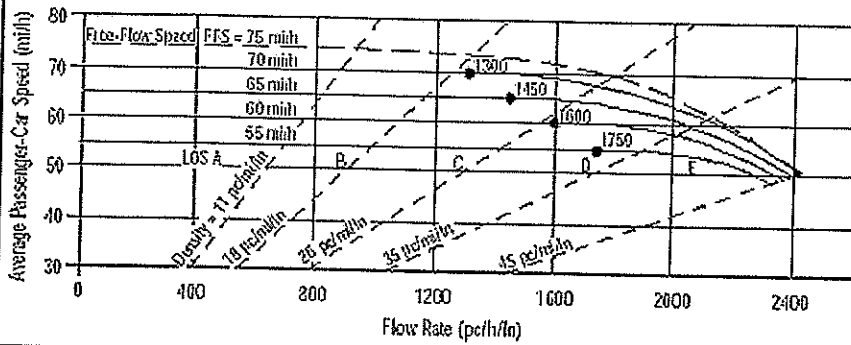


2012 No Build

## BASIC FREEWAY SEGMENTS WORKSHEET



### General Information

Analyst: *KNM*  
 Agency or Company: *HNTB*  
 Date Performed: *3/25/2008*  
 Analysis Time Period: *Peak*  
 Project Description: *Wekiva Parkway PD&E*

### Site Information

Highway/Direction of Travel: *I-4/Eastbound*  
 From/To: *Lake Mary Blvd /CR 46A/SR417*  
 Jurisdiction:  
 Analysis Year: *2012 No Build*

Oper. (LOS)

Des. (N)

Planning Data

### Flow Inputs

Volume, V	<i>5590</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>
AAADT		veh/day	%Trucks and Buses, P <sub>T</sub>	<i>9</i>
Peak-Hr Prop. of AAADT, K			%RVs, P <sub>R</sub>	<i>0</i>
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>
DDHV = AAADT x K x D		veh/h	Grade %	<i>mi</i>
Driver type adjustment	<i>1.00</i>		Up/Down %	

### Calculate Flow Adjustments

f <sub>p</sub>	<i>1.00</i>	E <sub>R</sub>	<i>1.2</i>
E <sub>T</sub>	<i>1.5</i>	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> -1) + P <sub>R</sub> (E <sub>R</sub> -1)]	<i>0.957</i>

### Speed Inputs

Lane Width	<i>12.0</i>	ft
Rt-Shoulder Lat. Clearance	<i>6.0</i>	ft
Interchange Density	<i>0.45</i>	l/mi
Number of Lanes, N	<i>3</i>	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	<i>70.0</i>	mi/h

### Calc Speed Adj and FFS

f <sub>LW</sub>	<i>0.0</i>	mi/h
f <sub>LC</sub>	<i>0.0</i>	mi/h
f <sub>ID</sub>	<i>0.0</i>	mi/h
f <sub>N</sub>	<i>3.0</i>	mi/h
FFS	<i>67.0</i>	mi/h

### LOS and Performance Measures

Operational (LOS)

v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )	<i>2050</i>	pc/h/ln
S	<i>61.9</i>	mi/h
D = v <sub>p</sub> / S	<i>33.1</i>	pc/mi/ln
LOS	<i>D</i>	

### Design (N)

Design (N)

Design LOS

v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f <sub>p</sub> )		pc/h
S		mi/h
D = v <sub>p</sub> / S		pc/mi/ln

Required Number of Lanes, N

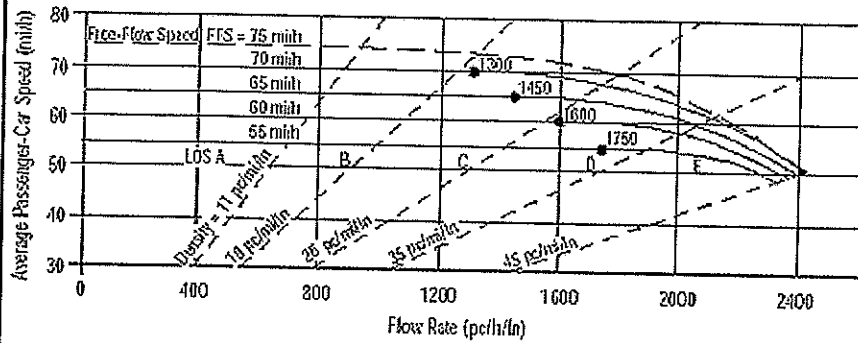
### Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v <sub>p</sub> - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

### Factor Location

E <sub>R</sub> - Exhibits 23-8, 23-10	f <sub>LW</sub> - Exhibit 23-4
E <sub>T</sub> - Exhibits 23-8, 23-10, 23-11	f <sub>LC</sub> - Exhibit 23-5
f <sub>p</sub> - Page 23-12	f <sub>N</sub> - Exhibit 23-6
LOS, S, FFS, v <sub>p</sub> - Exhibits 23-2, 23-3	f <sub>ID</sub> - Exhibit 23-7

## BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, $v_p$	LOS, S, D
Design (N)	FFS, LOS, $v_p$	N, S, D
Design ( $v_p$ )	FFS, LOS, N	$v_p$ , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning ( $v_p$ )	FFS, LOS, N	$v_p$ , S, D

### General Information

Analyst: *KNM*  
 Agency or Company: *HNTB*  
 Date Performed: *3/25/2008*  
 Analysis Time Period: *Peak*  
 Project Description: *Wekiva Parkway PD&E*

### Site Information

Highway/Direction of Travel: *I-4/Eastbound*  
 From/To: *CR 46A/SR 417/SR 46*  
 Jurisdiction:  
 Analysis Year: *2012 No Build*

 Oper. (LOS)

 Des. (N)

 Planning Data

### Flow Inputs

Volume, V: *4400* veh/h  
 AADT: veh/day  
 Peak-Hr Prop. of AADT, K: *0.95*  
 Peak-Hr Direction Prop, D: *9*  
 DDHV = AADT x K x D: veh/h  
 Driver type adjustment: *1.00*  
 Peak-Hour Factor, PHF: *0.95*  
 %Trucks and Buses,  $P_T$ : *9*  
 %RVs,  $P_R$ : *0*  
 General Terrain: *Level*  
 Grade % Length: *mi*  
 Up/Down %

### Calculate Flow Adjustments

$f_p$ : *1.00*  
 $E_T$ : *1.5*  
 $E_R$ : *1.2*  
 $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ : *0.957*

### Speed Inputs

Lane Width: *12.0* ft  
 Rt-Shoulder Lat. Clearance: *6.0* ft  
 Interchange Density: *0.54* l/mi  
 Number of Lanes, N: *3*  
 FFS (measured): mi/h  
 Base free-flow Speed, BFFS: *70.0* mi/h

### Calc Speed Adj and FFS

$f_{LW}$ : *0.0* mi/h  
 $f_{LC}$ : *0.0* mi/h  
 $f_{ID}$ : *0.2* mi/h  
 $f_N$ : *3.0* mi/h  
 FFS: *66.8* mi/h

### LOS and Performance Measures

Operational (LOS)  
 $v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$ : *1613* pc/h/ln  
 S: *66.5* mi/h  
 $D = v_p / S$ : *24.3* pc/mi/ln  
 LOS: *C*

### Design (N)

Design (N)  
 Design LOS  
 $v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$ : pc/h  
 S: mi/h  
 $D = v_p / S$ : pc/mi/ln  
 Required Number of Lanes, N

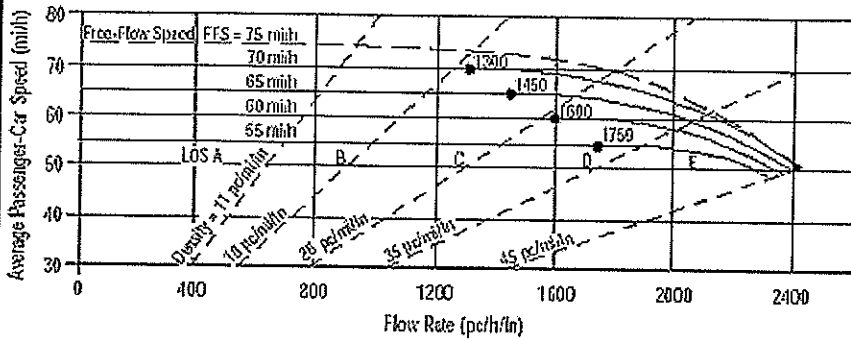
### Glossary

N - Number of lanes  
 V - Hourly volume  
 $v_p$  - Flow rate  
 LOS - Level of service  
 DDHV - Directional design hour volume  
 S - Speed  
 D - Density  
 FFS - Free-flow speed  
 BFFS - Base free-flow speed

### Factor Location

$E_R$  - Exhibits 23-8, 23-10  
 $E_T$  - Exhibits 23-8, 23-10, 23-11  
 $f_p$  - Page 23-12  
 LOS, S, FFS,  $v_p$  - Exhibits 23-2, 23-3  
 $f_{LW}$  - Exhibit 23-4  
 $f_{LC}$  - Exhibit 23-5  
 $f_N$  - Exhibit 23-6  
 $f_{ID}$  - Exhibit 23-7

## BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, $v_p$	LOS, S, D
Design (N)	FFS, LOS, $v_p$	N, S, D
Design ( $v_p$ )	FFS, LOS, N	$v_p$ , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning ( $v_p$ )	FFS, LOS, N	$v_p$ , S, D

### General Information

### Site Information

Analyst	KNM	Highway/Direction of Travel	I-4/Eastbound
Agency or Company	HNTB	From/To	SR 46/US17/92
Date Performed	3/25/2008	Jurisdiction	
Analysis Time Period	Peak	Analysis Year	2012 No Build

Project Description Wekiva Parkway PD&E

Oper. (LOS)

Des. (N)

Planning Data

### Flow Inputs

Volume, V	5410	veh/h	Peak-Hour Factor, PHF	0.95
AADT		veh/day	%Trucks and Buses, $P_T$	9
Peak-Hr Prop. of AADT, K			%RVs, $P_R$	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade %	Length mi
Driver type adjustment	1.00		Up/Down %	

### Calculate Flow Adjustments

$f_p$	1.00	$E_R$	1.2
$E_T$	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

### Speed Inputs

### Calc Speed Adj and FFS

Lane Width	12.0	ft	$f_{LW}$	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	$f_{LC}$	0.0	mi/h
Interchange Density	0.67	l/mi	$f_{ID}$	0.9	mi/h
Number of Lanes, N	4		$f_N$	1.5	mi/h
FFS (measured)		mi/h	FFS	67.6	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

### LOS and Performance Measures

### Design (N)

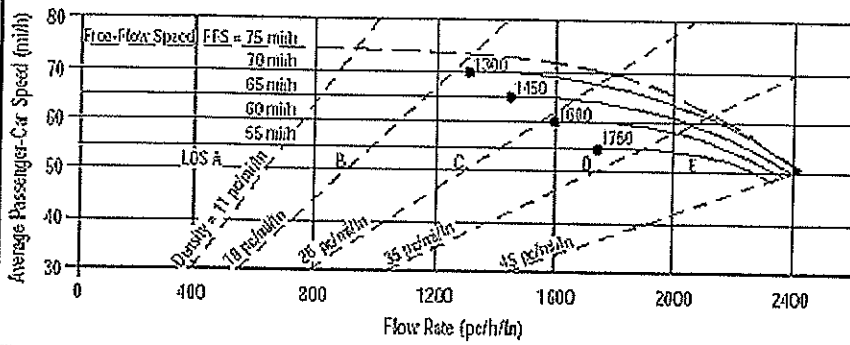
Operational (LOS)		Design (N)	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	1488	Design LOS	
S	67.6	$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h
D = $v_p / S$	22.0	S	mi/h
LOS	C	D = $v_p / S$	pc/mi/ln
		Required Number of Lanes, N	

### Glossary

### Factor Location

N - Number of lanes	S - Speed	$E_R$ - Exhibits 23-8, 23-10	$f_{LW}$ - Exhibit 23-4
V - Hourly volume	D - Density	$E_T$ - Exhibits 23-8, 23-10, 23-11	$f_{LC}$ - Exhibit 23-5
$v_p$ - Flow rate	FFS - Free-flow speed	$f_p$ - Page 23-12	$f_N$ - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, $v_p$ - Exhibits 23-2, 23-3	$f_{ID}$ - Exhibit 23-7
DDHV - Directional design hour volume			

## BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, $v_p$	LOS, S, D
Design (N)	FFS, LOS, $v_p$	N, S, D
Design ( $v_p$ )	FFS, LOS, N	$v_p$ , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning ( $v_p$ )	FFS, LOS, N	$v_p$ , S, D

General Information		Site Information	
Analyst	KNM	Highway/Direction of Travel	I-4/Eastbound
Agency or Company	HNTB	From/To	Us17/92 to Volusia County Line
Date Performed	3/25/2008	Jurisdiction	
Analysis Time Period	Peak	Analysis Year	2012 No Build
Project Description Wekiva Parkway PD&E			

Oper. (LOS)                     
  Des. (N)                     
  Planning Data

Flow Inputs			
Volume, V	5090	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, $P_T$
Peak-Hr Prop. of AADT, K			%RVs, $P_R$
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
Driver type adjustment	1.00		Up/Down %

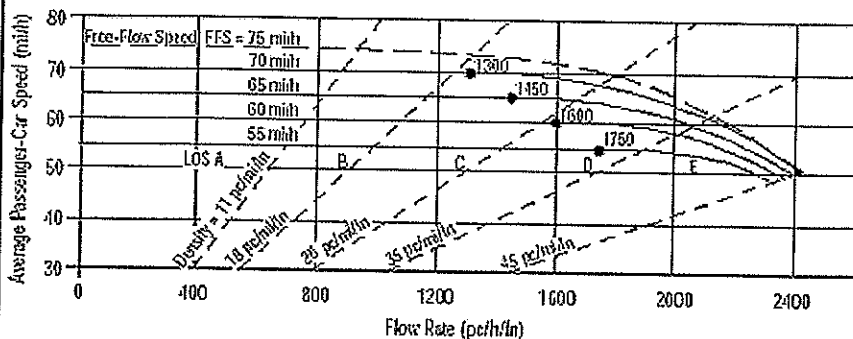
Calculate Flow Adjustments			
$f_p$	1.00	$E_R$	1.2
$E_T$	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	12.0 ft	$f_{LW}$	0.0 mi/h
Rt-Shoulder Lat. Clearance	6.0 ft	$f_{LC}$	0.0 mi/h
Interchange Density	2.00 l/mi	$f_{ID}$	7.5 mi/h
Number of Lanes, N	3	$f_N$	3.0 mi/h
FFS (measured)		FFS	59.5 mi/h
Base free-flow Speed, BFFS	70.0 mi/h		

LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	1866 pc/h/ln	Design LOS	
S	58.9 mi/h	$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h
$D = v_p / S$	31.7 pc/mi/ln	S	mi/h
LOS	D	$D = v_p / S$	pc/mi/ln
		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	$E_R$ - Exhibits 23-8, 23-10	$f_{LW}$ - Exhibit 23-4
V - Hourly volume	D - Density	$E_T$ - Exhibits 23-8, 23-10, 23-11	$f_{LC}$ - Exhibit 23-5
$v_p$ - Flow rate	FFS - Free-flow speed	$f_p$ - Page 23-12	$f_N$ - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, $v_p$ - Exhibits 23-2, 23-3	$f_{ID}$ - Exhibit 23-7
DDHV - Directional design hour volume			

## BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, $v_p$	LOS, S, D
Design (N)	FFS, LOS, $v_p$	N, S, D
Design ( $v_p$ )	FFS, LOS, N	$v_p$ , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning ( $v_p$ )	FFS, LOS, N	$v_p$ , S, D

### General Information

Analyst: *KNM*  
 Agency or Company: *HNTB*  
 Date Performed: *3/25/2008*  
 Analysis Time Period: *Peak*

### Site Information

Highway/Direction of Travel: *SR 417/Westbound*  
 From/To: *North of Rinehart Rd/Rinehart*  
 Jurisdiction:  
 Analysis Year: *2012 No Build*

Project Description: *Wekiva Parkway PD&E*

Oper. (LOS)

Des. (N)

Planning Data

### Flow Inputs

Volume, V	<i>2820</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>
AAADT		veh/day	%Trucks and Buses, $P_T$	<i>10</i>
Peak-Hr Prop. of AAADT, K			%RVs, $P_R$	<i>0</i>
Peak-Hr Direction Prop, D			General Terrain:	<i>Level</i>
DDHV = AAADT x K x D		veh/h	Grade %	<i>mi</i>
Driver type adjustment	<i>1.00</i>		Length	
			Up/Down %	

### Calculate Flow Adjustments

$f_p$	<i>1.00</i>	$E_R$	<i>1.2</i>
$E_T$	<i>1.5</i>	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	<i>0.952</i>

### Speed Inputs

Lane Width	<i>12.0</i>	ft
Rt-Shoulder Lat. Clearance	<i>6.0</i>	ft
Interchange Density	<i>0.40</i>	l/mi
Number of Lanes, N	<i>3</i>	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	<i>70.0</i>	mi/h

### Calc Speed Adj and FFS

$f_{LW}$	<i>0.0</i>	mi/h
$f_{LC}$	<i>0.0</i>	mi/h
$f_{ID}$	<i>0.0</i>	mi/h
$f_N$	<i>3.0</i>	mi/h
FFS	<i>67.0</i>	mi/h

### LOS and Performance Measures

Operational (LOS)

$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	<i>1039</i>	pc/h/ln
S	<i>67.0</i>	mi/h
$D = v_p / S$	<i>15.5</i>	pc/mi/ln
LOS	<i>B</i>	

### Design (N)

Design (N)

Design LOS	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h
S	mi/h
$D = v_p / S$	pc/mi/ln
Required Number of Lanes, N	

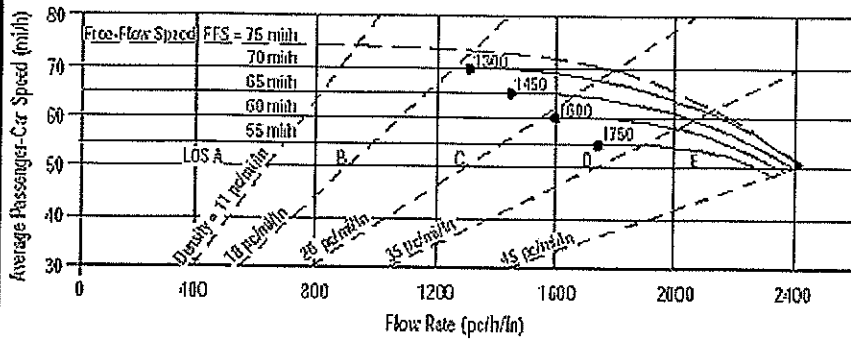
### Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
$v_p$ - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

### Factor Location

$E_R$ - Exhibits 23-8, 23-10	$f_{LW}$ - Exhibit 23-4
$E_T$ - Exhibits 23-8, 23-10, 23-11	$f_{LC}$ - Exhibit 23-5
$f_p$ - Page 23-12	$f_N$ - Exhibit 23-6
LOS, S, FFS, $v_p$ - Exhibits 23-2, 23-3	$f_{ID}$ - Exhibit 23-7

## BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, $v_p$	LOS, S, D
Design (N)	FFS, LOS, $v_p$	N, S, D
Design ( $v_p$ )	FFS, LOS, N	$v_p$ , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning ( $v_p$ )	FFS, LOS, N	$v_p$ , S, D

### General Information

Analyst: *KNM*  
 Agency or Company: *HNTB*  
 Date Performed: *3/25/2008*  
 Analysis Time Period: *Peak*

### Site Information

Highway/Direction of Travel: *SR 417/Westbound*  
 From/To: *Rinehart Rd to I-4*  
 Jurisdiction:  
 Analysis Year: *2012 No Build*

Project Description: *Wekiva Parkway PD&E*

Oper. (LOS)

Des. (N)

Planning Data

### Flow Inputs

Volume, V: *2100* veh/h  
 AADT: veh/day  
 Peak-Hr Prop. of AADT, K: %RVs,  $P_R$ : *0*  
 Peak-Hr Direction Prop, D: General Terrain: *Level*  
 DDHV = AADT x K x D: veh/h  
 Driver type adjustment: *1.00*  
 Grade % Length: *mi*  
 Up/Down %

### Calculate Flow Adjustments

$f_p$ : *1.00*  
 $E_T$ : *1.5*  
 $E_R$ : *1.2*  
 $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ : *0.952*

