 | 3 |
| 11.86 | 9.33 | 15.67 | 14.87 |
| 13.18 | 8.46 | 12.2 | 13.97 |
| 16:00- 16:15 | 13.19 | 3 | 16:00- 16:15 | 10.86 | 3 | 16:00- 16:15 | 13.92 | 3 | 16:00- 16:15 | 16.48 | 3 |
| 10.27 | 13.89 | 13.55 | 14.79 |
| 11.26 | 11.85 | 11.65 | 16.43 |
| 16:15- 16:30 | 11.84 | 3 | 16:15- 16:30 | 14.58 | 3 | 16:15- 16:30 | 13.35 | 3 | 16:15- 16:30 | 15.23 | 3 |
| 17.35 | 10.63 | 13.42 | 13.74 |
| 13.32 | 13.47 | 14.01 | 11.12 |
| 16:30- 16:45 | 13.95 | 3 | 16:30- 16:45 | 7.54 | 3 | 16:30- 16:45 | 13.93 | 3 | 16:30- 16:45 | 21.27 | 3 |
| 9.59 | 11.57 | 12.65 | 17.6 |
| 13.58 | 12.12 | 12.76 | 13.68 |
| 16:45- 17:00 | 11.84 | 3 | 16:45- 17:00 | 10.15 | 3 | 16:45- 17:00 | 14.46 | 3 | 16:45- 17:00 | 11.77 | 2 |
| 11.42 | 11.37 | 16.32 | 10.97 |
| 11.65 | 16.27 | 14.72 |  |
| 17:00- 17:15 | 13.87 | 3 | 17:00- 17:15 | 20.27 | 3 | 17:00- 17:15 | 13.64 | 3 | 17:00- 17:15 | 12.01 | 2 |
| 14.82 | 11.12 | 11.64 | 13.26 |
| 11.32 | 11.22 | 13.62 |  |
| 17:15- 17:30 | 15.14 | 3 | 17:15- 17:30 | 11.14 | 3 | 17:15- 17:30 | 12.86 | 3 | 17:15- 17:30 |  | 0 |
| 13.89 | 12.2 | 13.28 |  |
| 12.48 | 10.02 | 12.86 |  |
| 17:30- 17:45 | 11.5 | 3 | 17:30- 17:45 | 11.51 | 3 | 17:30- 17:45 | 13.14 | 3 | 17:30- 17:45 | 12.34 | 3 |
| 13.08 | 12.82 | 16.99 | 10.21 |
| 10.1 | 12.24 | 11.29 | 17.3 |
| 17:45- 18:00 | 9.5 | 3 | 17:45- 18:00 | 14.17 | 3 | 17:45- 18:00 | 12.37 | 3 | 17:45- 18:00 |  | 0 |
| 10.38 | 8.09 | 10.43 |  |
| 10.62 | 9.7 | 9.71 |  |
| 18:00- 18:15 | 13.58 | 3 | 18:00- 18:15 | 9.39 | 3 | 18:00- 18:15 | 13.59 | 3 | 18:00- 18:15 | 12.76 | 3 |
| 9.52 | 9.98 | 8.7 | 13.42 |
| 14.29 | 9.67 | 11.47 | 10.34 |
| 18:15- 18:30 | 9.83 | 3 | 18:15- 18:30 | 11.91 | 3 | 18:15- 18:30 | 12.46 | 3 | 18:15- 18:30 | 11.45 | 3 |
| 10.03 | 8.29 | 9.13 | 10.38 |
| 11.07 | 6.46 | 10.94 | 14.4 |
| 18:30- 18:45 | 12.46 | 3 | 18:30- 18:45 | 8.3 | 3 | 18:30- 18:45 | 11.31 | 3 | 18:30- 18:45 | 14.5 | 2 |
| 10.42 | 9.89 | 10.7 | 17.29 |
| 11.29 | 11.57 | 13.14 |  |
| 18:45- 19:00 | 13.81 | 3 | 18:45- 19:00 | 12.28 | 3 | 18:45- 19:00 | 9.07 | 3 | 18:45- 19:00 | 13.46 | 1 |
| 10.62 | 9.7 | 11.39 |  |
| 11.62 | 9.75 | 10.13 |  |

Table 2.1 shows the vehicle (car, motorcycle, light truck and heavy truck) speed for 100 meters from Kebon Jeruk to Kelapa Dua at 07.00 until 19.00.

Table 2.2 Speed Data of Kelapa Dua – Kebon Jeruk

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Car** | | | **Motorcycle** | | | **Light Truck** | | | **Heavy Truck** | | |
| **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** |
| 07:00- 07.15 | 5.85 | 3 | 07:00- 07.15 | 8.54 | 3 | 07:00- 07.15 |  | 0 | 07:00- 07.15 | 11.9 | 2 |
| 6.51 | 7.3 |  | 14.4 |
| 6.3 | 8.71 |  |  |
| 07:15- 07:30 | 6.52 | 3 | 07:15- 07:30 | 6.53 | 3 | 07:15- 07:30 | 7.03 | 3 | 07:15- 07:30 | 6.33 | 3 |
| 6.86 | 4.65 | 7.74 | 9.88 |
| 7.49 | 6.71 | 6.27 | 7.65 |
| 07:30- 07:45 | 7.31 | 3 | 07:30- 07:45 | 6.35 | 3 | 07:30- 07:45 | 8.28 | 3 | 07:30- 07:45 | 7.39 | 3 |
| 6.61 | 6.11 | 7.3 | 7.01 |
| 5.42 | 10.2 | 7.9 | 10.22 |
| 07:45- 08:00 | 7.47 | 3 | 07:45- 08:00 | 10.6 | 3 | 07:45- 08:00 | 6.48 | 3 | 07:45- 08:00 | 10.38 | 2 |
| 8.21 | 7.99 | 6.38 | 8.23 |
| 7.97 | 7.17 | 7.34 |  |
| 08:00- 08:15 | 5.32 | 3 | 08:00- 08:15 | 8.07 | 3 | 08:00- 08:15 | 7.8 | 3 | 08:00- 08:15 | 7.68 | 3 |
| 6.54 | 9.9 | 7.75 | 7.55 |
| 5.16 | 5.37 | 8.22 | 8.06 |
| 08:15- 08:30 | 8.15 | 3 | 08:15- 08:30 | 9.26 | 3 | 08:15- 08:30 | 6.62 | 3 | 08:15- 08:30 | 14.12 | 3 |
| 7.74 | 8.5 | 6.61 | 8.25 |
| 7.36 | 6.95 | 8.33 | 7.32 |
| 08:30- 08:45 | 8.24 | 3 | 08:30- 08:45 | 6.65 | 3 | 08:30- 08:45 | 8.17 | 3 | 08:30- 08:45 | 13.59 | 3 |
| 7.9 | 7.03 | 6.01 | 10.64 |
| 5.78 | 7.46 | 8.51 | 7.36 |
| 08:45- 09:00 | 7.53 | 3 | 08:45- 09:00 | 7.61 | 3 | 08:45- 09:00 | 6.82 | 3 | 08:45- 09:00 | 11.25 | 2 |
| 5.35 | 7.28 | 9.83 | 8.6 |
| 5.99 | 6.27 | 6.53 | 7.99 |
| 09:00- 09:15 | 6.31 | 3 | 09:00- 09:15 | 6.82 | 3 | 09:00- 09:15 | 9.74 | 3 | 09:00- 09:15 | 7.69 | 3 |
| 7.16 | 5.06 | 7.03 | 6.53 |
| 5.14 | 8.76 | 8.24 | 8.59 |
| 09:15- 09:30 | 7.63 | 3 | 09:15- 09:30 | 7.77 | 3 | 09:15- 09:30 | 8.44 | 3 | 09:15- 09:30 | 12.79 | 3 |
| 8.09 | 8.87 | 6.54 | 7.27 |
| 8.69 | 9.16 | 7.84 | 11.11 |
| 09:30- 09:45 | 5.8 | 3 | 09:30- 09:45 | 8.98 | 3 | 09:30- 09:45 | 7.69 | 3 | 09:30- 09:45 | 7.89 | 3 |
| 6.27 | 8.22 | 9.88 | 7.22 |
| 6.97 | 6.58 | 8.77 | 8.36 |
| 09:45- 10:00 | 9.72 | 3 | 09:45- 10:00 | 6.14 | 3 | 09:45- 10:00 | 10.72 | 3 | 09:45- 10:00 | 9 | 3 |
| 7.67 | 7.01 | 8.75 | 9.27 |
| 8.46 | 7.57 | 10.74 | 8.59 |
| 10:00- 10:15 | 8.77 | 3 | 10:00- 10:15 | 5.16 | 3 | 10:00- 10:15 | 7.92 | 3 | 10:00- 10:15 | 8.08 | 3 |
| 7.36 | 6.26 | 8.2 | 10.49 |
| 7.83 | 6.27 | 8.4 | 8.19 |
| 10:15- 10:30 | 7.63 | 3 | 10:15- 10:30 | 6.05 | 3 | 10:15- 10:30 | 11.54 | 3 | 10:15- 10:30 | 8.78 | 3 |
| 8.97 | 7.5 | 6.8 | 7.19 |
| 7.07 | 9.84 | 9.7 | 7.28 |

Table 2.2 Speed Data of Kelapa Dua – Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Car** | | | **Motorcycle** | | | **Light Truck** | | | **Heavy Truck** | | |
| **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** |
| 10:30- 10:45 | 7.22 | 3 | 10:30- 10:45 | 4.5 | 3 | 10:30- 10:45 | 7.3 | 3 | 10:30- 10:45 | 8.29 | 3 |
| 6.95 | 5.9 | 7.16 | 8.49 |
| 7.89 | 8.81 | 8.83 | 8.9 |
| 10:45- 11:00 | 8.66 | 3 | 10:45- 11:00 | 6.78 | 3 | 10:45- 11:00 | 9.42 | 3 | 10:45- 11:00 | 8.34 | 3 |
| 8.33 | 6.99 | 7.91 | 9.4 |
| 8.51 | 7.79 | 9.77 | 8.79 |
| 11:00- 11:15 | 8.31 | 3 | 11:00- 11:15 | 5.04 | 3 | 11:00- 11:15 | 7.44 | 3 | 11:00- 11:15 | 8.79 | 3 |
| 6.94 | 7.45 | 10.5 | 7.49 |
| 7.13 | 6.25 | 9.4 | 8.87 |
| 11:15- 11:30 | 8.69 | 3 | 11:15- 11:30 | 7.94 | 3 | 11:15- 11:30 | 8.76 | 3 | 11:15- 11:30 | 8.24 | 3 |
| 7.93 | 5.99 | 8.18 | 9.27 |
| 8.93 | 6.71 | 8.35 | 7.91 |
| 11:30- 11:45 | 9.7 | 3 | 11:30- 11:45 | 7.96 | 3 | 11:30- 11:45 | 8.74 | 3 | 11:30- 11:45 | 8.76 | 2 |
| 8.49 | 8.84 | 10.64 | 9.32 |
| 9.51 | 7.86 | 7.41 |  |
| 11:45- 12:00 | 6.74 | 3 | 11:45- 12:00 | 4.34 | 3 | 11:45- 12:00 | 10.72 | 3 | 11:45- 12:00 | 10.21 | 2 |
| 5.83 | 6.87 | 10.61 | 9.55 |
| 7.26 | 8.63 | 10.03 |  |
| 12:00- 12:15 | 7.44 | 3 | 12:00- 12:15 | 5.48 | 3 | 12:00- 12:15 | 10.1 | 3 | 12:00- 12:15 | 6.09 | 3 |
| 7.15 | 5.68 | 9.58 | 17.31 |
| 8.28 | 6.21 | 8.57 | 8.21 |
| 12:15- 12:30 | 8.6 | 3 | 12:15- 12:30 | 9.57 | 3 | 12:15- 12:30 | 10.28 | 3 | 12:15- 12:30 | 7.42 | 3 |
| 6.07 | 5.29 | 6.74 | 10.17 |
| 7.2 | 6.39 | 9.52 | 8.2 |
| 12:30- 12:45 | 6.84 | 3 | 12:30- 12:45 | 7.98 | 3 | 12:30- 12:45 | 8.13 | 3 | 12:30- 12:45 | 9.84 | 3 |
| 7.73 | 6.67 | 5.62 | 8.2 |
| 7.48 | 6.82 | 8.32 | 8.86 |
| 12:45- 13:00 | 8.53 | 3 | 12:45- 13:00 | 7.12 | 3 | 12:45- 13:00 | 8.14 | 3 | 12:45- 13:00 | 14.6 | 1 |
| 8.98 | 6.33 | 9.84 |  |
| 10.19 | 6.99 | 9.87 |  |
| 13:00- 13:15 | 12.32 | 3 | 13:00- 13:15 | 7.48 | 3 | 13:00- 13:15 | 8.53 | 3 | 13:00- 13:15 | 10.94 | 3 |
| 11.84 | 7.69 | 7.55 | 12.31 |
| 9.11 | 7.68 | 8.65 | 11.04 |
| 13:15- 13:30 | 8.62 | 3 | 13:15- 13:30 | 8.08 | 3 | 13:15- 13:30 | 6.88 | 3 | 13:15- 13:30 | 7.93 | 3 |
| 9.24 | 6.65 | 10.45 | 7.74 |
| 8 | 7.42 | 8.85 | 9.37 |
| 13:30- 13:45 | 14.46 | 3 | 13:30- 13:45 | 8.89 | 3 | 13:30- 13:45 | 13.82 | 3 | 13:30- 13:45 | 7.4 | 3 |
| 10.87 | 8.96 | 19.49 | 9.67 |
| 9.32 | 7.61 | 8.12 | 9.4 |
| 13:45- 14:00 | 9.97 | 3 | 13:45- 14:00 | 7.74 | 3 | 13:45- 14:00 | 13.69 | 3 | 13:45- 14:00 | 10.94 | 3 |
| 8.19 | 7.65 | 8.38 | 11.47 |
| 8.65 | 6.64 | 12.31 | 10.43 |
| 14:00- 14:15 | 10.42 | 3 | 14:00- 14:15 | 7.28 | 3 | 14:00- 14:15 | 9.56 | 3 | 14:00- 14:15 | 8.4 | 3 |
| 11.09 | 9.35 | 9.47 | 9.22 |
| 8.25 | 6.65 | 7.53 | 16.35 |

