

FINAL REPORT

to

THE FLORIDA DEPARTMENT OF TRANSPORTATION  
SYSTEMS PLANNING OFFICE

on Project

“Improvements and Enhancements to LOSPLAN 2007”

FDOT Contract BD-545-84, (UF Project 00067828)

Part A: Software upgrade, User Interface Enhancements, and  
Interoperability Features



June 2009

University of Florida  
Transportation Research Center  
Department of Civil and Coastal Engineering

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**Disclaimer**

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data published herein. The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the State of Florida Department of Transportation.

## SI\* (MODERN METRIC) CONVERSION FACTORS

### APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
<b>LENGTH</b>				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
<b>AREA</b>				
in <sup>2</sup>	square inches	645.2	square millimeters	mm <sup>2</sup>
ft <sup>2</sup>	square feet	0.093	square meters	m <sup>2</sup>
yd <sup>2</sup>	square yard	0.836	square meters	m <sup>2</sup>
ac	acres	0.405	hectares	ha
mi <sup>2</sup>	square miles	2.59	square kilometers	km <sup>2</sup>
<b>VOLUME</b>				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft <sup>3</sup>	cubic feet	0.028	cubic meters	m <sup>3</sup>
yd <sup>3</sup>	cubic yards	0.765	cubic meters	m <sup>3</sup>
NOTE: volumes greater than 1000 L shall be shown in m <sup>3</sup>				
<b>MASS</b>				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
<b>TEMPERATURE (exact degrees)</b>				
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
<b>ILLUMINATION</b>				
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m <sup>2</sup>	cd/m <sup>2</sup>
<b>FORCE and PRESSURE or STRESS</b>				
lbf	poundforce	4.45	newtons	N
lbf/in <sup>2</sup>	poundforce per square inch	6.89	kilopascals	kPa

### APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
<b>LENGTH</b>				
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
<b>AREA</b>				
mm <sup>2</sup>	square millimeters	0.0016	square inches	in <sup>2</sup>
m <sup>2</sup>	square meters	10.764	square feet	ft <sup>2</sup>
m <sup>2</sup>	square meters	1.195	square yards	yd <sup>2</sup>
ha	hectares	2.47	acres	ac
km <sup>2</sup>	square kilometers	0.386	square miles	mi <sup>2</sup>
<b>VOLUME</b>				
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m <sup>3</sup>	cubic meters	35.314	cubic feet	ft <sup>3</sup>
m <sup>3</sup>	cubic meters	1.307	cubic yards	yd <sup>3</sup>
<b>MASS</b>				
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
<b>TEMPERATURE (exact degrees)</b>				
°C	Celsius	1.8C+32	Fahrenheit	°F
<b>ILLUMINATION</b>				
lx	lux	0.0929	foot-candles	fc
cd/m <sup>2</sup>	candela/m <sup>2</sup>	0.2919	foot-Lamberts	fl
<b>FORCE and PRESSURE or STRESS</b>				
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in <sup>2</sup>

\*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380.  
(Revised March 2003)

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**Improvements and Enhancements to LOSPLAN 2007**  
**Part A: Software upgrade, User Interface Enhancements, and**  
**Interoperability Features**

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## Table of Contents

Introduction.....	1
Overview of Changes to LOSPLAN Software .....	2
ARTPLAN .....	2
HIGHPLAN .....	3
FREEPLAN .....	3
Changes to Input and Output Fields.....	3
ARTPLAN .....	3
HIGHPLAN .....	4
FREEPLAN .....	5
User Interface Screen Shots .....	6
ARTPLAN .....	6
HIGHPLAN .....	13
FREEPLAN .....	17

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## Introduction

There were three major objectives for this project. The first objective addressed the issue of arterial left turn spillover on the discharge rate of through movements at the signalized intersection. A major assumption within the ARTPLAN software is that the through traffic is not impeded by turning movements. However, in urban settings, congestion is the norm, and the probability of left turning traffic spilling over from turn lanes and into the adjacent through lanes can occur frequently during the peak period. If ARTPLAN is used for an analysis under these conditions, the results will not be valid. However, feedback from review staff is that ARTPLAN is often used under these conditions. In ARTPLAN 2007, a feature was added to calculate whether left turn spillover is likely at an intersection. However, no quantitative guidance is offered with respect to the corresponding reduction in throughput of the adjacent through traffic lanes. This objective was achieved by determining the factors that significantly affect left-turn lane spillover and developing models to predict the expected through movement discharge rate as a function of this spillover. The developed models will be incorporated into the next version of ARTPLAN to provide for more accurate analysis of signalized arterial conditions during congested time periods. The study supporting the accomplishment of this objective is described in detail in Part B of this project report.

The second objective was to upgrade the LOSPLAN software architecture and enhance the user interface. In the first part of this objective, the software was upgraded to the latest software technology, namely the Microsoft .NET platform. Upgrading the software architecture made it possible to implement further enhancements to the user interface and improve the overall reliability of the program, as well as provide for better long term maintainability. In the second part of the objective, enhancements to the user interface were made based upon input received from previous LOS Task Team meetings and from a user focus group conducted as part of this project. In the focus group forum, input was solicited on such things as difficulties users may be having with using the software, desired user interface enhancements, additional features that would be helpful to the majority of the users, desired methodological enhancements, etc. The input received was incorporated into the software as deemed appropriate by the PI and Project Manager, based on an evaluation of reasonableness, complexity, effort required, and amount of benefit. Certain items that were not incorporated into this version of the software still may be included in a future version.