### Speed Inputs

Lane Width: *12.0* ft  
 Rt-Shoulder Lat. Clearance: *6.0* ft  
 Interchange Density: *2.00* l/mi  
 Number of Lanes, N: *3*  
 FFS (measured): mi/h  
 Base free-flow Speed, BFFS: *70.0* mi/h

### Calc Speed Adj and FFS

$f_{LW}$ : *0.0* mi/h  
 $f_{LC}$ : *0.0* mi/h  
 $f_{ID}$ : *7.5* mi/h  
 $f_N$ : *3.0* mi/h  
 FFS: *59.5* mi/h

### LOS and Performance Measures

Operational (LOS)  
 $v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$ : *774* pc/h/ln  
 S: *59.5* mi/h  
 $D = v_p / S$ : *13.0* pc/mi/ln  
 LOS: *B*

### Design (N)

Design (N)  
 Design LOS  
 $v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$ : pc/h  
 S: mi/h  
 $D = v_p / S$ : pc/mi/ln  
 Required Number of Lanes, N

### Glossary

N - Number of lanes  
 V - Hourly volume  
 $v_p$  - Flow rate  
 LOS - Level of service  
 DDHV - Directional design hour volume  
 S - Speed  
 D - Density  
 FFS - Free-flow speed  
 BFFS - Base free-flow speed

### Factor Location

$E_R$  - Exhibits 23-8, 23-10  
 $E_T$  - Exhibits 23-8, 23-10, 23-11  
 $f_p$  - Page 23-12  
 LOS, S, FFS,  $v_p$  - Exhibits 23-2, 23-3  
 $f_{LW}$  - Exhibit 23-4  
 $f_{LC}$  - Exhibit 23-5  
 $f_N$  - Exhibit 23-6  
 $f_{ID}$  - Exhibit 23-7

SR 417WB on Ramp from Rinehart.txt  
HCS+: Ramps and Ramp Junctions Release 5.4

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
E-mail: \_\_\_\_\_

Merge Analysis

---

Analyst: CTR  
Agency/Co.: HNTB  
Date performed: 08/05/2010  
Analysis time period: No Build  
Freeway/Dir of Travel: SR 417 WB  
Junction: On Ramp from Rinehart Rd  
Jurisdiction: Seminole County  
Analysis Year: 2012  
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

---

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1940	vph

On Ramp Data

---

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	160	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

---

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	940	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1700	ft

Conversion to pc/h Under Base Conditions

---

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1940	160	940	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	527	43	255	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	





SR 417EB off to Rinehart Rd.txt  
HCS+: Ramps and Ramp Junctions Release 5.4

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
E-mail: \_\_\_\_\_

\_\_\_\_\_Diverge Analysis\_\_\_\_\_

Analyst: CTR  
Agency/Co.: HNTB  
Date performed: 08/05/2010  
Analysis time period: No Build  
Freeway/Dir of Travel: SR 417 EB  
Junction: Off Ramp to Rinehart Rd  
Jurisdiction: Seminole County  
Analysis Year: 2012  
Description: Wekiva Parkway Project Development & Environment Study

\_\_\_\_\_Freeway Data\_\_\_\_\_

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2100	vph

\_\_\_\_\_Off Ramp Data\_\_\_\_\_

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	160	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

\_\_\_\_\_Adjacent Ramp Data (if one exists)\_\_\_\_\_

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	740	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

\_\_\_\_\_Conversion to pc/h Under Base Conditions\_\_\_\_\_

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2100	160	740	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	571	43	201	v
Trucks and buses	10	10	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	0.00	0.00	%
Length	0.00	0.00	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.957	
Driver population factor, fP	1.00	1.00	1.00	



SR 417EB on Ramp from Rinehart.txt  
HCS+: Ramps and Ramp Junctions Release 5.4

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
E-mail: \_\_\_\_\_

Merge Analysis

Analyst: CTR  
Agency/Co.: HNTB  
Date performed: 08/05/2010  
Analysis time period: No Build  
Freeway/Dir of Travel: SR 417 EB  
Junction: On Ramp from Rinehart Rd  
Jurisdiction: Seminole County  
Analysis Year: 2012  
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1940	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	740	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	160	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1940	740	160	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	527	201	43	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	



SR 417WB off to Rinehart Rd.txt  
HCS+: Ramps and Ramp Junctions Release 5.4

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
E-mail: \_\_\_\_\_

\_\_\_\_\_Diverge Analysis\_\_\_\_\_

Analyst: CTR  
Agency/Co.: HNTB  
Date performed: 08/05/2010  
Analysis time period: No Build  
Freeway/Dir of Travel: SR 417 WB  
Junction: Off Ramp to Rinehart Rd  
Jurisdiction: Seminole County  
Analysis Year: 2012  
Description: Wekiva Parkway Project Development & Environment Study

\_\_\_\_\_Freeway Data\_\_\_\_\_

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2820	vph

\_\_\_\_\_Off Ramp Data\_\_\_\_\_

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	940	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

\_\_\_\_\_Adjacent Ramp Data (if one exists)\_\_\_\_\_

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	160	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1700	ft

\_\_\_\_\_Conversion to pc/h Under Base Conditions\_\_\_\_\_

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2820	940	160	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	766	255	43	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	0.00	0.00	%
Length	0.00	0.00	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	



CD Rd EB Off Ramp to SR 417 EB.txt  
HCS+: Ramps and Ramp Junctions Release 5.4

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
E-mail: \_\_\_\_\_

\_\_\_\_\_Diverge Analysis\_\_\_\_\_

Analyst: CTR  
Agency/Co.: HNTB  
Date performed: 8/05/10  
Analysis time period: No Build  
Freeway/Dir of Travel: Frontage Rd (East of I-4) EB  
Junction: Off Ramp to SR 417 EB  
Jurisdiction: Seminole County  
Analysis Year: 2012  
Description: Wekiva Parkway Project Development & Environment Study

\_\_\_\_\_Freeway Data\_\_\_\_\_

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1280	vph

\_\_\_\_\_Off Ramp Data\_\_\_\_\_

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	350	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

\_\_\_\_\_Adjacent Ramp Data (if one exists)\_\_\_\_\_

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

\_\_\_\_\_Conversion to pc/h Under Base Conditions\_\_\_\_\_

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1280	350		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	348	95		v
Trucks and buses	9	9		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	0.00	%	%
Length	0.00	0.00	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.957	0.957		
Driver population factor, fP	1.00	1.00		



Flow rate, vp CD Rd EB Off Ramp to SR 417 EB.txt 1454 398 pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
EQ
P = 1.000 Using Equation 0
FD
v12 = vR + (vF - vR) P / FD = 1454 pc/h

Capacity Checks

vF = vF 1454 Actual Maximum LOS F? 4500 No
vFO = vF - vR 1056 4500 No
vR 398 2000 No
v3 or vav34 0 pc/h (Equation 25-15 or 25-16)
Is v3 or vav34 > 2700 pc/h? No
Is v3 or vav34 > 1.5 v12 / 2 No
If yes, v12A = 1454 (Equation 25-18)

Flow Entering Diverge Influence Area

v12 Actual Max Desirable Violation? 1454 4400 No

Level of Service Determination (if not F)

Density, D = 4.252 + 0.0086 v12 - 0.009 L / D = 12.3 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D = 0.464
Space mean speed in ramp influence area, S = 49.0 mph
Space mean speed in outer lanes, S = N/A mph
Space mean speed for all vehicles, S0 = 49.0 mph

Phone: Fax:  
E-mail:

Merge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: Frontage Rd (West of I-4) WB  
 Junction: On Ramp from SR 46 EB  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	680 ✓	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0 ✓	mph
Volume on ramp	610	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes ✓	
Volume on adjacent Ramp	1270 ✓	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	4005	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	680 ✓	610	1270	vph
Peak-hour factor, PHF	0.92 ✓	0.92	0.92	
Peak 15-min volume, v15	185 ✓	166	345	v
Trucks and buses	9 ✓	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%
Length	mi	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	772	693	1443	pcph

Estimation of V12 Merge Areas

---

L = (Equation 25-2 or 25-3)  
EQ  
P = 1.000 Using Equation 0  
FM  
 $v_{12} = v_F (P_{FM}) = 772 \text{ pc/h}$

Capacity Checks

---

	v	Actual	Maximum	LOS F?
	FO	1465	4500	No
	v	0	pc/h	(Equation 25-4 or 25-5)
Is	v	> 2700	pc/h?	No
Is	v	> 1.5 v	/2	No
If yes,	v	= 772		(Equation 25-8)

12A

Flow Entering Merge Influence Area

---

	v	Actual	Max Desirable	Violation?
	R12	772	4600	No

Level of Service Determination (if not F)

---

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 13.4 \text{ pc/mi/ln}$   
Level of service for ramp-freeway junction areas of influence B ✓

Speed Estimation

---

Intermediate speed variable,	M	= 0.303	
Space mean speed in ramp influence area,	S	= 51.1	mph
Space mean speed in outer lanes,	S	= N/A	mph
Space mean speed for all vehicles,	S	= 51.1	mph

---

I-4 EB On Ramp from SR 46.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:  
E-mail:

Merge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 EB  
 Junction: On Ramp from SR 46  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	4400	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1010	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	870	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	5148	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4400	1010	870	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1196	274	236	v
Trucks and buses	9	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp I-4 EB On Ramp from SR 46.txt 988 pcph  
 4998 1147

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)  
 EQ  
 P = 0.591 Using Equation 1  
 FM  
 $v_{12} = v_F (P_{FM}) = 2956 \text{ pc/h}$

Capacity Checks

		Actual	Maximum	LOS F?
	$v_{FO}$	6145	6750	No
	$v_{3 \text{ or } av34}$	2042 pc/h	(Equation 25-4 or 25-5)	
Is	$v_{3 \text{ or } av34} > 2700 \text{ pc/h?}$		No	
Is	$v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes,	$v_{12A} = 2956$		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$v_{R12}$	2956	4600	No

Level of Service Determination (if not F)

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 33.8 \text{ pc/mi/ln}$   
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M = 0.522	
Space mean speed in ramp influence area,	$S_R = 48.2$	mph
Space mean speed in outer lanes,	$S_0 = 49.4$	mph
Space mean speed for all vehicles,	$S = 48.6$	mph

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

Diverge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 03/09/07  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 NB  
 Junction: Off Ramp to SR 46  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	5000	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	1010	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane	1000	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1270	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	6098	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5000	1010	1270	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1389	281	353	v
Trucks and buses	0	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5556	1122	1411	pcph

Estimation of V12 Diverge Areas

$$L = \frac{EQ}{P} \quad (\text{Equation 25-8 or 25-9})$$

$$P = 0.450 \quad \text{Using Equation 0}$$

$$V_{12} = V_R + (V_F - V_R) P = 3117 \quad \text{pc/h}$$

Capacity Checks

$v = v$	Actual	Maximum	LOS F?
$F_i = F$	5556	6750	No
$v = v - v$	4434	6750	No
$F_O = F - R$			
$v$	1122	3800	No
$R$			
$v$	2439 pc/h	(Equation 25-15 or 25-16)	
$3 \text{ or } av34$			
Is $v > 2700 \text{ pc/h?}$		No	
$3 \text{ or } av34$			
Is $v > 1.5 v / 2$		Yes	

3 or av34 12  
 If yes,  $v_{12A} = 3174$

(Equation 25-18)

Flow Entering Diverge Influence Area			
$v_{12A}$	Actual	Max Desirable	Violation?
	3174	4600	No
Level of Service Determination (if not F)			

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 4.5$  pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation	
Intermediate speed variable,	$D = 0.529$
Space mean speed in ramp influence area,	$S_R = 48.1$ mph
Space mean speed in outer lanes,	$S_0 = 54.9$ mph
Space mean speed for all vehicles,	$S = 50.8$ mph

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

Merge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: SR 417 EB  
 Junction: On Ramp from I-4 EB  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2 ✓	
Free-flow speed on freeway	55.0 ✓	mph
Volume on freeway	1750 ✓	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1 ✓	
Free-flow speed on ramp	35.0	mph
Volume on ramp	350 ✓	vph
Length of first accel/decel lane	500 ✓	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1140 ✓	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	2584	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1750 ✓	350	1140	vph
Peak-hour factor, PHF	0.92 ✓	0.92	0.92	
Peak 15-min volume, v15	476 ✓	95	310	v
Trucks and buses	10	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	



Heavy vehicle adjustment, fHV	0.952	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1997	398	1295	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \text{ Using Equation 0}$$

$$FM$$

$$v_{12} = v_{F, FM} (P) = 1997 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v <sub>FO</sub>	2395	4500	No
v <sub>3 or av34</sub>	0 pc/h	(Equation 25-4 or 25-5)	
Is v <sub>3 or av34</sub> > 2700 pc/h?		No	
Is v <sub>3 or av34</sub> > 1.5 v <sub>12</sub> / 2		No	
If yes, v <sub>12A</sub> = 1997		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v <sub>R12</sub>	1997	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 20.8 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M = 0.329	
Space mean speed in ramp influence area,	S = 50.7	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 50.7	mph

Phone: Fax:  
E-mail:

Merge Analysis

Analyst: CTR  
Agency/Co.: HNTB  
Date performed: 3/09/07  
Analysis time period: No Build  
Freeway/Dir of Travel: I-4 NB  
Junction: On Ramp from SR 417 WB  
Jurisdiction: Seminole County  
Analysis Year: 2012  
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2720	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	350	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1270	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3490	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2720	350	1270	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	756	97	353	v
Trucks and buses	0	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3022	389	1411	pcph

Estimation of v12 Merge Areas

L = 557.75 (Equation 25-2 or 25-3)  
EQ  
P = 0.603 Using Equation 1  
FM  
 $v_{12} = v \left( \frac{P}{F} \right) = 1821$  pc/h

Capacity Checks

v	Actual	Maximum	LOS F?
F0	3411	6750	No
v	1201 pc/h	(Equation 25-4 or 25-5)	
3 or av34			
Is v > 2700 pc/h?		No	
3 or av34			
Is v > 1.5 v /2		No	
3 or av34			
If yes, v =		(Equation 25-8)	
12A			

Flow Entering Merge Influence Area			
	Actual	Max Desirable	Violation?
v <sub>12</sub>	1821	4400	No
Level of Service Determination (if not F)			
Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 16.9$ pc/mi/ln			
Level of service for ramp-freeway junction areas of influence B			
Speed Estimation			
Intermediate speed variable,		M = 0.294	
Space mean speed in ramp influence area,		S <sub>S</sub> = 51.2	mph
Space mean speed in outer lanes,		S <sub>R</sub> = 52.5	mph
Space mean speed for all vehicles,		S <sub>0</sub> = 51.6	mph

Phone:  
E-mail:

Fax:

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Merge Analysis

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Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 08/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 EB  
 Junction: On Ramp from SR 417 WB  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

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Freeway Data

---

Type of analysis	Merge		
Number of lanes in freeway	3		
Free-flow speed on freeway	55.0	mph	
Volume on freeway	3530	vph	

---

On Ramp Data

---

Side of freeway	Right		
Number of lanes in ramp	1		
Free-flow speed on ramp	35.0	mph	
Volume on ramp	870	vph	
Length of first accel/decel lane	500	ft	
Length of second accel/decel lane		ft	

---

Adjacent Ramp Data (if one exists)

---

Does adjacent ramp exist?	Yes		
Volume on adjacent Ramp	1010	vph	
Position of adjacent Ramp	Downstream		
Type of adjacent Ramp	On		
Distance to adjacent Ramp	5148	ft	

---

Conversion to pc/h Under Base Conditions

---

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3530	870	1010	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	959	236	274	v
Trucks and buses	9	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	

I-4 EB On Ramp from SR 417 WB\_Downstream.txt  
Flow rate, vp 4010 988 1147 pcph

---

Estimation of V12 Merge Areas

---

L = (Equation 25-2 or 25-3)  
EQ  
P = 0.591 Using Equation 1  
FM  
 $v_{12} = v_F (P_{FM}) = 2372 \text{ pc/h}$

---

Capacity Checks

---

	Actual	Maximum	LOS F?
v <sub>FO</sub>	4998	6750	No
v <sub>3 or av34</sub>	1638 pc/h	(Equation 25-4 or 25-5)	
Is v <sub>3 or av34</sub> > 2700 pc/h?		No	
Is v <sub>3 or av34</sub> > 1.5 v <sub>12</sub> / 2		No	
If yes, v <sub>12A</sub> = 2372		(Equation 25-8)	

---

Flow Entering Merge Influence Area

---

	Actual	Max Desirable	Violation?
v <sub>R12</sub>	2372	4600	No

---

Level of Service Determination (if not F)

---

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 28.1 \text{ pc/mi/ln}$   
Level of service for ramp-freeway junction areas of influence D

---

Speed Estimation

---

Intermediate speed variable,	M = 0.398	
Space mean speed in ramp influence area,	S <sub>R</sub> = 49.8	mph
Space mean speed in outer lanes,	S <sub>O</sub> = 50.9	mph
Space mean speed for all vehicles,	S = 50.2	mph

---

Phone: Fax:  
E-mail:

Merge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 EB  
 Junction: On Ramp from SR 417 WB  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3530	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	870	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	410	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	4826	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3530	870	410	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	959	236	111	v
Trucks and buses	9	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fhv	0.957	0.957	0.957	
Driver population factor, fp	1.00	1.00	1.00	

I-4 EB On Ramp from SR 417 WB\_Upstream.txt  
 Flow rate,  $v_p$  4010 988 466 pcph

Estimation of V12 Merge Areas

---

$$L = \text{(Equation 25-2 or 25-3)}$$

$$P = 0.591 \text{ Using Equation 1}$$

$$v_{12} = v_F \left( \frac{P}{P_{FM}} \right) = 2372 \text{ pc/h}$$

Capacity Checks

---

		Actual	Maximum	LOS F?
	$v_{FO}$	4998	6750	No
	$v_3$ or $v_{av34}$	1638 pc/h	(Equation 25-4 or 25-5)	
Is	$v_3$ or $v_{av34} > 2700$ pc/h?		No	
Is	$v_3$ or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes,	$v_{12A} = 2372$		(Equation 25-8)	

Flow Entering Merge Influence Area

---

		Actual	Max Desirable	Violation?
	$v_{R12}$	2372	4600	No

Level of Service Determination (if not F)

---

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 28.1$  pc/mi/ln  
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

---

Intermediate speed variable,	$M_S = 0.398$	
Space mean speed in ramp influence area,	$S_R = 49.8$	mph
Space mean speed in outer lanes,	$S_0 = 50.9$	mph
Space mean speed for all vehicles,	$S = 50.2$	mph

---

Phone: Fax:  
E-mail:

Diverge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: SR 417 WB  
 Junction: Off Ramp to I-4 WB  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1230	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	350	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	870	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	3070	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1230	350	870	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	334	95	236	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	0.00	0.00	%
Length	0.00	0.00	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	





Phone:  
E-mail:

Fax:

Diverge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: SR 417 WB  
 Junction: Off Ramp to I-4 EB  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge		
Number of lanes in freeway	3	✓	
Free-flow speed on freeway	55.0		mph
Volume on freeway	2100	✓	vph

Off Ramp Data

Side of freeway	Right		
Number of lanes in ramp	2		
Free-Flow speed on ramp	35.0		mph
Volume on ramp	870	✓	vph
Length of first accel/decel lane	600		ft
Length of second accel/decel lane	600		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	✓	
Volume on adjacent ramp	350	✓	vph
Position of adjacent ramp	Downstream		
Type of adjacent ramp	Off		
Distance to adjacent ramp	3070		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2100	870	350	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	571	236	95	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2397	993	399	pcph

Estimation of V12 Diverge Areas

$$L = \text{EQ} \quad (\text{Equation 25-8 or 25-9})$$

$$P = 0.450 \quad \text{Using Equation 0}$$

$$v_{12} = v_R + (v_F - v_R) P = 1625 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2397	6750	No
$v_{FO} = v_F - v_R$	1404	6750	No
$v_R$	993	3800	No
$v_{3 \text{ or } av34}$	772 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700 \text{ pc/h?}$		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 1625$		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	1625	4400	No

Level of Service Determination (if not F)

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 2.0 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence A ✓

Speed Estimation

Intermediate speed variable,	$D = 0.517$	
Space mean speed in ramp influence area,	$S_R = 48.3$	mph
Space mean speed in outer lanes,	$S_0 = 60.3$	mph
Space mean speed for all vehicles,	$S = 51.6$	mph