Table 2.2 Speed Data of Kelapa Dua – Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Car** | | | **Motorcycle** | | | **Light Truck** | | | **Heavy Truck** | | |
| **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** |
| 14:15- 14:30 | 8.4 | 3 | 14:15- 14:30 | 6.05 | 3 | 14:15- 14:30 | 8.19 | 3 | 14:15- 14:30 | 9.68 | 3 |
| 7.77 | 6.65 | 9.13 | 7.63 |
| 6.33 | 5.83 | 7.21 | 15.34 |
| 14:30- 14:45 | 6.92 | 3 | 14:30- 14:45 | 8.4 | 3 | 14:30- 14:45 | 7.53 | 3 | 14:30- 14:45 | 10.35 | 3 |
| 8.2 | 6.81 | 8.45 | 8.991 |
| 7.12 | 7.68 | 10.64 | 8 |
| 14:45- 15:00 | 7.17 | 3 | 14:45- 15:00 | 6.73 | 3 | 14:45- 15:00 | 8.01 | 3 | 14:45- 15:00 | 8.96 | 3 |
| 7.88 | 12.2 | 9.82 | 12.49 |
| 11.3 | 7.07 | 8.55 | 11.05 |
| 15:00- 15:15 | 6.75 | 3 | 15:00- 15:15 | 7.27 | 3 | 15:00- 15:15 | 5.04 | 3 | 15:00- 15:15 | 7.94 | 3 |
| 6.83 | 10.7 | 9.76 | 8.54 |
| 11.7 | 7.21 | 10.8 | 12.58 |
| 15:15- 15:30 | 7.87 | 3 | 15:15- 15:30 | 12.9 | 3 | 15:15- 15:30 | 10.26 | 3 | 15:15- 15:30 | 9.68 | 3 |
| 11.7 | 8.77 | 8.38 | 9.72 |
| 8.77 | 6.29 | 8.39 | 9.17 |
| 15:30- 15:45 | 8.06 | 3 | 15:30- 15:45 | 7.31 | 3 | 15:30- 15:45 | 7.94 | 3 | 15:30- 15:45 | 8.2 | 3 |
| 8.28 | 11 | 9.24 | 9.55 |
| 10.11 | 9.51 | 9.42 | 9.69 |
| 15:45- 16:00 | 10.46 | 3 | 15:45- 16:00 | 7.15 | 3 | 15:45- 16:00 | 9.88 | 3 | 15:45- 16:00 | 8.03 | 3 |
| 8.71 | 7.16 | 9.95 | 10.04 |
| 6.55 | 8.39 | 9.21 | 12.77 |
| 16:00- 16:15 | 10.16 | 3 | 16:00- 16:15 | 10.3 | 3 | 16:00- 16:15 | 8.91 | 3 | 16:00- 16:15 | 10.98 | 3 |
| 9.94 | 9.36 | 9.9 | 8.38 |
| 10.22 | 9.41 | 8.29 | 7.51 |
| 16:15- 16:30 | 11.01 | 3 | 16:15- 16:30 | 6.29 | 3 | 16:15- 16:30 | 9.96 | 3 | 16:15- 16:30 | 25 | 3 |
| 10.98 | 8.45 | 7.21 | 13.26 |
| 8.24 | 9.57 | 9.42 | 8.48 |
| 16:30- 16:45 | 11.18 | 3 | 16:30- 16:45 | 6.42 | 3 | 16:30- 16:45 | 7.39 | 3 | 16:30- 16:45 | 9.17 | 1 |
| 8.31 | 7.15 | 7.85 |  |
| 10.27 | 9.19 | 10.2 |  |
| 16:45- 17:00 | 8.33 | 3 | 16:45- 17:00 | 8.64 | 3 | 16:45- 17:00 | 11.25 | 3 | 16:45- 17:00 | 8.36 | 2 |
| 10.53 | 9.09 | 8.05 | 8.38 |
| 6.42 | 7.29 | 8.59 | 10.44 |
| 17:00- 17:15 | 10.31 | 3 | 17:00- 17:15 | 9.42 | 3 | 17:00- 17:15 | 10.77 | 3 | 17:00- 17:15 |  | 0 |
| 9.52 | 7.32 | 10.85 |  |
| 6.7 | 10.8 | 9.57 |  |
| 17:15- 17:30 | 9.6 | 3 | 17:15- 17:30 | 10.3 | 3 | 17:15- 17:30 | 12.15 | 3 | 17:15- 17:30 |  | 0 |
| 9.63 | 9.27 | 9.07 |  |
| 8.4 | 8.93 | 8.95 |  |
| 17:30- 17:45 | 8.2 | 3 | 17:30- 17:45 | 9.06 | 3 | 17:30- 17:45 | 11.03 | 3 | 17:30- 17:45 | 10.77 | 1 |
| 11.57 | 8.88 | 12.5 |  |
| 8.58 | 8.18 | 12.19 |  |
| 17:45- 18:00 | 9.12 | 3 | 17:45- 18:00 | 11.6 | 3 | 17:45- 18:00 | 14.32 | 3 | 17:45- 18:00 | 11.27 | 1 |
| 11.09 | 9.96 | 6.67 |  |
| 10.57 | 8.61 | 8.59 |  |

Table 2.2 Speed Data of Kelapa Dua – Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Car** | | | **Motorcycle** | | | **Light Truck** | | | **Heavy Truck** | | |
| **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** | **Time Period** | **Time (s)** | ***n*** |
| 18:00- 18:15 | 9.42 | 3 | 18:00- 18:15 | 10.1 | 3 | 18:00- 18:15 | 14.72 | 3 | 18:00- 18:15 | 13.22 | 3 |
| 8.51 | 10.1 | 9.42 | 10.18 |
| 8.31 | 9.72 | 10.37 | 12.33 |
| 18:15- 18:30 | 8.58 | 3 | 18:15- 18:30 | 7.78 | 3 | 18:15- 18:30 | 12.51 | 3 | 18:15- 18:30 |  | 0 |
| 7.39 | 9.81 | 7.39 |  |
| 11.28 | 9.5 | 11.11 |  |
| 18:30- 18:45 | 8.28 | 3 | 18:30- 18:45 | 7.58 | 3 | 18:30- 18:45 | 12.08 | 3 | 18:30- 18:45 |  | 0 |
| 9.49 | 8.97 | 11.38 |  |
| 9.27 | 9.3 | 9.37 |  |
| 18:45- 19:00 | 8.27 | 3 | 18:45- 19:00 | 9.27 | 3 | 18:45- 19:00 | 9.57 | 3 | 18:45- 19:00 | 9.14 | 2 |
| 8.31 | 7.68 | 9.38 |  |
| 7.72 | 8.21 | 10.56 | 11.9 |

Table 2.2 shows the vehicle (car, motorcycle, light truck and heavy truck) speed for 100 meters from Kelapa Dua to Kebon Jeruk at 07.00 until 19.00.

### ANALYSIS

The following section contains the additional practicum data and analysis for Traffic Speed Study practicum.

Table 2.3 Car Speed Calculation of Kelapa Dua - Kebon Jeruk

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 7:00 | 5.85 | 17.09 | 3 | 6.22 | 16.109 | 16.077 |
| - | 6.51 | 15.36 |
| 7:15 | 6.3 | 15.87 |
| Total | 18.66 | 48.33 |
| 7:15 | 6.52 | 15.34 | 3 | 6.9567 | 14.422 | 14.375 |
| - | 6.86 | 14.58 |
| 7:30 | 7.49 | 13.35 |
| Total | 20.87 | 43.27 |
| 7:30 | 7.31 | 13.68 | 3 | 6.4467 | 15.753 | 15.512 |
| - | 6.61 | 15.13 |
| 7:45 | 5.42 | 18.45 |
| Total | 19.34 | 47.26 |
| 7:45 | 7.47 | 13.39 | 3 | 7.8833 | 12.705 | 12.685 |
| - | 8.21 | 12.18 |
| 8:00 | 7.97 | 12.55 |
| Total | 23.65 | 38.11 |
| 8:00 | 5.32 | 18.80 | 3 | 5.6733 | 17.822 | 17.626 |
| - | 6.54 | 15.29 |
| 8:15 | 5.16 | 19.38 |
| Total | 17.02 | 53.47 |
| 8:15 | 8.15 | 12.27 | 3 | 7.75 | 12.926 | 12.903 |
| - | 7.74 | 12.92 |
| 8:30 | 7.36 | 13.59 |
| Total | 23.25 | 38.78 |
| 8:30 | 8.24 | 12.14 | 3 | 7.3067 | 14.032 | 13.686 |
| - | 7.9 | 12.66 |
| 8:45 | 5.78 | 17.30 |
| Total | 21.92 | 42.10 |
| 8:45 | 7.53 | 13.28 | 3 | 6.29 | 16.222 | 15.898 |
| - | 5.35 | 18.69 |
| 9:00 | 5.99 | 16.69 |
| Total | 18.87 | 48.67 |
| 9:00 | 6.31 | 15.85 | 3 | 6.2033 | 16.423 | 16.12 |
| - | 7.16 | 13.97 |
| 9:15 | 5.14 | 19.46 |
| Total | 18.61 | 49.27 |

Table 2.3 Car Speed Calculation of Kelapa Dua - Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 9:15 | 7.63 | 13.11 | 3 | 8.1367 | 12.325 | 12.29 |
| - | 8.09 | 12.36 |
| 9:30 | 8.69 | 11.51 |
| Total | 24.41 | 36.97 |
| 9:30 | 5.8 | 17.24 | 3 | 6.3467 | 15.846 | 15.756 |
| - | 6.27 | 15.95 |
| 9:45 | 6.97 | 14.35 |
| Total | 19.04 | 47.54 |
| 9:45 | 9.72 | 10.29 | 3 | 8.6167 | 11.715 | 11.605 |
| - | 7.67 | 13.04 |
| 10:00 | 8.46 | 11.82 |
| Total | 25.85 | 35.15 |
| 10:00 | 8.77 | 11.40 | 3 | 7.9867 | 12.587 | 12.521 |
| - | 7.36 | 13.59 |
| 10:15 | 7.83 | 12.77 |
| Total | 23.96 | 37.76 |
| 10:15 | 7.63 | 13.11 | 3 | 7.89 | 12.8 | 12.674 |
| - | 8.97 | 11.15 |
| 10:30 | 7.07 | 14.14 |
| Total | 23.67 | 38.40 |
| 10:30 | 7.22 | 13.85 | 3 | 7.3533 | 13.638 | 13.599 |
| - | 6.95 | 14.39 |
| 10:45 | 7.89 | 12.67 |
| Total | 22.06 | 40.91 |
| 10:45 | 8.66 | 11.55 | 3 | 8.5 | 11.768 | 11.765 |
| - | 8.33 | 12.00 |
| 11:00 | 8.51 | 11.75 |
| Total | 25.5 | 35.30 |
| 11:00 | 8.31 | 12.03 | 3 | 7.46 | 13.489 | 13.405 |
| - | 6.94 | 14.41 |
| 11:15 | 7.13 | 14.03 |
| Total | 22.38 | 40.47 |
| 11:15 | 8.69 | 11.51 | 3 | 8.5167 | 11.772 | 11.742 |
| - | 7.93 | 12.61 |
| 11:30 | 8.93 | 11.20 |
| Total | 25.55 | 35.32 |
| 11:30 | 9.7 | 10.31 | 3 | 9.2333 | 10.868 | 10.83 |
| - | 8.49 | 11.78 |
| 11:45 | 9.51 | 10.52 |
| Total | 27.7 | 32.60 |

Table 2.3 Car Speed Calculation of Kelapa Dua - Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 11:45 | 6.74 | 14.84 | 3 | 6.61 | 15.255 | 15.129 |
| - | 5.83 | 17.15 |
| 12:00 | 7.26 | 13.77 |
| Total | 19.83 | 45.76 |
| 12:00 | 7.44 | 13.44 | 3 | 7.6233 | 13.168 | 13.118 |
| - | 7.15 | 13.99 |
| 12:15 | 8.28 | 12.08 |
| Total | 22.87 | 39.50 |
| 12:15 | 8.6 | 11.63 | 3 | 7.29 | 13.997 | 13.717 |
| - | 6.07 | 16.47 |
| 12:30 | 7.2 | 13.89 |
| Total | 21.87 | 41.99 |
| 12:30 | 6.84 | 14.62 | 3 | 7.35 | 13.642 | 13.605 |
| - | 7.73 | 12.94 |
| 12:45 | 7.48 | 13.37 |
| Total | 22.05 | 40.93 |
| 12:45 | 8.53 | 11.72 | 3 | 9.2333 | 10.891 | 10.83 |
| - | 8.98 | 11.14 |
| 13:00 | 10.19 | 9.81 |
| Total | 27.7 | 32.67 |
| 13:00 | 12.32 | 8.12 | 3 | 11.09 | 9.1799 | 9.0171 |
| - | 11.84 | 8.45 |
| 13:15 | 9.11 | 10.98 |
| Total | 33.27 | 27.54 |
| 13:15 | 8.62 | 11.60 | 3 | 8.62 | 11.641 | 11.601 |
| - | 9.24 | 10.82 |
| 13:30 | 8 | 12.50 |
| Total | 25.86 | 34.92 |
| 13:30 | 14.46 | 6.92 | 3 | 11.55 | 8.9483 | 8.658 |
| - | 10.87 | 9.20 |
| 13:45 | 9.32 | 10.73 |
| Total | 34.65 | 26.84 |
| 13:45 | 9.97 | 10.03 | 3 | 8.9367 | 11.267 | 11.19 |
| - | 8.19 | 12.21 |
| 14:00 | 8.65 | 11.56 |
| Total | 26.81 | 33.80 |
| 14:00 | 10.42 | 9.60 | 3 | 9.92 | 10.245 | 10.081 |
| - | 11.09 | 9.02 |
| 14:15 | 8.25 | 12.12 |
| Total | 29.76 | 30.74 |