The third objective addressed enhancements to the interoperability of the software. There are a variety of traffic analysis tools available today to the transportation professional, each with its own set of strengths and weaknesses. While the LOSPLAN programs are appropriate and sufficient in a number of these analysis contexts, there are still numerous situations where other analysis tools might be applicable. For example, for a detailed operational analysis, the Highway Capacity Software (HCS) might be the more appropriate tool. Or for very complex operational analyses, a simulation tool, such as CORSIM, might be the only logical option. With the adoption of the eXtensible Markup Language (XML) by many of these software tools for data storage, including LOSPLAN, the ability to exchange data between tools has never been easier. The use of XML, or more specifically the Traffic Model Markup Language (TMML) specification developed by the TRC, can facilitate the interoperability of certain software tools. To accomplish this objective, the ability to go directly from an ARTPLAN analysis to a

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TRANSYT-7F (T-7F) analysis was implemented. This capability allows a more detailed operational analysis of the arterial to be performed. For example, more accurate estimates of progression quality can be obtained, signal timings and offsets can be optimized, and so forth. Furthermore, once an ARTPLAN file has been imported into T-7F, HCS can be launched to perform an analysis of an individual signalized intersection. And finally, with the click of one button, a TRAFVU (if CORSIM is installed) animation can be performed of the arterial.

The updated software can be found at the following URL:

[http://www.dot.state.fl.us/planning/systems/sm/los/los\\_sw2.shtml#software](http://www.dot.state.fl.us/planning/systems/sm/los/los_sw2.shtml#software)

The following sections provide a quick overview of the changes made to the 2009 version of the LOSPLAN software and the differences from the 2007 version of the software. Complete information about the specific details and operation of each of the programs can be found in the electronic help contained within each of the programs.

## **Overview of Changes to LOSPLAN Software**

The section outlines the general changes made to each of the LOSPLAN programs.

### ARTPLAN

ARTPLAN 2009 has been significantly overhauled with respect to the user interface (UI) and the software architecture. The biggest changes to the UI include the removal of the general facility data input screen and implementation of spreadsheet-like tables for the input of intersection and segment data. Input fields that apply only at the facility level are now incorporated into the intersection and segment data screens. The spreadsheet-style tables for input provide more flexibility for data entry (such as being able to insert a new intersection between previously entered intersections) and display (if the entire table does not fit within your visible program window area, you can scroll horizontally and vertically as needed). The program code has been completely rewritten in C# (previously written in Visual Basic 6). Upgrading the software architecture offers several benefits, such as reliability improvements, UI improvements, and better compatibility with the latest Windows operating systems.

A major new feature that has been added to ARTPLAN 2009 is the ability to export your arterial project to TRANSYT-7F, which will allow you to perform a signal timing optimization, as well as interface with the Highway Capacity Software (HCS) and perform a simulation animation in TRAFVU. Note that TRANSYT-7F, HCS, and TSIS must be previously installed on your computer to utilize these features. Features from ARTPLAN 2007 such as input validation, dynamic field value updating, separately formatted reports for printing, context sensitive help, and data exchange capability with other XML compliant transportation software applications are still maintained in this version.

No significant revisions to the analysis methodology have been made in this version, only bug fixes identified since the latest release of ARTPLAN 2007.

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## HIGHPLAN

HIGHPLAN 2009 has been significantly overhauled with respect to the software architecture. The program code has been completely rewritten in C# (previously written in Visual Basic 6). Upgrading the software architecture offers several benefits, such as reliability improvements, UI improvements, and better compatibility with the latest Windows operating systems.

Features from HIGHPLAN 2007 such as input validation, dynamic field value updating, separately formatted reports for printing, context sensitive help, and data exchange capability with other XML compliant transportation software applications are still maintained in this version.

No significant revisions to the analysis methodology have been made in this version, only bug fixes identified since the latest release of HIGHPLAN 2007.

## FREEPLAN

FREEPLAN 2009 has been significantly overhauled with respect to the user interface (UI) and the software architecture. The biggest changes to the UI include the removal of the general facility data input screen and implementation of spreadsheet-like tables for the input of segment data. Input fields that apply only at the facility level are now incorporated into the segment data screen. The spreadsheet-style table for input provide more flexibility for data entry (such as being able to insert a new segment between previously entered segments) and display (if the entire table does not fit within your visible program window area, you can scroll horizontally and vertically as needed). The program code has been completely rewritten in C# (previously written in Visual Basic 6). Upgrading the software architecture offers several benefits, such as reliability improvements, UI improvements, and better compatibility with the latest Windows operating systems.

No significant revisions to the analysis methodology have been made in this version, only bug fixes identified since the latest release of FREEPLAN 2007.

## **Changes to Input and Output Fields**

This section identifies the differences between the data input and output fields of the LOSPLAN 2007 and LOSPLAN 2009 programs.

### ARTPLAN

#### **Project Properties**

Removed  
District/City

Changed  
Modal Analysis: 'Isolated Signal Only' added to list of options  
Type of Analysis: 'Isolated Signal Only' removed from list of options

---

## Facility Data

Form removed

## Intersection Data

### Added

Control Type (applies to just the facility level)

Base Saturation Flow Rate (applies to just the facility level)

Number of Left Turn Lanes

Total Left Turn Storage

## Segment Data

### Added

Arterial Length (applies to just the facility level)

K Factor (applies to just the facility level)

D Factor (applies to just the facility level)

Peak Hour Factor (applies to just the facility level)

% Heavy Vehicles (applies to just the facility level)

Posted Speed

## LOS Results

### Changed

'Left Turn Spill' → 'Queue Storage Ratio' (Displayed output changed from 'Y' or 'N' to numeric value)

## HIGHPLAN

## Project Properties

### Removed

District

Type of Analysis (the selection of a two-lane or a multilane analysis is now accomplished through the number of lanes input on the Highway Data input form.