SR 417 EB On Ramp from I-4 WB.txt  
HCS+: Ramps and Ramp Junctions Release 5.4

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
E-mail: \_\_\_\_\_

Merge Analysis

---

Analyst: CTR  
Agency/Co.: HNTB  
Date performed: 8/05/10  
Analysis time period: No Build  
Freeway/Dir of Travel: SR 417 EB  
Junction: On Ramp from I-4 WB  
Jurisdiction: Seminole County  
Analysis Year: 2012  
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

---

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	610	vph

On Ramp Data

---

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1140	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

---

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	350	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	2584	ft

Conversion to pc/h Under Base Conditions

---

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	610	1140	350	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	166	310	95	v
Trucks and buses	10	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade				%
Length				mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	



Phone:  
E-mail:

Fax:

Diverge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: Frontage Rd (West of I-4) WB  
 Junction: Off Ramp to SR 417 EB  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2560 ✓	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	1140 ✓	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes ✓	
Volume on adjacent ramp	490 ✓	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	4594	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2560 ✓	1140	490	vph
Peak-hour factor, PHF	0.92 ✓	0.92	0.92	
Peak 15-min volume, v15	696 ✓	310	133	v
Trucks and buses	9 ✓	9	9	%
Recreational vehicles	0 ✓	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2908	1295	557	pcph

Estimation of V12 Diverge Areas

$$L = \text{EQ} \quad (\text{Equation 25-8 or 25-9})$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$v_{12} = v_R + (v_F - v_R) P = 2908 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2908	4500	No
$v_{FO} = v_F - v_R$	1613	4500	No
$v_R$	1295	2000	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700 \text{ pc/h?}$		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2908$		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	2908	4400	No

Level of Service Determination (if not F)

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 24.8 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence C ✓

Speed Estimation

Intermediate speed variable,	$D = 0.545$	
Space mean speed in ramp influence area,	$S_R = 47.9$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 47.9$	mph

Phone:  
E-mail:

Fax:

Diverge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: Frontage Rd (West of I-4) WB  
 Junction: Off Ramp to SR 417 EB  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2560	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	1140	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1270	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1954	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2560	1140	1270	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	696	310	345	v
Trucks and buses	9	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	



Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2908	1295	1443	pcph

Estimation of V12 Diverge Areas

$$L = \text{EQ} \quad (\text{Equation 25-8 or 25-9})$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$v_{12} = v_R + (v_F - v_R) P = 2908 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2908	4500	No
$v_{FO} = v_F - v_R$	1613	4500	No
$v_R$	1295	2000	No
$v_{3 \text{ or } 34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } 34} > 2700$ pc/h?		No	
Is $v_{3 \text{ or } 34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2908$		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	2908	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 24.8 \quad \text{pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D = 0.545$	
Space mean speed in ramp influence area,	$S_R = 47.9$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 47.9$	mph

Phone:  
E-mail:

Fax:

Diverge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/06/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 EB  
 Junction: Off Ramp to CR 46A  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4 ✓	
Free-flow speed on freeway	55.0	mph
Volume on freeway	5590 ✓	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0 ✓	mph
Volume on ramp	1190 ✓	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes ✓	
Volume on adjacent ramp	1280 ✓	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1906	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5590	1190	1280	vph
Peak-hour factor, PHF	0.92 ✓	0.92	0.92	
Peak 15-min volume, v15	1519	323	348	v
Trucks and buses	9 ✓	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6350	1352	1454	pcph

Estimation of V12 Diverge Areas

$$L = \text{EQ} \quad (\text{Equation 25-8 or 25-9})$$

$$P = 0.260 \quad \text{Using Equation 0}$$

$$v_{12} = v_R + (v_F - v_R) P = 2651 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	6350	9000	No
$v_{12} = v_F - v_R$	4998	9000	No
$v_R$	1352	3800	No
$v_{12}$	1849 pc/h	(Equation 25-15 or 25-16)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_R / 2$ ?		No	
If yes, $v_{12} = 2651$		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	2651	4400	No

Level of Service Determination (if not F)

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 13.6 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence B ✓

Speed Estimation

Intermediate speed variable,	$D = 0.550$	
Space mean speed in ramp influence area,	$S_R = 47.9$	mph
Space mean speed in outer lanes,	$S_0 = 57.0$	mph
Space mean speed for all vehicles,	$S = 52.8$	mph

Phone: Fax:  
E-mail:

Merge Analysis

Analyst: CTR  
Agency/Co.: HNTB  
Date performed: 3/09/07  
Analysis time period: No Build  
Freeway/Dir of Travel: Frontage Rd (West of I-4) SB  
Junction: On Ramp from SR 46 EB  
Jurisdiction: Seminole County  
Analysis Year: 2012  
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis Merge  
Number of lanes in freeway 2  
Free-flow speed on freeway 55.0 mph  
Volume on freeway 930 vph

On Ramp Data

Side of freeway Right  
Number of lanes in ramp 1  
Free-flow speed on ramp 35.0 mph  
Volume on ramp 1190 vph  
Length of first accel/decel lane 500 ft  
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes  
Volume on adjacent Ramp 490 vph  
Position of adjacent Ramp Upstream  
Type of adjacent Ramp Off  
Distance to adjacent Ramp 1320 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, v (vph)	930	1190	490	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	258	331	136	v
Trucks and buses	0	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1033	1322	544	pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)  
EQ  
P = 1.000 Using Equation 0  
FM  
 $v_{12} = v_{F} (P_{FM}) = 1033 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
v <sub>FO</sub>	2355	4500	No
v <sub>3 or av34</sub>	0 pc/h	(Equation 25-4 or 25-5)	
Is v <sub>3 or av34</sub> > 2700 pc/h?		No	
Is v <sub>3 or av34</sub> > 1.5 v <sub>12</sub> / 2		No	
If yes, v <sub>12A</sub> =		(Equation 25-8)	

Flow Entering Merge Influence Area			
	Actual	Max Desirable	Violation?
$v_R$ 12	1033	4400	No
Level of Service Determination (if not F)			

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 20.1$  pc/mi/ln  
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation			
Intermediate speed variable,	$M$	$= 0.327$	
Space mean speed in ramp influence area,	$S_R$	$= 50.7$	mph
Space mean speed in outer lanes,	$S_0$	$= N/A$	mph
Space mean speed for all vehicles,	$S$	$= 50.7$	mph

Phone:  
E-mail:

Fax:

Merge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 EB  
 Junction: On Ramp from CR 46A  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge		
Number of lanes in freeway	3		
Free-flow speed on freeway	55.0	mph	
Volume on freeway	3120 ✓	vph	

On Ramp Data

Side of freeway	Right		
Number of lanes in ramp	1		
Free-flow speed on ramp	35.0	mph	
Volume on ramp	410 ✓	vph	
Length of first accel/decel lane	1500	ft	
Length of second accel/decel lane		ft	

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes		
Volume on adjacent Ramp	870 ✓	vph	
Position of adjacent Ramp	Downstream		
Type of adjacent Ramp	On		
Distance to adjacent Ramp	4826	ft	

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3120	410	870	vph
Peak-hour factor, PHF	0.92 ✓	0.92	0.92	
Peak 15-min volume, v15	848 ✓	111	236	v
Trucks and buses	9 ✓	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3544	466	988	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 0.619 \text{ Using Equation 1}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 2196 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v <sub>FO</sub>	4010	6750	No
v <sub>3 or av34</sub>	1348 pc/h	(Equation 25-4 or 25-5)	
Is v <sub>3 or av34</sub> > 2700 pc/h?		No	
Is v <sub>3 or av34</sub> > 1.5 v <sub>12</sub> / 2		No	
If yes, v <sub>12A</sub> = 2196		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v <sub>R12</sub>	2196	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 16.6 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B ✓

Speed Estimation

Intermediate speed variable,	M = 0.272	
Space mean speed in ramp influence area,	S <sub>R</sub> = 51.5	mph
Space mean speed in outer lanes,	S <sub>0</sub> = 51.9	mph
Space mean speed for all vehicles,	S = 51.6	mph

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

Merge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 EB  
 Junction: On Ramp from CR 46A  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3120 ✓	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0 ✓	mph
Volume on ramp	410 ✓	vph
Length of first accel/decel lane	1500 ✓	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes ✓	
Volume on adjacent Ramp	1280 ✓	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1410	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3120	410	1280	vph
Peak-hour factor, PHF	0.92 ✓	0.92	0.92	
Peak 15-min volume, v15	848 ✓	111	348	v
Trucks and buses	9 ✓	9	9	%
Recreational vehicles	0 ✓	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%
Length	mi	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	



Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3544	466	1454	pcph

Estimation of V12 Merge Areas

---

L = 952.34 (Equation 25-2 or 25-3)  
EQ  
P = 0.619 Using Equation 1  
FM  
 $v_{12} = v_{F \text{ FM}} (P) = 2196 \text{ pc/h}$

Capacity Checks

---

	Actual	Maximum	LOS F?
v FO	4010	6750	No
v 3 or av34	1348 pc/h	(Equation 25-4 or 25-5)	
Is v 3 or av34	> 2700 pc/h?	No	
Is v 3 or av34	> 1.5 v / 2	No	
If yes, v 12A	= 2196	(Equation 25-8)	

Flow Entering Merge Influence Area

---

	Actual	Max Desirable	Violation?
v R12	2196	4600	No

Level of Service Determination (if not F)

---

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 16.6 \text{ pc/mi/ln}$   
Level of service for ramp-freeway junction areas of influence B ✓

Speed Estimation

---

Intermediate speed variable,	M = 0.272	
Space mean speed in ramp influence area,	S = 51.5	mph
Space mean speed in outer lanes,	S = 51.9	mph
Space mean speed for all vehicles,	S = 51.6	mph

---

Phone:  
E-mail:

Fax:

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Diverge Analysis

---

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: Frontage Rd (West of I-4) WB  
 Junction: Off Ramp to CR 46A  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

---

Freeway Data

---

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1420 ✓	vph

---

Off Ramp Data

---

Side of freeway	Right	
Number of lanes in ramp	1 ✓	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	490 ✓	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

---

Adjacent Ramp Data (if one exists)

---

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1190 ✓	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1320	ft

---

Conversion to pc/h Under Base Conditions

---

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1420 ✓	490	1190	vph
Peak-hour factor, PHF	0.92 ✓	0.92	0.92	
Peak 15-min volume, v15	386	133	323	v
Trucks and buses	9 ✓	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1613	557	1352	pcph

Estimation of V12 Diverge Areas

---

$$L = \text{(Equation 25-8 or 25-9)}$$

$$EQ$$

$$P = 1.000 \quad \text{Using Equation 0}$$

$$FD$$

$$v_{12R} = v_{FR} + (v_{FR} - v_{FD}) P = 1613 \quad \text{pc/h}$$

Capacity Checks

---

	Actual	Maximum	LOS F?
$v_{Fi} = v_{FR}$	1613	4500	No
$v_{FO} = v_{FR} - v_{R}$	1056	4500	No
$v_{R}$	557	2000	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700$ pc/h?		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 1613$		(Equation 25-18)	

Flow Entering Diverge Influence Area

---

	Actual	Max Desirable	Violation?
$v_{12}$	1613	4400	No

Level of Service Determination (if not F)

---

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 13.6$  pc/mi/ln

Level of service for ramp-freeway junction areas of influence B ✓

Speed Estimation

---

Intermediate speed variable,	$D = 0.478$	
Space mean speed in ramp influence area,	$S_R = 48.8$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 48.8$	mph

---

Phone:  
E-mail:

Fax:

Diverge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: Frontage Rd (West of I-4) WB  
 Junction: Off Ramp to CR 46A  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1420 ✓	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	490 ✓	vph
Length of first accel/decel lane	500 ✓	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1140 ✓	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	4594	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1420 ✓	490	1140	vph
Peak-hour factor, PHF	0.92 ✓	0.92	0.92	
Peak 15-min volume, v15	386	133	310	v
Trucks and buses	9 ✓	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1613	557	1295	pcph

Estimation of V12 Diverge Areas

---

L = (Equation 25-8 or 25-9)  
EQ  
P = 1.000 Using Equation 0  
FD  
 $v_{12} = v_R + (v_F - v_R) P = 1613$  pc/h

Capacity Checks

---

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1613	4500	No
$v_{FO} = v_F - v_R$	1056	4500	No
$v_R$	557	2000	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700$ pc/h?		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 1613$		(Equation 25-18)	

Flow Entering Diverge Influence Area

---

	Actual	Max Desirable	Violation?
$v_{12}$	1613	4400	No

Level of Service Determination (if not F)

---

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 13.6$  pc/mi/ln  
Level of service for ramp-freeway junction areas of influence B ✓

Speed Estimation

---

Intermediate speed variable,	D = 0.478	
Space mean speed in ramp influence area,	S <sub>R</sub> = 48.8	mph
Space mean speed in outer lanes,	S <sub>0</sub> = N/A	mph
Space mean speed for all vehicles,	S = 48.8	mph

---

Phone: Fax:  
E-mail:

---

Merge Analysis

---

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: Frontage Rd (West of I-4) WB  
 Junction: On Ramp from CR 46A  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

---

Freeway Data

---

Type of analysis	Merge		
Number of lanes in freeway	2		
Free-flow speed on freeway	55.0		mph
Volume on freeway	930 ✓		vph

---

On Ramp Data

---

Side of freeway	Right		
Number of lanes in ramp	1		
Free-flow speed on ramp	35.0		mph
Volume on ramp	1190 ✓		vph
Length of first accel/decel lane	500		ft
Length of second accel/decel lane			ft

---

Adjacent Ramp Data (if one exists)

---

Does adjacent ramp exist?	Yes ✓		
Volume on adjacent Ramp	490 ✓		vph
Position of adjacent Ramp	Upstream		
Type of adjacent Ramp	Off		
Distance to adjacent Ramp	1320		ft

---

Conversion to pc/h Under Base Conditions

---

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	930 ✓	1190	490	vph
Peak-hour factor, PHF	0.92 ✓	0.92	0.92	
Peak 15-min volume, v15	253 ✓	323	133	v
Trucks and buses	9 ✓	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%
Length	mi	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1056	1352	557	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \text{ Using Equation 0}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1056 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v <sub>FO</sub>	2408	4500	No
v <sub>3 or av34</sub>	0 pc/h	(Equation 25-4 or 25-5)	
Is v <sub>3 or av34</sub> > 2700 pc/h?		No	
Is v <sub>3 or av34</sub> > 1.5 v <sub>12</sub> / 2		No	
If yes, v <sub>12A</sub> = 1056		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v <sub>R12</sub>	1056	4600	No

Level of Service Determination (if not F)

$$Density, D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 20.5 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C ✓

Speed Estimation

Intermediate speed variable,	M = 0.329	
Space mean speed in ramp influence area,	S <sub>R</sub> = 50.7	mph
Space mean speed in outer lanes,	S <sub>0</sub> = N/A	mph
Space mean speed for all vehicles,	S = 50.7	mph

Phone:  
E-mail:

Fax:

Diverge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 EB  
 Junction: Off Ramp to SR 417 EB & SR 46  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	4400 ✓	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	1280 ✓	vph
Length of first accel/decel lane	575	ft
Length of second accel/decel lane	575	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes ✓	
Volume on adjacent ramp	1190 ✓	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1906	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4400	1280	1190	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1196	348	323	v
Trucks and buses	9	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	%
Length	0.00 mi	0.00 mi	0.00 mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	



Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4998	1454	1352	pcph

Estimation of V12 Diverge Areas

$$L = \frac{EQ}{P} \quad (\text{Equation 25-8 or 25-9})$$

$$P = 0.450 \quad \text{Using Equation 0}$$

$$v_{12} = v_R + (v_F - v_R) P = 3049 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4998	6750	No
$v_{FO} = v_F - v_R$	3544	6750	No
$v_R$	1454	3800	No
$v_{3 \text{ or } av34}$	1949 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700$ pc/h?		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3049$		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	3049	4400	No

Level of Service Determination (if not F)

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 14.9$  pc/mi/ln

Level of service for ramp-freeway junction areas of influence B ✓

Speed Estimation

Intermediate speed variable,	$D = 0.559$	
Space mean speed in ramp influence area,	$S = 47.7$	mph
Space mean speed in outer lanes,	$S = 56.6$	mph
Space mean speed for all vehicles,	$S = 50.9$	mph

Phone: Fax:  
 E-mail:

Diverge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 08/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 WB  
 Junction: Off Ramp to SR 417 EB & CR 46A  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3 ✓	
Free-flow speed on freeway	55.0 ✓	mph
Volume on freeway	4400 ✓	vph

Off Ramp Data

Side of freeway	Right ✓	
Number of lanes in ramp	2 ✓	
Free-Flow speed on ramp	35.0 ✓	mph
Volume on ramp	1270 ✓	vph
Length of first accel/decel lane	500 ✓	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes ✓	
Volume on adjacent ramp	1010 ✓	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	6098	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4400	1270	1010	vph
Peak-hour factor, PHF	0.92 ✓	0.92	0.92	
Peak 15-min volume, v15	1196 ✓	345	274	v
Trucks and buses	9 ✓	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	%
Length	0.00 mi	0.00 mi	0.00 mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4998	1443	1147	pcph

Estimation of V12 Diverge Areas

---

$$L = \text{EQ} \quad (\text{Equation 25-8 or 25-9})$$

$$P = 0.450 \quad \text{Using Equation 0}$$

$$v_{12R} = v_{FR} + (v_{FR} - v_{FD}) P = 3043 \text{ pc/h}$$

Capacity Checks

---

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4998	6750	No
$v_{FO} = v_F - v_R$	3555	6750	No
$v_R$	1443	3800	No
$v_{3 \text{ or } av34}$	1955 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700 \text{ pc/h?}$		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3043$		(Equation 25-18)	

Flow Entering Diverge Influence Area

---

	Actual	Max Desirable	Violation?
$v_{12}$	3043	4400	No

Level of Service Determination (if not F)

---

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 16.9 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence B ✓

Speed Estimation

---

Intermediate speed variable,	$D = 0.558$	
Space mean speed in ramp influence area,	$S_R = 47.7$	mph
Space mean speed in outer lanes,	$S_0 = 56.6$	mph
Space mean speed for all vehicles,	$S = 50.9$	mph

---

Phone: Fax:  
E-mail:

Merge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: Frontage Rd (west of I-4) WB  
 Junction: On Ramp from I-4 WB  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1290	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1270	vph
Length of first accel/decel lane	1300	ft
Length of second accel/decel lane	1300	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	610	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	4005	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1290	1270	610	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	351	345	166	v
Trucks and buses	9	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	



Phone: Fax:  
E-mail:

Merge Analysis

Analyst: CTR  
Agency/Co.: HNTB  
Date performed: 3/09/07  
Analysis time period: No Build  
Freeway/Dir of Travel: I-4 NB  
Junction: On Ramp from SR 46 & CR 46A  
Jurisdiction: Seminole County  
Analysis Year: 2012  
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3070	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	2120	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane	750	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	350	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	3654	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, v (vph)	3070	2120	350	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	853	589	97	v
Trucks and buses	0	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3411	2356	389	pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)  
EQ  
P = 0.209 Using Equation 0  
FM  
 $v_{12} = v_{12} \left( \frac{P}{F} \right)_{FM} = 713 \text{ pc/h}$

Capacity Checks

v	Actual	Maximum	LOS F?
F0	5767	9000	No
v	1349 pc/h	(Equation 25-4 or 25-5)	
3 or av34			
Is v > 2700 pc/h?		No	
3 or av34			
Is v > 1.5 v <sub>12</sub> / 2		Yes	
3 or av34			
If yes, v <sub>12A</sub> = 1364		(Equation 25-8)	

Flow Entering Merge Influence Area			
v	Actual	Max Desirable	Violation?
12A	1364	4400	No
Level of Service Determination (if not F)			

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 19.3$  pc/mi/ln  
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation	
Intermediate speed variable,	M = 0.324
Space mean speed in ramp influence area,	S <sub>R</sub> = 50.8 mph
Space mean speed in outer lanes,	S <sub>0</sub> = 53.1 mph
Space mean speed for all vehicles,	S = 51.6 mph

Phone: Fax:  
E-mail:

Merge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 WB  
 Junction: On Ramp from SR 46 & CR 46A  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3480	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	2120	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane	750	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	350	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	3654	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3480	2120	350	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	946	576	95	v
Trucks and buses	9	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	





Phone: Fax:  
E-mail:

Merge Analysis

Analyst: CTR  
Agency/Co.: HNTB  
Date performed: 3/09/07  
Analysis time period: No Build  
Freeway/Dir of Travel: SR 417 EB  
Junction: On Ramp from I-4 SB  
Jurisdiction: Seminole County  
Analysis Year: 2012  
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis Merge  
Number of lanes in freeway 2  
Free-flow speed on freeway 55.0 mph  
Volume on freeway 610 vph

On Ramp Data

Side of freeway Right  
Number of lanes in ramp 1  
Free-flow speed on ramp 35.0 mph  
Volume on ramp 1140 vph  
Length of first accel/decel lane 750 ft  
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes  
Volume on adjacent Ramp 350 vph  
Position of adjacent Ramp Downstream  
Type of adjacent Ramp On  
Distance to adjacent Ramp 2584 ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	610	1140	350	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	169	317	97	v
Trucks and buses	0	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	678	1267	389	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 1.000 \text{ Using Equation 0}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 678 \text{ pc/h}$$

Capacity Checks

Actual 1945 Maximum 4500 LOS F? NO

$v_{FO} = 0 \text{ pc/h}$  (Equation 25-4 or 25-5)

Is  $v_{3 \text{ or } av34} > 2700 \text{ pc/h?}$  No

Is  $v_{3 \text{ or } av34} > 1.5 \frac{v_{12}}{2}$  No

If yes,  $v_{12A} =$  (Equation 25-8)

Flow Entering Merge Influence Area			
	Actual	Max Desirable	Violation?
v	678	4400	No
12			!
Level of Service Determination (if not F)			
Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 15.4$ pc/mi/ln			
Level of service for ramp-freeway junction areas of influence B			
Speed Estimation			
Intermediate speed variable,		M = 0.296	
Space mean speed in ramp influence area,		S <sub>R</sub> = 51.2	mph
Space mean speed in outer lanes,		S <sub>0</sub> = N/A	mph
Space mean speed for all vehicles,		S = 51.2	mph

Phone:  
E-mail:

Fax:

Operational Analysis

Analyst: CTR  
Agency/Co.: HNTB  
Date Performed: 3/09/07  
Analysis Time Period: No-Build  
Freeway/Dir of Travel: I-4 WB  
Weaving Location: I-4 WB CD Road  
Jurisdiction: Seminole County  
Analysis Year: 2012  
Description: Wekiva Parkway PD&E

Inputs

Freeway free-flow speed, SFF 65 mph  
weaving number of lanes, N 3  
weaving segment length, L 1954 ft  
Terrain type Level  
Grade %  
Length mi  
Weaving type B Multilane or C-D  
Volume ratio, VR 0.73  
Weaving ratio, R 0.46

Conversion to pc/h Under Base Conditions

	Non-weaving		Weaving		veh/h
	V A-C	V B-D	V A-D	V B-C	
Volume, V	410	280	860	1010	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	114	78	239	281	v
Trucks and buses	0	0	0	0	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fhv	1.000	1.000	1.000	1.000	
Driver population adjustment, fp	1.00	1.00	1.00	1.00	
Flow rate, v	455	311	955	1122	pc/h

Weaving and Non-weaving Speeds

	Weaving	Non-weaving
a (Exhibit 24-6)	0.08	0.0020
b (Exhibit 24-6)	2.20	6.00
c (Exhibit 24-6)	0.70	1.00
d (Exhibit 24-6)	0.50	0.50
Weaving intensity factor, wi	0.73	1.15
Weaving and non-weaving speeds, Si	46.73	40.56
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		2.49
Maximum number of lanes, Nw (max) (Exhibit 24-7)		3.50
Type of operation is		Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 44.89 mph  
Weaving segment density, D 21.11 pc/mi/ln  
Level of service, LOS B  
Capacity of base condition, cb 5006 pc/h  
Capacity as a 15-minute flow rate, c 5006 pc/h  
Capacity as a full-hour volume, ch 4505 pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded	See Note
Weaving flow rate, vw	2077	4000	a
Average flow rate (pcphpl)	947	2350	b
Volume ratio, VR	0.73	0.80	c
Weaving ratio, R	0.46	N/A	d
Weaving length (ft)	1954	2500	e

Notes:

- a. weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
- b. Capacity constrained by basic freeway capacity.

- c. Capacity occurs under constrained operating conditions.
- d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
- e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
- f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
- g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
- h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
- i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

I-4 WB On Ramp from CR 46A & SR 46.txt  
HCS+: Basic Freeway Segments Release 5.4

Phone: Fax:  
E-mail:

Operational Analysis

Analyst: CTR  
Agency or Company: HNTB  
Date Performed: 8/10/2010  
Analysis Time Period: No-Build  
Freeway/Direction: I-4 WB  
From/To: On Ramp from CR 46A & SR 46  
Jurisdiction: Seminole County  
Analysis Year: 2012  
Description: Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	5590	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1519	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fhv	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	1587	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.90	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	2.0	mi/h
Number of lanes adjustment, fn	1.5	mi/h
Free-flow speed, FFS	66.5	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1587	pc/h/ln
Free-flow speed, FFS	66.5	mi/h
Average passenger-car speed, S	66.3	mi/h
Number of lanes, N	4	
Density, D	23.9	pc/mi/ln
Level of service, LOS	C	

I-4 WB On Ramp from CR 46A & SR 46.txt

Overall results are not computed when free-flow speed is less than 55 mph.

Phone: Fax:  
E-mail:

Diverge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 EB  
 Junction: Off Ramp to US 17/92  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4 ✓	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5410 ✓	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	620 ✓	vph
Length of first accel/decel lane	1045	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	300 ✓	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1948	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5410	620	300	vph
Peak-hour factor, PHF	0.92 J	0.92	0.92	
Peak 15-min volume, v15	1470 J	168	82	v
Trucks and buses	9	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	%
Length	0.00 mi	0.00 mi	0.00 mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	



Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6145	704	341	pcph

Estimation of V12 Diverge Areas

$$L = \text{EQ} \quad (\text{Equation 25-8 or 25-9})$$

$$P = 0.436 \quad \text{Using Equation 8}$$

$$v_{12} = v_R + (v_F - v_R) P = 3076 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6145	9600	No
$v_{FO} = v_F - v_R$	5441	9600	No
$v_R$	704	2000	No
$v_{3 \text{ or } 34}$	1534 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } 34} > 2700 \text{ pc/h?}$		No	
Is $v_{3 \text{ or } 34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3076$		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	3076	4400	No

Level of Service Determination (if not F)

Density,  $D = 4.252 + 0.0086 v_R - 0.009 L_D = 21.3 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence C ✓

Speed Estimation

Intermediate speed variable,	$D = 0.491$	
Space mean speed in ramp influence area,	$S_R = 56.2$	mph
Space mean speed in outer lanes,	$S_0 = 74.7$	mph
Space mean speed for all vehicles,	$S = 64.2$	mph

Phone: Fax:  
E-mail:

Merge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 08/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 EB  
 Junction: On Ramp from US 17/92  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	✓3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4790 ✓	vph

On Ramp Data

Side of freeway	✓Right	
Number of lanes in ramp	✓1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	300 ✓	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	620	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1948	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4790	300	620	vph
Peak-hour factor, PHF	0.92 ✓	0.92	0.92	
Peak 15-min volume, v15	1302 ✓	82	168	v
Trucks and buses	9 ✓	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	%
Length	mi	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5441	341	704	pcph

Estimation of V12 Merge Areas

$$L = 887.55 \text{ (Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 0.591 \text{ Using Equation 1}$$

$$FM$$

$$v_{12} = v_{F, FM} (P) = 3218 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v <sub>FO</sub>	5782	7200	No
v <sub>3 or av34</sub>	2223 pc/h	(Equation 25-4 or 25-5)	
Is v <sub>3 or av34</sub> > 2700 pc/h?		No	
Is v <sub>3 or av34</sub> > 1.5 v <sub>12</sub> / 2		No	
If yes, v <sub>12A</sub> = 3218		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v <sub>R12</sub>	3218	4600	No

Level of Service Determination (if not F)

$$Density, D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 29.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence D ✓

Speed Estimation

Intermediate speed variable,	M = 0.423	
Space mean speed in ramp influence area,	S = 58.2	mph
Space mean speed in outer lanes,	S = 63.8	mph
Space mean speed for all vehicles,	S = 60.2	mph

Phone: Fax:  
 E-mail:

Diverge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 WB  
 Junction: Off Ramp to US 17/92  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3 ✓	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5090 ✓	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1 ✓	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	300 ✓	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	620 ✓	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1948	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5090 ✓	300	620	vph
Peak-hour factor, PHF	0.92 ✓	0.92	0.92	
Peak 15-min volume, v15	1383 ✓	82	168	v
Trucks and buses	9 ✓	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5782	341	704	pcph

Estimation of V12 Diverge Areas

---

L = (Equation 25-8 or 25-9)  
EQ  
P = 0.600 Using Equation 5  
FD  
 $v_{12} = v_R + (v_F - v_R) P = 3604$  pc/h  
FD

Capacity Checks

---

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5782	7200	No
$v_{FO} = v_F - v_R$	5441	7200	No
$v_R$	341	2000	No
$v_{3 \text{ or } av34}$	2178 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700$ pc/h?		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3604$		(Equation 25-18)	

Flow Entering Diverge Influence Area

---

	Actual	Max Desirable	Violation?
$v_{12}$	3604	4400	No

Level of Service Determination (if not F)

---

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 29.8$  pc/mi/ln  
Level of service for ramp-freeway junction areas of influence D ✓

Speed Estimation

---

Intermediate speed variable,	D = 0.459	
Space mean speed in ramp influence area,	S = 57.2	mph
Space mean speed in outer lanes,	S = 72.2	mph
Space mean speed for all vehicles,	S = 62.0	mph

---

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

Merge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 WB  
 Junction: On Ramp from US 17/92  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge		
Number of lanes in freeway	4		
Free-flow speed on freeway	70.0	mph	
Volume on freeway	4790	vph	

On Ramp Data

Side of freeway	Right		
Number of lanes in ramp	1		
Free-flow speed on ramp	35.0	mph	
Volume on ramp	620	vph	
Length of first accel/decel lane	500	ft	
Length of second accel/decel lane		ft	

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes		
Volume on adjacent Ramp	300	vph	
Position of adjacent Ramp	Upstream		
Type of adjacent Ramp	Off		
Distance to adjacent Ramp	1948	ft	

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4790	620	300	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1302	168	82	v
Trucks and buses	9	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5*	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5441	704	341	pcph

Estimation of V12 Merge Areas

$$L = \text{(Equation 25-2 or 25-3)}$$

$$EQ$$

$$P = 0.130 \text{ Using Equation 4}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 706 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v <sub>FO</sub>	6145	9600	No
v <sub>3 or av34</sub>	2367 pc/h	(Equation 25-4 or 25-5)	
Is v <sub>3 or av34</sub> > 2700 pc/h?		No	
Is v <sub>3 or av34</sub> > 1.5 v <sub>12</sub> / 2		Yes	
If yes, v <sub>12A</sub> = 2176		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v <sub>12A</sub>	2176	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 24.5 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C ✓

Speed Estimation

Intermediate speed variable,	M = 0.355	
Space mean speed in ramp influence area,	S = 60.0	mph
Space mean speed in outer lanes,	S = 65.9	mph
Space mean speed for all vehicles,	S = 63.0	mph

Phone:  
E-mail:

Fax:

---

Diverge Analysis

---

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 08/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 WB  
 Junction: Off Ramp to SR 46  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

---

Freeway Data

---

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	55.0	mph
Volume on freeway	5410	vph

---

Off Ramp Data

---

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	1010	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane	500	ft

---

Adjacent Ramp Data (if one exists)

---

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1270	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	6098	ft

---

Conversion to pc/h Under Base Conditions

---

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5410	1010	1270	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1470	274	345	v
Trucks and buses	9	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	



Flow rate, vp I-4 WB Off Ramp to SR 46.txt 1443 pcph  
 6145 1147

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)  
 EQ  
 P = 0.260 Using Equation 0  
 FD  

$$v_{12} = v_R + (v_F - v_R) P = 2446 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6145	9000	No
$v_{FO} = v_F - v_R$	4998	9000	No
$v_R$	1147	3800	No
$v_{3 \text{ or } av34}$	1849 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700 \text{ pc/h?}$		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 2458$		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12A}$	2458	4400	No

Level of Service Determination (if not F)

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 20.9 \text{ pc/mi/ln}$   
 Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	$D = 0.531$	
Space mean speed in ramp influence area,	$S_R = 48.1$	mph
Space mean speed in outer lanes,	$S_0 = 57.0$	mph
Space mean speed for all vehicles,	$S = 53.1$	mph

Phone:  
E-mail:

Fax:

Merge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 WB  
 Junction: On Ramp from SR 417 WB  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3 ✓	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3130 ✓	vph

On Ramp Data

Side of freeway	Right ✓	
Number of lanes in ramp	1 ✓	
Free-flow speed on ramp	35.0	mph
Volume on ramp	350 ✓	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes ✓	
Volume on adjacent Ramp	2120 ✓	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	3654	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3130 ✓	350	2120	vph
Peak-hour factor, PHF	0.92 ✓	0.92	0.92	
Peak 15-min volume, v15	851 ✓	95	576	v
Trucks and buses	9	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3555	398	2408	pcph

Estimation of V12 Merge Areas

---

L = (Equation 25-2 or 25-3)  
EQ  
P = 0.603 Using Equation 1  
FM  
 $v_{12} = v_F (P_{FM}) = 2143 \text{ pc/h}$

Capacity Checks

---

	Actual	Maximum	LOS F?
v <sub>FO</sub>	3953	6750	No
v <sub>3 or av34</sub>	1412 pc/h	(Equation 25-4 or 25-5)	
Is v <sub>3 or av34</sub> > 2700 pc/h?		No	
Is v <sub>3 or av34</sub> > 1.5 v <sub>12</sub> / 2		No	
If yes, v <sub>12A</sub> = 2143		(Equation 25-8)	

Flow Entering Merge Influence Area

---

	Actual	Max Desirable	Violation?
v <sub>R12</sub>	2143	4600	No

Level of Service Determination (if not F)

---

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 19.5 \text{ pc/mi/ln}$   
Level of service for ramp-freeway junction areas of influence B ✓

Speed Estimation

---

Intermediate speed variable,	M = 0.308	
Space mean speed in ramp influence area,	S <sub>R</sub> = 51.0	mph
Space mean speed in outer lanes,	S <sub>0</sub> = 51.7	mph
Space mean speed for all vehicles,	S = 51.3	mph

---

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

Merge Analysis

Analyst: CTR  
 Agency/Co.: HNTB  
 Date performed: 8/05/10  
 Analysis time period: No Build  
 Freeway/Dir of Travel: I-4 WB  
 Junction: On Ramp from SR 417 WB  
 Jurisdiction: Seminole County  
 Analysis Year: 2012  
 Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3130	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	350	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1270	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3490	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3130	350	1270	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	851	95	345	v
Trucks and buses	9	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3555	398	1443	pcph

Estimation of V12 Merge Areas

---

L = 673.74 (Equation 25-2 or 25-3)  
EQ  
P = 0.603 Using Equation 1  
FM  
 $v_{12} = v_F (P_{FM}) = 2143 \text{ pc/h}$

Capacity Checks

---

v	Actual	Maximum	LOS F?
FO	3953	6750	No
v	1412 pc/h	(Equation 25-4 or 25-5)	
Is v	> 2700 pc/h?	No	
Is v	> 1.5 v / 2	No	
If yes, v	= 2143	(Equation 25-8)	

Flow Entering Merge Influence Area

---

v	Actual	Max Desirable	Violation?
R12	2143	4600	No

Level of Service Determination (if not F)

---

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 19.5 \text{ pc/mi/ln}$   
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

---

Intermediate speed variable,	M = 0.308	
Space mean speed in ramp influence area,	S = 51.0	mph
Space mean speed in outer lanes,	S = 51.7	mph
Space mean speed for all vehicles,	S = 51.3	mph

---

# RAMPS AND RAMP JUNCTIONS WORKSHEET

## General Information

Analyst: KNM  
 Agency or Company: HNTB  
 Date Performed: 3/24/08  
 Analysis Time Period: No Build

## Site Information

Freeway/Dir of Travel: I-4 WB  
 Junction: Off Ramp to US 1792  
 Jurisdiction: Seminole County  
 Analysis Year: 2012

Project Description: Wekiva Parkway Project Development & Environment Study

## Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft		$L_{down} =$ 1948 ft
$V_u =$ veh/h	$S_{FF} = 70.0$ mph $S_{FR} = 35.0$ mph	$V_D =$ 620 veh/h
Sketch (show lanes, $L_A, L_D, V_R, V_f$ )		

## Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4700	0.95	Level	9	0	0.957	1.00	5170
Ramp	300	0.95	Level	9	0	0.957	1.00	330
UpStream								
DownStream	620	0.95	Level	9	0	0.957	1.00	682

## Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$   
 (Equation 25-2 or 25-3)  
 $L_{EQ} =$     using Equation (Exhibit 25-5)  
 $P_{FM} =$     pc/h  
 $V_{12} =$     pc/h (Equation 25-4 or 25-5)  
 $V_3$  or  $V_{av34}$     pc/h (Equation 25-4 or 25-5)  
 Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No  
 Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No  
 If Yes,  $V_{12a} =$     pc/h (Equation 25-8)

## Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 25-8 or 25-9)  
 $L_{EQ} =$     0.616 using Equation (Exhibit 25-12)  
 $P_{FD} =$     3309 pc/h  
 $V_{12} =$     1861 pc/h (Equation 25-15 or 25-16)  
 $V_3$  or  $V_{av34}$     1861 pc/h (Equation 25-15 or 25-16)  
 Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No  
 Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No  
 If Yes,  $V_{12a} =$     pc/h (Equation 25-18)

## Capacity Checks

	Actual	Capacity	LOS F?
$V_{FO}$		Exhibit 25-7	

## Capacity Checks

	Actual	Capacity	LOS F?
$V_F$	5170	Exhibit 25-14	7200 No
$V_{FO} = V_F - V_R$	4840	Exhibit 25-14	7200 No
$V_R$	330	Exhibit 25-3	2000 No

## Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$		Exhibit 25-7	

## Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$	3309	Exhibit 25-14	4400:All No

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$   
 $D_R =$     (pc/mi/ln)  
 LOS =    (Exhibit 25-4)

## Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 v_{12} - 0.0009 L_D$   
 $D_R =$     27.3 (pc/mi/ln)  
 LOS =    C (Exhibit 25-4)

## Speed Determination

$M_S =$     (Exhibit 25-19)  
 $S_R =$     mph (Exhibit 25-19)

## Speed Determination

$D_s =$     0.458 (Exhibit 25-19)  
 $S_R =$     57.2 mph (Exhibit 25-19)  
           73.4 mph (Exhibit 25-19)

# RAMPS AND RAMP JUNCTIONS WORKSHEET

## General Information

## Site Information

Analyst	KNM	Freeway/Dir of Travel	I-4 WB
Agency or Company	HNTB	Junction	On Ramp from US 1792
Date Performed	3/24/08	Jurisdiction	Seminole County
Analysis Time Period	No Build	Analysis Year	2012
Project Description: Wekiva Parkway Project Development & Environment Study			

## Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Off $L_{up} = 1948$ ft $V_u = 300$ veh/h	Terrain: Level  $S_{FF} = 70.0$ mph $S_{FR} = 35.0$ mph Sketch ( show lanes, $L_A, L_D, V_R, V_I$ )	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Off $L_{down} =$ ft $V_D =$ veh/h
--	--	---

## Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4400	0.95	Level	9	0	0.957	1.00	4840
Ramp	620	0.95	Level	9	0	0.957	1.00	682
UpStream	300	0.95	Level	9	0	0.957	1.00	330
DownStream								

### Merge Areas

### Diverge Areas

## Estimation of $v_{12}$

## Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$   
(Equation 25-2 or 25-3)

$L_{EQ} =$  \_\_\_\_\_

$P_{FM} = 0.292$  using Equation (Exhibit 25-5)

$V_{12} = 1412$  pc/h

$V_3$  or  $V_{av34} = 1714$  pc/h (Equation 25-4 or 25-5)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} = 1936$  pc/h (Equation 25-8)

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
(Equation 25-8 or 25-9)

$L_{EQ} =$  \_\_\_\_\_

$P_{FD} =$  \_\_\_\_\_ using Equation (Exhibit 25-12)

$V_{12} =$  \_\_\_\_\_ pc/h

$V_3$  or  $V_{av34} =$  \_\_\_\_\_ pc/h (Equation 25-15 or 25-16)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  \_\_\_\_\_ pc/h (Equation 25-18)