Table 2.3 Car Speed Calculation of Kelapa Dua - Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 14:15 | 8.4 | 11.90 | 3 | 7.5 | 13.524 | 13.333 |
| - | 7.77 | 12.87 |
| 14:30 | 6.33 | 15.80 |
| Total | 22.5 | 40.57 |
| 14:30 | 6.92 | 14.45 | 3 | 7.4133 | 13.564 | 13.489 |
| - | 8.2 | 12.20 |
| 14:45 | 7.12 | 14.04 |
| Total | 22.24 | 40.69 |
| 14:45 | 7.17 | 13.95 | 3 | 8.7833 | 11.829 | 11.385 |
| - | 7.88 | 12.69 |
| 15:00 | 11.3 | 8.85 |
| Total | 26.35 | 35.49 |
| 15:00 | 6.75 | 14.81 | 3 | 8.4267 | 12.668 | 11.867 |
| - | 6.83 | 14.64 |
| 15:15 | 11.7 | 8.55 |
| Total | 25.28 | 38.00 |
| 15:15 | 7.87 | 12.71 | 3 | 9.4467 | 10.885 | 10.586 |
| - | 11.7 | 8.55 |
| 15:30 | 8.77 | 11.40 |
| Total | 28.34 | 32.66 |
| 15:30 | 8.06 | 12.41 | 3 | 8.8167 | 11.458 | 11.342 |
| - | 8.28 | 12.08 |
| 15:45 | 10.11 | 9.89 |
| Total | 26.45 | 34.38 |
| 15:45 | 10.46 | 9.56 | 3 | 8.5733 | 12.103 | 11.664 |
| - | 8.71 | 11.48 |
| 16:00 | 6.55 | 15.27 |
| Total | 25.72 | 36.31 |
| 16:00 | 10.16 | 9.84 | 3 | 10.107 | 9.8959 | 9.8945 |
| - | 9.94 | 10.06 |
| 16:15 | 10.22 | 9.78 |
| Total | 30.32 | 29.69 |
| 16:15 | 11.01 | 9.08 | 3 | 10.077 | 10.109 | 9.9239 |
| - | 10.98 | 9.11 |
| 16:30 | 8.24 | 12.14 |
| Total | 30.23 | 30.33 |
| 16:30 | 11.18 | 8.94 | 3 | 9.92 | 10.238 | 10.081 |
| - | 8.31 | 12.03 |
| 16:45 | 10.27 | 9.74 |
| Total | 29.76 | 30.72 |

Table 2.3 Car Speed Calculation of Kelapa Dua - Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 16:45 | 8.33 | 12.00 | 3 | 8.4267 | 12.359 | 11.867 |
| - | 10.53 | 9.50 |
| 17:00 | 6.42 | 15.58 |
| Total | 25.28 | 37.08 |
| 17:00 | 10.31 | 9.70 | 3 | 8.8433 | 11.71 | 11.308 |
| - | 9.52 | 10.50 |
| 17:15 | 6.7 | 14.93 |
| Total | 26.53 | 35.13 |
| 17:15 | 9.6 | 10.42 | 3 | 9.21 | 10.902 | 10.858 |
| - | 9.63 | 10.38 |
| 17:30 | 8.4 | 11.90 |
| Total | 27.63 | 32.71 |
| 17:30 | 8.2 | 12.20 | 3 | 9.45 | 10.831 | 10.582 |
| - | 11.57 | 8.64 |
| 17:45 | 8.58 | 11.66 |
| Total | 28.35 | 32.49 |
| 17:45 | 9.12 | 10.96 | 3 | 10.26 | 9.8143 | 9.7466 |
| - | 11.09 | 9.02 |
| 18:00 | 10.57 | 9.46 |
| Total | 30.78 | 29.44 |
| 18:00 | 9.42 | 10.62 | 3 | 8.7467 | 11.467 | 11.433 |
| - | 8.51 | 11.75 |
| 18:15 | 8.31 | 12.03 |
| Total | 26.24 | 34.40 |
| 18:15 | 8.58 | 11.66 | 3 | 9.0833 | 11.351 | 11.009 |
| - | 7.39 | 13.53 |
| 18:30 | 11.28 | 8.87 |
| Total | 27.25 | 34.05 |
| 18:30 | 8.28 | 12.08 | 3 | 9.0133 | 11.134 | 11.095 |
| - | 9.49 | 10.54 |
| 18:45 | 9.27 | 10.79 |
| Total | 27.04 | 33.40 |
| 18:45 | 8.27 | 12.09 | 3 | 8.1 | 12.36 | 12.346 |
| - | 8.31 | 12.03 |
| 19:00 | 7.72 | 12.95 |
| Total | 24.3 | 37.08 |

These are the calculation of Table .2.2 above with car unit at perios time 07.00 – 07.15.

* 1. *V* =

=

= 17.09 m/s;

* 1. *tavg* =

=

= 6.22 s;

* 1. *Vt* =

=

= 16.109 m/s;

* 1. *Vs* =

=

To find speed is by comparing distance and time. To find the average time, it is a comparison of the amount of time obtained with the total data. To find the mean speed, it is a comparison of the amount of speed data with the total data. And to find the space mean speed, namely the comparison of distance times the amount of data with the amount of time obtained.

Figure 2.1 Car Speed Graphic for Kelapa Dua – Kebon Jeruk

Table 2.4 Motorcycle Speed Calculation of Kelapa Dua - Kebon Jeruk

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 7:00 | 8.54 | 11.71 | 3 | 8.1833 | 12.296 | 12.22 |
| - | 7.3 | 13.70 |
| 7:15 | 8.71 | 11.48 |
| Total | 24.55 | 36.89 |
| 7:15 | 6.53 | 15.31 | 3 | 5.9633 | 17.241 | 16.769 |
| - | 4.65 | 21.51 |
| 7:30 | 6.71 | 14.90 |
| Total | 17.89 | 51.72 |
| 7:30 | 6.35 | 15.75 | 3 | 7.56 | 13.966 | 13.228 |
| - | 6.11 | 16.37 |
| 7:45 | 10.22 | 9.78 |
| Total | 22.68 | 41.90 |
| 7:45 | 10.59 | 9.44 | 3 | 8.5833 | 11.969 | 11.65 |
| - | 7.99 | 12.52 |
| 8:00 | 7.17 | 13.95 |
| Total | 25.75 | 35.91 |
| 8:00 | 8.07 | 12.39 | 3 | 7.78 | 13.705 | 12.853 |
| - | 9.9 | 10.10 |
| 8:15 | 5.37 | 18.62 |
| Total | 23.34 | 41.11 |
| 8:15 | 9.26 | 10.80 | 3 | 8.2367 | 12.317 | 12.141 |
| - | 8.5 | 11.76 |
| 8:30 | 6.95 | 14.39 |
| Total | 24.71 | 36.95 |
| 8:30 | 6.65 | 15.04 | 3 | 7.0467 | 14.222 | 14.191 |
| - | 7.03 | 14.22 |
| 8:45 | 7.46 | 13.40 |
| Total | 21.14 | 42.67 |
| 8:45 | 7.61 | 13.14 | 3 | 7.0533 | 14.275 | 14.178 |
| - | 7.28 | 13.74 |
| 9:00 | 6.27 | 15.95 |
| Total | 21.16 | 42.83 |
| 9:00 | 6.82 | 14.66 | 3 | 6.88 | 15.28 | 14.535 |
| - | 5.06 | 19.76 |
| 9:15 | 8.76 | 11.42 |
| Total | 20.64 | 45.84 |
| 9:15 | 7.77 | 12.87 | 3 | 8.6 | 11.687 | 11.628 |
| - | 8.87 | 11.27 |
| 9:30 | 9.16 | 10.92 |
| Total | 25.8 | 35.06 |

Table 2.4 Motorcycle Speed Calculation of Kelapa Dua - Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 9:30 | 8.98 | 11.14 | 3 | 7.9267 | 12.833 | 12.616 |
| - | 8.22 | 12.17 |
| 9:45 | 6.58 | 15.20 |
| Total | 23.78 | 38.50 |
| 9:45 | 6.14 | 16.29 | 3 | 6.9067 | 14.587 | 14.479 |
| - | 7.01 | 14.27 |
| 10:00 | 7.57 | 13.21 |
| Total | 20.72 | 43.76 |
| 10:00 | 5.16 | 19.38 | 3 | 5.8967 | 17.101 | 16.959 |
| - | 6.26 | 15.97 |
| 10:15 | 6.27 | 15.95 |
| Total | 17.69 | 51.30 |
| 10:15 | 6.05 | 16.53 | 3 | 7.7967 | 13.342 | 12.826 |
| - | 7.5 | 13.33 |
| 10:30 | 9.84 | 10.16 |
| Total | 23.39 | 40.02 |
| 10:30 | 4.5 | 22.22 | 3 | 6.4033 | 16.841 | 15.617 |
| - | 5.9 | 16.95 |
| 10:45 | 8.81 | 11.35 |
| Total | 19.21 | 50.52 |
| 10:45 | 6.78 | 14.75 | 3 | 7.1867 | 13.964 | 13.915 |
| - | 6.99 | 14.31 |
| 11:00 | 7.79 | 12.84 |
| Total | 21.56 | 41.89 |
| 11:00 | 5.04 | 19.84 | 3 | 6.2467 | 16.421 | 16.009 |
| - | 7.45 | 13.42 |
| 11:15 | 6.25 | 16.00 |
| Total | 18.74 | 49.26 |
| 11:15 | 7.94 | 12.59 | 3 | 6.88 | 14.731 | 14.535 |
| - | 5.99 | 16.69 |
| 11:30 | 6.71 | 14.90 |
| Total | 20.64 | 44.19 |
| 11:30 | 7.96 | 12.56 | 3 | 8.22 | 12.199 | 12.165 |
| - | 8.84 | 11.31 |
| 11:45 | 7.86 | 12.72 |
| Total | 24.66 | 36.60 |
| 11:45 | 4.34 | 23.04 | 3 | 6.6133 | 16.395 | 15.121 |
| - | 6.87 | 14.56 |
| 12:00 | 8.63 | 11.59 |
| Total | 19.84 | 49.19 |

Table 2.4 Motorcycle Speed Calculation of Kelapa Dua - Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 12:00 | 5.48 | 18.25 | 3 | 5.79 | 17.319 | 17.271 |
| - | 5.68 | 17.61 |
| 12:15 | 6.21 | 16.10 |
| Total | 17.37 | 51.96 |
| 12:15 | 9.57 | 10.45 | 3 | 7.0833 | 15.001 | 14.118 |
| - | 5.29 | 18.90 |
| 12:30 | 6.39 | 15.65 |
| Total | 21.25 | 45.00 |
| 12:30 | 7.98 | 12.53 | 3 | 7.1567 | 14.062 | 13.973 |
| - | 6.67 | 14.99 |
| 12:45 | 6.82 | 14.66 |
| Total | 21.47 | 42.19 |
| 12:45 | 7.12 | 14.04 | 3 | 6.8133 | 14.716 | 14.677 |
| - | 6.33 | 15.80 |
| 13:00 | 6.99 | 14.31 |
| Total | 20.44 | 44.15 |
| 13:00 | 7.48 | 13.37 | 3 | 7.6167 | 13.131 | 13.129 |
| - | 7.69 | 13.00 |
| 13:15 | 7.68 | 13.02 |
| Total | 22.85 | 39.39 |
| 13:15 | 8.08 | 12.38 | 3 | 7.3833 | 13.63 | 13.544 |
| - | 6.65 | 15.04 |
| 13:30 | 7.42 | 13.48 |
| Total | 22.15 | 40.89 |
| 13:30 | 8.89 | 11.25 | 3 | 8.4867 | 11.85 | 11.783 |
| - | 8.96 | 11.16 |
| 13:45 | 7.61 | 13.14 |
| Total | 25.46 | 35.55 |
| 13:45 | 7.74 | 12.92 | 3 | 7.3433 | 13.684 | 13.618 |
| - | 7.65 | 13.07 |
| 14:00 | 6.64 | 15.06 |
| Total | 22.03 | 41.05 |
| 14:00 | 7.28 | 13.74 | 3 | 7.76 | 13.156 | 12.887 |
| - | 9.35 | 10.70 |
| 14:15 | 6.65 | 15.04 |
| Total | 23.28 | 39.47 |
| 14:15 | 6.05 | 16.53 | 3 | 6.1767 | 16.24 | 16.19 |
| - | 6.65 | 15.04 |
| 14:30 | 5.83 | 17.15 |
| Total | 18.53 | 48.72 |

Table 2.4 Motorcycle Speed Calculation of Kelapa Dua - Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 14:30 | 8.4 | 11.90 | 3 | 7.63 | 13.203 | 13.106 |
| - | 6.81 | 14.68 |
| 14:45 | 7.68 | 13.02 |
| Total | 22.89 | 39.61 |
| 14:45 | 6.73 | 14.86 | 3 | 8.6633 | 12.402 | 11.543 |
| - | 12.19 | 8.20 |
| 15:00 | 7.07 | 14.14 |
| Total | 25.99 | 37.21 |
| 15:00 | 7.27 | 13.76 | 3 | 8.4033 | 12.315 | 11.9 |
| - | 10.73 | 9.32 |
| 15:15 | 7.21 | 13.87 |
| Total | 25.21 | 36.94 |
| 15:15 | 12.9 | 7.75 | 3 | 9.32 | 11.684 | 10.73 |
| - | 8.77 | 11.40 |
| 15:30 | 6.29 | 15.90 |
| Total | 27.96 | 35.05 |
| 15:30 | 7.31 | 13.68 | 3 | 9.26 | 11.106 | 10.799 |
| - | 10.96 | 9.12 |
| 15:45 | 9.51 | 10.52 |
| Total | 27.78 | 33.32 |
| 15:45 | 7.15 | 13.99 | 3 | 7.5667 | 13.29 | 13.216 |
| - | 7.16 | 13.97 |
| 16:00 | 8.39 | 11.92 |
| Total | 22.7 | 39.87 |
| 16:00 | 10.28 | 9.73 | 3 | 9.6833 | 10.346 | 10.327 |
| - | 9.36 | 10.68 |
| 16:15 | 9.41 | 10.63 |
| Total | 29.05 | 31.04 |
| 16:15 | 6.29 | 15.90 | 3 | 8.1033 | 12.727 | 12.341 |
| - | 8.45 | 11.83 |
| 16:30 | 9.57 | 10.45 |
| Total | 24.31 | 38.18 |
| 16:30 | 6.42 | 15.58 | 3 | 7.5867 | 13.481 | 13.181 |
| - | 7.15 | 13.99 |
| 16:45 | 9.19 | 10.88 |
| Total | 22.76 | 40.44 |
| 16:45 | 8.64 | 11.57 | 3 | 8.34 | 12.098 | 11.99 |
| - | 9.09 | 11.00 |
| 17:00 | 7.29 | 13.72 |
| Total | 25.02 | 36.29 |

