CERTIFICATE

ICESIT 2023

UNIVERSITAS MERCU BUANA — 38

NO: 07-7/431/ICESIT2023/X/2023

This is to Certify that

Darmadi

as

Presenter

with a paper entitled

Analysis of influnce on to the vehicle headway on the Jakarta Cikampek toll road

at the International Conference on Engineering Science, Innovation Technology, and
Sustainability (ICESIT) 2023
"Sustainable Energy and Technology Innovation to Achieve Sustainable Developement Goals"
Yogyakarta, 26 - 27 October 2023

Dr. Zulfa Fitri Ikatrinasari, MT
Dean of Faculty of Engineering

Dr. Sawarni Hasibuan, ST, MT
Chairman of Committee

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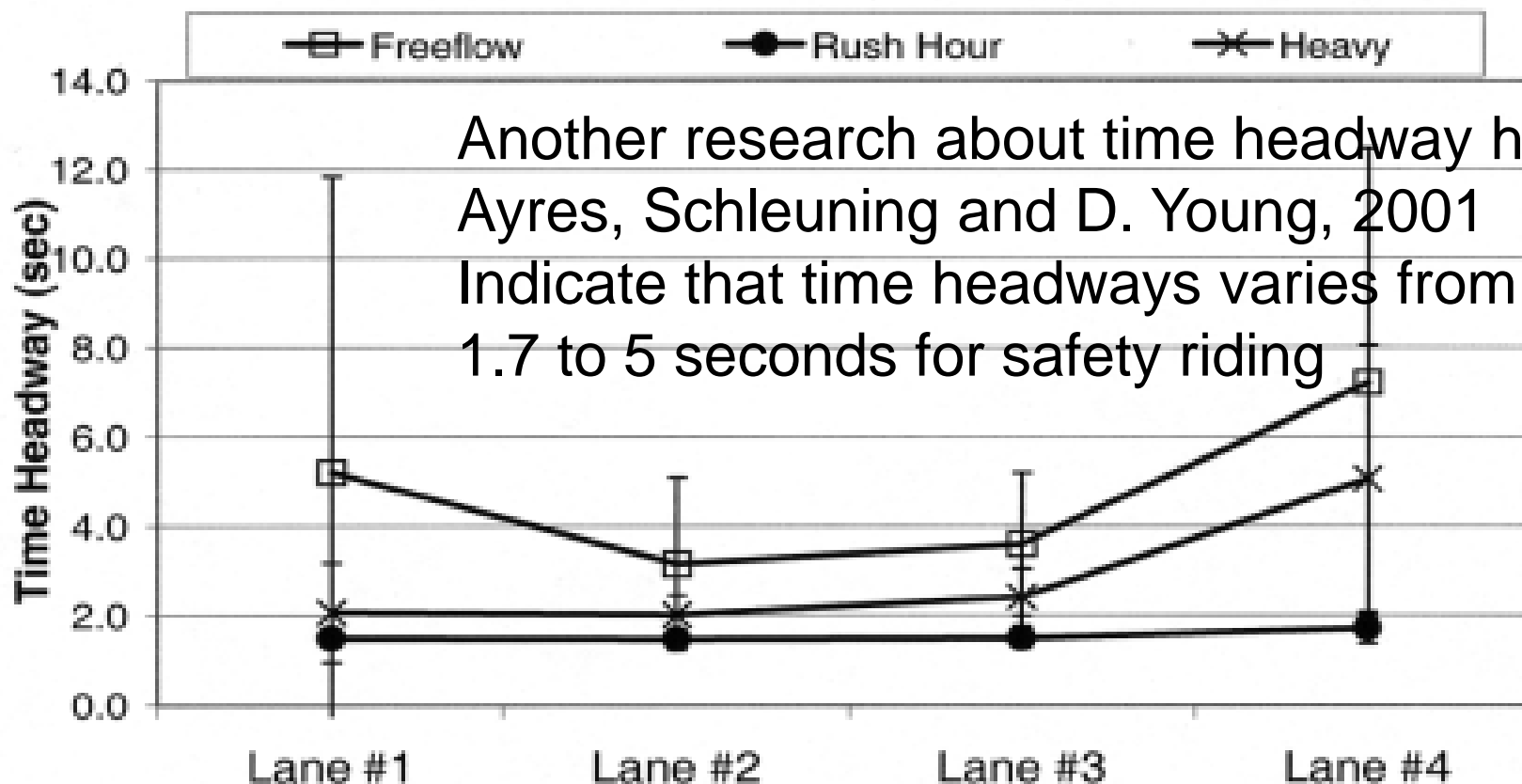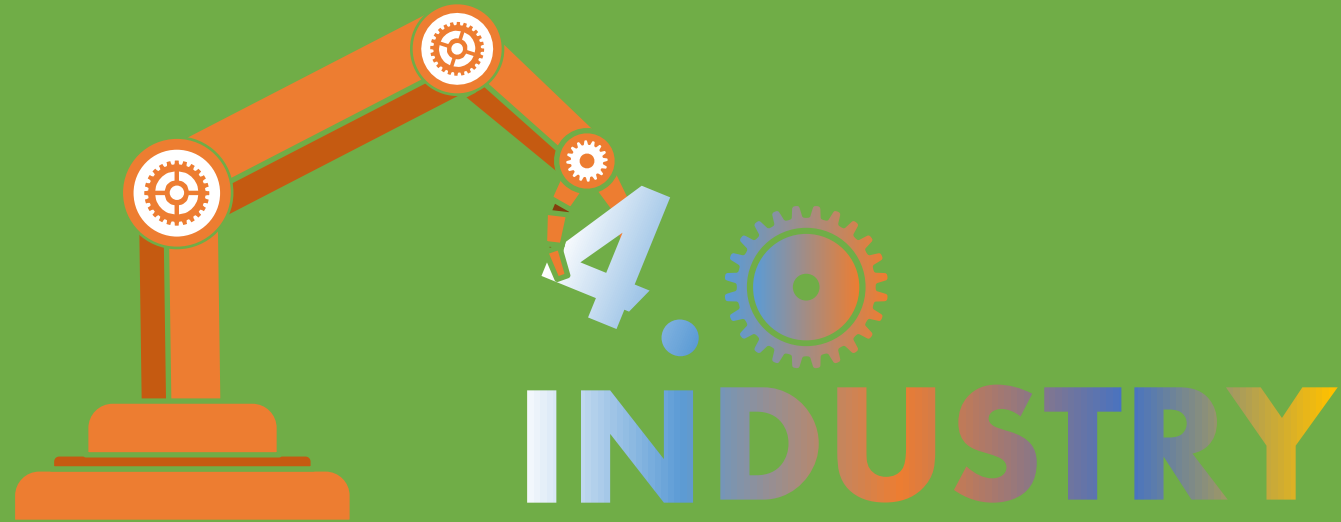HSE & Engineering Consultant

