

**THE DELAYS FOR SIGNALIZED INTERSECTION USING ATCS DATA
AND FIELD SURVEY METHOD
(Case Study At Simpang Tiga Kerten, Surakarta)**

Final Project

Presented in accordance with the requirements
for the degree of Bachelor of Civil Engineering



submitted by :

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**CIVIL ENGINEERING DEPARTMENT
ENGINEERING FACULTY
UNIVERSITAS MUHAMMADIYAH SURAKARTA
2014**

CERTIFICATION'S SHEET

**THE DELAYS FOR SIGNALIZED INTERSECTION USING ATCS DATA
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Final Project

submitted and defended in Final Examination of
Final Project in front of Examiners Committee
On October, 13 2014

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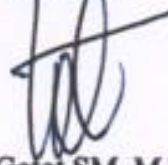
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PREFACE

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Assalamu'alaikum Wr Wb.

Alhamdulillah, thanks to Allah SWT for His abundant mercy, blessing and guidance, so this Final Project can be finished. This Final in accordance with the requirements for the degree of Bachelor, Engineering Faculty majoring Civil Engineering Department, Universitas Muhammadiyah Surakarta. Along with this, the writer expressed her gratefulness to all parties that have full support to complete this Final Project. Then with the completion of this Final Project, the writer would like to thank to:

- 1) Mr. Ir. Sri Sunarjono, M.T., Ph.D, as Head of Engineering Faculty, Universitas Muhammadiyah Surakarta.
- 2) Mr. Mochamad Solikin, S.T., M.T., Ph.D, as Head of Civil Engineering Department, Universitas Muhammadiyah Surakarta.
- 3) Mr. Ir. Suhendro Trinugroho, M.T., as Academic Advisor of Civil Engineering International Program 2010, Universitas Muhammadiyah Surakarta.
- 4) Ms. Nurul Hidayati, S.T., M.T., Ph.D, as Supervisor and also Chair Of Examiners Committee for giving support, understanding, assistance and guidance for the change for the better of this Final Project.
- 5) Mrs. Ika Setyaningsih, S.T., M.T., as Co-Supervisor and also Secretary Of Examiners Committee for giving support, attention, advice and guidance for enhanced of this Final Project.
- 6) Mr. Drs. Gotot SM, M.T., as Member of Examiner Committee of Final Project for giving support, attention, suggestion and advice for the perfection of this Final Project.
- 7) All lectures and staffs of Civil Engineering Department, Engineering Faculty, Universitas Muhammadiyah Surakarta, thanks for guidance and knowledge that has been given.

- 8) Mr. Yosca, Mr. Baskoro, Mr. Didik and Mr. Robet (Dishubkominfo Surakarta) thanks for the data, valuable suggestion and guidance.
- 9) Mum, Dad and my beloved family that always giving material and spiritual encouragement. Thanks for the pray and the love for me. May Allah bless you all.
- 10) My surveyor friends and all parties that helped in finishing this Final Project.

The writer recognizes that this Final Project Report is far from perfect, so criticism and recommendation is expected for the improvement report in the future, and it is expected so that this report can be beneficial for all of us. Amen.

Wassalamu'alaikum Wr Wb.

Surakarta, October 2014



The writer

DECLARATION OF AUTHORSHIP

Bismillahirrahmanirrohim

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Declare that this final project report is made and presented by mine, except the quotations that I have explained from all of the sources. If in the future it is found any plagiarism in this final project, then I am willing to accept any legal consequences that may be imposed to me.

Surakarta, October 2014

Person responsible,



Alfia Magfirona

MOTTO

“Hasbunallah wa ni'mal wakil ni'mal maula wa ni'man nashir.”

(QS. Al-Anfal : 40)

“Man Jadda Wa Jadda.”

(Negeri 5 Menara)

“A pessimist sees the difficulty in every opportunity; an optimist sees the opportunity in every difficulty.”

(Winston Churchill)

“Be less curious about people and more curious about ideas.”

(Marie Curie)

“Never study to be successful but looking for the best. Don't run behind success but follow behind excellence, success will come away behind you.”