Table 2.4 Motorcycle Speed Calculation of Kelapa Dua - Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 17:00 | 9.42 | 10.62 | 3 | 9.19 | 11.17 | 10.881 |
| - | 7.32 | 13.66 |
| 17:15 | 10.83 | 9.23 |
| Total | 27.57 | 33.51 |
| 17:15 | 10.25 | 9.76 | 3 | 9.4833 | 10.581 | 10.545 |
| - | 9.27 | 10.79 |
| 17:30 | 8.93 | 11.20 |
| Total | 28.45 | 31.74 |
| 17:30 | 9.06 | 11.04 | 3 | 8.7067 | 11.508 | 11.485 |
| - | 8.88 | 11.26 |
| 17:45 | 8.18 | 12.22 |
| Total | 26.12 | 34.52 |
| 17:45 | 11.62 | 8.61 | 3 | 10.063 | 10.087 | 9.9371 |
| - | 9.96 | 10.04 |
| 18:00 | 8.61 | 11.61 |
| Total | 30.19 | 30.26 |
| 18:00 | 10.06 | 9.94 | 3 | 9.9533 | 10.05 | 10.047 |
| - | 10.08 | 9.92 |
| 18:15 | 9.72 | 10.29 |
| Total | 29.86 | 30.15 |
| 18:15 | 7.78 | 12.85 | 3 | 9.03 | 11.191 | 11.074 |
| - | 9.81 | 10.19 |
| 18:30 | 9.5 | 10.53 |
| Total | 27.09 | 33.57 |
| 18:30 | 7.58 | 13.19 | 3 | 8.6167 | 11.698 | 11.605 |
| - | 8.97 | 11.15 |
| 18:45 | 9.3 | 10.75 |
| Total | 25.85 | 35.09 |
| 18:45 | 9.27 | 10.79 | 3 | 8.3867 | 11.996 | 11.924 |
| - | 7.68 | 13.02 |
| 19:00 | 8.21 | 12.18 |
| Total | 25.16 | 35.99 |

Figure 2.2 Motorcycle Speed Graphic for Kelapa Dua – Kebon Jeruk

Table 2.5 Light Truck Speed Calculation of Kelapa Dua - Kebon Jeruk

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 7:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | 0 | 0 |
| 7:15 | 0 | 0 |
| Total | 0 | 0 |
| 7:15 | 7.03 | 14.22 | 3 | 7.0133 | 14.365 | 14.259 |
| - | 7.74 | 12.92 |
| 7:30 | 6.27 | 15.95 |
| Total | 21.04 | 43.09 |
| 7:30 | 8.28 | 12.08 | 3 | 7.8267 | 12.811 | 12.777 |
| - | 7.3 | 13.70 |
| 7:45 | 7.9 | 12.66 |
| Total | 23.48 | 38.43 |
| 7:45 | 6.48 | 15.43 | 3 | 6.7333 | 14.91 | 14.851 |
| - | 6.38 | 15.67 |
| 8:00 | 7.34 | 13.62 |
| Total | 20.2 | 44.73 |
| 8:00 | 7.8 | 12.82 | 3 | 7.9233 | 12.63 | 12.621 |
| - | 7.75 | 12.90 |
| 8:15 | 8.22 | 12.17 |
| Total | 23.77 | 37.89 |
| 8:15 | 6.62 | 15.11 | 3 | 7.1867 | 14.08 | 13.915 |
| - | 6.61 | 15.13 |
| 8:30 | 8.33 | 12.00 |
| Total | 21.56 | 42.24 |
| 8:30 | 8.17 | 12.24 | 3 | 7.5633 | 13.543 | 13.222 |
| - | 6.01 | 16.64 |
| 8:45 | 8.51 | 11.75 |
| Total | 22.69 | 40.63 |
| 8:45 | 6.82 | 14.66 | 3 | 7.7267 | 13.383 | 12.942 |
| - | 9.83 | 10.17 |
| 9:00 | 6.53 | 15.31 |
| Total | 23.18 | 40.15 |
| 9:00 | 9.74 | 10.27 | 3 | 8.3367 | 12.209 | 11.995 |
| - | 7.03 | 14.22 |
| 9:15 | 8.24 | 12.14 |
| Total | 25.01 | 36.63 |
| 9:15 | 8.44 | 11.85 | 3 | 7.6067 | 13.298 | 13.146 |
| - | 6.54 | 15.29 |
| 9:30 | 7.84 | 12.76 |
| Total | 22.82 | 39.89 |

Table 2.5 Light Truck Speed Calculation of Kelapa Dua - Kebon Jeruk (Coninued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 9:30 | 7.69 | 13.00 | 3 | 8.78 | 11.509 | 11.39 |
| - | 9.88 | 10.12 |
| 9:45 | 8.77 | 11.40 |
| Total | 26.34 | 34.53 |
| 9:45 | 10.72 | 9.33 | 3 | 10.07 | 10.023 | 9.9305 |
| - | 8.75 | 11.43 |
| 10:00 | 10.74 | 9.31 |
| Total | 30.21 | 30.07 |
| 10:00 | 7.92 | 12.63 | 3 | 8.1733 | 12.242 | 12.235 |
| - | 8.2 | 12.20 |
| 10:15 | 8.4 | 11.90 |
| Total | 24.52 | 36.73 |
| 10:15 | 11.54 | 8.67 | 3 | 9.3467 | 11.227 | 10.699 |
| - | 6.8 | 14.71 |
| 10:30 | 9.7 | 10.31 |
| Total | 28.04 | 33.68 |
| 10:30 | 7.3 | 13.70 | 3 | 7.7633 | 12.997 | 12.881 |
| - | 7.16 | 13.97 |
| 10:45 | 8.83 | 11.33 |
| Total | 23.29 | 38.99 |
| 10:45 | 9.42 | 10.62 | 3 | 9.0333 | 11.164 | 11.07 |
| - | 7.91 | 12.64 |
| 11:00 | 9.77 | 10.24 |
| Total | 27.1 | 33.49 |
| 11:00 | 7.44 | 13.44 | 3 | 9.1133 | 11.201 | 10.973 |
| - | 10.5 | 9.52 |
| 11:15 | 9.4 | 10.64 |
| Total | 27.34 | 33.60 |
| 11:15 | 8.76 | 11.42 | 3 | 8.43 | 11.872 | 11.862 |
| - | 8.18 | 12.22 |
| 11:30 | 8.35 | 11.98 |
| Total | 25.29 | 35.62 |
| 11:30 | 8.74 | 11.44 | 3 | 8.93 | 11.445 | 11.198 |
| - | 10.64 | 9.40 |
| 11:45 | 7.41 | 13.50 |
| Total | 26.79 | 34.34 |
| 11:45 | 10.72 | 9.33 | 3 | 10.453 | 9.5745 | 9.5663 |
| - | 10.61 | 9.43 |
| 12:00 | 10.03 | 9.97 |
| Total | 31.36 | 28.72 |

Table 2.5 Light Truck Speed Calculation of Kelapa Dua - Kebon Jeruk (Coninued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 12:00 | 10.1 | 9.90 | 3 | 9.4167 | 10.669 | 10.619 |
| - | 9.58 | 10.44 |
| 12:15 | 8.57 | 11.67 |
| Total | 28.25 | 32.01 |
| 12:15 | 10.28 | 9.73 | 3 | 8.8467 | 11.69 | 11.304 |
| - | 6.74 | 14.84 |
| 12:30 | 9.52 | 10.50 |
| Total | 26.54 | 35.07 |
| 12:30 | 8.13 | 12.30 | 3 | 7.3567 | 14.038 | 13.593 |
| - | 5.62 | 17.79 |
| 12:45 | 8.32 | 12.02 |
| Total | 22.07 | 42.11 |
| 12:45 | 8.14 | 12.29 | 3 | 9.2833 | 10.86 | 10.772 |
| - | 9.84 | 10.16 |
| 13:00 | 9.87 | 10.13 |
| Total | 27.85 | 32.58 |
| 13:00 | 8.53 | 11.72 | 3 | 8.2433 | 12.176 | 12.131 |
| - | 7.55 | 13.25 |
| 13:15 | 8.65 | 11.56 |
| Total | 24.73 | 36.53 |
| 13:15 | 6.88 | 14.53 | 3 | 8.7267 | 11.801 | 11.459 |
| - | 10.45 | 9.57 |
| 13:30 | 8.85 | 11.30 |
| Total | 26.18 | 35.40 |
| 13:30 | 13.82 | 7.24 | 3 | 13.81 | 8.2273 | 7.2411 |
| - | 19.49 | 5.13 |
| 13:45 | 8.12 | 12.32 |
| Total | 41.43 | 24.68 |
| 13:45 | 13.69 | 7.30 | 3 | 11.46 | 9.1204 | 8.726 |
| - | 8.38 | 11.93 |
| 14:00 | 12.31 | 8.12 |
| Total | 34.38 | 27.36 |
| 14:00 | 9.56 | 10.46 | 3 | 8.8533 | 11.433 | 11.295 |
| - | 9.47 | 10.56 |
| 14:15 | 7.53 | 13.28 |
| Total | 26.56 | 34.30 |
| 14:15 | 8.19 | 12.21 | 3 | 8.1767 | 12.344 | 12.23 |
| - | 9.13 | 10.95 |
| 14:30 | 7.21 | 13.87 |
| Total | 24.53 | 37.03 |

Table 2.5 Light Truck Speed Calculation of Kelapa Dua - Kebon Jeruk (Coninued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 14:30 | 7.53 | 13.28 | 3 | 8.8733 | 11.504 | 11.27 |
| - | 8.45 | 11.83 |
| 14:45 | 10.64 | 9.40 |
| Total | 26.62 | 34.51 |
| 14:45 | 8.01 | 12.48 | 3 | 8.7933 | 11.455 | 11.372 |
| - | 9.82 | 10.18 |
| 15:00 | 8.55 | 11.70 |
| Total | 26.38 | 34.36 |
| 15:00 | 5.04 | 19.84 | 3 | 8.5333 | 13.115 | 11.719 |
| - | 9.76 | 10.25 |
| 15:15 | 10.8 | 9.26 |
| Total | 25.6 | 39.35 |
| 15:15 | 10.26 | 9.75 | 3 | 9.01 | 11.2 | 11.099 |
| - | 8.38 | 11.93 |
| 15:30 | 8.39 | 11.92 |
| Total | 27.03 | 33.60 |
| 15:30 | 7.94 | 12.59 | 3 | 8.8667 | 11.344 | 11.278 |
| - | 9.24 | 10.82 |
| 15:45 | 9.42 | 10.62 |
| Total | 26.6 | 34.03 |
| 15:45 | 9.88 | 10.12 | 3 | 9.68 | 10.343 | 10.331 |
| - | 9.95 | 10.05 |
| 16:00 | 9.21 | 10.86 |
| Total | 29.04 | 31.03 |
| 16:00 | 8.91 | 11.22 | 3 | 9.0333 | 11.129 | 11.07 |
| - | 9.9 | 10.10 |
| 16:15 | 8.29 | 12.06 |
| Total | 27.1 | 33.39 |
| 16:15 | 9.96 | 10.04 | 3 | 8.8633 | 11.508 | 11.282 |
| - | 7.21 | 13.87 |
| 16:30 | 9.42 | 10.62 |
| Total | 26.59 | 34.53 |
| 16:30 | 7.39 | 13.53 | 3 | 8.48 | 12.025 | 11.792 |
| - | 7.85 | 12.74 |
| 16:45 | 10.2 | 9.80 |
| Total | 25.44 | 36.07 |
| 16:45 | 11.25 | 8.89 | 3 | 9.2967 | 10.984 | 10.757 |
| - | 8.05 | 12.42 |
| 17:00 | 8.59 | 11.64 |
| Total | 27.89 | 32.95 |

Table 2.5 Light Truck Speed Calculation of Kelapa Dua - Kebon Jeruk (Coninued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 17:00 | 10.77 | 9.29 | 3 | 10.397 | 9.6503 | 9.6185 |
| - | 10.85 | 9.22 |
| 17:15 | 9.57 | 10.45 |
| Total | 31.19 | 28.95 |
| 17:15 | 12.15 | 8.23 | 3 | 10.057 | 10.143 | 9.9437 |
| - | 9.07 | 11.03 |
| 17:30 | 8.95 | 11.17 |
| Total | 30.17 | 30.43 |
| 17:30 | 11.03 | 9.07 | 3 | 11.907 | 8.4232 | 8.3987 |
| - | 12.5 | 8.00 |
| 17:45 | 12.19 | 8.20 |
| Total | 35.72 | 25.27 |
| 17:45 | 14.32 | 6.98 | 3 | 9.86 | 11.206 | 10.142 |
| - | 6.67 | 14.99 |
| 18:00 | 8.59 | 11.64 |
| Total | 29.58 | 33.62 |
| 18:00 | 14.72 | 6.79 | 3 | 11.503 | 9.0175 | 8.6931 |
| - | 9.42 | 10.62 |
| 18:15 | 10.37 | 9.64 |
| Total | 34.51 | 27.05 |
| 18:15 | 12.51 | 7.99 | 3 | 10.337 | 10.175 | 9.6743 |
| - | 7.39 | 13.53 |
| 18:30 | 11.11 | 9.00 |
| Total | 31.01 | 30.53 |
| 18:30 | 12.08 | 8.28 | 3 | 10.943 | 9.246 | 9.138 |
| - | 11.38 | 8.79 |
| 18:45 | 9.37 | 10.67 |
| Total | 32.83 | 27.74 |
| 18:45 | 9.57 | 10.45 | 3 | 9.8367 | 10.193 | 10.166 |
| - | 9.38 | 10.66 |
| 19:00 | 10.56 | 9.47 |
| Total | 29.51 | 30.58 |

Figure 2.3 Light Truck Speed Graph for Kelapa Dua – Kebon Jeruk

Table 2.6 Heavy Truck Speed Calculation of Kelapa Dua - Kebon Jeruk

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 7:00 | 11.9 | 8.4034 | 2 | 13.15 | 7.6739 | 7.6046 |
| - | 14.4 | 6.9444 |
| 7:15 | 0 | 0 |
| Total | 26.3 | 15.348 |
| 7:15 | 6.33 | 15.80 | 3 | 7.9533 | 12.997 | 12.573 |
| - | 9.88 | 10.12 |
| 7:30 | 7.65 | 13.07 |
| Total | 23.86 | 38.99 |
| 7:30 | 7.39 | 13.53 | 3 | 8.2067 | 12.527 | 12.185 |
| - | 7.01 | 14.27 |
| 7:45 | 10.22 | 9.78 |
| Total | 24.62 | 37.58 |
| 7:45 | 10.38 | 9.6339 | 2 | 9.305 | 10.892 | 10.747 |
| - | 8.23 | 12.151 |
| 8:00 | 0 | 0 |
| Total | 18.61 | 21.785 |
| 8:00 | 7.68 | 13.02 | 3 | 7.7633 | 12.891 | 12.881 |
| - | 7.55 | 13.25 |
| 8:15 | 8.06 | 12.41 |
| Total | 23.29 | 38.67 |
| 8:15 | 14.12 | 7.08 | 3 | 9.8967 | 10.955 | 10.104 |
| - | 8.25 | 12.12 |
| 8:30 | 7.32 | 13.66 |
| Total | 29.69 | 32.86 |
| 8:30 | 13.59 | 7.36 | 3 | 10.53 | 10.115 | 9.4967 |
| - | 10.64 | 9.40 |
| 8:45 | 7.36 | 13.59 |
| Total | 31.59 | 30.34 |
| 8:45 | 11.25 | 8.89 | 3 | 9.28 | 11.011 | 10.776 |
| - | 8.6 | 11.63 |
| 9:00 | 7.99 | 12.52 |
| Total | 27.84 | 33.03 |
| 9:00 | 7.69 | 13.00 | 3 | 7.6033 | 13.32 | 13.152 |
| - | 6.53 | 15.31 |
| 9:15 | 8.59 | 11.64 |
| Total | 22.81 | 39.96 |
| 9:15 | 12.79 | 7.82 | 3 | 10.39 | 10.192 | 9.6246 |
| - | 7.27 | 13.76 |
| 9:30 | 11.11 | 9.00 |
| Total | 31.17 | 30.57 |

