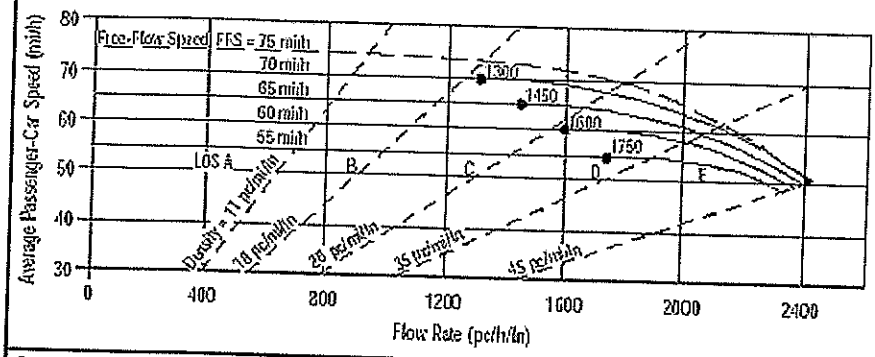
2012 Build - Preferred Alternative

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	*I-4/Eastbound*
From/To	*Lake Mary Blvd /CR 46A/SR417*
Jurisdiction	
Analysis Year	*2012 Build*

Project Description Wekiva Parkway PD&E

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

Flow Inputs

Volume, V	*5530*	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

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.45*	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}	*0.0*	mi/h
f_N	*3.0*	mi/h
FFS	*67.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2028*	pc/h/ln
S	*62.3*	mi/h
D = v_p / S	*32.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

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

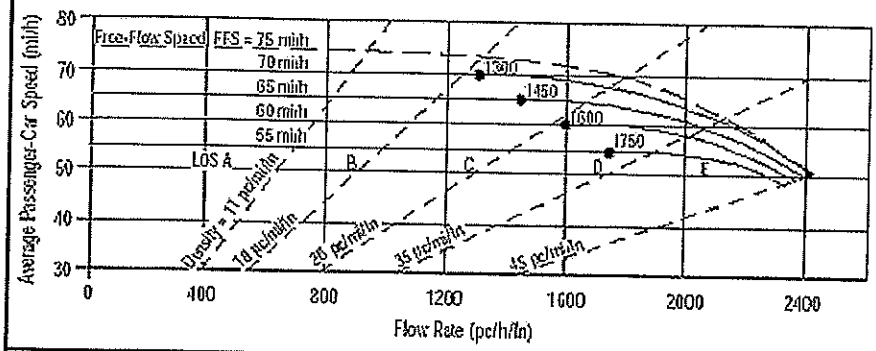
Glossary

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 - Exhibits23-8, 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	*I-4/Eastbound*
From/To	*CR 46A/SR 417/SR 46*
Jurisdiction	
Analysis Year	*2012 Build*

Project Description Wekiva Parkway PD&E

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

Flow Inputs

Volume, V	*4220*	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

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.54*	I/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 or DDHV) / (PHF x N x f_{HV} x f_p)	*1547*	pc/h/ln
S	*66.7*	mi/h
D = v_p / S	*23.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

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

Glossary

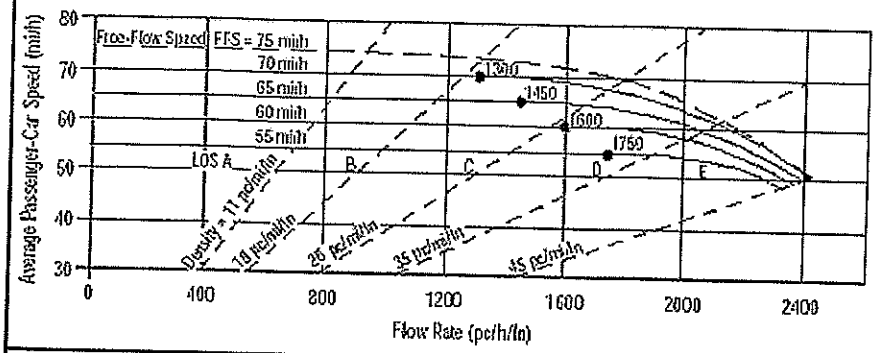
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 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

Generated: 3/25/2008 9:57 PM

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	*I-4/Eastbound*
From/To	*SR 46/US17/92*
Jurisdiction	
Analysis Year	*2012 Build*

Project Description Wekiva Parkway PD&E

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

Flow Inputs

Volume, V	*5640*	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

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.67*	I/mi
Number of Lanes, N	*4*	
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}	*0.9*	mi/h
f_N	*1.5*	mi/h
FFS	*67.6*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1551*	pc/h/ln
S	*67.4*	mi/h
D = v_p / S	*23.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