(3 Idiot)

ACKNOWLEDGEMENTS

On this occasion the writer does not forget to express the gratitude to all the parties who have helped process of drafting the Final Report this until the completion, among others:

1. Allah SWT for His blessings in faith and islam.
2. Rasulullah SAW that has changed human life from tyranny to be protection, affection and help each other fellow human beings.
3. My parents, who always love, inspire, educate, support, pray, and give the best for their children.
4. All of my family, thank you for the support that has been given.
5. Zata, Dewi, Risa, Laras, Titin, Siti, Selia, Tsuraya, Saptarini, Haefa, Dini, Diajeng, Anggi, Nuning, Rahman, Rifzal, Ghoni, Rasyid, Tegar, Andi etc. You're all my friends and my brother.
6. My surveyor friends, Fatiha, Indah, Yulinda, Bona, Beni, Hudi, Dita, Yogi, Jarwo, Sri, Wafiq, Mega, Nadia, Ira, Mely, Fuad, Puguh, Dadis, Robet, Isvan, Gita, Sobirin, Rosyad, Hasan etc. Thank you for happiness and togetherness during survey.
7. Big Family of Pesma International KH Mas Mansyur (Arifah, Miss Ichya, Mr. Mujazin etc). Thank you for beautiful memories and giving religious knowledge.
8. Big Family of Civil Engineering 2010. I hope that one day we can meet again.

TABLE OF CONTENT

	Pages
CERTIFICATION'S SHEET	ii
PREFACE	iii
DECLARATION OF AUTHORSHIP	v
MOTTO	vi
ACKNOWLEDMENT	vii
TABLE OF CONTENT	viii
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF NOTATION	xii
ABSTRACT	xiii
I. INTRODUCTION	1
A. Background	1
B. Research Problem	3
C. Research Objective	3
D. Research Contribution	3
E. Research Limitation	3
F. Originality of Research	4
G. Similarities and Differences with Previous Research	4
II. LITERATURE REVIEW	7
A. Traffif Regulations	7
B. Intersection	7
C. Traffic Lights	7
D. ATCS	8
E. Delay	10
III. THEORITICAL APPROACH	11
A. MKJI 1997 Manual	11
B. Computation Procedure of Signalized Intersection	11
C. Field Survey Method	24
D. Level of Service	25
IV. RESEARCH METHODS	26
A. Research Location	26
B. Data	26
1. Secondary data	26
2. Primary data	27
C. Data Collection Stages	27
1. Preparation for survey tools	28
2. Preliminary survey	28
3. Implementation of research	28
4. Data analysis	34
V. ANALYSIS AND DISCUSSION	36
A. Empirical Delay Using MKJI 1997 Method	36
1. Traffic Signal conditions	36
2. Geometric data	36

3.	The environmental condition data	38
4.	Gradient	38
5.	Total population of Surakarta	38
6.	Traffic flow condition	38
7.	Cycle time	43
8.	Capacity and degree of saturation	43
9.	Level of Service	44
B.	Field Delay	49
1.	Traffic volume	49
2.	Delay per approach	52
3.	Field delay for the entire intersection	55
C.	Discussion	55
VI.	CONCLUSION AND RECOMMENDATION	58
A.	Conclusion	58
B.	Recommendation	58
REFERENCES		
APPENDIX		

LIST OF TABLES

		Pages
Table. I.1	Similarities and differences with previous research	5
Table III.1	Conversion of pce value	12
Table III.2	The normal value intergreen time	13
Table III.3	City size adjustment factor (F_{CS})	15
Table III.4	Side friction adjustment factor (F_{SF})	15
Table III.5	Reasonable cycle time range	17
Table III.6	Level of service signalized intersection	24
Table V.1	Signal time setting plan in 3 phases	36
Table V.2	Result of the effective width (W_e) measurement	37
Table V.3	Traffic flow recapitulation Simpang Tiga Kerten (Thursday, June 5 th , 2014 : 06.00 - 07.00 AM)	39
Table V.4	Turning movement ratio	40
Table V.5	Unmotorised (P_{UM}) ratio	40
Table V.6	Base saturation flow (S_o)	41
Table V.7	Side friction adjustment factor (F_{SF})	41
Table V.8	Gradient (F_G) and parking (F_P) adjustment factors	42
Table V.9	Right turn (F_{RT}) adjustment and left turn adjustment (F_{LT}) factors	43
Table V.10	Saturation flow (S)	43
Table V.11	Capacity (C) and degree of saturation (DS)	44
Table V.12	Green ratio (GR)	44
Table V.13	Queue calculation	45
Table V.14	Queue length (QL) at each approach	45
Table V.15	Stop rate (NS) and the number of vehicles stopped (N_{sv})	46
Table V.16	Traffic delay (DT)	47
Table V.17	Geometric delay (DG_i)	47
Table V.18	Average delay value (D)	48
Table V.19	Total delay (D_{total}) of each approach	48
Table V.20	Traffic flow recapitulation at peak hour for waiting vehicles in range 15 seconds at Simpang Tiga Kerten (Thursday, June 5 th , 2014 : 06.00 AM - 07.00 AM)	50
Table V.21	Traffic flow recapitulation at peak hour for not stopped vehicle at Simpang Tiga Kerten (Thursday, June 5 th , 2014 : 06.00 AM - 07.00 AM)	51
Table V.22	Traffic flow recapitulation at peak hour for stopped vehicle at Simpang Tiga Kerten (Thursday, June 5 th , 2014 : 06.00 AM - 07.00 AM)	52
Table V.23	Field delay	54
Table V.24	Empirical delay (MKJI 1997 method) and field delay recapitulation	55