4.0 INDUSTRY
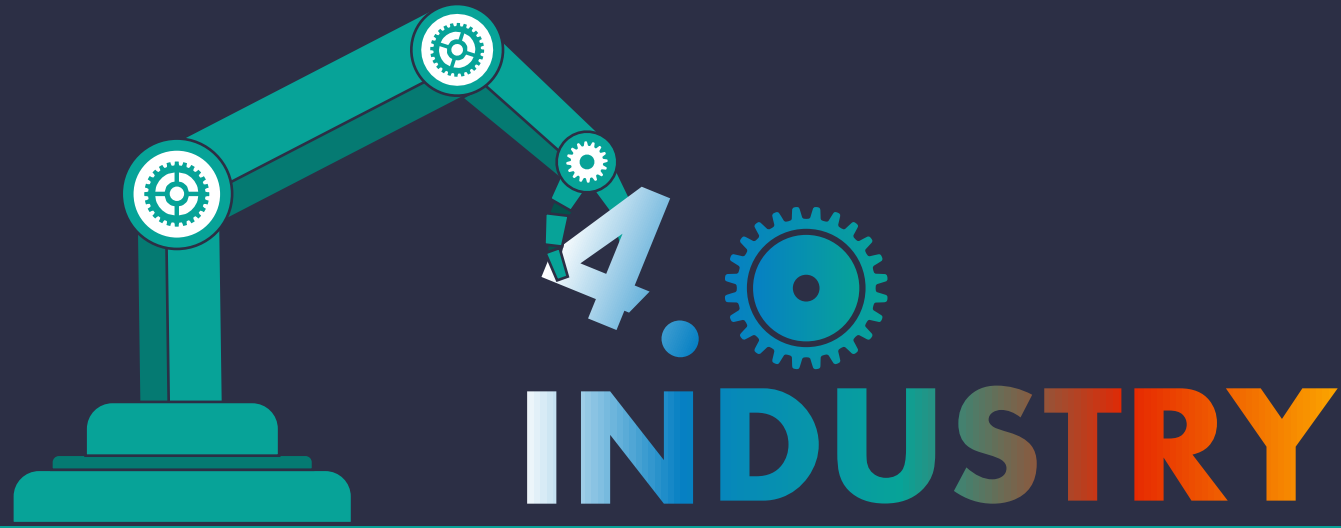
BACKGROUND

Background

a. **To drive safely behind the vehicle in front in a steady stream of traffic, motor vehicle drivers are advised to keep 2-4 seconds time headway. This creates a buffer to prevent a rear-end collision, should the driver need to stop in an emergency. Such crashes can occur on all roads, but the risk is highest on motorways and on toll roads,**

b. The distance between vehicles or headway becomes more important especially in the operation of an autonomous cars,

c. This research discusses the distance between vehicles or headway using Greenberg theory

Introduction

Time Headway Variations with Lane

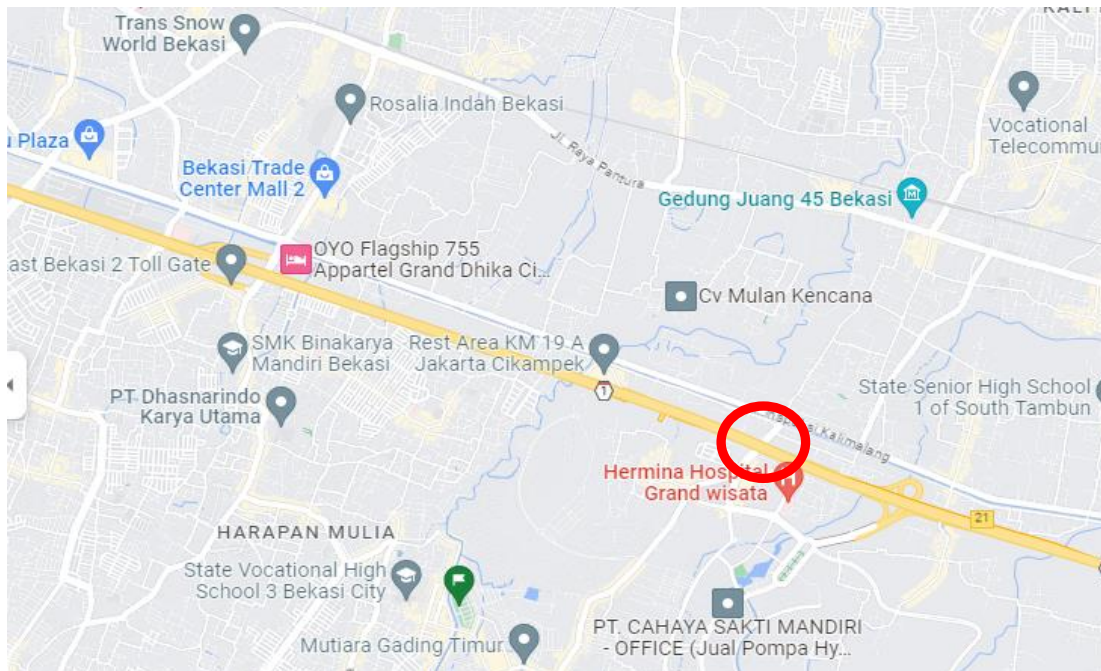Another research about time headway has done by T. J. Ayres, Schleuning and D. Young, 2001
Indicate that time headways varies from 1.7 to 5 seconds for safety riding