Table 2.6 Heavy Truck Speed Calculation of Kelapa Dua - Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 9:30 | 7.89 | 12.67 | 3 | 7.8233 | 12.829 | 12.782 |
| - | 7.22 | 13.85 |
| 9:45 | 8.36 | 11.96 |
| Total | 23.47 | 38.49 |
| 9:45 | 9 | 11.11 | 3 | 8.9533 | 11.18 | 11.169 |
| - | 9.27 | 10.79 |
| 10:00 | 8.59 | 11.64 |
| Total | 26.86 | 33.54 |
| 10:00 | 8.08 | 12.38 | 3 | 8.92 | 11.373 | 11.211 |
| - | 10.49 | 9.53 |
| 10:15 | 8.19 | 12.21 |
| Total | 26.76 | 34.12 |
| 10:15 | 8.78 | 11.39 | 3 | 7.75 | 13.011 | 12.903 |
| - | 7.19 | 13.91 |
| 10:30 | 7.28 | 13.74 |
| Total | 23.25 | 39.03 |
| 10:30 | 8.29 | 12.06 | 3 | 8.56 | 11.692 | 11.682 |
| - | 8.49 | 11.78 |
| 10:45 | 8.9 | 11.24 |
| Total | 25.68 | 35.08 |
| 10:45 | 8.34 | 11.99 | 3 | 8.8433 | 11.335 | 11.308 |
| - | 9.4 | 10.64 |
| 11:00 | 8.79 | 11.38 |
| Total | 26.53 | 34.01 |
| 11:00 | 8.79 | 11.38 | 3 | 8.3833 | 12.001 | 11.928 |
| - | 7.49 | 13.35 |
| 11:15 | 8.87 | 11.27 |
| Total | 25.15 | 36.00 |
| 11:15 | 8.24 | 12.14 | 3 | 8.4733 | 11.855 | 11.802 |
| - | 9.27 | 10.79 |
| 11:30 | 7.91 | 12.64 |
| Total | 25.42 | 35.57 |
| 11:30 | 8.76 | 11.416 | 2 | 9.04 | 11.073 | 11.062 |
| - | 9.32 | 10.73 |
| 11:45 | 0 | 0 |
| Total | 18.08 | 22.145 |
| 11:45 | 10.21 | 9.7943 | 2 | 9.88 | 10.133 | 10.121 |
| - | 9.55 | 10.471 |
| 12:00 | 0 | 0 |
| Total | 19.76 | 20.266 |

Table 2.6 Heavy Truck Speed Calculation of Kelapa Dua - Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 12:00 | 6.09 | 16.42 | 3 | 10.537 | 11.459 | 9.4907 |
| - | 17.31 | 5.78 |
| 12:15 | 8.21 | 12.18 |
| Total | 31.61 | 34.38 |
| 12:15 | 7.42 | 13.48 | 3 | 8.5967 | 11.835 | 11.632 |
| - | 10.17 | 9.83 |
| 12:30 | 8.2 | 12.20 |
| Total | 25.79 | 35.51 |
| 12:30 | 9.84 | 10.16 | 3 | 8.9667 | 11.215 | 11.152 |
| - | 8.2 | 12.20 |
| 12:45 | 8.86 | 11.29 |
| Total | 26.9 | 33.64 |
| 12:45 | 14.6 | 6.8493 | 1 | 14.6 | 6.8493 | 6.8493 |
| - | 0 | 0 |
| 13:00 | 0 | 0 |
| Total | 14.6 | 6.8493 |
| 13:00 | 10.94 | 9.14 | 3 | 11.43 | 8.7741 | 8.7489 |
| - | 12.31 | 8.12 |
| 13:15 | 11.04 | 9.06 |
| Total | 34.29 | 26.32 |
| 13:15 | 7.93 | 12.61 | 3 | 8.3467 | 12.068 | 11.981 |
| - | 7.74 | 12.92 |
| 13:30 | 9.37 | 10.67 |
| Total | 25.04 | 36.20 |
| 13:30 | 7.4 | 13.51 | 3 | 8.8233 | 11.498 | 11.334 |
| - | 9.67 | 10.34 |
| 13:45 | 9.4 | 10.64 |
| Total | 26.47 | 34.49 |
| 13:45 | 10.94 | 9.14 | 3 | 10.947 | 9.149 | 9.1352 |
| - | 11.47 | 8.72 |
| 14:00 | 10.43 | 9.59 |
| Total | 32.84 | 27.45 |
| 14:00 | 8.4 | 11.90 | 3 | 11.323 | 9.6223 | 8.8313 |
| - | 9.22 | 10.85 |
| 14:15 | 16.35 | 6.12 |
| Total | 33.97 | 28.87 |
| 14:15 | 9.68 | 10.33 | 3 | 10.883 | 9.9852 | 9.1884 |
| - | 7.63 | 13.11 |
| 14:30 | 15.34 | 6.52 |
| Total | 32.65 | 29.96 |

Table 2.6 Heavy Truck Speed Calculation of Kelapa Dua - Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 14:30 | 10.35 | 9.66 | 3 | 9.1137 | 11.095 | 10.973 |
| - | 8.991 | 11.12 |
| 14:45 | 8 | 12.50 |
| Total | 27.341 | 33.28 |
| 14:45 | 8.96 | 11.16 | 3 | 10.833 | 9.4056 | 9.2308 |
| - | 12.49 | 8.01 |
| 15:00 | 11.05 | 9.05 |
| Total | 32.5 | 28.22 |
| 15:00 | 7.94 | 12.59 | 3 | 9.6867 | 10.751 | 10.323 |
| - | 8.54 | 11.71 |
| 15:15 | 12.58 | 7.95 |
| Total | 29.06 | 32.25 |
| 15:15 | 9.68 | 10.33 | 3 | 9.5233 | 10.508 | 10.501 |
| - | 9.72 | 10.29 |
| 15:30 | 9.17 | 10.91 |
| Total | 28.57 | 31.52 |
| 15:30 | 8.2 | 12.20 | 3 | 9.1467 | 10.995 | 10.933 |
| - | 9.55 | 10.47 |
| 15:45 | 9.69 | 10.32 |
| Total | 27.44 | 32.99 |
| 15:45 | 8.03 | 12.45 | 3 | 10.28 | 10.081 | 9.7276 |
| - | 10.04 | 9.96 |
| 16:00 | 12.77 | 7.83 |
| Total | 30.84 | 30.24 |
| 16:00 | 10.98 | 9.11 | 3 | 8.9567 | 11.452 | 11.165 |
| - | 8.38 | 11.93 |
| 16:15 | 7.51 | 13.32 |
| Total | 26.87 | 34.36 |
| 16:15 | 25 | 4.00 | 3 | 15.58 | 7.778 | 6.4185 |
| - | 13.26 | 7.54 |
| 16:30 | 8.48 | 11.79 |
| Total | 46.74 | 23.33 |
| 16:30 | 9.17 | 10.905 | 1 | 9.17 | 10.905 | 10.905 |
| - | 0 | 0 |
| 16:45 | 0 | 0 |
| Total | 9.17 | 10.905 |
| 16:45 | 8.36 | 11.96 | 3 | 9.06 | 11.158 | 11.038 |
| - | 8.38 | 11.93 |
| 17:00 | 10.44 | 9.58 |
| Total | 27.18 | 33.47 |

Table 2.6 Heavy Truck Speed Calculation of Kelapa Dua - Kebon Jeruk (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 17:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | 0 | 0 |
| 17:15 | 0 | 0 |
| Total | 0 | 0 |
| 17:15 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | 0 | 0 |
| 17:30 | 0 | 0 |
| Total | 0 | 0 |
| 17:30 | 10.77 | 9.2851 | 1 | 10.77 | 9.2851 | 9.2851 |
| - | 0 | 0 |
| 17:45 | 0 | 0 |
| Total | 10.77 | 9.2851 |
| 17:45 | 11.27 | 8.8731 | 1 | 11.27 | 8.8731 | 8.8731 |
| - | 0 | 0 |
| 18:00 | 0 | 0 |
| Total | 11.27 | 8.8731 |
| 18:00 | 13.22 | 7.56 | 3 | 11.91 | 8.4993 | 8.3963 |
| - | 10.18 | 9.82 |
| 18:15 | 12.33 | 8.11 |
| Total | 35.73 | 25.50 |
| 18:15 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | 0 | 0 |
| 18:30 | 0 | 0 |
| Total | 0 | 0 |
| 18:30 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | 0 | 0 |
| 18:45 | 0 | 0 |
| Total | 0 | 0 |
| 18:45 | 9.14 | 10.941 | 1 | 9.14 | 10.941 | 10.941 |
| - | 0 | 0 |
| 19:00 | 0 | 0 |
| Total | 9.14 | 10.941 |

Figure 2.4 Heavy Truck Speed Graph for Kelapa Dua – Kebon Jeruk

Table 2.7 Car Speed Calculation of Kebon Jeruk - Kelapa Dua

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 7:00 | 6.36 | 15.723 | 3 | 6.5267 | 15.341 | 15.322 |
| - | 6.36 | 15.723 |
| 7:15 | 6.86 | 14.577 |
| Total | 19.58 | 46.024 |
| 7:15 | 6.07 | 16.474 | 3 | 6.59 | 15.276 | 15.175 |
| - | 6.35 | 15.748 |
| 7:30 | 7.35 | 13.605 |
| Total | 19.77 | 45.828 |
| 7:30 | 9.35 | 10.695 | 3 | 8.7033 | 11.546 | 11.49 |
| - | 8.85 | 11.299 |
| 7:45 | 7.91 | 12.642 |
| Total | 26.11 | 34.637 |
| 7:45 | 9.19 | 10.881 | 3 | 8.69 | 11.603 | 11.507 |
| - | 7.61 | 13.141 |
| 8:00 | 9.27 | 10.787 |
| Total | 26.07 | 34.809 |
| 8:00 | 9.98 | 10.02 | 3 | 9.9067 | 10.12 | 10.094 |
| - | 9.26 | 10.799 |
| 8:15 | 10.48 | 9.542 |
| Total | 29.72 | 30.361 |
| 8:15 | 10.12 | 9.8814 | 3 | 9.7067 | 10.332 | 10.302 |
| - | 8.98 | 11.136 |
| 8:30 | 10.02 | 9.98 |
| Total | 29.12 | 30.997 |
| 8:30 | 10.2 | 9.8039 | 3 | 9.9067 | 10.117 | 10.094 |
| - | 10.26 | 9.7466 |
| 8:45 | 9.26 | 10.799 |
| Total | 29.72 | 30.35 |
| 8:45 | 9.91 | 10.091 | 3 | 9.3267 | 10.771 | 10.722 |
| - | 9.6 | 10.417 |
| 9:00 | 8.47 | 11.806 |
| Total | 27.98 | 32.314 |
| 9:00 | 7.86 | 12.723 | 3 | 9.2033 | 10.994 | 10.866 |
| - | 10.04 | 9.9602 |
| 9:15 | 9.71 | 10.299 |
| Total | 27.61 | 32.981 |
| 9:15 | 10.98 | 9.1075 | 3 | 9.91 | 10.164 | 10.091 |
| - | 9.83 | 10.173 |
| 9:30 | 8.92 | 11.211 |
| Total | 29.73 | 30.491 |

Table 2.7 Car Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 9:30 | 8.79 | 11.377 | 3 | 8.6033 | 11.643 | 11.623 |
| - | 8.9 | 11.236 |
| 9:45 | 8.12 | 12.315 |
| Total | 25.81 | 34.928 |
| 9:45 | 10.29 | 9.7182 | 3 | 10.25 | 9.7568 | 9.7561 |
| - | 10.13 | 9.8717 |
| 10:00 | 10.33 | 9.6805 |
| Total | 30.75 | 29.27 |
| 10:00 | 10.21 | 9.7943 | 3 | 9.9533 | 10.243 | 10.047 |
| - | 11.46 | 8.726 |
| 10:15 | 8.19 | 12.21 |
| Total | 29.86 | 30.73 |
| 10:15 | 9.69 | 10.32 | 3 | 9.48 | 10.586 | 10.549 |
| - | 10.03 | 9.9701 |
| 10:30 | 8.72 | 11.468 |
| Total | 28.44 | 31.758 |
| 10:30 | 10.89 | 9.1827 | 3 | 10.24 | 9.8559 | 9.7656 |
| - | 10.93 | 9.1491 |
| 10:45 | 8.9 | 11.236 |
| Total | 30.72 | 29.568 |
| 10:45 | 11.78 | 8.489 | 3 | 11.75 | 8.5561 | 8.5106 |
| - | 12.78 | 7.8247 |
| 11:00 | 10.69 | 9.3545 |
| Total | 35.25 | 25.668 |
| 11:00 | 11.23 | 8.9047 | 3 | 10.773 | 9.3011 | 9.2822 |
| - | 10.11 | 9.8912 |
| 11:15 | 10.98 | 9.1075 |
| Total | 32.32 | 27.903 |
| 11:15 | 9.12 | 10.965 | 3 | 9.9567 | 10.084 | 10.044 |
| - | 10.15 | 9.8522 |
| 11:30 | 10.6 | 9.434 |
| Total | 29.87 | 30.251 |
| 11:30 | 11.64 | 8.5911 | 3 | 10.497 | 9.5931 | 9.5268 |
| - | 10.35 | 9.6618 |
| 11:45 | 9.5 | 10.526 |
| Total | 31.49 | 28.779 |
| 11:45 | 9.24 | 10.823 | 3 | 9.6267 | 10.431 | 10.388 |
| - | 9.12 | 10.965 |
| 12:00 | 10.52 | 9.5057 |
| Total | 28.88 | 31.293 |