## Highway Data

### Changed

Number of Lanes input ranges from 2-8 lanes and the type of analysis (two lane or multilane) is automatically determined from this input

Left Turn Lanes → Left Turn Impact

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## **Service Volumes**

### Changed

'LOS Thresholds' → 'Notes'

## FREEPLAN

### **Project Properties**

Form added

### **Facility Data**

Form removed

### **Segment Data**

#### Removed

Influence Area

#### Added

AADT (applies to just the facility level)

K Factor (applies to just the facility level)

D Factor (applies to just the facility level)

Peak Hour Factor (applies to just the facility level)

% Heavy Vehicles (applies to just the facility level)

Local Adj. Factor (applies to just the facility level)

Length (applies to just the facility level)

Base Capacity (applies to just the facility level)

In Between Length

Hourly Volume

Posted Speed

### **LOS Results**

#### Added

Segment Type

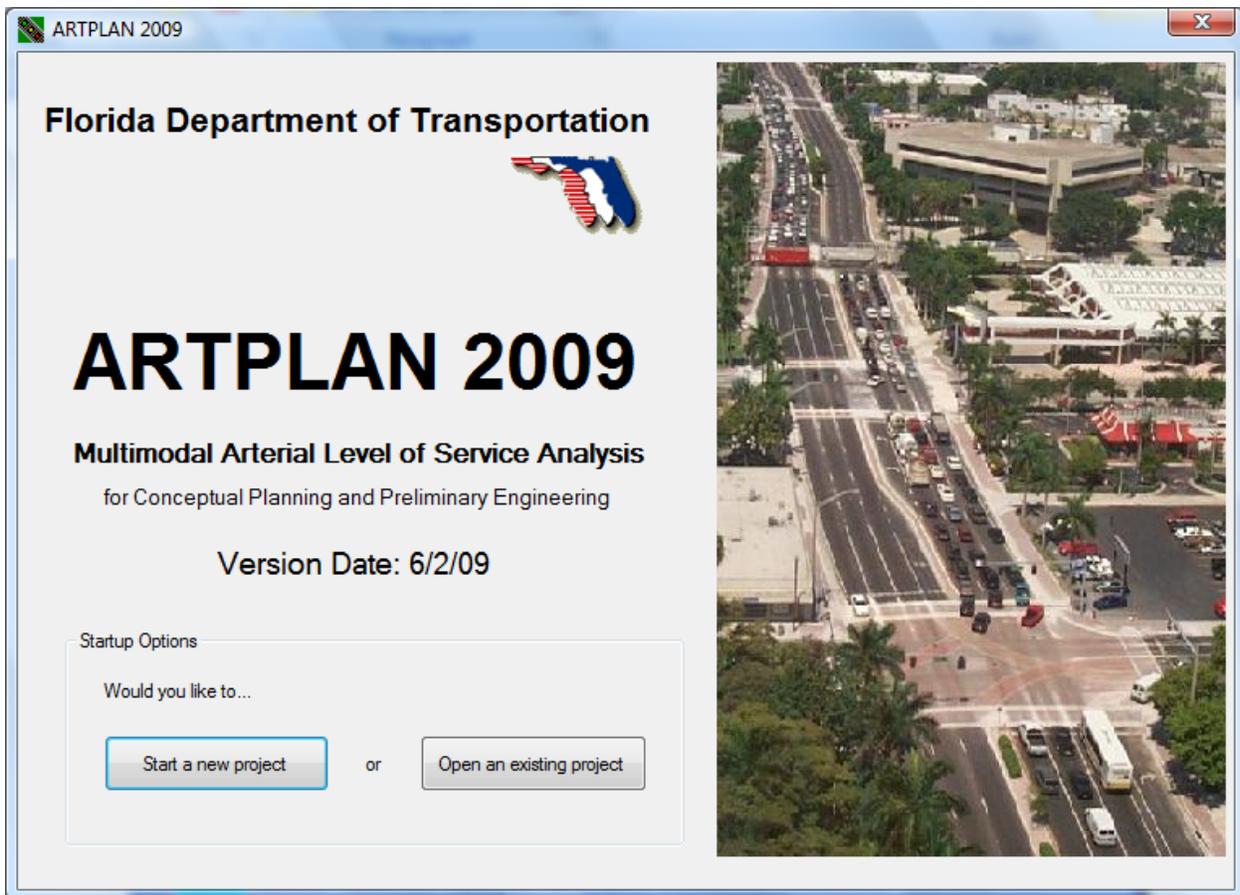
v/c Ratio (segment and facility)

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## User Interface Screen Shots

This section includes screen shots, for each individual screen, from all three LOSPLAN 2009 programs.

### ARTPLAN



ARTPLAN 2009 - [Project Properties]

File Edit View Tools Help

C:\My Documents\Projects\LOSPLAN Programs\\_Code\ARTPLAN\Version 7.0\AP\_20

**Roadway Information**

Road Name: Newbery Rd  
 Peak Direction: Westbound  
 Off Peak Direction: Eastbound  
 Area Type: Large Urbanized  
 Class: 3

**File Information**

File Name: AP\_2009test.xml  
 Analyst: SSW  
 Analysis Date: 3/ 9/2009  
 Agency: UF-TRC  
 Notes: Test File

**Analysis Information**

Modal Analysis: Multimodal  
 Type of Analysis: Peak Direction  
 Study Period: K100

For a roadway specific analysis, selections for area type and class must be completed. Press the F1 key if guidance on each of these variables is needed.