LIST OF FIGURES

		Pages
Figure II.1	Application of APILL ATCS in Surakarta	9
Figure II.2	CCTV cameras can detect the four corners intersections (spin 360°)	9
Figure III.1	The critical conflict point and distance to departure and arrival	13
Figure III.2	Gradient adjustment factor F_G	16
Figure III.3	Cycle time estimation	18
Figure III.4	Number of queue vehicles	20
Figure III.5	The relationship of the average number of queue (NQ) and the probability of loading (P_{OL})	21
Figure III.6	“A” value in delay equation	23
Figure IV.1	Research location map	26
Figure IV.2	The distribution of each surveyor at Simpang Tiga Kerten	33
Figure IV.3	Research flow chart	35
Figure V.1	Signal phase diagram	36
Figure V.2	Result of the effective width measurement	37
Figure V.3	Signal phase setting plan	37
Figure V.4	The comparison between MKJI 1997 and field delays diagram	56

LIST OF NOTATION

C	=	Capacity
D	=	Delay
DT	=	Traffic delay
DG	=	Geometric delay
DS	=	Degree of saturation
pce	=	Passenger car equivalent
LV	=	Light vehicles
HV	=	Heavy vehicles
MC	=	Motorcycles
UM	=	Unmotorised
pcu	=	Passenger car units
COM	=	Commercial
RES	=	Residential
RA	=	Restricted access
SF	=	Side friction
Q	=	Traffic flow
A	=	Constanta
c	=	Cycle time
c_{opt}	=	Optimum cycle time
c_{ua}	=	Cycle time before adjustment
CS	=	City size
F	=	Adjustment factor
g	=	Green time
G	=	Gradient
GR	=	Green ratio
IFR	=	Intersection flow ratio
IG	=	Intergreen
LTI	=	Total lost time
$LTOR$	=	Left Turn On Red
L_{EV}, L_{AV}	=	The distance to stop line to conflicting point vehicle departure and arrive
NQ	=	Number of queue
NS	=	Stop rate
O	=	Opposed
P	=	Protected
P_{OL}	=	Probability for overloading
QL	=	Queue length
P_{SV}	=	Stopped vehicle ratio
S	=	Saturation flow
S_0	=	Base saturation flow
W_A	=	Approach width
W_e	=	Effective width
W_{ENTRY}	=	Entry width
W_{EXIT}	=	Exit width

ABSTRACT

THE DELAYS FOR SIGNALIZED INTERSECTION USING ATCS DATA AND FIELD SURVEY METHOD (Case Study At Simpang Tiga Kerten, Surakarta)

The increasing of traffic volume in Surakarta has caused an increasing of congestion in several road networks. One of traffic jam phenomenon at intersection especially in peak hour can be found at some signalized intersections and roads especially in Simpang Tiga Kerten. It is located at the meeting between Jl. Slamet Riyadi and Jl. Ahmad Yani, Surakarta. The Local Government through the Communication, Informatics and Transportation Department (Dishubkominfo) Surakarta is developing integrated traffic management control system named Area Traffic Control System (ATCS). The aim of ATCS is to enable the vehicle movement continuously and minimize the delay in intersection (Risdiyanto, 2014). Traffic delay at signalized intersection is used as an indicator to evaluate the performance of intersection refers to MKJI 1997. The using of MKJI 1997 method for the traffic condition at present needs to be evaluated. The delay value needs to be compared with the result of field survey method using ATCS.

The implementation of manual traffic counts survey carried out for a day mainly at morning peak hour (06:00-07:00 AM). It is sourced from traffic counting data from ATCS detector of Dishubkominfo Surakarta after converted in passanger cars unit. The obtained data from field observation for calculating field delay are number of waiting vehicle every 15 seconds, stopped (in red and amber time) and not stopped vehicles (in green and amber time).

The average delay values by MKJI 1997 method at Simpang Tiga Kerten, Surakarta is 105.50 sec/pcu, while the average field delay values is 16.19 sec/pcu. Based on the comparison, it can be known that the field delay is lower than MKJI 1997 delay. It is caused by the differences in withdrawal traffic flow data that will be used in delay calculation analysis. Inaccurate of determining the adjustment values (which are: effective width, city size, side friction, turning movement, vehicles stopped ratio and turn at each approach will also cause inaccurate in the delay value.

Key words: delay, ATCS, MKJI 1997