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

Glossary

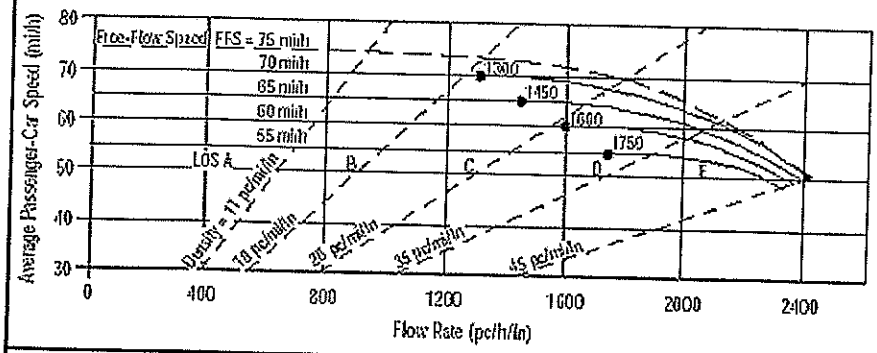
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 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

Generated: 3/25/2008 9:55 PM

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	*I-4/Eastbound*
From/To	*Us17/92 to Volusia County Line*
Jurisdiction	
Analysis Year	*2012 Build*

Project Description Wekiva Parkway PD&E

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

Flow Inputs

Volume, V	*5340*	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

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*2.00*	I/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 or DDHV) / (PHF x N x f_{HV} x f_p)	*1958*	pc/h/ln
S	*58.1*	mi/h
D = v_p / S	*33.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

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

Glossary

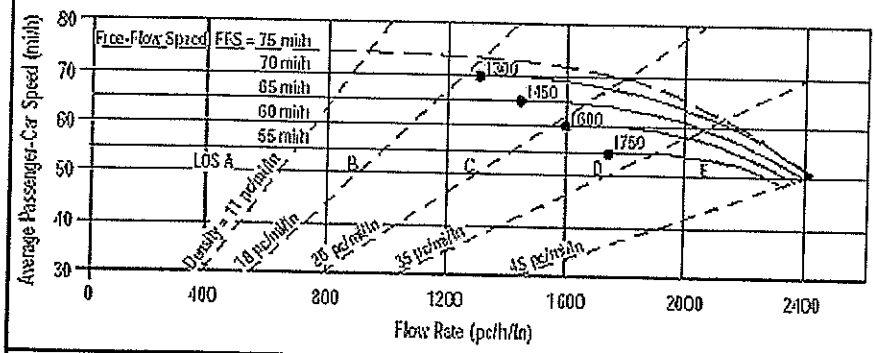
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 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

Generated: 3/25/2008 9:54 PM

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 Build*

Project Description Wekiva Parkway PD&E

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

Flow Inputs

Volume, V	*3370*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*10*
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*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.40*	I/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}	*0.0*	mi/h
f_N	*3.0*	mi/h
FFS	*67.0*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1242*	pc/h/ln
S	*67.0*	mi/h
D = v_p / S	*18.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

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

Glossary

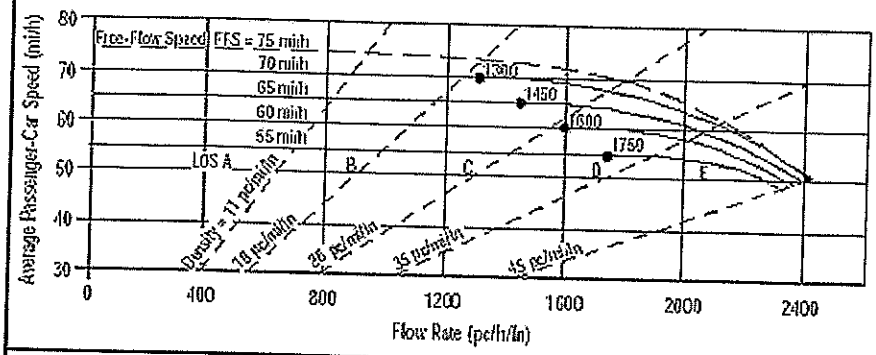
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 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

Generated: 3/26/2008 4:46 PM

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 Build*

Project Description Wekiva Parkway PD&E

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

Flow Inputs

Volume, V	*2810*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*10*
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*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

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 or DDHV) / (PHF x N x f_{HV} x f_p)	*1035*	pc/h/ln
S	*59.5*	mi/h
D = v_p / S	*17.4*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

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

Glossary

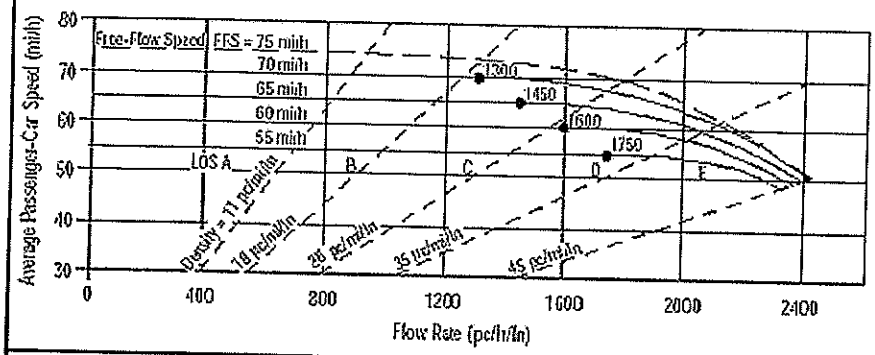
N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 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