<<-- Properties Intersection Segment (Auto) Segment (MM) Ped SubSegment LOS Results (Auto) LOS Results (MM) Service Volumes -->>

ARTPLAN 2009 - [Intersection Data]

File Edit View Tools Help

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Add New Row Insert New Row Delete Row

Facility-wide Values

Control Type: Semiactuated Base Saturation Flow Rate (pc/h/ln): 1950

Peak Direction Off-Peak Direction

	Cross Street Name	Cycle Length	Thru g/C	Arrival Type	# Thru Lanes	% Left Turns	% Right Turns	Excl. Left Turn Lane	Number LT Lanes	Total Left Turn Storage	Left g/C	Excl. Right Turn Lane
1	NW 8 Ave											
2	NW 55 St	150	0.50	4	3	0	12					
3	NW 57 St	150	0.50	4	3	1	12	<input checked="" type="checkbox"/>	1	160	0.1	<input type="checkbox"/>
4	NW 60 Terr	150	0.50	4	3	4	12	<input checked="" type="checkbox"/>	1	240	0.1	<input type="checkbox"/>
5	NW 62 Blvd	150	0.50	4	3	17	12	<input checked="" type="checkbox"/>	1	240	0.1	<input type="checkbox"/>
6	NW 66 St	150	0.50	4	3	4	12	<input checked="" type="checkbox"/>	1	295	0.1	<input type="checkbox"/>
7	Mall Street	150	0.50	4	3	4	12	<input checked="" type="checkbox"/>	1	170	0.1	<input type="checkbox"/>
8	NW 69 St	150	0.50	4	3	0	12	<input checked="" type="checkbox"/>	1	160	0.1	<input type="checkbox"/>
9	I-75N Ramp	150	0.50	4	2	15	15					<input type="checkbox"/>
10	I75S Ramp	150	0.50	4	2	10	15	<input checked="" type="checkbox"/>	1	266	0.1	<input type="checkbox"/>

<<-- Properties Intersection Intersection Segment (Auto) Segment (MM) Ped SubSegment LOS Results (Auto) LOS Results (MM) Service Volumes -->>

ARTPLAN 2009 - [Segment Data (Auto)]

File Edit View Tools Help

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Facility-wide Values  
 Arterial Length (mi) 1.264 K Factor 0.095 D Factor 0.55 Peak Hour Factor 0.925 % Heavy Vehicles 2.0

Peak Direction Off-Peak Direction

	Segment	Length	AADT	Adj. Dir. Hourly Volume	# of Thru Lanes	Posted Speed	Free Flow Speed	Median Type
1	NW 8 Ave-NW 55 St	586	43000	2247	3	35	40	Restrictive
2	NW 55 St-NW 57 St	634	43000	2247	3	35	40	Restrictive
3	NW 57 St-NW 60 Terr	935	56000	2926	3	35	40	Restrictive
4	NW 60 Terr-NW 62 Blvd	755	51750	2704	3	35	40	Restrictive
5	NW 62 Blvd-NW 66 St	1056	47500	2482	3	35	40	Restrictive
6	NW 66 St-Mall Street	459	49250	2573	3	35	40	Restrictive
7	Mall Street-NW 69 St	882	51000	2665	3	35	40	Restrictive
8	NW 69 St-I-75N Ramp	517	51000	2665	3	35	40	Restrictive
9	I-75N Ramp-I75S Ramp	850	51000	2665	3	35	40	Restrictive

<<-- | Properties | Intersection | **Segment (Auto)** | Segment (MM) | Ped SubSegment | LOS Results (Auto) | LOS Results (MM) | Service Volumes | -->>

ARTPLAN 2009 - [Segment Data (Multimodal)]

File Edit View Tools Help

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Peak Direction Off-Peak Direction

	Segment	Auto Outside Lane Width	Specific Lane Width	Bike Pavement Condition	Paved Shoulder / Bike Lane	Sidewalk	Sidewalk / Roadway Separation	Sidewalk / Roadway Barrier	Obstacle to Bus Stop	Bus Frequency	Bus Span of Service
1	NW 8 Ave-NW 55 St	Typical		Typical	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Typical	<input type="checkbox"/>	<input type="checkbox"/>	1	5
2	NW 55 St-NW 57 St	Typical		Typical	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Typical	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	5
3	NW 57 St-NW 60 Terr	Custom	9	Typical	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Typical	<input type="checkbox"/>	<input type="checkbox"/>	1	5
4	NW 60 Terr-NW 62 Blvd	Typical		Typical	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Typical	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1	5
5	NW 62 Blvd-NW 66 St	Typical		Typical	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Typical	<input type="checkbox"/>	<input type="checkbox"/>	1	5
6	NW 66 St-Mall Street	Typical		Typical	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Typical	<input type="checkbox"/>	<input type="checkbox"/>	1	5
7	Mall Street-NW 69 St	Custom	11	Typical	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Typical	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	5
8	NW 69 St-I-75N Ramp	Typical		Typical	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Typical	<input type="checkbox"/>	<input type="checkbox"/>	1	5
9	I-75N Ramp-I75S Ramp	Typical		Typical	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Typical	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1	5

<<-- | Properties | Intersection | Segment (Auto) | **Segment (MM)** | Ped SubSegment | LOS Results (Auto) | LOS Results (MM) | Service Volumes | -->>

ARTPLAN 2009 - [Pedestrian Subsegment Data]

File Edit View Tools Help

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Peak Direction Off-Peak Direction

	Segment	Pct. Subseg Length (1)	Pct. Subseg Length (2)	Pct. Subseg Length (3)	Sidewalk (1)	Sidewalk (2)	Sidewalk (3)	Sidewalk / Roadway Separation (1)	
▶ 1	NW 8 Ave-NW 55 St	33	22	45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Typical	Typic
2	NW 55 St-NW 57 St	44	56		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Typical	
3	NW 57 St-NW 60 Terr	100			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Typical	
4	NW 60 Terr-NW 62 Blvd	100			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Typical	
5	NW 62 Blvd-NW 66 St	100			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Typical	
6	NW 66 St-Mall Street	100			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Typical	
7	Mall Street-NW 69 St	100			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Typical	
8	NW 69 St-I-75N Ramp	100			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Typical	
9	I-75N Ramp-I75S Ramp	100			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Typical	