## Capacity Checks

## Capacity Checks

	Actual	Capacity	LOS F?
$V_{FO}$	5522	Exhibit 25-7	No

	Actual	Capacity	LOS F?
$V_F$		Exhibit 25-14	
$V_{FO} = V_F - V_R$		Exhibit 25-14	
$V_R$		Exhibit 25-3	

## Flow Entering Merge Influence Area

## Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	2618	Exhibit 25-7 4600:All	No

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 25-14	

## Level of Service Determination (if not F)

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R = 22.4$  (pc/mi/ln)

LOS = C (Exhibit 25-4)

$D_R = 4.252 + 0.0086 V_{12} - 0.0009 L_D$

$D_R =$  \_\_\_\_\_ (pc/mi/ln)

LOS = \_\_\_\_\_ (Exhibit 25-4)

## Speed Determination

## Speed Determination

$M_S = 0.339$  (Exhibit 25-19)

$S_R = 60.5$  mph (Exhibit 25-19)

$D_s =$  \_\_\_\_\_ (Exhibit 25-19)

$S_R =$  \_\_\_\_\_ mph (Exhibit 25-19)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

### General Information

Analyst: KNM  
 Agency or Company: HNTB  
 Date Performed: 3/24/08  
 Analysis Time Period: No Build

### Site Information

Freeway/Dir of Travel: I-4 EB  
 Junction: Off Ramp to US 1792  
 Jurisdiction: Seminole County  
 Analysis Year: 2012

Project Description: Wekiva Parkway Project Development & Environment Study

### Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft		$L_{down} =$ 1948 ft
$V_u =$ veh/h	$S_{FF} = 70.0$ mph $S_{FR} = 35.0$ mph Sketch ( show lanes, $L_A, L_D, V_R, V_F$ )	$V_D =$ 300 veh/h

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5410	0.95	Level	9	0	0.957	1.00	5951
Ramp	620	0.95	Level	9	0	0.957	1.00	682
UpStream								
DownStream	300	0.95	Level	9	0	0.957	1.00	330

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$   
 (Equation 25-2 or 25-3)  
 $L_{EQ} =$  using Equation (Exhibit 25-5)  
 $P_{FM} =$  pc/h  
 $V_{12} =$  pc/h (Equation 25-4 or 25-5)  
 $V_3$  or  $V_{av34}$  pc/h  
 Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No  
 Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No  
 If Yes,  $V_{12a} =$  pc/h (Equation 25-8)

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 25-8 or 25-9)  
 $L_{EQ} =$  0.436 using Equation (Exhibit 25-12)  
 $P_{FD} =$  2979 pc/h  
 $V_{12} =$  1486 pc/h (Equation 25-15 or 25-16)  
 $V_3$  or  $V_{av34}$  pc/h  
 Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No  
 Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No  
 If Yes,  $V_{12a} =$  pc/h (Equation 25-18)

### Capacity Checks

### Capacity Checks

	Actual	Capacity	LOS F?
$V_{FO}$		Exhibit 25-7	
	$V_F$	Exhibit 25-14	9600 No
	$V_{FO} = V_F - V_R$	Exhibit 25-14	9600 No
	$V_R$	Exhibit 25-3	2000 No

### Flow Entering Merge Influence Area

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$		Exhibit 25-7	
	$V_{12}$	Exhibit 25-14	4400:All No

### Level of Service Determination (if not F)

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$   
 $D_R =$  (pc/mi/ln)  
 LOS = (Exhibit 25-4)

$D_R = 4.252 + 0.0086 V_{12} - 0.0009 L_D$   
 $D_R =$  20.5 (pc/mi/ln)  
 LOS = C (Exhibit 25-4)

### Speed Determination

### Speed Determination

$M_S =$  (Exhibit 25-19)  
 $S_R =$  mph (Exhibit 25-19)

$D_S =$  0.489 (Exhibit 25-19)  
 $S_R =$  56.3 mph (Exhibit 25-19)  
 74.9 mph (Exhibit 25-19)



Phone: Fax:  
E-mail:

Operational Analysis

Analyst: CTR  
Agency/Co.: HNTB  
Date Performed: 8/06/10  
Analysis Time Period: No-Build  
Freeway/Dir of Travel: I-4 WB CD Road  
Weaving Location: SR 46 to SR 417  
Jurisdiction: Seminole County  
Analysis Year: 2012  
Description: Wekiva Parkway PD&E

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	3	
Weaving segment length, L	1954	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	Multilane or C-D
Volume ratio, VR	0.73	
Weaving ratio, R	0.46	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V	V	V	V	
	o1	o2	w1	w2	
Volume, V	410	280	860	1010	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	111	76	234	274	v
Trucks and buses	9	9	9	9	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.957	0.957	0.957	0.957	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	465	318	976	1147	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.08	0.0020
b (Exhibit 24-6)	2.20	6.00
c (Exhibit 24-6)	0.70	1.00
d (Exhibit 24-6)	0.50	0.50
Weaving intensity factor, Wi	0.74	1.18
Weaving and non-weaving speeds, Si	46.52	40.26
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	2.49
Maximum number of lanes, Nw (max) (Exhibit 24-7)	3.50
Type of operation is	Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	44.65	mph
Weaving segment density, D	21.69	pc/mi/ln
Level of service, LOS	B	
Capacity of base condition, cb	5006	pc/h
Capacity as a 15-minute flow rate, c	4790	pc/h
Capacity as a full-hour volume, ch	4407	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded	See Note
Weaving flow rate, Vw	2123	4000	a
Average flow rate (pcphpl)	968	2350	b
Volume ratio, VR	0.73	0.80	c
Weaving ratio, R	0.46	N/A	d
Weaving length (ft)	1954	2500	e

Notes:

- a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
- b. Capacity constrained by basic freeway capacity.
- c. Capacity occurs under constrained operating conditions.
- d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
- e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
- f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
- g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
- h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
- i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

# RAMPS AND RAMP JUNCTIONS WORKSHEET

## General Information

## Site Information

Analyst: KNM	Freeway/Dir of Travel: I-4 EB
Agency or Company: HNTB	Junction: On Ramp from US 1792
Date Performed: 03/24/08	Jurisdiction: Seminole County
Analysis Time Period: No Build	Analysis Year: 2012
Project Description: Wekiva Parkway Project Development & Environment Study	

## Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Off		<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Off
$L_{up} = 1948$ ft		$L_{down} =$ ft
$V_u = 620$ veh/h	$S_{FF} = 70.0$ mph $S_{FR} = 35.0$ mph Sketch ( show lanes, $L_A, L_D, V_R, V_I$ )	$V_D =$ veh/h

## Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4790	0.95	Level	9	0	0.957	1.00	5269
Ramp	300	0.95	Level	9	0	0.957	1.00	330
UpStream	620	0.95	Level	9	0	0.957	1.00	682
DownStream								

### Merge Areas

### Diverge Areas

## Estimation of $v_{12}$

## Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$   
 $L_{EQ} = 848.39$  (Equation 25-2 or 25-3)  
 $P_{FM} = 0.591$  using Equation (Exhibit 25-5)  
 $V_{12} = 3117$  pc/h  
 $V_3$  or  $V_{av34} = 2152$  pc/h (Equation 25-4 or 25-5)  
 Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No  
 Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No  
 If Yes,  $V_{12a} =$  pc/h (Equation 25-8)

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 $L_{EQ} =$  (Equation 25-8 or 25-9)  
 $P_{FD} =$  using Equation (Exhibit 25-12)  
 $V_{12} =$  pc/h  
 $V_3$  or  $V_{av34} =$  pc/h (Equation 25-15 or 25-16)  
 Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No  
 Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No  
 If Yes,  $V_{12a} =$  pc/h (Equation 25-18)

## Capacity Checks

## Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	5599	Exhibit 25-7	No	$V_F$		Exhibit 25-14	
				$V_{FO} = V_F - V_R$		Exhibit 25-14	
				$V_R$		Exhibit 25-3	

## Flow Entering Merge Influence Area

## Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
$V_{R12}$	3447	Exhibit 25-7	No	$V_{12}$		Exhibit 25-14	

## Level of Service Determination (if not F)

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 $D_R = 29.1$  (pc/mi/ln)  
 LOS = D (Exhibit 25-4)

$D_R = 4.252 + 0.0086 V_{12} - 0.0009 L_D$   
 $D_R =$  (pc/mi/ln)  
 LOS = (Exhibit 25-4)

## Speed Determination

## Speed Determination

$M_S = 0.408$  (Exhibit 25-19)  
 $S_R = 58.6$  mph (Exhibit 25-19)

$D_S =$  (Exhibit 25-19)  
 $S_R =$  mph (Exhibit 25-19)

## SHORT REPORT

General Information	Site Information
Analyst <i>KNM</i>	Intersection <i>US 441 at CR 437</i>
Agency or Co. <i>HNTB</i>	Area Type <i>All other areas</i>
Date Performed <i>9/14/07</i>	Jurisdiction <i>Orange County</i>
Time Period <i>No Build SR46 2-Lane Arterial</i>	Analysis Year <i>2012 No Build</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2			2	0				0		0
Lane Group	L	T			TR						LR	
Volume (vph)	250	1220			1513	427				252		34
% Heavy Vehicles	11	11			11	11				2		2
PHF	0.95	0.95			0.95	0.95				0.95		0.95
Pretimed/Actuated (P/A)	A	A			A	A				A		A
Startup Lost Time	2.0	2.0			2.0						2.0	
Extension of Effective Green	2.0	2.0			2.0						2.0	
Arrival Type	3	3			3						3	
Unit Extension	3.0	3.0			3.0						3.0	
Ped/Bike/RTOR Volume	0	0		0	0	0				0	0	0
Lane Width	12.0	12.0			12.0						12.0	
Parking/Grade/Parking	N	0	N	N	0	N				N	0	N
Parking/Hour												
Bus Stops/Hour	0	0			0						0	
Minimum Pedestrian Time		3.2			3.2						3.2	
Phasing	EB Only	EW Perm	03	04	SB Only	06	07	08				
Timing	G = 15.0	G = 80.0	G =	G =	G = 35.0	G =	G =	G =				
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 145.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate	263	1284			2042						301	
Lane Group Capacity	218	2248			1739						424	
v/c Ratio	1.21	0.57			1.17						0.71	
Green Ratio	0.69	0.69			0.55						0.24	
Uniform Delay d <sub>1</sub>	53.2	11.5			32.5						50.4	
Delay Factor k	0.50	0.17			0.50						0.27	
Incremental Delay d <sub>2</sub>	127.9	0.4			84.9						5.5	
PF Factor	1.000	1.000			1.000						1.000	
Control Delay	181.1	11.9			117.4						55.8	
Lane Group LOS	F	B			F						E	
Approach Delay	40.6			117.4						55.8		
Approach LOS	D			F						E		
Intersection Delay	82.1			Intersection LOS						F		

SHORT REPORT												
General Information						Site Information						
Analyst	KNM					Intersection	US 441 West of WP Interchange					
Agency or Co.	HNTB					Area Type	All other areas					
Date Performed	09/28/07					Jurisdiction	Orange County					
Time Period	Build I-4 Connection @ SR417					Analysis Year	2012 No Build					
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		2			2	1				1		2
Lane Group		T			T	R				L		R
Volume (vph)		796			1691	89				141		1270
% Heavy Vehicles		10			10	10				2		2
PHF		0.95			0.95	0.95				0.95		0.95
Pretimed/Actuated (P/A)		A			A	A				A		A
Startup Lost Time		2.0			2.0	2.0				2.0		2.0
Extension of Effective Green		2.0			2.0	2.0				2.0		2.0
Arrival Type		3			3	3				3		3
Unit Extension		3.0			3.0	3.0				3.0		3.0
Ped/Bike/RTOR Volume	0	0		0	0	0	0	0		0	0	0
Lane Width		12.0			12.0	12.0				12.0		12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0			0	0				0		0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	
Phasing	Thru & RT	02	03	04	SB Only	06	07	08				
Timing	G = 35.0	G =	G =	G =	G = 25.0	G =	G =	G =				
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0						
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate		838			1780	94				148		1337
Lane Group Capacity		1645			1645	1468				632		2803
v/c Ratio		0.51			1.08	0.06				0.23		0.48
Green Ratio		0.50			0.50	1.00				0.36		1.00
Uniform Delay d <sub>1</sub>		11.7			17.5	0.0				15.8		0.0
Delay Factor k		0.12			0.50	0.11				0.11		0.11
Incremental Delay d <sub>2</sub>		0.3			48.0	0.0				0.2		0.1
PF Factor		1.000			1.000	0.950				1.000		0.950
Control Delay		12.0			65.5	0.0				16.0		0.1
Lane Group LOS		B			E	A				B		A
Approach Delay		12.0			62.2					1.7		
Approach LOS		B			E					A		
Intersection Delay		30.8			Intersection LOS							C

SHORT REPORT												
General Information						Site Information						
Analyst <i>KNM</i> Agency or Co. <i>HNTB</i> Date Performed <i>9/14/07</i> Time Period <i>Build I-4 Connection @ SR 417</i>						Intersection <i>US 441 at Wekiva Parkway</i> Area Type <i>All other areas</i> Jurisdiction <i>Orange County</i> Analysis Year <i>2012 No Build</i>						
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		1	2	2	1		2		1			
Lane Group		T	R	L	T		L		R			
Volume (vph)		106	1548	572	33		1378		742			
% Heavy Vehicles		2	2	2	2		10		10			
PHF		0.95	0.95	0.95	0.95		0.95		0.95			
Pretimed/Actuated (P/A)		A	A	A	A		A		A			
Startup Lost Time		2.0	2.0	2.0	2.0		2.0		2.0			
Extension of Effective Green		2.0	2.0	2.0	2.0		2.0		2.0			
Arrival Type		3	3	3	3		3		3			
Unit Extension		3.0	3.0	3.0	3.0		3.0		3.0			
Ped/Bike/RTOR Volume	0	0	0	0	0		0	0	0	0	0	
Lane Width		12.0	12.0	12.0	12.0		12.0		12.0			
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0	0	0	0		0		0			
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	
Phasing	WB Only	EW Perm	03	04	NB Only	06	07	08				
Timing	G = 35.0	G = 20.0	G =	G =	G = 50.0	G =	G =	G =				
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 120.0						
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
Adjusted Flow Rate		112	1629	602	35		1451		781			
Lane Group Capacity		311	1752	1260	311		1328		1101			
v/c Ratio		0.36	0.93	0.48	0.11		1.09		0.71			
Green Ratio		0.17	0.63	0.50	0.17		0.42		0.75			
Uniform Delay d <sub>1</sub>		44.3	20.1	18.5	42.5		35.0		8.0			
Delay Factor k		0.11	0.45	0.11	0.11		0.50		0.27			
Incremental Delay d <sub>2</sub>		0.7	9.3	0.3	0.2		54.0		2.1			
PF Factor		1.000	1.000	1.000	1.000		1.000		1.000			
Control Delay		45.0	29.5	18.8	42.6		89.0		10.2			
Lane Group LOS		D	C	B	D		F		B			
Approach Delay	30.5			20.1			61.4					
Approach LOS	C			C			E					
Intersection Delay	44.0			Intersection LOS						D		

## SHORT REPORT

General Information				Site Information			
Analyst	KNM			Intersection	CR 437 East of WP Interchange		
Agency or Co.	HNTB			Area Type	All other areas		
Date Performed	9/14/07			Jurisdiction	Orange County		
Time Period	Build I-4 Connection @ SR417			Analysis Year	2012 No Build		

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1		1				1	2			2	1
Lane Group	L		R				L	T			T	R
Volume (vph)	805		43				38	727			243	567
% Heavy Vehicles	2		2				2	2			2	2
PHF	0.95		0.95				0.95	0.95			0.95	0.95
Pretimed/Actuated (P/A)	A		A				A	A			A	A
Startup Lost Time	2.0		2.0				2.0	2.0			2.0	2.0
Extension of Effective Green	2.0		2.0				2.0	2.0			2.0	2.0
Arrival Type	3		3				3	3			3	3
Unit Extension	3.0		3.0				3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0	0				0	0		0	0	0
Lane Width	12.0		12.0				12.0	12.0			12.0	12.0
Parking/Grade/Parking	N	0	N				N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0				0	0			0	0
Minimum Pedestrian Time		3.2						3.2			3.2	
Phasing	EB Only	02	03	04	NS Perm	06	07	08				
Timing	G = 20.0	G =	G =	G =	G = 30.0	G =	G =	G =				
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 60.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate	847		45				40	765			256	597
Lane Group Capacity	590		1583				553	1774			1774	1583
v/c Ratio	1.44		0.03				0.07	0.43			0.14	0.38
Green Ratio	0.33		1.00				0.50	0.50			0.50	1.00
Uniform Delay d <sub>1</sub>	20.0		0.0				7.8	9.6			8.1	0.0
Delay Factor k	0.50		0.11				0.11	0.11			0.11	0.11
Incremental Delay d <sub>2</sub>	205.6		0.0				0.1	0.2			0.0	0.2
PF Factor	1.000		0.950				1.000	1.000			1.000	0.950
Control Delay	225.6		0.0				7.8	9.7			8.1	0.2
Lane Group LOS	F		A				A	A			A	A
Approach Delay	214.2						9.6			2.5		
Approach LOS	F						A			A		
Intersection Delay	78.8			Intersection LOS						E		

## SHORT REPORT

General Information				Site Information			
Analyst	KNM			Intersection	CR 437 at Ponkan Road		
Agency or Co.	HNTB			Area Type	All other areas		
Date Performed	1/16/07			Jurisdiction	Orange County		
Time Period	No Build SR46 2-Lane Arterial			Analysis Year	2012 No Build		

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	1	2	1	1	1	1
Lane Group	LTR			LTR			L	T	R	L	T	R
Volume (vph)	40	127	63	32	184	84	68	826	26	56	322	32
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0		2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green		2.0			2.0		2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type		3			3		3	3	3	3	3	3
Unit Extension		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width		12.0			12.0		12.0	12.0	12.0	12.0	12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0			0		0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	
Phasing	EW Perm	02	03	04	Excl. Left	Thru & RT	07	08				
Timing	G = 40.0	G =	G =	G =	G = 20.0	G = 70.0	G =	G =				
	Y = 5	Y =	Y =	Y =	Y = 5	Y = 5	Y =	Y =				
Duration of Analysis (hrs) = 0.25							Cycle Length C = 145.0					

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted Flow Rate		242			316		72	869	27	59	339	34	
Lane Group Capacity		401			461		244	1712	764	244	899	764	
v/c Ratio		0.60			0.69		0.30	0.51	0.04	0.24	0.38	0.04	
Green Ratio		0.28			0.28		0.14	0.48	0.48	0.14	0.48	0.48	
Uniform Delay d <sub>1</sub>		45.6			46.9		56.2	25.7	19.7	55.7	23.7	19.8	
Delay Factor k		0.19			0.25		0.11	0.12	0.11	0.11	0.11	0.11	
Incremental Delay d <sub>2</sub>		2.6			4.2		0.7	0.3	0.0	0.5	0.3	0.0	
PF Factor		1.000			1.000		1.000	1.000	1.000	1.000	1.000	1.000	
Control Delay		48.2			51.1		56.8	25.9	19.8	56.3	24.0	19.8	
Lane Group LOS		D			D		E	C	B	E	C	B	
Approach Delay		48.2			51.1			28.1			28.1		
Approach LOS		D			D			C			C		
Intersection Delay		34.3			Intersection LOS						C		



## SHORT REPORT

General Information				Site Information			
Analyst	KNM			Intersection	CR 437 at Kelly Park Road		
Agency or Co.	HNTB			Area Type	All other areas		
Date Performed	1/16/2007			Jurisdiction	Orange County		
Time Period	No Build SR46 2-Lane Arterial			Analysis Year	2012		

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Lane Group	LTR			LTR			LTR			LTR		
Volume (vph)	60	138	42	86	116	118	38	520	82	95	312	23
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width		12.0			12.0			12.0			12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 30.0	G =	G =	G =	G = 45.0	G =	G =	G =				
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25							Cycle Length C = 85.0					

Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	Adjusted Flow Rate		252			337			673			452	
Lane Group Capacity		537			521			926			724		
v/c Ratio		0.47			0.65			0.73			0.62		
Green Ratio		0.35			0.35			0.53			0.53		
Uniform Delay d <sub>1</sub>		21.3			23.1			15.3			14.1		
Delay Factor k		0.11			0.22			0.29			0.21		
Incremental Delay d <sub>2</sub>		0.7			2.8			2.9			1.7		
PF Factor		1.000			1.000			1.000			1.000		
Control Delay		22.0			25.9			18.2			15.8		
Lane Group LOS		C			C			B			B		
Approach Delay		22.0			25.9			18.2			15.8		
Approach LOS		C			C			B			B		
Intersection Delay		19.6			Intersection LOS						B		