Generated: 3/26/2008 4:43 PM

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	*I-4 to CD Road*
Jurisdiction	
Analysis Year	*2012 Build*

Project Description Wekiva Parkway PD&E

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

Flow Inputs

Volume, V	*2050*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*10*
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*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*2.00*	I/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 or DDHV) / (PHF x N x f_{HV} x f_p)	*755*	pc/h/ln
S	*59.5*	mi/h
D = v_p / S	*12.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x 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 - Exhibits23-8, 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

Generated: 3/26/2008 5:18 PM

HCS+: Basic Freeway Segments Release 5.4

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KNM
Agency or Company:	HNTB
Date Performed:	09/2010
Analysis Time Period:	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	5530	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1503	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	1570	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	1570	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	23.7	pc/mi/ln
Level of service, LOS	C	

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

HCS+: Basic Freeway Segments Release 5.4

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KNM
Agency or Company:	HNTB
Date Performed:	09/2010
Analysis Time Period:	Build Service Road Concept
Freeway/Direction:	SR 417 WB
From/To:	On Ramp from I-4 EB & WB
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	1640	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	446	v
Trucks and buses	11	%
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	0.948	
Driver population factor, fp	1.00	
Flow rate, vp	470	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	2.00	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	7.5	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	61.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	470	pc/h/ln
Free-flow speed, FFS	61.0	mi/h
Average passenger-car speed, S	61.0	mi/h
Number of lanes, N	4	
Density, D	7.7	pc/mi/ln
Level of service, LOS	A	

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

2012 Build I-4 WB On from US1792.txt

HCS+: Basic Freeway Segments Release 5.4

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KNM
Agency or Company:	HNTB
Date Performed:	
Analysis Time Period:	Build Service Road Concept
Freeway/Direction:	I-4 WB
From/To:	US 17/92 WB On to Off to SR 46
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	5650	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1535	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	1604	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.67	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	0.9	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	67.6	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1604	pc/h/ln
Free-flow speed, FFS	67.6	mi/h
Average passenger-car speed, S	67.3	mi/h
Number of lanes, N	4	
Density, D	23.8	pc/mi/ln
Level of service, LOS	C	

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

HCS+: Basic Freeway Segments Release 5.4

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KNM
Agency or Company:	HNTB
Date Performed:	
Analysis Time Period:	Build Service Road Concept
Freeway/Direction:	I-4 EB
From/To:	SR 46 On to US 17/92 Off
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	5650	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1535	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	1604	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.54	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	0.2	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	68.3	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1604	pc/h/ln
Free-flow speed, FFS	68.3	mi/h
Average passenger-car speed, S	67.9	mi/h
Number of lanes, N	4	
Density, D	23.6	pc/mi/ln
Level of service, LOS	C	

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

HCS+: Basic Freeway Segments Release 5.4

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KNM
Agency or Company:	HNTB
Date Performed:	09/2010
Analysis Time Period:	Build Service Road Concept
Freeway/Direction:	CD Road/EB
From/To:	SR 417 EB On to Off to I-4 EB
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	1370	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	372	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	519	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.54	interchange/mi
Number of lanes, N	3	
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	0.2	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	66.8	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	519	pc/h/ln
Free-flow speed, FFS	66.8	mi/h
Average passenger-car speed, S	66.8	mi/h
Number of lanes, N	3	
Density, D	7.8	pc/mi/ln
Level of service, LOS	A	

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

HCS+: Basic Freeway Segments Release 5.4

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KNM
Agency or Company:	HNTB
Date Performed:	09/2010
Analysis Time Period:	Build Service Road Concept
Freeway/Direction:	CD Road/WB
From/To:	I-4 WB On to Off to SR 417 WB
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	2700	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	734	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	1022	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.54	interchange/mi
Number of lanes, N	3	
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	0.2	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	66.8	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1022	pc/h/ln
Free-flow speed, FFS	66.8	mi/h
Average passenger-car speed, S	66.8	mi/h
Number of lanes, N	3	
Density, D	15.3	pc/mi/ln
Level of service, LOS	B	

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

SR 417 WB ON Ramp from Rinehart.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
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	2580	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	230	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	790	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)	2580	230	790	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	701	62	215	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	

Flow rate, vp 2945 262 902 pcph

Estimation of V12 Merge Areas

L_{EQ} = 780.50 (Equation 25-2 or 25-3)

P_{FM} = 0.619 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1824 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3207	6750	No
v_3 or v_{av34}	1121 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} = 1824		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1824	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 12.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.247

Space mean speed in ramp influence area, S_R = 51.8 mph

Space mean speed in outer lanes, S_O = 52.8 mph

Space mean speed for all vehicles, S = 52.1 mph

SR 417 EB OFF to Rinehart_Upstream Analysis.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
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	4	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2810	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	230	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1220	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2810		230		1220		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	764		62		332		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	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	0.952		0.952		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, v_p 3207 262 1386 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1546 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3207	9000	No
$v_{FO} = v_F - v_R$	2945	9000	No
v_R	262	2000	No
v_3 or v_{av34}	830 pc/h	(Equation 25-15 or 25-16)	
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} = 1546		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1546	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.452