<--> Properties Intersection Segment (Auto) Segment (MM) Ped SubSegment LOS Results (Auto) LOS Results (MM) Service Volumes -->>

ARTPLAN 2009 - [LOS Results (Auto)]

File Edit View Tools Help

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Peak Direction Off-Peak Direction

	Segment	Thru Mvmt Flow Rate	Adj. Sat. Flow Rate	v/c	Control Delay	Thru Mvmt Intersection LOS	Queue Storage Ratio	Average Speed	Segment LOS
▶ 1	NW 8 Ave-NW 55 St	2429	5359	0.907	28.2	C	0.00	10.0	E
2	NW 55 St-NW 57 St	2405	5359	0.897	27.8	C	0.15	10.7	E
3	NW 57 St-NW 60 Terr	3037	5359	1.133	90.5	F	0.56	5.8	F
4	NW 60 Terr-NW 62 Blvd	2426	5359	0.905	26.9	C	7.01	12.2	E
5	NW 62 Blvd-NW 66 St	2576	5359	0.961	31.8	C	0.38	13.7	E
6	NW 66 St-Mall Street	2670	5359	0.997	35.3	D	0.67	7.0	F
7	Mall Street-NW 69 St	2881	5359	1.075	63.5	E	0.00	7.4	F
8	NW 69 St-I-75N Ramp	2881	2838	2.030	492.5	F	0.00	0.7	F
9	I-75N Ramp-I75S Ramp	2593	3548	1.462	236.8	F	2.64	2.3	F

Length (mi) 1.264 Wtd. g/C 0.50 Free Flow Delay (sec/veh) 1053.6 LOS Threshold Delay (sec/veh) 842.3 Avg. Speed (mi/h) 0.7 LOS F

<--> Properties Intersection Segment (Auto) Segment (MM) Ped SubSegment LOS Results (Auto) LOS Results (MM) Service Volumes -->>

ARTPLAN 2009 - [LOS Results (Multimodal)]

File Edit View Tools Help

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Peak Direction Off-Peak Direction

	Segment	Bike Score	Bike LOS	Ped LOS SubSeg (1)	Ped LOS SubSeg (2)	Ped LOS SubSeg (3)	Ped Score Segment	Ped LOS Segment	Adj. Buses	Bus LOS
▶ 1	NW 8 Ave-NW 55 St	4.41	D	D	D	E	4.60	E	0.64	F
2	NW 55 St-NW 57 St	2.71	C	D	E		4.43	D	0.68	F
3	NW 57 St-NW 60 Terr	4.84	E	D			4.39	D	0.75	F
4	NW 60 Terr-NW 62 Blvd	4.49	D	D			4.13	D	0.75	F
5	NW 62 Blvd-NW 66 St	4.46	D	D			3.96	D	0.75	F
6	NW 66 St-Mall Street	2.76	C	D			3.89	D	0.75	F
7	Mall Street-NW 69 St	4.60	E	D			4.13	D	0.68	F
8	NW 69 St-I-75N Ramp	4.48	D	D			4.09	D	0.75	F
9	I-75N Ramp-I75S Ramp	4.49	D	D			4.10	D	0.75	F

Bike Score 4.36 Pedestrian Score 4.20 Adj. Buses 0.72

Bike LOS D Pedestrian LOS D Bus LOS F

<<-- Properties Intersection Segment (Auto) Segment (MM) Ped SubSegment LOS Results (Auto) LOS Results (MM) Service Volumes -->>

ARTPLAN 2009 - [Service Volumes]

File Edit View Tools Help

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Mode

Automobile  Bike  Pedestrian  Bus

Notes

\* Service volumes for the specific facility being analyzed, based on the number of thru lanes appearing in the intersection and segment data screens.

\*\* Cannot be achieved based on input data provided.