Table 2.7 Car Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 12:00 | 10.75 | 9.3023 | 3 | 10.79 | 9.2723 | 9.2678 |
| - | 10.52 | 9.5057 |
| 12:15 | 11.1 | 9.009 |
| Total | 32.37 | 27.817 |
| 12:15 | 11.8 | 8.4746 | 3 | 10.26 | 9.9136 | 9.7466 |
| - | 10.39 | 9.6246 |
| 12:30 | 8.59 | 11.641 |
| Total | 30.78 | 29.741 |
| 12:30 | 7.65 | 13.072 | 3 | 8.38 | 12.058 | 11.933 |
| - | 9.62 | 10.395 |
| 12:45 | 7.87 | 12.706 |
| Total | 25.14 | 36.173 |
| 12:45 | 10.24 | 9.7656 | 3 | 11.24 | 8.9389 | 8.8968 |
| - | 11.39 | 8.7796 |
| 13:00 | 12.09 | 8.2713 |
| Total | 33.72 | 26.817 |
| 13:00 | 9.77 | 10.235 | 3 | 10.417 | 9.6211 | 9.6 |
| - | 10.55 | 9.4787 |
| 13:15 | 10.93 | 9.1491 |
| Total | 31.25 | 28.863 |
| 13:15 | 12.26 | 8.1566 | 3 | 11.617 | 8.6242 | 8.6083 |
| - | 11.04 | 9.058 |
| 13:30 | 11.55 | 8.658 |
| Total | 34.85 | 25.873 |
| 13:30 | 12.79 | 7.8186 | 3 | 11.277 | 8.955 | 8.8679 |
| - | 10.07 | 9.9305 |
| 13:45 | 10.97 | 9.1158 |
| Total | 33.83 | 26.865 |
| 13:45 | 10.97 | 9.1158 | 3 | 10.437 | 9.6787 | 9.5816 |
| - | 9.02 | 11.086 |
| 14:00 | 11.32 | 8.8339 |
| Total | 31.31 | 29.036 |
| 14:00 | 12.52 | 7.9872 | 3 | 11.097 | 9.3908 | 9.0117 |
| - | 12.61 | 7.9302 |
| 14:15 | 8.16 | 12.255 |
| Total | 33.29 | 28.172 |
| 14:15 | 12.78 | 7.8247 | 3 | 10.533 | 9.8751 | 9.4937 |
| - | 10.9 | 9.1743 |
| 14:30 | 7.92 | 12.626 |
| Total | 31.6 | 29.625 |

Table 2.7 Car Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 14:30 | 10.96 | 9.1241 | 3 | 9.98 | 10.106 | 10.02 |
| - | 8.78 | 11.39 |
| 14:45 | 10.2 | 9.8039 |
| Total | 29.94 | 30.318 |
| 14:45 | 11.1 | 9.009 | 3 | 10.11 | 9.9785 | 9.8912 |
| - | 8.87 | 11.274 |
| 15:00 | 10.36 | 9.6525 |
| Total | 30.33 | 29.935 |
| 15:00 | 13.31 | 7.5131 | 3 | 11.17 | 9.1369 | 8.9526 |
| - | 9.4 | 10.638 |
| 15:15 | 10.8 | 9.2593 |
| Total | 33.51 | 27.411 |
| 15:15 | 13.81 | 7.2411 | 3 | 13.107 | 7.6522 | 7.6297 |
| - | 12.15 | 8.2305 |
| 15:30 | 13.36 | 7.485 |
| Total | 39.32 | 22.957 |
| 15:30 | 11.56 | 8.6505 | 3 | 11.563 | 8.6515 | 8.648 |
| - | 11.28 | 8.8652 |
| 15:45 | 11.85 | 8.4388 |
| Total | 34.69 | 25.955 |
| 15:45 | 17.48 | 5.7208 | 3 | 14.173 | 7.2466 | 7.0555 |
| - | 11.86 | 8.4317 |
| 16:00 | 13.18 | 7.5873 |
| Total | 42.52 | 21.74 |
| 16:00 | 13.19 | 7.5815 | 3 | 11.573 | 8.7332 | 8.6406 |
| - | 10.27 | 9.7371 |
| 16:15 | 11.26 | 8.881 |
| Total | 34.72 | 26.2 |
| 16:15 | 11.84 | 8.4459 | 3 | 14.17 | 7.239 | 7.0572 |
| - | 17.35 | 5.7637 |
| 16:30 | 13.32 | 7.5075 |
| Total | 42.51 | 21.717 |
| 16:30 | 13.95 | 7.1685 | 3 | 12.373 | 8.3199 | 8.0819 |
| - | 9.59 | 10.428 |
| 16:45 | 13.58 | 7.3638 |
| Total | 37.12 | 24.96 |
| 16:45 | 11.84 | 8.4459 | 3 | 11.637 | 8.5954 | 8.5935 |
| - | 11.42 | 8.7566 |
| 17:00 | 11.65 | 8.5837 |
| Total | 34.91 | 25.786 |

Table 2.7 Car Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 17:00 | 13.87 | 7.2098 | 3 | 13.337 | 7.5971 | 7.4981 |
| - | 14.82 | 6.7476 |
| 17:15 | 11.32 | 8.8339 |
| Total | 40.01 | 22.791 |
| 17:15 | 15.14 | 6.605 | 3 | 13.837 | 7.2724 | 7.2272 |
| - | 13.89 | 7.1994 |
| 17:30 | 12.48 | 8.0128 |
| Total | 41.51 | 21.817 |
| 17:30 | 11.5 | 8.6957 | 3 | 11.56 | 8.7473 | 8.6505 |
| - | 13.08 | 7.6453 |
| 17:45 | 10.1 | 9.901 |
| Total | 34.68 | 26.242 |
| 17:45 | 9.5 | 10.526 | 3 | 10.167 | 9.8588 | 9.8361 |
| - | 10.38 | 9.6339 |
| 18:00 | 10.62 | 9.4162 |
| Total | 30.5 | 29.576 |
| 18:00 | 13.58 | 7.3638 | 3 | 12.463 | 8.2886 | 8.0235 |
| - | 9.52 | 10.504 |
| 18:15 | 14.29 | 6.9979 |
| Total | 37.39 | 24.866 |
| 18:15 | 9.83 | 10.173 | 3 | 10.31 | 9.7255 | 9.6993 |
| - | 10.03 | 9.9701 |
| 18:30 | 11.07 | 9.0334 |
| Total | 30.93 | 29.176 |
| 18:30 | 12.46 | 8.0257 | 3 | 11.39 | 8.8267 | 8.7796 |
| - | 10.42 | 9.5969 |
| 18:45 | 11.29 | 8.8574 |
| Total | 34.17 | 26.48 |
| 18:45 | 13.81 | 7.2411 | 3 | 12.017 | 8.4211 | 8.3218 |
| - | 10.62 | 9.4162 |
| 19:00 | 11.62 | 8.6059 |
| Total | 36.05 | 25.263 |

Figure 2.5 Car Speed Grapf for Kebon Jeruk - Kelapa Dua

Table 2.8 Motorcycle Speed Calculation of Kebon Jeruk - Kelapa Dua

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 7:00 | 6.54 | 15.291 | 3 | 6.59 | 15.278 | 15.175 |
| - | 7.28 | 13.736 |
| 7:15 | 5.95 | 16.807 |
| Total | 19.77 | 45.834 |
| 7:15 | 5.7 | 17.544 | 3 | 6.17 | 16.26 | 16.207 |
| - | 6.29 | 15.898 |
| 7:30 | 6.52 | 15.337 |
| Total | 18.51 | 48.78 |
| 7:30 | 9.33 | 10.718 | 3 | 8.0333 | 12.661 | 12.448 |
| - | 6.78 | 14.749 |
| 7:45 | 7.99 | 12.516 |
| Total | 24.1 | 37.983 |
| 7:45 | 7.15 | 13.986 | 3 | 7.9733 | 12.66 | 12.542 |
| - | 9.03 | 11.074 |
| 8:00 | 7.74 | 12.92 |
| Total | 23.92 | 37.98 |
| 8:00 | 7.96 | 12.563 | 3 | 7.9367 | 12.62 | 12.6 |
| - | 7.54 | 13.263 |
| 8:15 | 8.31 | 12.034 |
| Total | 23.81 | 37.859 |
| 8:15 | 7.84 | 12.755 | 3 | 7.82 | 12.845 | 12.788 |
| - | 7.17 | 13.947 |
| 8:30 | 8.45 | 11.834 |
| Total | 23.46 | 38.536 |
| 8:30 | 9.09 | 11.001 | 3 | 9.1733 | 10.922 | 10.901 |
| - | 9.7 | 10.309 |
| 8:45 | 8.73 | 11.455 |
| Total | 27.52 | 32.765 |
| 8:45 | 8.23 | 12.151 | 3 | 8.6533 | 11.591 | 11.556 |
| - | 9.33 | 10.718 |
| 9:00 | 8.4 | 11.905 |
| Total | 25.96 | 34.774 |
| 9:00 | 7.41 | 13.495 | 3 | 8.1033 | 12.389 | 12.341 |
| - | 8.54 | 11.71 |
| 9:15 | 8.36 | 11.962 |
| Total | 24.31 | 37.167 |
| 9:15 | 9.16 | 10.917 | 3 | 8.6433 | 11.629 | 11.57 |
| - | 7.8 | 12.821 |
| 9:30 | 8.97 | 11.148 |
| Total | 25.93 | 34.886 |

Table 2.8 Motorcycle Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 9:30 | 9.22 | 10.846 | 3 | 9.0733 | 11.127 | 11.021 |
| - | 7.94 | 12.594 |
| 9:45 | 10.06 | 9.9404 |
| Total | 27.22 | 33.381 |
| 9:45 | 8.93 | 11.198 | 3 | 9.56 | 10.512 | 10.46 |
| - | 10.51 | 9.5147 |
| 10:00 | 9.24 | 10.823 |
| Total | 28.68 | 31.535 |
| 10:00 | 7.58 | 13.193 | 3 | 8.0867 | 12.417 | 12.366 |
| - | 7.87 | 12.706 |
| 10:15 | 8.81 | 11.351 |
| Total | 24.26 | 37.25 |
| 10:15 | 9.1 | 10.989 | 3 | 8.6267 | 11.612 | 11.592 |
| - | 8.23 | 12.151 |
| 10:30 | 8.55 | 11.696 |
| Total | 25.88 | 34.836 |
| 10:30 | 9.59 | 10.428 | 3 | 8.7467 | 11.667 | 11.433 |
| - | 9.57 | 10.449 |
| 10:45 | 7.08 | 14.124 |
| Total | 26.24 | 35.001 |
| 10:45 | 10.61 | 9.4251 | 3 | 8.7333 | 11.739 | 11.45 |
| - | 8.36 | 11.962 |
| 11:00 | 7.23 | 13.831 |
| Total | 26.2 | 35.218 |
| 11:00 | 10.28 | 9.7276 | 3 | 8.8233 | 11.51 | 11.334 |
| - | 8.6 | 11.628 |
| 11:15 | 7.59 | 13.175 |
| Total | 26.47 | 34.531 |
| 11:15 | 8.64 | 11.574 | 3 | 9.1 | 11.045 | 10.989 |
| - | 8.62 | 11.601 |
| 11:30 | 10.04 | 9.9602 |
| Total | 27.3 | 33.135 |
| 11:30 | 10.87 | 9.1996 | 3 | 9.8467 | 10.21 | 10.156 |
| - | 9.2 | 10.87 |
| 11:45 | 9.47 | 10.56 |
| Total | 29.54 | 30.629 |
| 11:45 | 9.22 | 10.846 | 3 | 9.2833 | 10.772 | 10.772 |
| - | 9.34 | 10.707 |
| 12:00 | 9.29 | 10.764 |
| Total | 27.85 | 32.317 |

Table 2.8 Motorcycle Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 12:00 | 8.17 | 12.24 | 3 | 8.5733 | 11.707 | 11.664 |
| - | 9.32 | 10.73 |
| 12:15 | 8.23 | 12.151 |
| Total | 25.72 | 35.12 |
| 12:15 | 7.97 | 12.547 | 3 | 8.52 | 11.763 | 11.737 |
| - | 8.69 | 11.507 |
| 12:30 | 8.9 | 11.236 |
| Total | 25.56 | 35.29 |
| 12:30 | 6.37 | 15.699 | 3 | 7.8067 | 13.278 | 12.81 |
| - | 7.1 | 14.085 |
| 12:45 | 9.95 | 10.05 |
| Total | 23.42 | 39.833 |
| 12:45 | 9.44 | 10.593 | 3 | 8.6533 | 11.779 | 11.556 |
| - | 9.47 | 10.56 |
| 13:00 | 7.05 | 14.184 |
| Total | 25.96 | 35.337 |
| 13:00 | 8.78 | 11.39 | 3 | 8.63 | 11.59 | 11.587 |
| - | 8.5 | 11.765 |
| 13:15 | 8.61 | 11.614 |
| Total | 25.89 | 34.769 |
| 13:15 | 8.45 | 11.834 | 3 | 8.7367 | 11.464 | 11.446 |
| - | 9.23 | 10.834 |
| 13:30 | 8.53 | 11.723 |
| Total | 26.21 | 34.392 |
| 13:30 | 7.98 | 12.531 | 3 | 8.1867 | 12.221 | 12.215 |
| - | 8.15 | 12.27 |
| 13:45 | 8.43 | 11.862 |
| Total | 24.56 | 36.664 |
| 13:45 | 8.75 | 11.429 | 3 | 7.0467 | 14.918 | 14.191 |
| - | 7.29 | 13.717 |
| 14:00 | 5.1 | 19.608 |
| Total | 21.14 | 44.754 |
| 14:00 | 9.17 | 10.905 | 3 | 9.6 | 10.445 | 10.417 |
| - | 10.32 | 9.6899 |
| 14:15 | 9.31 | 10.741 |
| Total | 28.8 | 31.336 |
| 14:15 | 8.24 | 12.136 | 3 | 9.32 | 10.869 | 10.73 |
| - | 10.8 | 9.2593 |
| 14:30 | 8.92 | 11.211 |
| Total | 27.96 | 32.606 |