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 54.4 mph

SR 417 EB OFF to Rinehart_Downstream Analysis.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
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	4	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2810	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	230	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	790	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2402	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2810		230		790	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	764		62		215	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	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	0.952		0.952		0.957	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp 3207 262 897 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1546 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3207	9000	No
$v_{FO} = v_F - v_R$	2945	9000	No
v_R	262	2000	No
v_3 or v_{av34}	830 pc/h	(Equation 25-15 or 25-16)	
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} = 1546		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1546	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 17.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.452

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 54.4 mph

SR 417 EB ON from Rinehart.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
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	2580	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	790	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	230	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2402	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2580	790	230	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	701	215	62	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	

Flow rate, vp 2945 902 262 pcph

Estimation of V12 Merge Areas

L_{EQ} = 695.46 (Equation 25-2 or 25-3)

P_{FM} = 0.605 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1783 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3847	6750	No
v_3 or v_{av34}	1162 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}	= 1783	(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1783	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.308

Space mean speed in ramp influence area, S_R = 51.0 mph

Space mean speed in outer lanes, S_O = 52.6 mph

Space mean speed for all vehicles, S = 51.5 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
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	3370	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	790	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	0	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	230	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1833	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3370		790		230		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	916		215		62		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	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	0.952		0.952		0.952		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3846 902 262 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2227 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3846	6750	No
$v_{FO} = v_F - v_R$	2944	6750	No
v_R	902	3800	No
v_3 or v_{av34}	1619 pc/h	(Equation 25-15 or 25-16)	
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} = 2227		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2227	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 14.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.509

Space mean speed in ramp influence area, S_R = 48.4 mph

Space mean speed in outer lanes, S_O = 57.9 mph

Space mean speed for all vehicles, S = 52.0 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	3/12/2007
Analysis time period:	Build I-4 Connection @ SR417
Freeway/Dir of Travel:	Frontage Rd (East of I-4) EB
Junction:	Off Ramp to I-4 NB
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	1370	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	460	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	460	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3010	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1370		460		460		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	381		128		128		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	1522		511		511		pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 966 pc/h

Capacity Checks

		Actual		Maximum	LOS F?
$v_{Fi} = v_F$		1522		6750	No
$v_{FO} = v_F - v_R$		1011		6750	No
v_R		511		3800	No
v_3 or v_{av34}		556	pc/h	(Equation 25-15 or 25-16)	
Is v_3 or v_{av34}	> 2700 pc/h?			No	
Is v_3 or v_{av34}	> 1.5 v_R /2			No	

If yes, $v_{12A} = v_{av34} + v_{12}$ (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	966	4600	No

!

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = -0.5$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	$D_S = 0.474$	
Space mean speed in ramp influence area,	$S_R = 48.8$	mph
Space mean speed in outer lanes,	$S_O = 60.3$	mph
Space mean speed for all vehicles,	$S = 52.2$	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	CD 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	720	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	260	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1720	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	1426	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	720	260	1720	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	196	71	467	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 818 295 1954 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 818 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1113	4500	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-4 or 25-5)	
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} = 818		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	818	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 9.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.284

Space mean speed in ramp influence area, S_R = 51.3 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 51.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build
Freeway/Dir of Travel:	I-4 EB
Junction:	Off Ramp to US 1792
Jurisdiction:	Seminole County
Analysis Year:	2022
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	5650	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	660	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	360	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)	5650		660		360		vph
Peak-hour factor, PHF	0.95		0.95		0.95		
Peak 15-min volume, v15	1487		174		95		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 6215 726 396 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3119 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6215	9600	No
$v_{FO} = v_F - v_R$	5489	9600	No
v_R	726	2000	No
v_3 or v_{av34}	1548 pc/h	(Equation 25-15 or 25-16)	
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} = 3119		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3119	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 21.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.493

Space mean speed in ramp influence area, S_R = 56.2 mph

Space mean speed in outer lanes, S_O = 74.7 mph

Space mean speed for all vehicles, S = 64.1 mph

2012 Build I-4 EB On from US1792.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build
Freeway/Dir of Travel:	I-4 EB
Junction:	On Ramp from US 1792
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	4990	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	360	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	660	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)	4990	360	660	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1356	98	179	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 5668 409 750 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1128.28 (Equation 25-2 or 25-3)

P_{FM} = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 3416 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6077	7200	No
v_3 or v_{av34}	2252 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} = 3416		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3416	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 29.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.437

Space mean speed in ramp influence area, S_R = 57.8 mph

Space mean speed in outer lanes, S_O = 63.7 mph

Space mean speed for all vehicles, S = 59.8 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build
Freeway/Dir of Travel:	I-4 WB
Junction:	Off Ramp to US 1792
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	5350	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	360	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	660	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)	5350		360		660	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	1454		98		179	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	6077	409	750	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.589 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3749 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6077	7200	No
$v_{FO} = v_F - v_R$	5668	7200	No
v_R	409	2000	No
v_3 or v_{av34}	2328 pc/h	(Equation 25-15 or 25-16)	
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} = 3749		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3749	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 32.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.465