Lanes Hourly Volume in Peak Direction

	A	B	C	D	E
▶ 1	**	**	**	420	700
2	**	**	100	960	1420
3	**	**	160	1510	2140
4	**	**	230	2060	2860
*	**	**	150	1360	2660

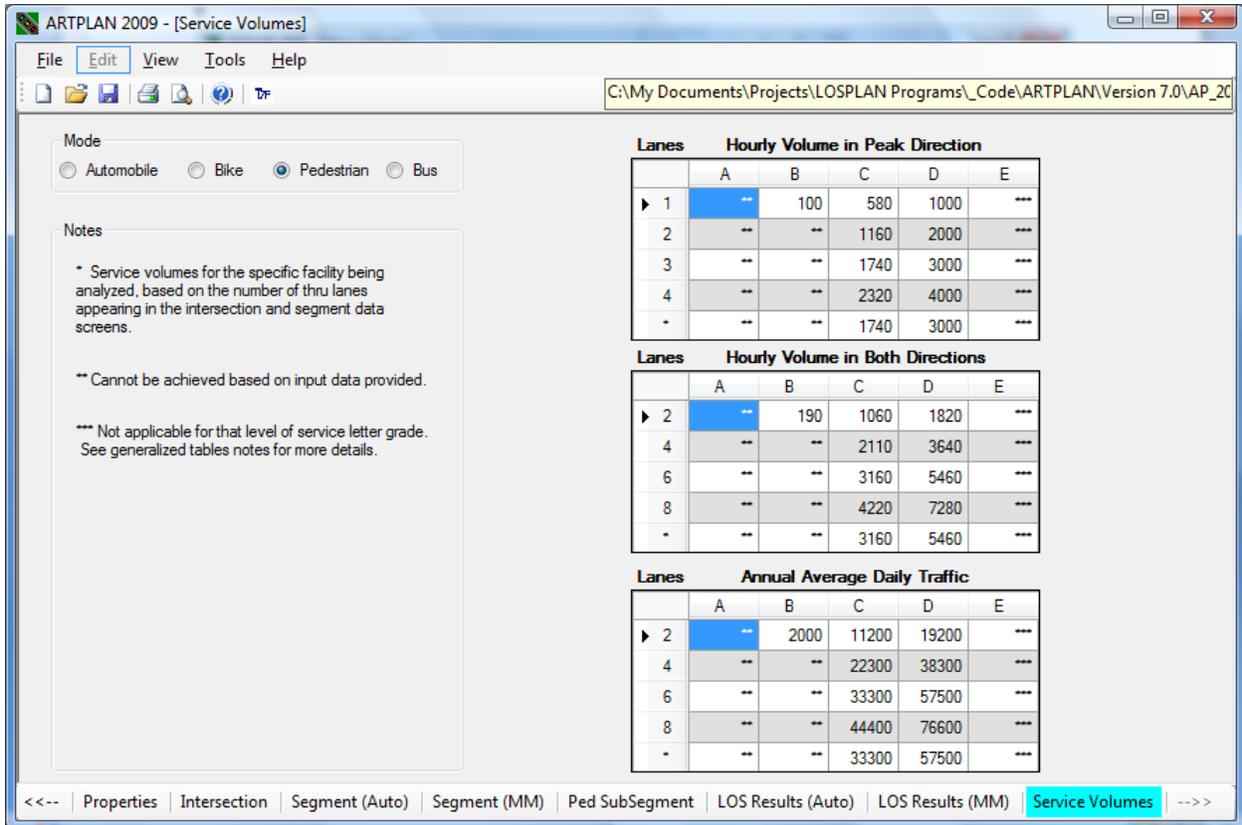
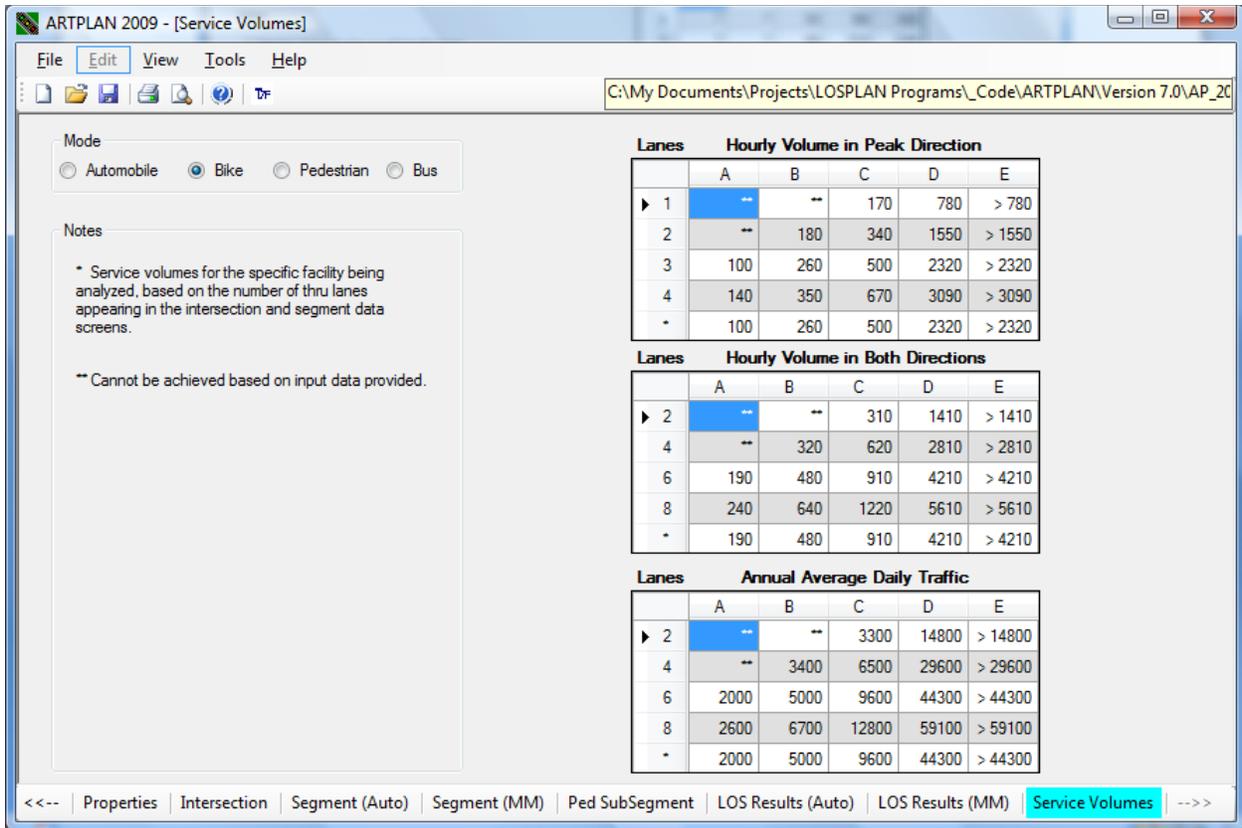
Lanes Hourly Volume in Both Directions

	A	B	C	D	E
▶ 2	**	**	**	770	1280
4	**	**	190	1750	2580
6	**	**	300	2750	3900
8	**	**	420	3750	5200
*	**	**	280	2480	4850

Lanes Annual Average Daily Traffic

	A	B	C	D	E
▶ 2	**	**	**	8100	13400
4	**	**	2000	18400	27200
6	**	**	3100	28900	41000
8	**	**	4500	39500	54800
*	**	**	2900	26100	51100

<<-- Properties Intersection Segment (Auto) Segment (MM) Ped SubSegment LOS Results (Auto) LOS Results (MM) Service Volumes -->>



ARTPLAN 2009 - [Service Volumes]

File Edit View Tools Help

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Mode

Automobile  Bike  Pedestrian  Bus

Notes

\*\* Cannot be achieved based on input data provided.

