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
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CERTIFICATION'S SHEET

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submitted and defended in Final Examination of
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On October, 13 2014

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PREFACE

بِسۡمِ ٱللَّهِ ٱلرَّحۡمَٰنِ ٱلرَّحِيمِ

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:

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2) Mr. Mochamad Solikin, S.T., M.T., Ph.D, as Head of Civil Engineering Department, Universitas Muhammadiyah Surakarta.
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9) Mum, Dad and my beloved family that always giving material and spiritual encoragement. 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

Herewith I,

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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)

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TABLE OF CONTENT

LIST OF TABLES

Pages

LIST OF FIGURES

.

LIST OF NOTATION

C	=	Capacity
D	=	Delay
DT	=	Traffic delay
DG	=	Geometric delay
DS	=	Degree of saturation
pce	=	Passenger car equivanlent
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
So	=	Base saturation flow
W_A	=	Approach width
We	=	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 every15 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