Space mean speed in ramp influence area, S_R = 57.0 mph

Space mean speed in outer lanes, S_O = 71.6 mph

Space mean speed for all vehicles, S = 61.8 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	3/12/2007
Analysis time period:	Build I-4 Connection @ SR417
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	4	
Free-flow speed on freeway	55.0	mph
Volume on freeway	4680	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	970	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	460	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	3172	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4680	970	460	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1300	269	128	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, E_T	1.5	1.5	1.5	
Recreational vehicle PCE, E_R	1.2	1.2	1.2	
Heavy vehicle adjustment, f_{HV}	1.000	1.000	1.000	
Driver population factor, f_P	1.00	1.00	1.00	
Flow rate, v_p	5200	1078	511	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.209 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1087 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6278	9000	No
v_3 or v_{av34}	2056 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	Yes	
If yes, v_{12A}	= 2080	(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2080	4400	No

!

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.308	
Space mean speed in ramp influence area,	S_R = 51.0	mph
Space mean speed in outer lanes,	S_0 = 51.2	mph
Space mean speed for all vehicles,	S = 51.1	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
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	5650	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	970	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	1720	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)	5650		970		1720		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1535		264		467		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	6418	1102	1954	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2484 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6418	9000	No
$v_{FO} = v_F - v_R$	5316	9000	No
v_R	1102	3800	No
v_3 or v_{av34}	1967 pc/h	(Equation 25-15 or 25-16)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12}/2	Yes	
If yes, v_{12A} = 2567		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2567	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 21.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.527

Space mean speed in ramp influence area, S_R = 48.1 mph

Space mean speed in outer lanes, S_O = 56.7 mph

Space mean speed for all vehicles, S = 53.0 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	I-4 WB
Junction:	On Ramp from SR 417
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	2960	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	480	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	2090	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)	2960	480	2090	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	804	130	568	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, v_p 3362 545 2374 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1866 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3907	6750	No
v_3 or v_{av34}	1496 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	Yes	
If yes, v_{12A} = 1921		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1921	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 7.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.178

Space mean speed in ramp influence area, S_R = 52.7 mph

Space mean speed in outer lanes, S_O = 51.6 mph

Space mean speed for all vehicles, S = 52.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	SR 417 EB
Junction:	On Ramp from I-4 EB & WB
Jurisdiction:	Seminole County
Analysis Year:	2012

Description: Wekiva Parkway Project Development & Environment Project

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1590	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	1220	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	540	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	3106	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1590	1220	540	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	432	332	147	v
Trucks and buses	11	9	11	%
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	0.948	0.957	0.948	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1823 1386 619 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1012 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		3209	6750	No
$v_{3 \text{ or } av34}$		811 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$	> 2700 pc/h?		No	
Is $v_{3 \text{ or } av34}$	> 1.5 $v_{12}/2$		Yes	
If yes, v_{12A} = 1041			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1041	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 3.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.134	
Space mean speed in ramp influence area,	S_R = 53.3	mph
Space mean speed in outer lanes,	S_O = 54.0	mph
Space mean speed for all vehicles,	S = 53.4	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	CD 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	1390	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	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	130	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1584	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1390		350		130		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	378		95		35		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, v_p 1579 398 148 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1579 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1579	4500	No
$v_{FO} = v_F - v_R$	1181	4500	No
v_R	398	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} = 1579		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1579	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.464

Space mean speed in ramp influence area, S_R = 49.0 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 49.0 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	02/16/2007
Analysis time period:	Build I-4 Connection @ SR417
Freeway/Dir of Travel:	SR 417 WB
Junction:	On Ramp from I-4 EB & 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	1050	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	590	vph
Length of first accel/decel lane	1325	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	550	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2076	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1050	590	550	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	292	164	153	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	1167	656	611	pcph

Estimation of V12 Merge Areas

L_{EQ} = 406.62 (Equation 25-2 or 25-3)

P_{FM} = 0.615 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 717 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		1823	6750	No
v_3 or v_{av34}		450 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} =			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?	
v_{12}	717	4400	No	!

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 7.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.244	
Space mean speed in ramp influence area,	S_R = 51.8	mph
Space mean speed in outer lanes,	S_O = 55.0	mph
Space mean speed for all vehicles,	S = 52.6	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	CD Rd (East of I-4) EB
Junction:	Off Ramp to SR 417 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	1040	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	130	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	230	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1478	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1040		130		230		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	283		35		62		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 1181 148 261 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1181 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1181	4500	No
$v_{FO} = v_F - v_R$	1033	4500	No
v_R	148	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} = 1181		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1181	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 14.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.441

Space mean speed in ramp influence area, S_R = 49.3 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 49.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	I-4 WB
Junction:	On Ramp from SR 417
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	2960	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	480	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1720	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)	2960	480	1720	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	804	130	467	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 3362 545 1954 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1866 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3907	6750	No
v_3 or v_{av34}	1496 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		Yes	
If yes, v_{12A} = 1921		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1921	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 7.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.178

Space mean speed in ramp influence area, S_R = 52.7 mph

Space mean speed in outer lanes, S_O = 51.6 mph

Space mean speed for all vehicles, S = 52.3 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	02/16/2007
Analysis time period:	Build I-4 Connection @ SR417
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	2810	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	1210	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	550	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	3765	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2810		1210		550		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	781		336		153		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	3122		1344		611		pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 2144 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
$v_{Fi} = v_F$		3122	6750	No
$v_{FO} = v - v_R$		1778	6750	No
v_R		1344	3800	No
v_3 or v_{av34}		978 pc/h	(Equation 25-15 or 25-16)	
Is v_3 or v_{av34}	> 2700 pc/h?		No	
Is v_3 or v_{av34}	> 1.5 v_R /2		No	

If yes, $v_{12A} = v_{av34} + v_{12}$ (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2144	4600	No

!