\*\*\* Not applicable for that level of service letter grade. See generalized tables notes for more details.

**Buses Per Hour in Peak Direction**

	A	B	C	D	E
▶ 1	**	> 5	>= 3	>= 2	>= 1

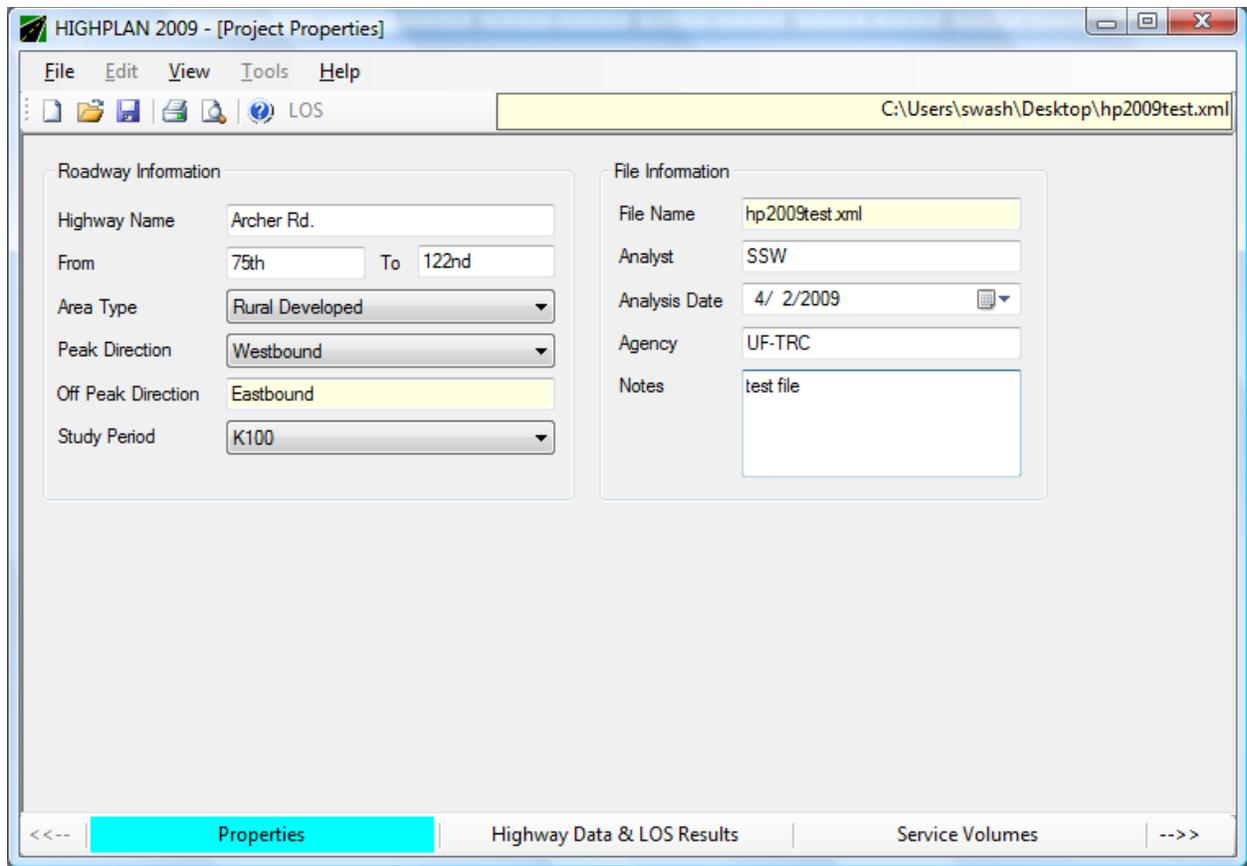
**Buses in Study Hour in Peak Direction (Daily)**

	A	B	C	D	E
▶ 2	**	> 6.67	>= 4.00	>= 2.67	>= 1.33

<<-- Properties Intersection Segment (Auto) Segment (MM) Ped SubSegment LOS Results (Auto) LOS Results (MM) Service Volumes -->>

# HIGHPLAN





HIGHPLAN 2009 - [Highway Data & LOS Results]

File Edit View Tools Help

LOS C:\Users\swash\Desktop\hp2009test.xml

**Roadway Variables**

Num. of Lanes (both dir.)

Terrain

Posted Speed

Free-Flow Speed

Segment Length

Left Turn Impact

Median

Passing Lanes

Spacing

% No Passing Zones

**LOS Results**

v/c Ratio

% Time Spent Following

Average Speed (mi/h)

% Free Flow Speed

Free-Flow Delay (sec/veh)

LOS Threshold Delay (sec/veh)

LOS

**Traffic Variables**

ADT  Peak Dir. Hr. Vol.  Base Capacity

K factor  Off-peak Dir. Hr. Vol.  Local Adj. Factor

D factor  % Heavy Vehicles

PHF

**For the variables highlighted in blue, local values must be used.**

<<-- | Properties | Highway Data & LOS Results | Service Volumes | -->>

HIGHPLAN 2009 - [Service Volumes]