Table 2.8 Motorcycle Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 14:30 | 11.39 | 8.7796 | 3 | 9.5267 | 10.691 | 10.497 |
| - | 8.32 | 12.019 |
| 14:45 | 8.87 | 11.274 |
| Total | 28.58 | 32.073 |
| 14:45 | 8.8 | 11.364 | 3 | 9.4467 | 10.727 | 10.586 |
| - | 8.51 | 11.751 |
| 15:00 | 11.03 | 9.0662 |
| Total | 28.34 | 32.181 |
| 15:00 | 9.29 | 10.764 | 3 | 10.293 | 9.8019 | 9.715 |
| - | 11.64 | 8.5911 |
| 15:15 | 9.95 | 10.05 |
| Total | 30.88 | 29.406 |
| 15:15 | 11 | 9.0909 | 3 | 11.923 | 8.6466 | 8.3869 |
| - | 14.91 | 6.7069 |
| 15:30 | 9.86 | 10.142 |
| Total | 35.77 | 25.94 |
| 15:30 | 15.73 | 6.3573 | 3 | 11.917 | 8.8047 | 8.3916 |
| - | 10.63 | 9.4073 |
| 15:45 | 9.39 | 10.65 |
| Total | 35.75 | 26.414 |
| 15:45 | 11.59 | 8.6281 | 3 | 9.7933 | 10.389 | 10.211 |
| - | 9.33 | 10.718 |
| 16:00 | 8.46 | 11.82 |
| Total | 29.38 | 31.167 |
| 16:00 | 10.86 | 9.2081 | 3 | 12.2 | 8.2821 | 8.1967 |
| - | 13.89 | 7.1994 |
| 16:15 | 11.85 | 8.4388 |
| Total | 36.6 | 24.846 |
| 16:15 | 14.58 | 6.8587 | 3 | 12.893 | 7.8967 | 7.7559 |
| - | 10.63 | 9.4073 |
| 16:30 | 13.47 | 7.4239 |
| Total | 38.68 | 23.69 |
| 16:30 | 7.54 | 13.263 | 3 | 10.41 | 10.052 | 9.6061 |
| - | 11.57 | 8.643 |
| 16:45 | 12.12 | 8.2508 |
| Total | 31.23 | 30.156 |
| 16:45 | 10.15 | 9.8522 | 3 | 12.597 | 8.2645 | 7.9386 |
| - | 11.37 | 8.7951 |
| 17:00 | 16.27 | 6.1463 |
| Total | 37.79 | 24.794 |

Table 2.8 Motorcycle Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 17:00 | 20.27 | 4.9334 | 3 | 14.203 | 7.613 | 7.0406 |
| - | 11.12 | 8.9928 |
| 17:15 | 11.22 | 8.9127 |
| Total | 42.61 | 22.839 |
| 17:15 | 11.14 | 8.9767 | 3 | 11.12 | 9.0511 | 8.9928 |
| - | 12.2 | 8.1967 |
| 17:30 | 10.02 | 9.98 |
| Total | 33.36 | 27.153 |
| 17:30 | 11.51 | 8.6881 | 3 | 12.19 | 8.2194 | 8.2034 |
| - | 12.82 | 7.8003 |
| 17:45 | 12.24 | 8.1699 |
| Total | 36.57 | 24.658 |
| 17:45 | 14.17 | 7.0572 | 3 | 10.653 | 9.9091 | 9.3867 |
| - | 8.09 | 12.361 |
| 18:00 | 9.7 | 10.309 |
| Total | 31.96 | 29.727 |
| 18:00 | 9.39 | 10.65 | 3 | 9.68 | 10.337 | 10.331 |
| - | 9.98 | 10.02 |
| 18:15 | 9.67 | 10.341 |
| Total | 29.04 | 31.011 |
| 18:15 | 11.91 | 8.3963 | 3 | 8.8867 | 11.98 | 11.253 |
| - | 8.29 | 12.063 |
| 18:30 | 6.46 | 15.48 |
| Total | 26.66 | 35.939 |
| 18:30 | 8.3 | 12.048 | 3 | 9.92 | 10.267 | 10.081 |
| - | 9.89 | 10.111 |
| 18:45 | 11.57 | 8.643 |
| Total | 29.76 | 30.802 |
| 18:45 | 12.28 | 8.1433 | 3 | 10.577 | 9.5697 | 9.4548 |
| - | 9.7 | 10.309 |
| 19:00 | 9.75 | 10.256 |
| Total | 31.73 | 28.709 |

Figure 2.6 Motorcycle Speed Graph for Kebon Jeruk – Kelapa Dua

Table 2.9 Light Truck Speed Calculation of Kebon Jeruk - Kelapa Dua

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 7:00 | 7.61 | 13.141 | 3 | 7.8533 | 12.742 | 12.733 |
| - | 7.83 | 12.771 |
| 7:15 | 8.12 | 12.315 |
| Total | 23.56 | 38.227 |
| 7:15 | 7.83 | 12.771 | 3 | 8.4433 | 11.915 | 11.844 |
| - | 9.37 | 10.672 |
| 7:30 | 8.13 | 12.3 |
| Total | 25.33 | 35.744 |
| 7:30 | 9.68 | 10.331 | 3 | 9.3033 | 10.76 | 10.749 |
| - | 8.93 | 11.198 |
| 7:45 | 9.3 | 10.753 |
| Total | 27.91 | 32.281 |
| 7:45 | 8.15 | 12.27 | 3 | 8.6767 | 11.66 | 11.525 |
| - | 7.85 | 12.739 |
| 8:00 | 10.03 | 9.9701 |
| Total | 26.03 | 34.979 |
| 8:00 | 11.98 | 8.3472 | 3 | 11.73 | 8.5422 | 8.5251 |
| - | 11.01 | 9.0827 |
| 8:15 | 12.2 | 8.1967 |
| Total | 35.19 | 25.627 |
| 8:15 | 7.86 | 12.723 | 3 | 8.75 | 11.546 | 11.429 |
| - | 8.4 | 11.905 |
| 8:30 | 9.99 | 10.01 |
| Total | 26.25 | 34.637 |
| 8:30 | 10.32 | 9.6899 | 3 | 10.953 | 9.1731 | 9.1296 |
| - | 10.5 | 9.5238 |
| 8:45 | 12.04 | 8.3056 |
| Total | 32.86 | 27.519 |
| 8:45 | 8.99 | 11.123 | 3 | 11.017 | 9.25 | 9.0772 |
| - | 12.14 | 8.2372 |
| 9:00 | 11.92 | 8.3893 |
| Total | 33.05 | 27.75 |
| 9:00 | 10.75 | 9.3023 | 3 | 10.057 | 9.9671 | 9.9437 |
| - | 9.8 | 10.204 |
| 9:15 | 9.62 | 10.395 |
| Total | 30.17 | 29.901 |
| 9:15 | 8.12 | 12.315 | 3 | 9.5367 | 10.613 | 10.486 |
| - | 10.34 | 9.6712 |
| 9:30 | 10.15 | 9.8522 |
| Total | 28.61 | 31.839 |

Table 2.9 Light Truck Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 9:30 | 11.3 | 8.8496 | 3 | 10.207 | 9.8554 | 9.7975 |
| - | 9.9 | 10.101 |
| 9:45 | 9.42 | 10.616 |
| Total | 30.62 | 29.566 |
| 9:45 | 10.47 | 9.5511 | 3 | 11.01 | 9.1465 | 9.0827 |
| - | 12.34 | 8.1037 |
| 10:00 | 10.22 | 9.7847 |
| Total | 33.03 | 27.44 |
| 10:00 | 11.66 | 8.5763 | 3 | 10.77 | 9.4796 | 9.2851 |
| - | 11.95 | 8.3682 |
| 10:15 | 8.7 | 11.494 |
| Total | 32.31 | 28.439 |
| 10:15 | 11.47 | 8.7184 | 3 | 11.063 | 9.0513 | 9.0389 |
| - | 11.21 | 8.9206 |
| 10:30 | 10.51 | 9.5147 |
| Total | 33.19 | 27.154 |
| 10:30 | 10.04 | 9.9602 | 3 | 9.9567 | 10.064 | 10.044 |
| - | 10.46 | 9.5602 |
| 10:45 | 9.37 | 10.672 |
| Total | 29.87 | 30.193 |
| 10:45 | 10.75 | 9.3023 | 3 | 10.49 | 9.7075 | 9.5329 |
| - | 12.03 | 8.3126 |
| 11:00 | 8.69 | 11.507 |
| Total | 31.47 | 29.122 |
| 11:00 | 10.62 | 9.4162 | 3 | 11.253 | 9.0503 | 8.8863 |
| - | 13.41 | 7.4571 |
| 11:15 | 9.73 | 10.277 |
| Total | 33.76 | 27.151 |
| 11:15 | 9.29 | 10.764 | 3 | 9.7767 | 10.245 | 10.228 |
| - | 9.8 | 10.204 |
| 11:30 | 10.24 | 9.7656 |
| Total | 29.33 | 30.734 |
| 11:30 | 8.92 | 11.211 | 3 | 10.903 | 9.358 | 9.1715 |
| - | 11.25 | 8.8889 |
| 11:45 | 12.54 | 7.9745 |
| Total | 32.71 | 28.074 |
| 11:45 | 7.67 | 13.038 | 3 | 8.5867 | 11.843 | 11.646 |
| - | 10.22 | 9.7847 |
| 12:00 | 7.87 | 12.706 |
| Total | 25.76 | 35.529 |

Table 2.9 Light Truck Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 12:00 | 13.07 | 7.6511 | 3 | 12.5 | 8.0376 | 8 |
| - | 11.32 | 8.8339 |
| 12:15 | 13.11 | 7.6278 |
| Total | 37.5 | 24.113 |
| 12:15 | 10.9 | 9.1743 | 3 | 10.123 | 9.9082 | 9.8782 |
| - | 9.57 | 10.449 |
| 12:30 | 9.9 | 10.101 |
| Total | 30.37 | 29.725 |
| 12:30 | 9.22 | 10.846 | 3 | 9.71 | 10.354 | 10.299 |
| - | 10.74 | 9.311 |
| 12:45 | 9.17 | 10.905 |
| Total | 29.13 | 31.062 |
| 12:45 | 10.89 | 9.1827 | 3 | 11.503 | 8.7058 | 8.6931 |
| - | 11.82 | 8.4602 |
| 13:00 | 11.8 | 8.4746 |
| Total | 34.51 | 26.118 |
| 13:00 | 8.19 | 12.21 | 3 | 10.42 | 9.9256 | 9.5969 |
| - | 10.22 | 9.7847 |
| 13:15 | 12.85 | 7.7821 |
| Total | 31.26 | 29.777 |
| 13:15 | 8.6 | 11.628 | 3 | 8.83 | 11.415 | 11.325 |
| - | 7.99 | 12.516 |
| 13:30 | 9.9 | 10.101 |
| Total | 26.49 | 34.245 |
| 13:30 | 11.84 | 8.4459 | 3 | 11.253 | 9.1732 | 8.8863 |
| - | 13.24 | 7.5529 |
| 13:45 | 8.68 | 11.521 |
| Total | 33.76 | 27.52 |
| 13:45 | 10.14 | 9.8619 | 3 | 10.627 | 9.4236 | 9.4103 |
| - | 11.12 | 8.9928 |
| 14:00 | 10.62 | 9.4162 |
| Total | 31.88 | 28.271 |
| 14:00 | 10.1 | 9.901 | 3 | 10.483 | 9.7356 | 9.539 |
| - | 8.84 | 11.312 |
| 14:15 | 12.51 | 7.9936 |
| Total | 31.45 | 29.207 |
| 14:15 | 10.82 | 9.2421 | 3 | 10.687 | 9.5293 | 9.3575 |
| - | 12.35 | 8.0972 |
| 14:30 | 8.89 | 11.249 |
| Total | 32.06 | 28.588 |

Table 2.9 Light Truck Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 14:30 | 10.84 | 9.2251 | 3 | 12.18 | 8.2737 | 8.2102 |
| - | 13.43 | 7.446 |
| 14:45 | 12.27 | 8.15 |
| Total | 36.54 | 24.821 |
| 14:45 | 11.45 | 8.7336 | 3 | 11.16 | 8.985 | 8.9606 |
| - | 11.67 | 8.569 |
| 15:00 | 10.36 | 9.6525 |
| Total | 33.48 | 26.955 |
| 15:00 | 10.79 | 9.2678 | 3 | 13.5 | 7.5853 | 7.4074 |
| - | 14.22 | 7.0323 |
| 15:15 | 15.49 | 6.4558 |
| Total | 40.5 | 22.756 |
| 15:15 | 12.89 | 7.758 | 3 | 13 | 7.7162 | 7.6923 |
| - | 13.94 | 7.1736 |
| 15:30 | 12.17 | 8.2169 |
| Total | 39 | 23.148 |
| 15:30 | 11.63 | 8.5985 | 3 | 12.12 | 8.3003 | 8.2508 |
| - | 13.46 | 7.4294 |
| 15:45 | 11.27 | 8.8731 |
| Total | 36.36 | 24.901 |
| 15:45 | 15.6 | 6.4103 | 3 | 14.49 | 6.9962 | 6.9013 |
| - | 15.67 | 6.3816 |
| 16:00 | 12.2 | 8.1967 |
| Total | 43.47 | 20.989 |
| 16:00 | 13.92 | 7.1839 | 3 | 13.04 | 7.7159 | 7.6687 |
| - | 13.55 | 7.3801 |
| 16:15 | 11.65 | 8.5837 |
| Total | 39.12 | 23.148 |
| 16:15 | 13.35 | 7.4906 | 3 | 13.593 | 7.36 | 7.3565 |
| - | 13.42 | 7.4516 |
| 16:30 | 14.01 | 7.1378 |
| Total | 40.78 | 22.08 |
| 16:30 | 13.93 | 7.1788 | 3 | 13.113 | 7.6403 | 7.6258 |
| - | 12.65 | 7.9051 |
| 16:45 | 12.76 | 7.837 |
| Total | 39.34 | 22.921 |
| 16:45 | 14.46 | 6.9156 | 3 | 15.167 | 6.6122 | 6.5934 |
| - | 16.32 | 6.1275 |
| 17:00 | 14.72 | 6.7935 |
| Total | 45.5 | 19.837 |