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 9.2$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable, $D_S = 0.549$

Space mean speed in ramp influence area, $S_R = 47.9$ mph

Space mean speed in outer lanes, $S_O = 60.3$ mph

Space mean speed for all vehicles, $S = 51.2$ mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	SR 417 EB
Junction:	Off Ramp to I-4 EB & 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	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1640	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	590	vph
Length of first accel/decel lane	0	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	Off	
Distance to adjacent ramp	1250	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1640		590		410		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	446		160		111		v
Trucks and buses	11		11		11		%
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	0.948		0.948		0.948		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 1881 677 470 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.682 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1498 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1881	6750	No
$v_{FO} = v_F - v_R$	1204	6750	No
v_R	677	2000	No
v_3 or v_{av34}	383 pc/h	(Equation 25-15 or 25-16)	
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} = 1498		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1498	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 17.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.489

Space mean speed in ramp influence area, S_R = 48.6 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 50.6 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
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	3360	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	860	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	230	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	1976	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3360	860	230	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	913	234	62	v
Trucks and buses	9	10	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	0.952	0.957	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 3817 982 261 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2118 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4799	6750	No
v_3 or v_{av34}	1699 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	Yes	
If yes, v_{12A} = 2181		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2181	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 9.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.182

Space mean speed in ramp influence area, S_R = 52.6 mph

Space mean speed in outer lanes, S_O = 50.9 mph

Space mean speed for all vehicles, S = 52.0 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	3/12/2007
Analysis time period:	Build I-4 Connection @ SR417
Freeway/Dir of Travel:	Frontage Rd (East of I-4) EB
Junction:	On Ramp from SR 417 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	910	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	460	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	130	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1478	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	910	460	130	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	253	128	36	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	1011	511	144	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1011 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		1522	4500	No
v_{3} or v_{av34}		0 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} =			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?	
v_{12}	1011	4400	No	!

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 7.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.236	
Space mean speed in ramp influence area,	S_R = 51.9	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 51.9	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	03/12/2007
Analysis time period:	Build I-4 Connection @ SR417
Freeway/Dir of Travel:	SR 417 EB
Junction:	On Ramp from I-4 EB & WB
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development & Environment Project

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
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	1220	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	540	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	3106	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	680	1220	540	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	189	339	150	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	756	1356	600	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.208 Using Equation 4

$v_{12} = v_F (P_{FM})$ = 157 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2112	9000	No
$v_{3 \text{ or } av34}$	299 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$ > 2700 pc/h?		No	
Is $v_{3 \text{ or } av34}$ > 1.5 v_{12}/2		Yes	
If yes, v_{12A} = 302		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?	
v_{12A}	302	4400	No	!

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 14.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.306	
Space mean speed in ramp influence area,	S_R = 51.0	mph
Space mean speed in outer lanes,	S_O = 55.0	mph
Space mean speed for all vehicles,	S = 51.8	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	CD 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	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2240	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	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	460	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)	2240		870		460		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	609		236		125		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, v_p 2544 988 522 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1688 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2544	6750	No
$v_{FO} = v_F - v_R$	1556	6750	No
v_R	988	3800	No
v_3 or v_{av34}	856 pc/h	(Equation 25-15 or 25-16)	
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} = 1688		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1688	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 5.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.517

Space mean speed in ramp influence area, S_R = 48.3 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 51.8 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	CD Rd (West of I-4) WB
Junction:	Off Ramp to SR 417 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	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2700	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	460	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	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1531	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2700		460		870	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	734		125		236	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, v_p 3067 522 988 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 1150.31 (Equation 25-8 or 25-9)

P_{FD} = 0.659 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2200 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3067	6750	No
$v_{FO} = v_F - v_R$	2545	6750	No
v_R	522	2000	No
v_3 or v_{av34}	867 pc/h	(Equation 25-15 or 25-16)	
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}	= 2200	(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2200	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 18.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.475

Space mean speed in ramp influence area, S_R = 48.8 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 51.6 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
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	5530	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	0	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1390	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)	5530		1190		1390		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1503		323		378		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 6281 1352 1579 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2634 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6281	9000	No
$v_{FO} = v_F - v_R$	4929	9000	No
v_R	1352	3800	No
v_3 or v_{av34}	1823 pc/h	(Equation 25-15 or 25-16)	
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} = 2634		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2634	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 13.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.550

Space mean speed in ramp influence area, S_R = 47.9 mph

Space mean speed in outer lanes, S_O = 57.1 mph

Space mean speed for all vehicles, S = 52.8 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	3/12/2007
Analysis time period:	Build I-4 Connection @ SR417
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	900	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	470	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)	900	1190	470	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	250	331	131	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	1000	1322	522	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1000 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2322	4500	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-4 or 25-5)	
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} =		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?	
v_{12}	1000	4400	No	!