File Edit View Tools Help

LOS C:\Users\swash\Desktop\hp2009test.xml

**Lanes**      **Hourly Volume in Peak Direction**

	A	B	C	D	E
▶ 1	450	790	1070	1350	1470

**Lanes**      **Annual Average Daily Traffic**

	A	B	C	D	E
▶ 2	9000	15800	21400	27000	29400

**Lanes**      **Hourly Volume in Both Directions**

	A	B	C	D	E
▶ 2	900	1580	2140	2700	2940

Notes

<<-- | Properties | Highway Data & LOS Results | **Service Volumes** | -->>

# FREEPLAN



**FREEPLAN 2009 - [Project Properties]**

File Edit View Tools Help

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**Roadway Information**

Freeway Name: I-75

From: Williston Rd To: Newberry Rd

Area Type: Other Urbanized

Peak Direction: Northbound

Off Peak Direction: Southbound

Study Period: K100

**File Information**

File Name: C:\My Documents\Projects\LOSPLAN

Analyst: SSW

Analysis Date: 5/22/2009

Agency: UF-TRC

Notes: Test File

<<-- Project Properties Segment Data LOS Results Service Volumes -->>

**FREEPLAN 2009 - [Segment Data]**

File Edit View Tools Help

C:\My Documents\Projects\LOSPLAN Programs\\_Code\FREEPLAN\FP\_test

Add New Row Insert New Row Delete Row

**Facility-wide Values**

AADT: 55000 K Factor: 0.090 D Factor: 0.52 Peak Hour Factor: 0.925

% Heavy Vehicles: 2.0 Local Adj. Factor: 1.00 Base Capacity: 2350 Length (mi): 3.121

On-Ramp Accel Length (ft): 580 Off-Ramp Decel Length (ft): 350 Ramp Free Flow Speed: 70

	From	To	Segment Type	Segment Length	In Between Length	Hourly Volume	Number Thru Lanes	Number Aux Lanes	Posted Speed	Free Flow Speed	Terrain	Edit Int
▶ 1	first	second	Basic Segment	2640		2340	3	0	60	65	Level	Edit
2	second	third	Diamond	2280		2340	3	0	60	65	Level	Edit
3	third	fourth	Basic Segment	2640		2190	3	0	60	65	Level	Edit
4	fourth	fifth	Full Cloverleaf	2280		2190	3	0	60	65	Level	Edit
5	fifth	sixth	Basic Segment	2640		2360	3	0	60	65	Level	Edit
6	sixth	seventh	On Ramp	1500	2750	2360	3	0	60	65	Level	Edit
7	seventh	eighth	Partial Clover...	2500	2200	2710	3	0	60	65	Level	Edit

<<-- Project Properties Segment Data LOS Results Service Volumes -->>

Interchange Data

Segment # 4: From fourth to fifth

Gore to Gore Distance

A  B  C

	Ramp Number	Demand (veh/h)	% Heavy Vehicles	Number of Lanes	Ramp Analysis	Edit
▶	1	500	2	1	<input type="checkbox"/>	Edit
	2	600	2	1	<input type="checkbox"/>	Edit
	3	350	2	1	<input type="checkbox"/>	Edit
	4	420	2	1	<input type="checkbox"/>	Edit

OK

**Toll Plaza Data**

Segment # 7: From seventh to eighth

Lane Composition at Toll Plaza

Number of Manual Lanes: 4

Number of Exact Change Required Lanes: 4

Number of Dedicated AVI Lanes: 4

Percent AVI Participation: 25

OK Cancel

FREEPLAN 2009 - [LOS Results]

File Edit View Tools Help

C:\My Documents\Projects\LOSPLAN Programs\\_Code\FREEPLAN\FP\_test

	Segment	Segment Type	Dir. Hourly Volume	Adj. Dir. Capacity	v/c Ratio	Average Speed	Density	Segment LOS	Hot Spots
▶ 1	first-second	Basic	2340	6457	0.36	65.0	13.1	B	View
2	second-third	Diamond	2340	6090	0.00	62.8	13.3	B	View
3	third-fourth	Basic	2190	6457	0.34	65.0	12.3	B	View
4	fourth-fifth	FullClover	2190	6457	0.00	63.5	12.8	B	View
5	fifth-sixth	Basic	2360	6457	0.37	65.0	13.2	B	View
6	sixth-seventh	OnRamp	2360	6274	0.00	60.2	16.6	B	View
7	seventh-eighth	ParClo	2710	6090	0.00	62.6	15.8	B	View

Length (mi) 3.121 Free Flow Delay (sec/veh) 4.1 LOS Threshold Delay (sec/veh) 0.0 v/c Ratio 0.36 Avg. Speed (mi/h) 63.5 Density (pc/mi/ln) 13.6 LOS B

<<-- | Project Properties | Segment Data | **LOS Results** | Service Volumes | -->>

FREEPLAN 2009 - [Service Volumes]

File Edit View Tools Help

C:\My Documents\Projects\LOSPLAN Programs\\_Code\FREEPLAN\FP\_test

**Lanes**      **Hourly Volume in Peak Direction**

	A	B	C	D	E
▶ 2	1280	2060	2980	3700	4160
3	1920	3100	4480	5560	6240
4	2520	4160	5980	7420	8320
5	3180	5200	7420	9260	10420
6	3820	6200	8920	11120	12500

**Lanes**      **Annual Average Daily Traffic**

	A	B	C	D	E
▶ 4	27300	43900	63600	79100	89000
6	41200	66300	95700	118900	133500
8	54000	88700	127700	158400	177900
10	67900	111200	158700	197900	222600
12	81800	132500	190800	237400	267000

**Lanes**      **Hourly Volume in Both Directions**

	A	B	C	D	E
▶ 4	2460	3950	5730	7120	8010
6	3710	5970	8610	10700	12010
8	4860	7990	11500	14260	16010
10	6110	10000	14280	17810	20030
12	7360	11930	17170	21370	24030

Notes

<<< | Project Properties | Segment Data | LOS Results | **Service Volumes** | -->>