SHORT REPORT												
General Information						Site Information						
Analyst <i>KNM</i> Agency or Co. <i>HNTB</i> Date Performed <i>1/25/2007</i> Time Period <i>No Build SR46 2-Lane Arterial</i>						Intersection <i>SR 46 and US 441 SB Ramps</i> Area Type <i>All other areas</i> Jurisdiction <i>Lake County</i> Analysis Year <i>2012 No Build</i>						
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		1	1	1	1					1		1
Lane Group		T	R	L	T					L		R
Volume (vph)		328	40	98	403					237		107
% Heavy Vehicles		11	11	11	11					10		10
PHF		0.95	0.95	0.95	0.95					0.95		0.95
Pretimed/Actuated (P/A)		A	A	A	A					A		A
Startup Lost Time		2.0	2.0	2.0	2.0					2.0		2.0
Extension of Effective Green		2.0	2.0	2.0	2.0					2.0		2.0
Arrival Type		3	3	3	3					3		3
Unit Extension		3.0	3.0	3.0	3.0					3.0		3.0
Ped/Bike/RTOR Volume	0	0	0	0	0		0	0		0	0	0
Lane Width		12.0	12.0	12.0	12.0					12.0		12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0	0	0	0					0		0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	
Phasing	WB Only	EW Perm	03	04	SB Only	06	07	08				
Timing	G = 15.0	G = 50.0	G =	G =	G = 30.0	G =	G =	G =				
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 110.0						
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate		345	42	103	424					249		113
Lane Group Capacity		778	1124	574	1089					448		1468
v/c Ratio		0.44	0.04	0.18	0.39					0.56		0.08
Green Ratio		0.45	0.77	0.64	0.64					0.27		1.00
Uniform Delay d <sub>1</sub>		20.5	2.9	8.8	9.7					34.3		0.0
Delay Factor k		0.11	0.11	0.11	0.11					0.15		0.11
Incremental Delay d <sub>2</sub>		0.4	0.0	0.2	0.2					1.5		0.0
PF Factor		1.000	1.000	1.000	1.000					1.000		0.950
Control Delay		20.9	2.9	8.9	9.9					35.8		0.0
Lane Group LOS		C	A	A	A					D		A
Approach Delay	19.0			9.7						24.6		
Approach LOS	B			A						C		
Intersection Delay	16.8			Intersection LOS						B		

SHORT REPORT												
General Information						Site Information						
Analyst	KNM					Intersection	SR 46 and US 441 NB					
Agency or Co.	HNTB						Ramps					
Date Performed	1/25/2007					Area Type	All other areas					
Time Period	No Build SR46 2-Lane Arterial					Jurisdiction	Lake County					
						Analysis Year	2012 No Build					
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1			1	1	1		1			
Lane Group	L	T			T	R	L		R			
Volume (vph)	78	487			403	238	98		145			
% Heavy Vehicles	11	11			11	11	10		10			
PHF	0.95	0.95			0.95	0.95	0.95		0.95			
Pretimed/Actuated (P/A)	A	A			A	A	A		A			
Startup Lost Time	2.0	2.0			2.0	2.0	2.0		2.0			
Extension of Effective Green	2.0	2.0			2.0	2.0	2.0		2.0			
Arrival Type	3	3			3	3	3		3			
Unit Extension	3.0	3.0			3.0	3.0	3.0		3.0			
Ped/Bike/RTOR Volume	0	0		0	0	0	0	0	0	0	0	
Lane Width	12.0	12.0			12.0	12.0	12.0		12.0			
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0			0	0	0		0			
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	
Phasing	EB Only	EW Perm	03	04	NB Only	06	07	08				
Timing	G = 15.0	G = 60.0	G =	G =	G = 20.0	G =	G =	G =				
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 110.0						
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate	82	513			424	251	103		153			
Lane Group Capacity	620	1245			934	1124	298		1468			
v/c Ratio	0.13	0.41			0.45	0.22	0.35		0.10			
Green Ratio	0.73	0.73			0.55	0.77	0.18		1.00			
Uniform Delay d <sub>1</sub>	5.5	5.8			15.1	3.4	39.3		0.0			
Delay Factor k	0.11	0.11			0.11	0.11	0.11		0.11			
Incremental Delay d <sub>2</sub>	0.1	0.2			0.4	0.1	0.7		0.0			
PF Factor	1.000	1.000			1.000	1.000	1.000		0.950			
Control Delay	5.6	6.1			15.5	3.5	40.0		0.0			
Lane Group LOS	A	A			B	A	D		A			
Approach Delay	6.0			11.0			16.1					
Approach LOS	A			B			B					
Intersection Delay	9.9			Intersection LOS						A		

## SHORT REPORT

General Information				Site Information			
Analyst	KNM			Intersection	SR 46 at Round Lake Road		
Agency or Co.	HNTB			Area Type	All other areas		
Date Performed	1/25/2007			Jurisdiction	Lake County		
Time Period	No-Build SR46 2-Lane Arterial			Analysis Year	2012 No Build		

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	1	0	1	0	0	1	0
Lane Group	L	TR		L	T	R		LTR			LTR	
Volume (vph)	24	515	50	63	535	42	85	106	149	53	130	57
% Heavy Vehicles	11	11	11	11	11	11	2	2	2	2	2	2
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0	2.0		2.0			2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0	2.0		2.0			2.0	
Arrival Type	3	3		3	3	3		3			3	
Unit Extension	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0		12.0	12.0	12.0		12.0			12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0	0		0			0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 53.0	G =	G =	G =	G = 24.0	G =	G =	G =				
	Y = 7	Y =	Y =	Y =	Y = 6	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 90.0						

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	Adjusted Flow Rate	25	595		66	563	44		358			253
Lane Group Capacity	372	995		349	1008	857		363			373	
v/c Ratio	0.07	0.60		0.19	0.56	0.05		0.99			0.68	
Green Ratio	0.59	0.59		0.59	0.59	0.59		0.27			0.27	
Uniform Delay d <sub>1</sub>	7.9	11.7		8.6	11.3	7.8		32.8			29.5	
Delay Factor k	0.11	0.19		0.11	0.16	0.11		0.49			0.25	
Incremental Delay d <sub>2</sub>	0.1	1.0		0.3	0.7	0.0		43.4			4.9	
PF Factor	1.000	1.000		1.000	1.000	1.000		1.000			1.000	
Control Delay	8.0	12.7		8.8	12.0	7.9		76.2			34.4	
Lane Group LOS	A	B		A	B	A		E			C	
Approach Delay	12.5			11.4			76.2			34.4		
Approach LOS	B			B			E			C		
Intersection Delay	27.0			Intersection LOS						C		

## SHORT REPORT

General Information				Site Information			
Analyst	KNM			Intersection	SR 46 at CR 437		
Agency or Co.	HNTB			Area Type	All other areas		
Date Performed	1/25/2007			Jurisdiction	Lake County		
Time Period	No-Build SR46 2-Lane Arterial			Analysis Year	2012 No Build		

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	171	311	106	177	389	384	181	146	263	273	49	108
% Heavy Vehicles	11	11	11	11	11	11	2	2	2	2	2	2
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3	3	3	3	3	3	3	3	3	3
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	
Phasing	Excl. Left	Thru & RT	03	04	Excl. Left	Thru & RT	07	08				
Timing	G = 15.0	G = 40.0	G =	G =	G = 15.0	G = 15.0	G =	G =				
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =				
Duration of Analysis (hrs) = 0.25							Cycle Length C = 105.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	Adjusted Flow Rate	180	327	112	186	409	404	191	154	277	287	52
Lane Group Capacity	232	652	831	232	652	554	253	266	528	253	266	528
v/c Ratio	0.78	0.50	0.13	0.80	0.63	0.73	0.75	0.58	0.52	1.13	0.20	0.22
Green Ratio	0.14	0.38	0.57	0.14	0.38	0.38	0.14	0.14	0.33	0.14	0.14	0.33
Uniform Delay d <sub>1</sub>	43.4	24.9	10.4	43.6	26.4	27.9	43.2	42.0	28.3	45.0	39.7	25.1
Delay Factor k	0.33	0.11	0.11	0.35	0.21	0.29	0.31	0.17	0.13	0.50	0.11	0.11
Incremental Delay d <sub>2</sub>	15.2	0.6	0.1	18.0	1.9	4.9	12.2	3.1	1.0	97.7	0.4	0.2
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control Delay	58.6	25.5	10.5	61.6	28.4	32.7	55.4	45.2	29.2	142.7	40.0	25.3
Lane Group LOS	E	C	B	E	C	C	E	D	C	F	D	C
Approach Delay	32.4			36.3			41.2			101.4		
Approach LOS	C			D			D			F		
Intersection Delay	47.5			Intersection LOS						D		

## SHORT REPORT

General Information				Site Information			
Analyst	KNM			Intersection	SR 46 at CR 435		
Agency or Co.	HNTB			Area Type	All other areas		
Date Performed	1/16/07			Jurisdiction	Lake County		
Time Period	No-Build SR46 2-Lane Arterial			Analysis Year	2012		

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	0	1	1	0	1	0
Lane Group	L	TR		L	TR			LT	R		LTR	
Volume (vph)	4	568	208	310	584	16	245	13	182	8	15	5
% Heavy Vehicles	11	11	11	11	11	11	2	2	2	2	2	2
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0			2.0	2.0		2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0			2.0	2.0		2.0	
Arrival Type	3	3		3	3			3	3		3	
Unit Extension	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0		12.0	12.0			12.0	12.0		12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0			0	0		0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	
Phasing	WB Only	EW Perm	03	04	NS Perm	06	07	08				
Timing	G = 20.0	G = 74.5	G =	G =	G = 28.0	G =	G =	G =				
	Y = 5.5	Y = 5.5	Y =	Y =	Y = 6.5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25							Cycle Length C = 140.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate	4	817		326	632			272	192			29
Lane Group Capacity	387	874		344	1218			267	616			280
v/c Ratio	0.01	0.93		0.95	0.52			1.02	0.31			0.10
Green Ratio	0.53	0.53		0.71	0.71			0.20	0.39			0.20
Uniform Delay d <sub>1</sub>	15.4	30.5		37.9	9.1			56.0	29.7			45.7
Delay Factor k	0.11	0.45		0.46	0.12			0.50	0.11			0.11
Incremental Delay d <sub>2</sub>	0.0	16.8		35.0	0.4			60.0	0.3			0.2
PF Factor	1.000	1.000		1.000	1.000			1.000	1.000			1.000
Control Delay	15.4	47.3		72.9	9.5			116.0	30.0			45.9
Lane Group LOS	B	D		E	A			F	C			D
Approach Delay	47.2			31.1			80.4			45.9		
Approach LOS	D			C			F			D		
Intersection Delay	47.2			Intersection LOS						D		

## SHORT REPORT

General Information	Site Information
Analyst <i>KNM</i>	Intersection <i>SR 46 at CR 46A</i>
Agency or Co. <i>HNTB</i>	Area Type <i>All other areas</i>
Date Performed <i>1/16/07</i>	Jurisdiction <i>Lake County</i>
Time Period <i>No Build SR46 2-Lane Arterial</i>	Analysis Year <i>2012 No Build</i>

### Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1			1	1				0		0
Lane Group		LT			T	R					LR	
Volume (vph)	5	745			810	570				374		16
% Heavy Vehicles	11	11			11	11				2		2
PHF	0.95	0.95			0.95	0.95				0.95		0.95
Pretimed/Actuated (P/A)	A	A			A	A				A		A
Startup Lost Time		2.0			2.0	2.0					2.0	
Extension of Effective Green		2.0			2.0	2.0					2.0	
Arrival Type		3			3	3					3	
Unit Extension		3.0			3.0	3.0					3.0	
Ped/Bike/RTOR Volume	0	0		0	0	0				0	0	0
Lane Width		12.0			12.0	12.0					12.0	
Parking/Grade/Parking	N	0	N	N	0	N				N	0	N
Parking/Hour												
Bus Stops/Hour		0			0	0					0	
Minimum Pedestrian Time		3.2			3.2						3.2	

Phasing	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = 85.0	G =	G =	G =	G = 35.0	G =	G =	G =
	Y = 7	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 132.0		

### Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		789			853	600					411	
Lane Group Capacity		1097			1102	1455					469	
v/c Ratio		0.72			0.77	0.41					0.88	
Green Ratio		0.64			0.64	1.00					0.27	
Uniform Delay d <sub>1</sub>		15.6			16.7	0.0					46.4	
Delay Factor k		0.28			0.32	0.11					0.40	
Incremental Delay d <sub>2</sub>		2.3			3.5	0.2					16.8	
PF Factor		1.000			1.000	0.950					1.000	
Control Delay		17.9			20.2	0.2					63.3	
Lane Group LOS		B			C	A					E	
Approach Delay		17.9			11.9						63.3	
Approach LOS		B			B						E	
Intersection Delay		21.7			Intersection LOS						C	

## SHORT REPORT

General Information	Site Information
Analyst <i>KNM</i>	Intersection <i>SR 46 at Wekiva River Road</i>
Agency or Co. <i>HNTB</i>	
Date Performed <i>1/16/07</i>	
Time Period <i>No-Build SR46 2-Lane Arterial</i>	
	Area Type <i>All other areas</i>
	Jurisdiction <i>Lake County</i>
	Analysis Year <i>2012 No Build</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	1	1	1	1	0	1	1	0	1	0
Lane Group	L	T	R	L	T	R		LT	R		LTR	
Volume (vph)	1	1097	42	78	1301	1	21	0	59	1	0	1
% Heavy Vehicles	11	11	11	11	11	11	2	2	2	2	2	2
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	
Arrival Type	3	3	3	3	3	3		3	3		3	
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0		0	0		0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 125.0	G =	G =	G =	G = 10.0	G =	G =	G =				
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25							Cycle Length C = 145.0					

Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate	1	1155	44	82	1369	1		22	62		2	
Lane Group Capacity	166	1476	1254	290	1476	1254		93	109		108	
v/c Ratio	0.01	0.78	0.04	0.28	0.93	0.00		0.24	0.57		0.02	
Green Ratio	0.86	0.86	0.86	0.86	0.86	0.86		0.07	0.07		0.07	
Uniform Delay d <sub>1</sub>	1.4	4.2	1.4	1.8	6.9	1.4		63.9	65.4		62.9	
Delay Factor k	0.11	0.33	0.11	0.11	0.44	0.11		0.11	0.16		0.11	
Incremental Delay d <sub>2</sub>	0.0	2.8	0.0	0.5	10.5	0.0		1.3	6.9		0.1	
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000		1.000	
Control Delay	1.4	7.1	1.4	2.4	17.4	1.4		65.2	72.3		63.0	
Lane Group LOS	A	A	A	A	B	A		E	E		E	
Approach Delay	6.8			16.5			70.4			63.0		
Approach LOS	A			B			E			E		
Intersection Delay	14.0			Intersection LOS						B		



## SHORT REPORT

### General Information

Analyst *KNM*  
 Agency or Co. *HNTB*  
 Date Performed *3/24/08*  
 Time Period *Build I-4 Connection @ SR 417*

### Site Information

Intersection *US 17/92 and I-4 WB Ramps*  
 Area Type *All other areas*  
 Jurisdiction *Seminole County*  
 Analysis Year *2012 No Build*

### Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1		2				1	2			2	1
Lane Group	L		R				L	T			T	R
Volume (vph)	15		285				97	1800			517	523
% Heavy Vehicles	9		9				11	11			11	11
PHF	0.95		0.95				0.95	0.95			0.95	0.95
Pretimed/Actuated (P/A)	A		A				A	A			A	A
Startup Lost Time	2.0		2.0				2.0	2.0			2.0	2.0
Extension of Effective Green	2.0		2.0				2.0	2.0			2.0	2.0
Arrival Type	3		3				3	3			3	3
Unit Extension	3.0		3.0				3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0	40				0	0		0	0	0
Lane Width	12.0		12.0				12.0	12.0			12.0	12.0
Parking/Grade/Parking	N	0	N				N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0				0	0			0	0
Minimum Pedestrian Time		3.2						3.2			3.2	
Phasing	EB Only	02	03	04	NS Perm	06	07	08				
Timing	G = 20.0	G =	G =	G =	G = 90.0	G =	G =	G =				
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 120.0						

### Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	Adjusted Flow Rate	16		258				102	1895			544
Lane Group Capacity	276		2623				573	2444			2444	1455
w/c Ratio	0.06		0.10				0.18	0.78			0.22	0.38
Green Ratio	0.17		1.00				0.75	0.75			0.75	1.00
Uniform Delay d <sub>1</sub>	42.1		0.0				4.3	9.0			4.5	0.0
Delay Factor k	0.11		0.11				0.11	0.32			0.11	0.11
Incremental Delay d <sub>2</sub>	0.1		0.0				0.1	1.6			0.0	0.2
PF Factor	1.000		0.950				1.000	1.000			1.000	0.950
Control Delay	42.2		0.0				4.5	10.6			4.5	0.2
Lane Group LOS	D		A				A	B			A	A
Approach Delay	2.5						10.3			2.3		
Approach LOS	A						B			A		
Intersection Delay	7.1			Intersection LOS						A		

## SHORT REPORT

General Information	Site Information
Analyst <i>KNM</i>	Intersection <i>US 17/92 and I-4 EB Ramps</i>
Agency or Co. <i>HNTB</i>	
Date Performed <i>3/24/08</i>	
Time Period <i>Build I-4 Connection @ SR 417</i>	
	Area Type <i>All other areas</i>
	Jurisdiction <i>Seminole County</i>
	Analysis Year <i>2012 No Build</i>

Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2			1	1	1	1	2			2	1
Lane Group	L			L	T	R	L	T			T	R
Volume (vph)	880			43	31	54	199	471			417	385
% Heavy Vehicles	2			9	9	9	11	11			11	11
PHF	0.95			0.95	0.95	0.95	0.95	0.95			0.95	0.95
Pretimed/Actuated (P/A)	A			A	A	A	A	A			A	A
Startup Lost Time	2.0			2.0	2.0	2.0	2.0	2.0			2.0	2.0
Extension of Effective Green	2.0			2.0	2.0	2.0	2.0	2.0			2.0	2.0
Arrival Type	3			3	3	3	3	3			3	3
Unit Extension	3.0			3.0	3.0	3.0	3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0		0	0	0	0	0		0	0	0
Lane Width	12.0			12.0	12.0	12.0	12.0	12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0			0	0	0	0	0			0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	
Phasing	Excl. Left	WB Only	03	04	NB Only	NS Perm	07	08				
Timing	G = 40.0	G = 15.0	G =	G =	G = 20.0	G = 30.0	G =	G =				
	Y = 5	Y = 5	Y =	Y =	Y = 0	Y = 5	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 120.0						

### Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	
Adjusted Flow Rate	926			45	33	57	209	496			439	405
Lane Group Capacity	1146			828	218	864	426	1358			815	1152
v/c Ratio	0.81			0.05	0.15	0.07	0.49	0.37			0.54	0.35
Green Ratio	0.33			0.50	0.13	0.58	0.46	0.42			0.25	0.79
Uniform Delay d <sub>1</sub>	36.5			15.4	46.8	10.8	21.2	24.1			39.0	3.6
Delay Factor k	0.35			0.11	0.11	0.11	0.11	0.11			0.14	0.11
Incremental Delay d <sub>2</sub>	4.4			0.0	0.3	0.0	0.9	0.2			0.7	0.2
PF Factor	1.000			1.000	1.000	1.000	1.000	1.000			1.000	1.000
Control Delay	40.9			15.4	47.1	10.9	22.1	24.2			39.7	3.8
Lane Group LOS	D			B	D	B	C	C			D	A
Approach Delay	40.9			21.3			23.6			22.5		
Approach LOS	D			C			C			C		
Intersection Delay	29.3			Intersection LOS						C		

## SHORT REPORT

### General Information

Analyst *KNM*  
 Agency or Co. *HNTB*  
 Date Performed *3/24/08*  
 Time Period *Build I-4 Connection @ SR 417*

### Site Information

Intersection *CR 15 @ Orange Blvd*  
 Area Type *All other areas*  
 Jurisdiction *Seminole County*  
 Analysis Year *2012 No Build*

### Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1		1				1	1			1	1
Lane Group	L		R				L	T			T	R
Volume (vph)	322		58				73	827			352	140
% Heavy Vehicles	2		2				2	2			2	2
PHF	0.95		0.95				0.95	0.95			0.95	0.95
Pretimed/Actuated (P/A)	A		A				A	A			A	A
Startup Lost Time	2.0		2.0				2.0	2.0			2.0	2.0
Extension of Effective Green	2.0		2.0				2.0	2.0			2.0	2.0
Arrival Type	3		3				3	3			3	3
Unit Extension	3.0		3.0				3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0	40				0	0		0	0	0
Lane Width	12.0		12.0				12.0	12.0			12.0	12.0
Parking/Grade/Parking	N	0	N				N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0				0	0			0	0
Minimum Pedestrian Time		3.2						3.2			3.2	
Phasing	EB Only	02	03	04	NS Perm	06	07	08				
Timing	G = 30.0	G =	G =	G =	G = 60.0	G =	G =	G =				
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25							Cycle Length C = 100.0					

### Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	Adjusted Flow Rate	339		19				77	871			371
Lane Group Capacity	531		1583				550	1118			1118	950
v/c Ratio	0.64		0.01				0.14	0.78			0.33	0.15
Green Ratio	0.30		1.00				0.60	0.60			0.60	0.60
Uniform Delay d <sub>1</sub>	30.3		0.0				8.7	15.0			10.0	8.8
Delay Factor k	0.22		0.11				0.11	0.33			0.11	0.11
Incremental Delay d <sub>2</sub>	2.6		0.0				0.1	3.6			0.2	0.1
PF Factor	1.000		0.950				1.000	1.000			1.000	1.000
Control Delay	32.9		0.0				8.9	18.6			10.2	8.9
Lane Group LOS	C		A				A	B			B	A
Approach Delay	31.1						17.8			9.8		
Approach LOS	C						B			A		
Intersection Delay	18.2			Intersection LOS						B		

HCM Signalized Intersection Capacity Analysis  
 26: SR 46 & Wekiva Park Dr

Wekiva Parkway  
 2012 No Build Conditions - PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↑	↗	↘	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Flt	1.00	1.00	1.00	0.85	0.98	
Flt Protected	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (prot)	1770	1863	1863	1583	1746	
Flt Permitted	0.08	1.00	1.00	1.00	0.96	
Satd. Flow (perm)	154	1863	1863	1583	1746	
Volume (vph)	1	1139	1358	12	8	2
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1238	1476	13	9	2
RTOR Reduction (vph)	0	0	0	1	2	0
Lane Group Flow (vph)	1	1238	1476	12	9	0
Turn Type	Perm			Perm		
Protected Phases		2	6		4	
Permitted Phases	2			6		
Actuated Green, G (s)	94.5	94.5	93.5	93.5	1.5	
Effective Green, g (s)	97.0	97.0	97.0	97.0	5.0	
Actuated g/C Ratio	0.88	0.88	0.88	0.88	0.05	
Clearance Time (s)	6.5	6.5	7.5	7.5	7.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	136	1643	1643	1396	79	
v/s Ratio Prot		0.66	0.79		0.01	
v/s Ratio Perm	0.01			0.01		
v/c Ratio	0.01	0.75	0.90	0.01	0.12	
Uniform Delay, d1	0.8	2.3	3.7	0.8	50.4	
Progression Factor	1.00	1.00	0.87	1.21	1.00	
Incremental Delay, d2	0.1	3.3	4.0	0.0	0.7	
Delay (s)	0.9	5.5	7.2	0.9	51.0	
Level of Service	A	A	A	A	D	
Approach Delay (s)		5.5	7.2		51.0	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 1: SR 46 & Longwood Markham Road

Wekiva Parkway  
 2012 No Build Conditions - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↕	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Flt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		0.93	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1863	1583	1770	1863	1583	1770	1863	1583		1737	
Flt Permitted		1.00	1.00	0.16	1.00	1.00	0.76	1.00	1.00		1.00	
Satd. Flow (perm)		1863	1583	301	1863	1583	1409	1863	1583		1737	
Volume (vph)	0	1030	100	45	1224	1	135	2	53	0	1	1
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1120	109	49	1330	1	147	2	58	0	1	1
RTOR Reduction (vph)	0	0	23	0	0	0	0	0	50	0	1	0
Lane Group Flow (vph)	0	1120	86	49	1330	1	147	2	8	0	1	0
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		
Protected Phases		2			6			8				4
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)		84.1	84.1	84.1	84.1	84.1	12.9	12.9	12.9		12.9	
Effective Green, g (s)		86.6	86.6	86.6	86.6	86.6	15.4	15.4	15.4		15.4	
Actuated g/C Ratio		0.79	0.79	0.79	0.79	0.79	0.14	0.14	0.14		0.14	
Clearance Time (s)		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		6.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)		1467	1246	237	1467	1246	197	261	222		243	
v/s Ratio Prot		0.60			c0.71			0.00			0.00	
v/s Ratio Perm			0.05	0.16		0.00	c0.10		0.01			
v/c Ratio		0.76	0.07	0.21	0.91	0.00	0.75	0.01	0.04		0.00	
Uniform Delay, d1		6.2	2.6	3.0	8.7	2.5	45.4	40.7	40.9		40.7	
Progression Factor		0.75	0.41	0.19	0.22	0.15	1.00	1.00	1.00		1.00	
Incremental Delay, d2		2.8	0.1	0.7	4.1	0.0	14.2	0.0	0.1		0.0	
Delay (s)		7.5	1.1	1.3	6.0	0.4	59.7	40.7	41.0		40.7	
Level of Service		A	A	A	A	A	E	D	D		D	
Approach Delay (s)		6.9			5.8			54.2			40.7	
Approach LOS		A			A			D			D	

Intersection Summary

HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 3: SR 46 & Lake Markham Road

Wekiva Parkway  
 2012 No Build Conditions - PM Peak

























	→	↘	↙	←	↗	↘
Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑	↗	↙	↑	↙	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.18	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	333	1863	1770	1583
Volume (vph)	1040	10	50	1330	45	95
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1130	11	54	1446	49	103
RTOR Reduction (vph)	0	2	0	0	0	92
Lane Group Flow (vph)	1130	9	54	1446	49	11
Turn Type		Perm	Perm			Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	86.6	86.6	87.6	87.6	8.4	8.4
Effective Green, g (s)	90.1	90.1	90.1	90.1	11.9	11.9
Actuated g/C Ratio	0.82	0.82	0.82	0.82	0.11	0.11
Clearance Time (s)	7.5	7.5	6.5	6.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1526	1297	273	1526	191	171
v/s Ratio Prot	0.61			c0.78	c0.03	
v/s Ratio Perm		0.01	0.16			0.01
v/c Ratio	0.74	0.01	0.20	0.95	0.26	0.07
Uniform Delay, d <sub>1</sub>	4.6	1.8	2.1	8.0	45.0	44.1
Progression Factor	1.00	1.28	0.06	1.22	1.00	1.00
Incremental Delay, d <sub>2</sub>	2.2	0.0	1.1	9.8	0.7	0.2
Delay (s)	6.7	2.3	1.2	19.6	45.7	44.2
Level of Service	A	A	A	B	D	D
Approach Delay (s)	6.7			18.9	44.7	
Approach LOS	A			B	D	

**Intersection Summary**

HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
6: SR 46 & Orange Blvd

Wekiva Parkway  
2012 No Build Conditions - PM Peak

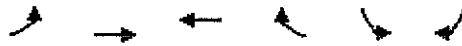
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.53	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	996	1863	1583	1250	1863	1583
Volume (vph)	103	1001	36	106	1314	170	231	123	76	103	60	77
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	112	1088	39	115	1428	185	251	134	83	112	65	84
RTOR Reduction (vph)	0	0	20	0	0	92	0	0	68	0	0	75
Lane Group Flow (vph)	112	1088	19	115	1428	94	251	134	15	112	65	9
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	9.6	50.8	50.8	11.3	52.5	52.5	26.9	16.1	16.1	12.2	7.9	7.9
Effective Green, g (s)	12.1	53.3	53.3	13.8	55.0	55.0	30.9	20.1	20.1	18.7	11.9	11.9
Actuated g/C Ratio	0.11	0.48	0.48	0.13	0.50	0.50	0.28	0.18	0.18	0.17	0.11	0.11
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	8.0	8.0	6.5	8.0	8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	195	1715	767	222	1770	792	385	340	289	245	202	171
v/s Ratio Prot	0.06	0.31		c0.06	c0.40		c0.09	0.07		0.03	0.03	
v/s Ratio Perm			0.01			0.06	c0.09		0.01	0.05		0.01
v/c Ratio	0.57	0.63	0.02	0.52	0.81	0.12	0.65	0.39	0.05	0.46	0.32	0.05
Uniform Delay, d1	46.5	21.1	14.8	45.0	23.0	14.6	33.2	39.6	37.1	40.4	45.3	44.0
Progression Factor	0.87	0.93	1.33	0.72	1.25	3.37	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.8	1.3	0.0	1.5	3.0	0.2	3.9	0.8	0.1	1.4	0.9	0.1
Delay (s)	43.3	20.9	19.7	33.8	31.8	49.5	37.2	40.3	37.2	41.8	46.2	44.1
Level of Service	D	C	B	C	C	D	D	D	D	D	D	D
Approach Delay (s)		22.9			33.8			38.1			43.7	
Approach LOS		C			C			D			D	

**Intersection Summary**

HCM Average Control Delay	31.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 29: SR 46 & Lake Forest Blvd

Wekiva Parkway  
 2012 No Build Conditions - PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↑↑	↗	↖	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	1.00	1.00	0.85	1.00	0.85
Fl <sub>t</sub> Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Fl <sub>t</sub> Permitted	0.08	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	157	3539	3539	1583	1770	1583
Volume (vph)	35	1275	1592	318	255	55
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	1386	1730	346	277	60
RTOR Reduction (vph)	0	0	0	104	0	21
Lane Group Flow (vph)	38	1386	1730	242	277	39
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	74.5	74.5	73.5	73.5	21.5	21.5
Effective Green, g (s)	77.0	77.0	77.0	77.0	25.0	25.0
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.23	0.23
Clearance Time (s)	6.5	6.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	110	2477	2477	1108	402	360
v/s Ratio Prot		0.39	c0.49		c0.16	
v/s Ratio Perm	0.24			0.15		0.02
v/c Ratio	0.35	0.56	0.70	0.22	0.69	0.11
Uniform Delay, d <sub>1</sub>	6.5	8.1	9.7	5.8	38.9	33.7
Progression Factor	0.41	0.21	0.73	1.48	1.00	1.00
Incremental Delay, d <sub>2</sub>	7.3	0.8	1.3	0.4	4.9	0.1
Delay (s)	9.9	2.5	8.4	9.0	43.8	33.8
Level of Service	A	A	A	A	D	C
Approach Delay (s)		2.7	8.5		42.0	
Approach LOS		A	A		D	

**Intersection Summary**

HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



HCM Signalized Intersection Capacity Analysis  
8: SR 46 & International Pkwy

Wekiva Parkway  
2012 No Build Conditions - PM Peak



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↓	↑↑	↑↓	↑↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	3433	3539	3433	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	3433	3539	3433	2787
Volume (vph)	1415	155	154	1586	282	248
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1538	168	167	1724	307	270
RTOR Reduction (vph)	0	70	0	0	0	226
Lane Group Flow (vph)	1538	98	167	1724	307	44
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	61.0	61.0	13.5	81.0	15.0	15.0
Effective Green, g (s)	64.0	64.0	16.0	84.0	18.0	18.0
Actuated g/C Ratio	0.58	0.58	0.15	0.76	0.16	0.16
Clearance Time (s)	7.0	7.0	6.5	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2059	921	499	2703	562	456
v/s Ratio Prot	c0.43		0.05	c0.49	c0.09	
v/s Ratio Perm		0.06				0.02
v/c Ratio	0.75	0.11	0.33	0.64	0.55	0.10
Uniform Delay, d1	17.0	10.3	42.2	6.0	42.2	39.1
Progression Factor	0.61	0.20	1.27	0.02	0.64	0.32
Incremental Delay, d2	2.2	0.2	0.8	0.5	1.1	0.1
Delay (s)	12.6	2.2	54.4	0.6	27.9	12.7
Level of Service	B	A	D	A	C	B
Approach Delay (s)	11.5			5.4	20.8	
Approach LOS	B			A	C	

Intersection Summary

HCM Average Control Delay	10.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
31: SR 46 & N Oregon St

Wekiva Parkway  
2012 No Build Conditions - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑↑		↘	↑↑	↗	↘	↑	↗	↘	↗	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	5084		1770	3539	1583	1770	1863	1583	1681	1693	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.65	1.00	1.00	0.61	0.59	1.00
Satd. Flow (perm)	1770	5084		1770	3539	1583	1203	1863	1583	1075	1051	1583
Volume (vph)	94	1343	3	54	1739	257	18	78	168	299	15	46
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	1460	3	59	1890	279	20	85	183	325	16	50
RTOR Reduction (vph)	0	0	0	0	0	114	0	0	102	0	0	41
Lane Group Flow (vph)	102	1463	0	59	1890	165	20	85	81	173	168	9
Turn Type	Prot			Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6	8		8	4		4
Actuated Green, G (s)	7.1	59.4		5.8	58.1	58.1	15.2	13.8	13.8	19.4	19.4	15.9
Effective Green, g (s)	9.6	61.9		8.3	60.6	60.6	21.7	17.8	17.8	25.9	25.9	19.9
Actuated g/C Ratio	0.09	0.56		0.08	0.55	0.55	0.20	0.16	0.16	0.24	0.24	0.18
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	6.5	8.0	8.0	6.5	8.0	8.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	154	2861		134	1950	872	257	301	256	286	282	286
v/s Ratio Prot	c0.06	0.29		0.03	c0.53		0.00	0.05		c0.03	0.03	
v/s Ratio Perm						0.10	0.01		0.05	c0.11	0.11	0.01
v/c Ratio	0.66	0.51		0.44	0.97	0.19	0.08	0.28	0.32	0.60	0.60	0.03
Uniform Delay, d1	48.6	14.8		48.6	23.8	12.4	35.8	40.5	40.7	37.0	37.4	37.1
Progression Factor	1.35	0.29		1.01	0.61	0.75	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.4	0.5		1.7	11.7	0.4	0.1	0.5	0.7	3.6	3.4	0.0
Delay (s)	73.0	4.7		51.0	26.1	9.6	36.0	41.0	41.4	40.6	40.8	37.2
Level of Service	E	A		D	C	A	D	D	D	D	D	D
Approach Delay (s)		9.1			24.7			40.9			40.2	
Approach LOS		A			C			D			D	

Intersection Summary

HCM Average Control Delay	21.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 42: SR 46 & I-4 WB Ramp

Wekiva Parkway  
 2012 No Build Conditions - PM Peak



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑	↑		↑↑		↑↑		↑↑		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0		4.0		
Lane Util. Factor		0.95	1.00		0.95		0.97		0.88		
Frt		1.00	0.85		1.00		1.00		0.85		
Flt Protected		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (prot)		3539	1583		3539		3433		2787		
Flt Permitted		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (perm)		3539	1583		3539		3433		2787		
Volume (vph)	0	1080	610	0	1591	0	645	0	365	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1174	663	0	1729	0	701	0	397	0	0
RTOR Reduction (vph)	0	0	231	0	0	0	0	0	31	0	0
Lane Group Flow (vph)	0	1174	432	0	1729	0	701	0	366	0	0
Turn Type			Perm				Prot		custom		
Protected Phases		2			6		4				
Permitted Phases			2						4		
Actuated Green, G (s)		69.1	69.1		69.1		27.9		27.9		
Effective Green, g (s)		71.6	71.6		71.6		30.4		30.4		
Actuated g/C Ratio		0.65	0.65		0.65		0.28		0.28		
Clearance Time (s)		6.5	6.5		6.5		6.5		6.5		
Vehicle Extension (s)		3.0	3.0		3.0		3.0		3.0		
Lane Grp Cap (vph)		2304	1030		2304		949		770		
v/s Ratio Prot		0.33			c0.49		c0.20				
v/s Ratio Perm			0.27						0.13		
v/c Ratio		0.51	0.42		0.75		0.74		0.48		
Uniform Delay, d1		10.0	9.2		13.1		36.2		33.2		
Progression Factor		0.67	1.26		0.51		1.00		1.00		
Incremental Delay, d2		0.7	1.1		1.6		3.0		0.5		
Delay (s)		7.5	12.7		8.2		39.2		33.6		
Level of Service		A	B		A		D		C		
Approach Delay (s)		9.4			8.2			37.2		0.0	
Approach LOS		A			A			D		A	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			
































HCM Signalized Intersection Capacity Analysis  
35: SR 46 &

Wekiva Parkway  
2012 No Build Conditions - PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			  		 		 			
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0		4.0			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.97		0.88			
Flt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	3433	3539			5085	1583	3433		2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	3539			5085	1583	3433		2787			
Volume (vph)	334	1391	0	0	1858	782	413	0	517	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	363	1512	0	0	2020	850	449	0	562	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	338	0	0	80	0	0	0
Lane Group Flow (vph)	363	1512	0	0	2020	512	449	0	482	0	0	0
Turn Type	Prot					Perm		Prot		custom		
Protected Phases	5		2		6		8					
Permitted Phases					6		8					
Actuated Green, G (s)	13.5		74.9		54.9		54.9		22.1		22.1	
Effective Green, g (s)	16.0		77.4		57.4		57.4		24.6		24.6	
Actuated g/C Ratio	0.15		0.70		0.52		0.52		0.22		0.22	
Clearance Time (s)	6.5		6.5		6.5		6.5		6.5		6.5	
Vehicle Extension (s)	3.0		3.0		3.0		3.0		3.0		3.0	
Lane Grp Cap (vph)	499		2490		2653		826		768		623	
v/s Ratio Prot	c0.11		0.43		c0.40		0.13					
v/s Ratio Perm							0.32		c0.17			
v/c Ratio	0.73		0.61		0.76		0.62		0.58		0.77	
Uniform Delay, d1	44.9		8.4		20.9		18.6		38.1		40.1	
Progression Factor	1.19		0.77		0.43		1.41		1.00		1.00	
Incremental Delay, d2	4.4		0.9		1.5		2.5		1.1		6.0	
Delay (s)	58.0		7.4		10.5		28.7		39.3		46.0	
Level of Service	E		A		B		C		D		D	
Approach Delay (s)			17.2		15.9				43.0		0.0	
Approach LOS			B		B				D		A	
<b>Intersection Summary</b>												
HCM Average Control Delay			21.1		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			110.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			67.2%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
98: SR 46 & Towne

Wekiva Parkway  
2012 No Build Conditions - PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  		 	  		 				 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.86	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Fr't	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	6408	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	6408	1583	3433	1863	1583	1770	1863	1583
Volume (vph)	239	1263	678	232	1556	102	605	56	199	121	52	168
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	260	1373	737	252	1691	111	658	61	216	132	57	183
RTOR Reduction (vph)	0	0	421	0	0	74	0	0	173	0	0	164
Lane Group Flow (vph)	260	1373	316	252	1691	37	658	61	43	132	57	19
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	19.2	41.8	41.8	11.2	33.8	33.8	22.1	19.2	19.2	11.8	8.9	8.9
Effective Green, g (s)	21.7	44.3	44.3	13.7	36.3	36.3	24.6	21.7	21.7	14.3	11.4	11.4
Actuated g/C Ratio	0.20	0.40	0.40	0.12	0.33	0.33	0.22	0.20	0.20	0.13	0.10	0.10
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	349	2048	638	428	2115	522	768	368	312	230	193	164
v/s Ratio Prot	c0.15	0.27		0.07	c0.26		c0.19	0.03		0.07	c0.03	
v/s Ratio Perm			0.20			0.02			0.03			0.01
v/c Ratio	0.74	0.67	0.50	0.59	0.80	0.07	0.86	0.17	0.14	0.57	0.30	0.12
Uniform Delay, d1	41.5	26.9	24.5	45.5	33.5	25.3	41.0	36.6	36.4	45.0	45.6	44.7
Progression Factor	1.03	0.83	0.61	0.77	1.08	2.56	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.0	1.5	2.3	1.5	2.3	0.2	9.3	0.2	0.2	3.4	0.9	0.3
Delay (s)	49.8	23.6	17.2	36.4	38.5	64.8	50.3	36.9	36.6	48.4	46.4	45.0
Level of Service	D	C	B	D	D	E	D	D	D	D	D	D
Approach Delay (s)		24.5			39.7			46.3			46.5	
Approach LOS		C			D			D			D	