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.326	
Space mean speed in ramp influence area,	S_R = 50.8	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 50.8	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
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	2950	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	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1390	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)	2950	410	1390	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	802	111	378	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, v_p 3351 466 1579 pcph

Estimation of V12 Merge Areas

L_{EQ} = 555.84 (Equation 25-2 or 25-3)

P_{FM} = 0.597 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2001 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3817	6750	No
v_3 or v_{av34}	1350 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} = 2001		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2001	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.318

Space mean speed in ramp influence area, S_R = 50.9 mph

Space mean speed in outer lanes, S_O = 51.9 mph

Space mean speed for all vehicles, S = 51.2 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	CD 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	1370	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	470	vph
Length of first accel/decel lane	0	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)	1370		470		1190	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	372		128		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 1556 534 1352 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1556 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1556	4500	No
$v_{FO} = v_F - v_R$	1022	4500	No
v_R	534	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} = 1556		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1556	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 17.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.476

Space mean speed in ramp influence area, S_R = 48.8 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 48.8 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	3/12/2007
Analysis time period:	Build I-4 Connection @ SR417
Freeway/Dir of Travel:	I-4 EB
Junction:	Off Ramp to SR 417 & 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	4340	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	1390	vph
Length of first accel/decel lane	406	ft
Length of second accel/decel lane	1500	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)	4340		1390		1190		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	1206		386		331		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	4822		1544		1322		pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3019 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
$v_{Fi} = v_F$		4822	6750	No
$v_{FO} = v_F - v_R$		3278	6750	No
v_R		1544	3800	No
v_3 or v_{av34}		1803 pc/h	(Equation 25-15 or 25-16)	
Is v_3 or v_{av34}	> 2700 pc/h?		No	
Is v_3 or v_{av34}	> 1.5 v_R /2		No	

If yes, $v_{12A} = v_{12} + v_{av34}$ or v_{3} (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3019	4600	No

!

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 9.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.567	
Space mean speed in ramp influence area,	S_R = 47.6	mph
Space mean speed in outer lanes,	S_O = 57.2	mph
Space mean speed for all vehicles,	S = 50.8	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	I-4 EB
Junction:	On Ramp from SR 417 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	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	4220	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	460	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	910	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3172	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4220	460	910	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1147	125	247	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 4793 522 1034 pcph

Estimation of V12 Merge Areas

L_{EQ} = 965.21 (Equation 25-2 or 25-3)

P_{FM} = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2889 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5315	6750	No
v_3 or v_{av34}	1904 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}	= 2889	(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2889	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 26.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.376	
Space mean speed in ramp influence area,	S_R = 50.1	mph
Space mean speed in outer lanes,	S_O = 49.9	mph
Space mean speed for all vehicles,	S = 50.1	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	3/12/2007
Analysis time period:	Build I-4 Connection @ SR417
Freeway/Dir of Travel:	Frontage Rd (West of I-4) WB
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	4	
Free-flow speed on freeway	55.0	mph
Volume on freeway	980	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	1720	vph
Length of first accel/decel lane	530	ft
Length of second accel/decel lane	530	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	260	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	1426	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	980	1720	260	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	272	478	72	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	1089	1911	289	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.209 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 228 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3000	9000	No
v_3 or v_{av34}	430 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	Yes	
If yes, v_{12A}	= 435	(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?	
v_{12A}	435	4400	No	!

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 13.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.253	
Space mean speed in ramp influence area,	S_R = 51.7	mph
Space mean speed in outer lanes,	S_O = 55.0	mph
Space mean speed for all vehicles,	S = 52.3	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	3/12/2007
Analysis time period:	Build I-4 Connection @ SR417
Freeway/Dir of Travel:	I-4 WB
Junction:	Off Ramp to SR 417 & 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	4250	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	1720	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	970	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)	4250		1720		970		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	1181		478		269		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	4722		1911		1078		pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2642 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4722	9000	No
$v_{FO} = v_F - v_R$	2811	9000	No
v_R	1911	3800	No
v_3 or v_{av34}	1040 pc/h	(Equation 25-15 or 25-16)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_R /2		No	

If yes, v_{12A} = $v_{3 \text{ or } av34} + v_{12}$ (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2642	4600	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 13.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.600	
Space mean speed in ramp influence area,	S_R = 47.2	mph
Space mean speed in outer lanes,	S_O = 60.2	mph
Space mean speed for all vehicles,	S = 52.2	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	3/12/2007
Analysis time period:	Build I-4 Connection @ SR417
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	3010	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	2090	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane	900	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	480	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)	3010	2090	480	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	836	581	133	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	3344	2322	533	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1856 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5666	6750	No
v_3 or v_{av34}	1488 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	Yes	
If yes, v_{12A}	= 1910	(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1910	4400	No

!