⬤ Location of survey

Locations of Traffic survey

Location survey and camera position

IP-Camera

WIFI-Internet

USB-hub

Video
Recorded

Computer
Software

HARDISK
xls-file

METHOD

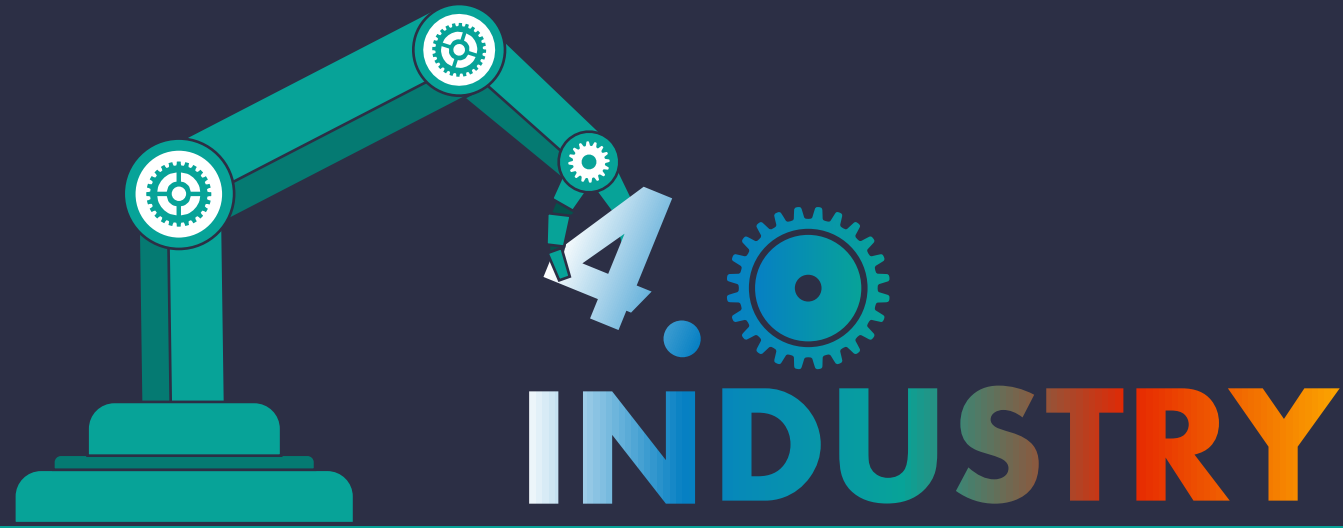Data Videos have collected from the field survey are processed manually in the office for getting traffic volume and density
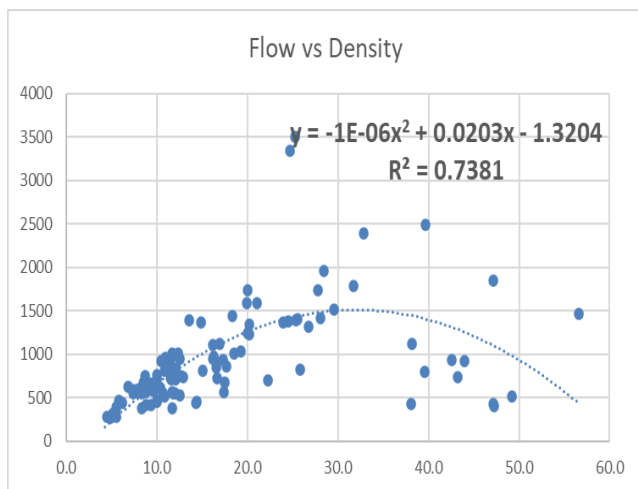
INSTRUMENT

The instruments used are a mobile phone camera with a minimum resolution of 1200 pixels, a 128 GB memory card, an umbrella, a computer, a portable hard disk.