Table 2.9 Light Truck Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 17:00 | 13.64 | 7.3314 | 3 | 12.967 | 7.7549 | 7.7121 |
| - | 11.64 | 8.5911 |
| 17:15 | 13.62 | 7.3421 |
| Total | 38.9 | 23.265 |
| 17:15 | 12.86 | 7.776 | 3 | 13 | 7.6941 | 7.6923 |
| - | 13.28 | 7.5301 |
| 17:30 | 12.86 | 7.776 |
| Total | 39 | 23.082 |
| 17:30 | 13.14 | 7.6104 | 3 | 13.807 | 7.4512 | 7.2429 |
| - | 16.99 | 5.8858 |
| 17:45 | 11.29 | 8.8574 |
| Total | 41.42 | 22.354 |
| 17:45 | 12.37 | 8.0841 | 3 | 10.837 | 9.3235 | 9.2279 |
| - | 10.43 | 9.5877 |
| 18:00 | 9.71 | 10.299 |
| Total | 32.51 | 27.97 |
| 18:00 | 13.59 | 7.3584 | 3 | 11.253 | 9.1903 | 8.8863 |
| - | 8.7 | 11.494 |
| 18:15 | 11.47 | 8.7184 |
| Total | 33.76 | 27.571 |
| 18:15 | 12.46 | 8.0257 | 3 | 10.843 | 9.3731 | 9.2223 |
| - | 9.13 | 10.953 |
| 18:30 | 10.94 | 9.1408 |
| Total | 32.53 | 28.119 |
| 18:30 | 11.31 | 8.8417 | 3 | 11.717 | 8.5993 | 8.5349 |
| - | 10.7 | 9.3458 |
| 18:45 | 13.14 | 7.6104 |
| Total | 35.15 | 25.798 |
| 18:45 | 9.07 | 11.025 | 3 | 10.197 | 9.8922 | 9.8071 |
| - | 11.39 | 8.7796 |
| 19:00 | 10.13 | 9.8717 |
| Total | 30.59 | 29.677 |

Figure 2.7 Light Truck Speed Graph for Kebon Jeruk – Kelapa Dua

Table 2.10 Heavy Truck Speed Calculation of Kebon Jeruk - Kelapa Dua

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 7:00 | 8.29 | 12.063 | 3 | 9.2167 | 10.923 | 10.85 |
| - | 9.23 | 10.834 |
| 7:15 | 10.13 | 9.8717 |
| Total | 27.65 | 32.769 |
| 7:15 | 10.07 | 9.9305 | 3 | 8.6433 | 11.806 | 11.57 |
| - | 7.12 | 14.045 |
| 7:30 | 8.74 | 11.442 |
| Total | 25.93 | 35.417 |
| 7:30 | 9.91 | 10.091 | 3 | 8.9633 | 11.218 | 11.157 |
| - | 8.62 | 11.601 |
| 7:45 | 8.36 | 11.962 |
| Total | 26.89 | 33.653 |
| 7:45 | 11.37 | 8.7951 | 2 | 10.885 | 9.2052 | 9.187 |
| - | 10.4 | 9.6154 |
| 8:00 | 0 | 0 |
| Total | 21.77 | 18.41 |
| 8:00 | 14.2 | 7.0423 | 3 | 10.267 | 10.39 | 9.7403 |
| - | 8.6 | 11.628 |
| 8:15 | 8 | 12.5 |
| Total | 30.8 | 31.17 |
| 8:15 | 12.92 | 7.7399 | 3 | 12.963 | 7.7147 | 7.7141 |
| - | 12.85 | 7.7821 |
| 8:30 | 13.12 | 7.622 |
| Total | 38.89 | 23.144 |
| 8:30 | 10.88 | 9.1912 | 3 | 10.823 | 9.2429 | 9.2393 |
| - | 11.05 | 9.0498 |
| 8:45 | 10.54 | 9.4877 |
| Total | 32.47 | 27.729 |
| 8:45 | 8.91 | 11.223 | 2 | 10.555 | 9.71 | 9.4742 |
| - | 12.2 | 8.1967 |
| 9:00 | 0 | 0 |
| Total | 21.11 | 19.42 |
| 9:00 | 8.97 | 11.148 | 3 | 10.097 | 9.97 | 9.9043 |
| - | 10.64 | 9.3985 |
| 9:15 | 10.68 | 9.3633 |
| Total | 30.29 | 29.91 |
| 9:15 | 11.26 | 8.881 | 3 | 10.58 | 9.5966 | 9.4518 |
| - | 8.83 | 11.325 |
| 9:30 | 11.65 | 8.5837 |
| Total | 31.74 | 28.79 |

Table 2.10 Heavy Truck Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 9:30 | 10.78 | 9.2764 | 3 | 10.49 | 9.5507 | 9.5329 |
| - | 10.83 | 9.2336 |
| 9:45 | 9.86 | 10.142 |
| Total | 31.47 | 28.652 |
| 9:45 | 9.24 | 10.823 | 3 | 10.48 | 9.7023 | 9.542 |
| - | 12.44 | 8.0386 |
| 10:00 | 9.76 | 10.246 |
| Total | 31.44 | 29.107 |
| 10:00 | 10.78 | 9.2764 | 3 | 11.4 | 8.8631 | 8.7719 |
| - | 13.07 | 7.6511 |
| 10:15 | 10.35 | 9.6618 |
| Total | 34.2 | 26.589 |
| 10:15 | 9.87 | 10.132 | 3 | 11.084 | 9.2625 | 9.0223 |
| - | 9.631 | 10.383 |
| 10:30 | 13.75 | 7.2727 |
| Total | 33.251 | 27.788 |
| 10:30 | 7.6 | 13.158 | 3 | 9.0367 | 11.221 | 11.066 |
| - | 9.64 | 10.373 |
| 10:45 | 9.87 | 10.132 |
| Total | 27.11 | 33.663 |
| 10:45 | 12.05 | 8.2988 | 3 | 12.597 | 7.9479 | 7.9386 |
| - | 13.1 | 7.6336 |
| 11:00 | 12.64 | 7.9114 |
| Total | 37.79 | 23.844 |
| 11:00 | 9.85 | 10.152 | 3 | 10.623 | 9.4489 | 9.4132 |
| - | 11.45 | 8.7336 |
| 11:15 | 10.57 | 9.4607 |
| Total | 31.87 | 28.347 |
| 11:15 | 18.46 | 5.4171 | 3 | 12.723 | 8.5944 | 7.8596 |
| - | 9.27 | 10.787 |
| 11:30 | 10.44 | 9.5785 |
| Total | 38.17 | 25.783 |
| 11:30 | 11.34 | 8.8183 | 3 | 10.693 | 9.3683 | 9.3516 |
| - | 10.35 | 9.6618 |
| 11:45 | 10.39 | 9.6246 |
| Total | 32.08 | 28.105 |
| 11:45 | 6.9 | 14.493 | 3 | 8.71 | 11.936 | 11.481 |
| - | 11.11 | 9.0009 |
| 12:00 | 8.12 | 12.315 |
| Total | 26.13 | 35.809 |

Table 2.10 Heavy Truck Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 12:00 | 12.31 | 8.1235 | 3 | 11.727 | 8.5394 | 8.5276 |
| - | 11.25 | 8.8889 |
| 12:15 | 11.62 | 8.6059 |
| Total | 35.18 | 25.618 |
| 12:15 | 10.45 | 9.5694 | 3 | 10.92 | 9.3109 | 9.1575 |
| - | 12.87 | 7.77 |
| 12:30 | 9.44 | 10.593 |
| Total | 32.76 | 27.933 |
| 12:30 | 10.87 | 9.1996 | 3 | 11.657 | 8.9054 | 8.5788 |
| - | 14.81 | 6.7522 |
| 12:45 | 9.29 | 10.764 |
| Total | 34.97 | 26.716 |
| 12:45 | 7.05 | 14.184 | 2 | 11.845 | 10.097 | 8.4424 |
| - | 16.64 | 6.0096 |
| 13:00 | 0 | 0 |
| Total | 23.69 | 20.194 |
| 13:00 | 10.42 | 9.5969 | 3 | 10.8 | 9.446 | 9.2593 |
| - | 12.86 | 7.776 |
| 13:15 | 9.12 | 10.965 |
| Total | 32.4 | 28.338 |
| 13:15 | 11.55 | 8.658 | 3 | 10.377 | 9.703 | 9.637 |
| - | 10.11 | 9.8912 |
| 13:30 | 9.47 | 10.56 |
| Total | 31.13 | 29.109 |
| 13:30 | 15.01 | 6.6622 | 3 | 13.85 | 7.4858 | 7.2202 |
| - | 16.11 | 6.2073 |
| 13:45 | 10.43 | 9.5877 |
| Total | 41.55 | 22.457 |
| 13:45 | 10.8 | 9.2593 | 3 | 11.68 | 8.6369 | 8.5616 |
| - | 13.27 | 7.5358 |
| 14:00 | 10.97 | 9.1158 |
| Total | 35.04 | 25.911 |
| 14:00 | 12.03 | 8.3126 | 3 | 10.777 | 9.3444 | 9.2793 |
| - | 10.44 | 9.5785 |
| 14:15 | 9.86 | 10.142 |
| Total | 32.33 | 28.033 |
| 14:15 | 9.04 | 11.062 | 3 | 12.263 | 8.5068 | 8.1544 |
| - | 14.64 | 6.8306 |
| 14:30 | 13.11 | 7.6278 |
| Total | 36.79 | 25.52 |

Table 2.10 Heavy Truck Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 14:30 | 11 | 9.0909 | 3 | 10.9 | 9.1826 | 9.1743 |
| - | 11.24 | 8.8968 |
| 14:45 | 10.46 | 9.5602 |
| Total | 32.7 | 27.548 |
| 14:45 | 12.31 | 8.1235 | 3 | 12.483 | 8.1593 | 8.0107 |
| - | 14.64 | 6.8306 |
| 15:00 | 10.5 | 9.5238 |
| Total | 37.45 | 24.478 |
| 15:00 | 12.22 | 8.1833 | 2 | 12.845 | 7.8036 | 7.7851 |
| - | 13.47 | 7.4239 |
| 15:15 | 0 | 0 |
| Total | 25.69 | 15.607 |
| 15:15 | 10.4 | 9.6154 | 3 | 11.437 | 8.7936 | 8.7438 |
| - | 11.4 | 8.7719 |
| 15:30 | 12.51 | 7.9936 |
| Total | 34.31 | 26.381 |
| 15:30 | 11.22 | 8.9127 | 3 | 11.217 | 8.9156 | 8.9153 |
| - | 11.29 | 8.8574 |
| 15:45 | 11.14 | 8.9767 |
| Total | 33.65 | 26.747 |
| 15:45 | 16.16 | 6.1881 | 3 | 15 | 6.6904 | 6.6667 |
| - | 14.87 | 6.7249 |
| 16:00 | 13.97 | 7.1582 |
| Total | 45 | 20.071 |
| 16:00 | 16.48 | 6.068 | 3 | 15.9 | 6.3052 | 6.2893 |
| - | 14.79 | 6.7613 |
| 16:15 | 16.43 | 6.0864 |
| Total | 47.7 | 18.916 |
| 16:15 | 15.23 | 6.566 | 3 | 13.363 | 7.6123 | 7.4832 |
| - | 13.74 | 7.278 |
| 16:30 | 11.12 | 8.9928 |
| Total | 40.09 | 22.837 |
| 16:30 | 21.27 | 4.7015 | 3 | 17.517 | 5.8977 | 5.7088 |
| - | 17.6 | 5.6818 |
| 16:45 | 13.68 | 7.3099 |
| Total | 52.55 | 17.693 |
| 16:45 | 11.77 | 8.4962 | 2 | 11.37 | 8.806 | 8.7951 |
| - | 10.97 | 9.1158 |
| 17:00 | 0 | 0 |
| Total | 22.74 | 17.612 |

Table 2.10 Heavy Truck Speed Calculation of Kebon Jeruk - Kelapa Dua (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time**  **Period** | **Time (s)** | ***v* (m/s)** | **n** | ***t*avg(s)** | ***v*t (m/s)** | ***vs*(m/s)** |
| 17:00 | 12.01 | 8.3264 | 2 | 12.635 | 7.9339 | 7.9145 |
| - | 13.26 | 7.5415 |
| 17:15 | 0 | 0 |
| Total | 25.27 | 15.868 |
| 17:15 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | 0 | 0 |
| 17:30 | 0 | 0 |
| Total | 0 | 0 |
| 17:30 | 12.34 | 8.1037 | 3 | 13.283 | 7.8928 | 7.5282 |
| - | 10.21 | 9.7943 |
| 17:45 | 17.3 | 5.7803 |
| Total | 39.85 | 23.678 |
| 17:45 | 0 | 0 | 0 | 0 | 0 | 0 |
| - | 0 | 0 |
| 18:00 | 0 | 0 |
| Total | 0 | 0 |
| 18:00 | 12.76 | 7.837 | 3 | 12.173 | 8.3199 | 8.2147 |
| - | 13.42 | 7.4516 |
| 18:15 | 10.34 | 9.6712 |
| Total | 36.52 | 24.96 |
| 18:15 | 11.45 | 8.7336 | 3 | 12.077 | 8.4373 | 8.2804 |
| - | 10.38 | 9.6339 |
| 18:30 | 14.4 | 6.9444 |
| Total | 36.23 | 25.312 |
| 18:30 | 14.5 | 6.8966 | 2 | 15.895 | 6.3401 | 6.2913 |
| - | 17.29 | 5.7837 |
| 18:45 | 0 | 0 |
| Total | 31.79 | 12.68 |
| 18:45 | 13.46 | 7.4294 | 1 | 13.46 | 7.4294 | 7.4294 |
| - | 0 | 0 |
| 19:00 | 0 | 0 |
| Total | 13.46 | 7.4294 |

Figure 2.8 Heavy Truck Speed Graph for Kebon Jeruk – Kelapa Dua

## CONCLUSIONS

1. Kelapa Dua – Kebon Jeruk direction:
2. Car maximum value of time mean speed and space mean speed is 17.823 m/s and 17.626 m/s at 08:00 – 08:15;
3. Motorcycle maximum value of time mean speed and space mean speed is 17.319 m/s and 17.271 m/s at 12:00 – 12:15;
4. Light truck maximum value of time mean speed and space mean speed is 14.91 m/s and 14.852 m/s at 07:45 - 08:00;
5. Heavy Truck maximum value of time mean speed and space mean speed is 13.32 m/s and 13.512 m/s at 09:00 – 09:15;
6. Kebon Jeruk – Kelapa Dua direction:
7. Car maximum value of time mean speed and space mean speed is 15.342 m/s and 15.322 m/s at 07:00 – 07:15;
8. Motorcycle maximum value of time mean speed and space mean speed is 16.260 m/s and 16.207 m/s at 07:15 – 07:30;
9. Light truck maximum value of time mean speed and space mean speed is 12.742 m/s and 12.733 m/s at 07:00 - 07:15;
10. Heavy Truck maximum value of time mean speed and space mean speed is 11.936 m/s and 11.570 m/s at 11:45 – 12:00.

## ERROR FACTORS

The following are error factors when doing Traffic speed practicum:

1. When stopping the stopwatch it is less accurate because the observer consists of 2 people so they are less coordinated;
2. When observing a passing vehicle at a distance of 100 m, the observer is not focused.

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