Intersection Summary

HCM Average Control Delay	34.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
104: SR 46 & Rinehart

Wekiva Parkway  
2012 No Build Conditions - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583	3433	1863	1583	1770	1863	1583
Volume (vph)	62	1225	273	380	1357	13	544	71	375	41	37	145
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	1332	297	413	1475	14	591	77	408	45	40	158
RTOR Reduction (vph)	0	0	187	0	0	8	0	0	273	0	0	111
Lane Group Flow (vph)	67	1332	110	413	1475	6	591	77	135	45	40	47
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	9.6	33.5	33.5	18.6	42.5	42.5	23.0	23.0	23.0	8.9	8.9	8.9
Effective Green, g (s)	12.1	36.0	36.0	21.1	45.0	45.0	25.5	25.5	25.5	11.4	11.4	11.4
Actuated g/C Ratio	0.11	0.33	0.33	0.19	0.41	0.41	0.23	0.23	0.23	0.10	0.10	0.10
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	195	1664	518	659	2080	648	796	432	367	183	193	164
v/s Ratio Prot	0.04	c0.26		c0.12	0.29		c0.17	0.04		0.03	0.02	
v/s Ratio Perm			0.07			0.00			0.09			c0.03
v/c Ratio	0.34	0.80	0.21	0.63	0.71	0.01	0.74	0.18	0.37	0.25	0.21	0.29
Uniform Delay, d <sub>1</sub>	45.3	33.7	26.7	40.8	27.1	19.3	39.2	33.9	35.5	45.3	45.2	45.5
Progression Factor	1.25	0.63	1.83	1.00	1.00	1.00	0.79	0.75	0.45	1.00	1.00	1.00
Incremental Delay, d <sub>2</sub>	3.7	3.3	0.7	4.5	2.1	0.0	3.4	0.2	0.6	0.7	0.5	1.0
Delay (s)	60.2	24.6	49.7	45.3	29.1	19.3	34.4	25.7	16.6	46.1	45.7	46.5
Level of Service	E	C	D	D	C	B	C	C	B	D	D	D
Approach Delay (s)		30.4			32.6			27.0			46.3	
Approach LOS		C			C			C			D	

























Intersection Summary

HCM Average Control Delay	31.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 14: CR 46A & International Pkwy

Wekiva Parkway  
 2012 No Build Conditions - PM Peak

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	1583
Volume (vph)	97	476	35	294	628	367	138	683	1277	267	255	108
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	105	517	38	320	683	399	150	742	1388	290	277	117
RTOR Reduction (vph)	0	0	32	0	0	231	0	0	75	0	0	54
Lane Group Flow (vph)	105	517	6	320	683	168	150	742	1313	290	277	63
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	5.5	20.5	20.5	9.5	24.5	24.5	16.3	85.5	85.5	8.5	77.7	77.7
Effective Green, g (s)	8.0	23.0	23.0	12.0	27.0	27.0	18.8	88.0	88.0	11.0	80.2	80.2
Actuated g/C Ratio	0.05	0.15	0.15	0.08	0.18	0.18	0.13	0.59	0.59	0.07	0.53	0.53
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	94	543	243	275	637	285	222	2076	929	252	1892	846
v/s Ratio Prot	0.06	0.15		c0.09	c0.19		0.08	0.21		c0.08	0.08	
v/s Ratio Perm			0.00			0.11			c0.83			0.04
v/c Ratio	1.12	0.95	0.02	1.16	1.07	0.59	0.68	0.36	1.41	1.15	0.15	0.07
Uniform Delay, d1	71.0	63.0	54.0	69.0	61.5	56.4	62.7	16.2	31.0	69.5	17.6	16.9
Progression Factor	1.00	1.00	1.00	0.89	0.68	1.21	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	127.9	28.4	0.2	98.6	51.5	6.3	7.9	0.1	192.5	103.6	0.0	0.0
Delay (s)	198.9	91.4	54.1	160.2	93.2	74.5	70.6	16.3	223.5	173.1	17.7	16.9
Level of Service	F	F	D	F	F	E	E	B	F	F	B	B
Approach Delay (s)		106.3			103.2			146.0			83.4	
Approach LOS		F			F			F			F	

**Intersection Summary**

HCM Average Control Delay	120.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	109.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
78: CR 46A &

Wekiva Parkway  
2012 No Build Conditions - PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	0.88	1.00	1.00	1.00
Fr't	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1681	1720	2787	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	1681	1720	2787	1770	1863	1583
Volume (vph)	30	1866	451	499	1357	63	124	35	331	333	240	34
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	2028	490	542	1475	68	135	38	360	362	261	37
RTOR Reduction (vph)	0	0	190	0	0	29	0	0	25	0	0	31
Lane Group Flow (vph)	33	2028	300	542	1475	39	84	89	335	362	261	6
Turn Type	Prot		Perm	Prot		Perm	Split		pt+ov	Split		Perm
Protected Phases	5	2		1	6		8	8	8 1	4	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	4.4	70.5	70.5	18.5	84.6	84.6	13.5	13.5	38.5	23.5	23.5	23.5
Effective Green, g (s)	5.9	72.0	72.0	20.0	86.1	86.1	16.0	16.0	40.0	26.0	26.0	26.0
Actuated g/C Ratio	0.04	0.48	0.48	0.13	0.57	0.57	0.11	0.11	0.27	0.17	0.17	0.17
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	6.5	6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	70	1699	760	458	2031	909	179	183	743	307	323	274
v/s Ratio Prot	0.02	c0.57		c0.16	0.42		0.05	0.05	c0.12	c0.20	0.14	
v/s Ratio Perm			0.19			0.02						0.00
v/c Ratio	0.47	1.19	0.39	1.18	0.73	0.04	0.47	0.49	0.45	1.18	0.81	0.02
Uniform Delay, d1	70.5	39.0	25.0	65.0	23.3	14.0	63.0	63.1	45.8	62.0	59.6	51.5
Progression Factor	0.99	0.94	1.18	0.75	1.34	2.54	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	87.7	0.1	96.0	1.4	0.1	1.9	2.0	0.4	109.1	13.8	0.0
Delay (s)	70.2	124.5	29.7	144.6	32.7	35.4	64.9	65.2	46.3	171.1	73.4	51.5
Level of Service	E	F	C	F	C	D	E	E	D	F	E	D
Approach Delay (s)		105.6			61.9			52.4			125.8	
Approach LOS		F			E			D			F	

**Intersection Summary**

HCM Average Control Delay	87.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

41: CR 46A & I-4

Wekiva Parkway  
2012 No Build Conditions - PM Peak



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕			↕	↖↗	↖↗	↕	↖↗			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0		4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.97		0.88			
Flt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	3433	3539			3539	1583	3433		2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	3539			3539	1583	3433		2787			
Volume (vph)	246	2284	0	0	1509	300	410	0	780	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	267	2483	0	0	1640	326	446	0	848	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	100	0	0	9	0	0	0
Lane Group Flow (vph)	267	2483	0	0	1640	226	446	0	839	0	0	0
Turn Type	Prot						Perm	Prot	custom			
Protected Phases	5	2					6	3	8			
Permitted Phases							6					
Actuated Green, G (s)	13.3	98.0					80.7	80.7	38.0	38.0		
Effective Green, g (s)	14.8	101.0					82.2	82.2	41.0	41.0		
Actuated g/C Ratio	0.10	0.67					0.55	0.55	0.27	0.27		
Clearance Time (s)	5.5	7.0					5.5	5.5	7.0	7.0		
Vehicle Extension (s)	3.0	3.0					3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	339	2383					1939	867	938	762		
v/s Ratio Prot	0.08	c0.70					0.46		0.13	c0.30		
v/s Ratio Perm								0.14				
v/c Ratio	0.79	1.04					0.85	0.26	0.48	1.10		
Uniform Delay, d1	66.1	24.5					28.6	17.9	45.5	54.5		
Progression Factor	0.95	0.79					0.17	0.01	1.00	1.00		
Incremental Delay, d2	1.7	20.4					1.5	0.2	1.7	63.9		
Delay (s)	64.8	39.8					6.4	0.3	47.2	118.4		
Level of Service	E	D					A	A	D	F		
Approach Delay (s)	42.2						5.4	93.9		0.0		
Approach LOS	D						A	F		A		

## Intersection Summary

HCM Average Control Delay	41.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
39: CR 46A & Rinehart

Wekiva Parkway  
2012 No Build Conditions - PM Peak































												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	1770	3539	1583
Fl <sub>t</sub> Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	1770	3539	1583
Volume (vph)	991	1388	685	282	589	109	816	795	399	109	637	404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1077	1509	745	307	640	118	887	864	434	118	692	439
RTOR Reduction (vph)	0	0	300	0	0	96	0	0	139	0	0	360
Lane Group Flow (vph)	1077	1509	445	307	640	22	887	864	295	118	692	79
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	41.9	55.5	55.5	11.6	25.2	25.2	34.4	47.1	47.1	11.8	24.5	24.5
Effective Green, g (s)	43.4	58.0	58.0	13.1	27.7	27.7	35.9	49.6	49.6	13.3	27.0	27.0
Actuated g/C Ratio	0.29	0.39	0.39	0.09	0.18	0.18	0.24	0.33	0.33	0.09	0.18	0.18
Clearance Time (s)	5.5	6.5	6.5	5.5	6.5	6.5	5.5	6.5	6.5	5.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	993	1368	612	300	654	292	822	1170	523	157	637	285
v/s Ratio Prot	c0.31	c0.43		0.09	0.18		c0.26	0.24		0.07	c0.20	
v/s Ratio Perm			0.28			0.01			0.19			0.05
v/c Ratio	1.08	1.10	0.73	1.02	0.98	0.07	1.08	0.74	0.56	0.75	1.09	0.28
Uniform Delay, d <sub>1</sub>	53.3	46.0	39.3	68.4	60.9	50.6	57.1	44.5	41.3	66.7	61.5	53.1
Progression Factor	1.00	1.08	1.25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d <sub>2</sub>	40.1	47.6	0.7	58.1	30.3	0.5	54.9	2.5	1.4	18.2	61.4	0.5
Delay (s)	93.4	97.2	49.9	126.5	91.2	51.1	112.0	46.9	42.7	84.9	122.9	53.6
Level of Service	F	F	D	F	F	D	F	D	D	F	F	D
Approach Delay (s)		85.4			96.9			72.5			94.9	
Approach LOS		F			F			E			F	

Intersection Summary

HCM Average Control Delay	84.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	100.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
38: John & Rinehart

Wekiva Parkway  
2012 No Build Conditions - PM Peak

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 					 	 		 	 	 
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	1863	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.68	1.00	1.00	0.50	1.00	1.00	0.44	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)	1261	3539	1583	936	1863	1583	1600	3539	1583	859	3539	1583
Volume (vph)	59	130	137	185	115	138	229	831	90	105	412	73
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	141	149	201	125	150	249	903	98	114	448	79
RTOR Reduction (vph)	0	0	131	0	0	121	0	0	47	0	0	39
Lane Group Flow (vph)	64	141	18	201	125	29	249	903	51	114	448	40
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	17.8	10.7	10.7	31.2	18.6	18.6	61.8	54.2	54.2	58.8	52.7	52.7
Effective Green, g (s)	21.8	13.2	13.2	33.7	21.1	21.1	65.8	56.7	56.7	62.8	55.2	55.2
Actuated g/C Ratio	0.20	0.12	0.12	0.31	0.19	0.19	0.60	0.52	0.52	0.57	0.50	0.50
Clearance Time (s)	5.5	6.5	6.5	5.5	6.5	6.5	5.5	6.5	6.5	5.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	290	425	190	412	357	304	1109	1824	816	668	1776	794
v/s Ratio Prot	0.02	0.04		c0.07	0.07		c0.02	c0.26		0.01	0.13	
v/s Ratio Perm	0.03		0.01	c0.08		0.02	0.12		0.03	0.09		0.03
v/c Ratio	0.22	0.33	0.09	0.49	0.35	0.09	0.22	0.50	0.06	0.17	0.25	0.05
Uniform Delay, d1	36.7	44.4	43.1	29.9	38.5	36.6	9.7	17.3	13.3	11.4	15.6	14.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.71	0.64	0.64	0.62	0.47	0.23
Incremental Delay, d2	0.4	0.5	0.2	0.9	0.6	0.1	0.1	0.8	0.1	0.1	0.3	0.1
Delay (s)	37.1	44.8	43.3	30.9	39.1	36.7	7.0	11.9	8.6	7.2	7.6	3.3
Level of Service	D	D	D	C	D	D	A	B	A	A	A	A
Approach Delay (s)		42.8			34.9			10.7			7.0	
Approach LOS		D			C			B			A	

Intersection Summary

HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
103: Rinehart &

Wekiva Parkway  
2012 No Build Conditions - PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.86	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1520	1504	3433	3539	1583	3433	3539	1583
Flt Permitted	0.27	1.00	1.00	0.59	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	503	1863	1583	1099	1520	1504	3433	3539	1583	3433	3539	1583
Volume (vph)	23	11	67	237	22	681	66	842	67	82	673	22
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	12	73	258	24	740	72	915	73	89	732	24
RTOR Reduction (vph)	0	0	63	0	204	204	0	0	39	0	0	13
Lane Group Flow (vph)	25	12	10	258	190	166	72	915	34	89	732	11
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	14.6	11.3	11.3	33.1	22.3	22.3	5.9	48.1	48.1	6.3	48.5	48.5
Effective Green, g (s)	21.6	14.8	14.8	36.6	25.8	25.8	9.4	51.6	51.6	9.8	52.0	52.0
Actuated g/C Ratio	0.20	0.13	0.13	0.33	0.23	0.23	0.09	0.47	0.47	0.09	0.47	0.47
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	177	251	213	474	357	353	293	1660	743	306	1673	748
v/s Ratio Prot	0.01	0.01		c0.09	0.13		0.02	c0.26		c0.03	0.21	
v/s Ratio Perm	0.02		0.01	c0.09		0.11			0.02			0.01
v/c Ratio	0.14	0.05	0.05	0.54	0.53	0.47	0.25	0.55	0.05	0.29	0.44	0.02
Uniform Delay, d1	36.5	41.5	41.5	28.8	36.8	36.2	47.0	20.9	15.8	46.9	19.3	15.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.37	0.47	0.26	1.24	0.60	0.43
Incremental Delay, d2	0.4	0.1	0.1	1.3	1.5	1.0	0.4	1.2	0.1	0.5	0.8	0.0
Delay (s)	36.9	41.5	41.5	30.0	38.4	37.2	64.7	11.1	4.3	58.6	12.3	6.6
Level of Service	D	D	D	C	D	D	E	B	A	E	B	A
Approach Delay (s)		40.5			35.9			14.2			17.0	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	23.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
101: Rinehart &

Wekiva Parkway  
2012 No Build Conditions - PM Peak



Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations	↵	↶	↕↕	↶	↵	↕↕
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	3539	1583	1770	3539
Volume (vph)	50	110	865	485	255	722
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	120	940	527	277	785
RTOR Reduction (vph)	0	108	0	222	0	0
Lane Group Flow (vph)	54	12	940	305	277	785
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	8.4	8.4	61.2	61.2	20.9	88.6
Effective Green, g (s)	10.9	10.9	63.7	63.7	23.4	91.1
Actuated g/C Ratio	0.10	0.10	0.58	0.58	0.21	0.83
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	175	157	2049	917	377	2931
v/s Ratio Prot	c0.03		c0.27		c0.16	0.22
v/s Ratio Perm		0.01		0.19		
v/c Ratio	0.31	0.08	0.46	0.33	0.73	0.27
Uniform Delay, d1	46.0	45.0	13.3	12.1	40.4	2.1
Progression Factor	0.99	0.98	0.28	0.04	0.88	1.99
Incremental Delay, d2	1.0	0.2	0.6	0.8	6.7	0.2
Delay (s)	46.7	44.4	4.3	1.3	42.2	4.4
Level of Service	D	D	A	A	D	A
Approach Delay (s)	45.1		3.2		14.2	
Approach LOS	D		A		B	

Intersection Summary

HCM Average Control Delay	10.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
16: Rinehart & Towne

Wekiva Parkway  
2012 No Build Conditions - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕		↖	↕			↕	↗		↕	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Fr <sub>t</sub>	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3502		1770	3525			1793	1583		1794	1583
Fl <sub>t</sub> Permitted	0.95	1.00		0.95	1.00			0.73	1.00		0.74	1.00
Satd. Flow (perm)	3433	3502		1770	3525			1369	1583		1380	1583
Volume (vph)	371	1051	78	35	745	20	43	12	20	44	14	397
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	403	1142	85	38	810	22	47	13	22	48	15	432
RTOR Reduction (vph)	0	5	0	0	1	0	0	0	19	0	0	326
Lane Group Flow (vph)	403	1222	0	38	831	0	0	60	3	0	63	106
Turn Type	Prot		Prot		Perm		Perm		Perm		Perm	
Protected Phases	5	2		1	6			8	8		4	4
Permitted Phases							8		8	4		4
Actuated Green, G (s)	17.8	49.9		29.1	61.2			12.5	12.5		12.5	12.5
Effective Green, g (s)	19.3	52.4		30.6	63.7			15.0	15.0		15.0	15.0
Actuated g/C Ratio	0.18	0.48		0.28	0.58			0.14	0.14		0.14	0.14
Clearance Time (s)	5.5	6.5		5.5	6.5			6.5	6.5		6.5	6.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	602	1668		492	2041			187	216		188	216
v/s Ratio Prot	c0.12	c0.35		0.02	c0.24							
v/s Ratio Perm								0.04	0.00		0.05	c0.07
v/c Ratio	0.67	0.73		0.08	0.41			0.32	0.01		0.34	0.49
Uniform Delay, d <sub>1</sub>	42.4	23.2		29.3	12.7			42.9	41.1		43.0	44.0
Progression Factor	1.00	1.00		0.64	1.32			1.00	1.00		1.00	1.00
Incremental Delay, d <sub>2</sub>	2.8	2.9		0.3	0.6			1.0	0.0		1.1	1.7
Delay (s)	45.2	26.1		19.0	17.4			43.9	41.1		44.0	45.7
Level of Service	D	C		B	B			D	D		D	D
Approach Delay (s)		30.8			17.5			43.2			45.5	
Approach LOS		C			B			D			D	

**Intersection Summary**

HCM Average Control Delay	29.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
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Wekiva Parkway  
2012 No Build Conditions - PM Peak

Movement	EBL	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR2	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Flt	1.00	0.85		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1639		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1583		1770	1639		1770	3539	1583	1770	3539	1583
Volume (vph)	18	27	35	621	40	159	53	414	553	30	330	40
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	29	38	675	43	173	58	450	601	33	359	43
RTOR Reduction (vph)	0	34	0	0	104	0	0	0	388	0	0	29
Lane Group Flow (vph)	20	33	0	675	112	0	58	450	213	33	359	14
Turn Type	Protcustom		pm+pt			Prot		Perm		Prot		Perm
Protected Phases	7		3			5		2		1		6
Permitted Phases	4		8			5		2		1		6
Actuated Green, G (s)	1.4	9.3		49.3	41.4		7.5	36.4	36.4	4.8	33.7	33.7
Effective Green, g (s)	3.9	11.8		51.8	43.9		10.0	38.9	38.9	7.3	36.2	36.2
Actuated g/C Ratio	0.04	0.11		0.47	0.40		0.09	0.35	0.35	0.07	0.33	0.33
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	63	170		834	654		161	1252	560	117	1165	521
v/s Ratio Prot	0.01			c0.27	0.07		c0.03	0.13		0.02	0.10	
v/s Ratio Perm		0.02		0.12					c0.13			0.01
v/c Ratio	0.32	0.19		0.81	0.17		0.36	0.36	0.38	0.28	0.31	0.03
Uniform Delay, d1	51.8	44.8		24.9	21.3		47.0	26.3	26.5	48.9	27.6	25.0
Progression Factor	1.00	1.00		0.98	0.96		1.00	1.00	1.00	0.66	0.94	1.07
Incremental Delay, d2	2.9	0.6		5.8	0.1		1.4	0.8	2.0	1.3	0.7	0.1
Delay (s)	54.6	45.3		30.2	20.7		48.4	27.1	28.5	33.6	26.4	26.8
Level of Service	D	D		C	C		D	C	C	C	C	C
Approach Delay (s)					27.9			29.0			27.0	
Approach LOS					C			C			C	

Intersection Summary

HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			