MicPo 1TB
MicPo 256GB
MicPo 128GB
MicPo XC 64GB

Method and Instruments

RESULT and DISCUSSION

Data Analysis

Flow vs Density
$y = -1\text{E-}06x^2 + 0.0203x - 1.3204$
$R^2 = 0.7381$

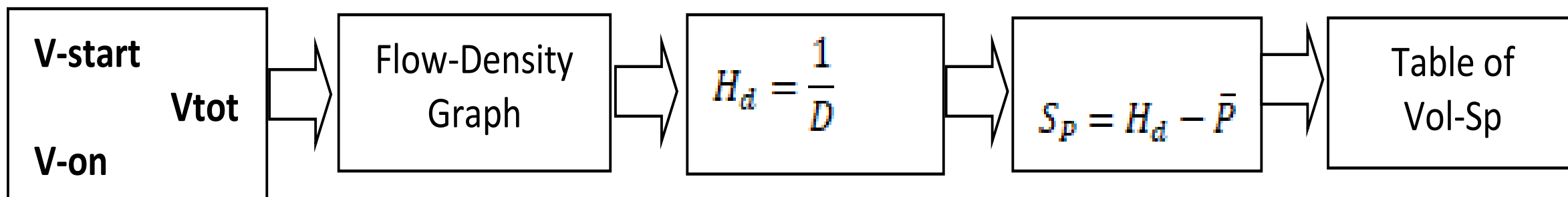| V-start		Flow-Density Graph		$H_d = \dfrac{1}{D}$		$S_p = H_d - \bar{P}$		Table of Vol-Sp

Vtot

V-on

DATA ANALYSIS

After getting the volume and density of traffic, it can can be made correlatin graph between flow and density of traffic The headway analysis is carried out by flow-density graph relation. From traffic volume (V-total) then we got the value of density and we calculate the headway of vehicle

RESULT

V-on (smp/jam)	V main road (smp/jam)									
	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
0	50	23	14	10	7	6	5	4	4	4
100	44	21	13	9	7	6	5	4	4	4
200	39	20	13	9	7	6	5	4	4	4
300	37	19	12	9	7	5	5	4	4	4
400	34	18	12	8	7	5	5	4	4	4
500	31	17	12	8	7	5	5	4	4	4
600	28	16	11	8	6	5	5	4	4	4
700	27	16	11	8	6	5	4	4	4	4
800	25	15	10	8	6	5	4	4	4	4
900	23	14	10	8	6	5	4	4	4	4
1000	23	14	10	7	6	5	4	4	4	4
1100	21	13	9	7	6	5	4	4	4	4
1200	20	13	9	7	6	5	4	4	4	4
1300	19	12	9	7	5	5	4	4	4	4
1400	18	12	8	7	5	5	4	4	4	4
1500	17	12	8	7	5	5	4	4	4	4
1600	16	11	8	6	5	5	4	4	4	4
1700	16	11	8	6	5	4	4	4	4	4
1800	15	10	8	6	5	4	4	4	4	4

CONCLUSSION

a) It obvious that distance between vehicles are stabil at 4 meters when flow of traffic reach more than 6000 PCU/hour.

b) Increasing traffic flow from on ramp influence the distance of vehicle about 5%.

c) This research is taken **only in two location** so in getting the more accurate the research should be continued along the roads of Jakarta-Cikampek toll roads

thank you!

Braking time dependent on driving speed