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable,	M_S = 0.401	
Space mean speed in ramp influence area,	S_R = 49.8	mph
Space mean speed in outer lanes,	S_O = 51.6	mph
Space mean speed for all vehicles,	S = 50.2	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	SR 417 WB
Junction:	On Ramp from International Pwy
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	1640	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	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	590	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	1325	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1640	410	590	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	446	111	160	v
Trucks and buses	11	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	0.948	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp	1881	466	670	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.446 Using Equation 4

$v_{12} = v_F (P_{FM})$ = 839 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2347	9000	No
v_3 or v_{av34}	521 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} = 839		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	839	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 9.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.272

Space mean speed in ramp influence area, S_R = 51.5 mph

Space mean speed in outer lanes, S_O = 54.9 mph

Space mean speed for all vehicles, S = 52.9 mph

SR 417 EB ON Ramp From Int'l Pkwy_Upstream Analysis.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	8/02/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	SR 417 EB
Junction:	On Ramp from International Pky
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development & Environment Project

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1050	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	540	vph
Length of first accel/decel lane	1200	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	Off	
Distance to adjacent Ramp	1964	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1050	540	410	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	285	147	111	v
Trucks and buses	11	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	0.948	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1204 616 468 pcph

Estimation of V12 Merge Areas

L_{EQ} = 350.48 (Equation 25-2 or 25-3)

P_{FM} = 0.611 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 736 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1820	6750	No
v_3 or v_{av34}	468 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} = 736		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	736	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 8.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.252

Space mean speed in ramp influence area, S_R = 51.7 mph

Space mean speed in outer lanes, S_O = 55.0 mph

Space mean speed for all vehicles, S = 52.5 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	SR 417 WB
Junction:	Off Ramp to International Pkwy
Jurisdiction:	Seminole County
Analysis Year:	2022
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	1600	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	550	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1210	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	3765	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1600		550		1210		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	435		149		329		v
Trucks and buses	11		11		11		%
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	0.948		0.948		0.948		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 1835 631 1388 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.685 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1456 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1835	6750	No
$v_{FO} = v_F - v_R$	1204	6750	No
v_R	631	2000	No
v_3 or v_{av34}	379 pc/h	(Equation 25-15 or 25-16)	
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} = 1456		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1456	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 16.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.485

Space mean speed in ramp influence area, S_R = 48.7 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 50.7 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	SR 417 WB
Junction:	Off Ramp to International Pkwy
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	1600	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	550	vph
Length of first accel/decel lane	0	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	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2076	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1600		550		410		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	435		149		111		v
Trucks and buses	11		11		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	0.948		0.948		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 1835 631 466 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.685 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1456 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1835	6750	No
$v_{FO} = v_F - v_R$	1204	6750	No
v_R	631	2000	No
$v_{3 \text{ or } av34}$	379 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} = 1456		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1456	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 16.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.485

Space mean speed in ramp influence area, S_R = 48.7 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 50.7 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	SR 417 EB
Junction:	Off Ramp to International Pkwy
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	2050	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	410	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	590	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1250	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2050		410		590		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	557		111		160		v
Trucks and buses	11		11		11		%
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	0.948		0.948		0.948		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2351 470 677 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 751.32 (Equation 25-8 or 25-9)

P_{FD} = 0.680 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1748 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2351	6750	No
$v_{FO} = v_F - v_R$	1881	6750	No
v_R	470	2000	No
v_3 or v_{av34}	603 pc/h	(Equation 25-15 or 25-16)	
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} = 1748		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1748	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 19.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.470

Space mean speed in ramp influence area, S_R = 48.9 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 51.4 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	SR 417 EB
Junction:	On Ramp from International Pky
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development & Environment Project

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1050	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	540	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1220	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	3106	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1050	540	1220	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	285	147	332	v
Trucks and buses	11	10	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	0.948	0.952	0.957	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, v_p 1204 616 1386 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.611 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 736 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1820	6750	No
$v_{3 \text{ or } av34}$	468 pc/h	(Equation 25-4 or 25-5)	
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} = 736		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	736	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 8.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.252

Space mean speed in ramp influence area, S_R = 51.7 mph

Space mean speed in outer lanes, S_O = 55.0 mph

Space mean speed for all vehicles, S = 52.5 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. EB
Junction:	Off Ramp to EB CD
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	2500	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	200	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	120	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2500		200		120		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	679		54		33		v
Trucks and buses	11		11		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	0.948		0.948		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp	2867	229	136	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 139.71 (Equation 25-8 or 25-9)

P_{FD} = 0.678 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2017 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2867	6750	No
$v_{FO} = v_F - v_R$	2638	6750	No
v_R	229	2000	No
$v_{3 \text{ or } av34}$	850 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} = 2017		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2017	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.449

Space mean speed in ramp influence area, S_R = 49.2 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 52.0 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. EB CD
Junction:	On Ramp from Wekiva Pkwy. 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	10	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	200	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	120	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	10	200	120	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	3	54	33	v
Trucks and buses	9	11	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	0.948	0.957	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 11 229 136 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 11 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		240	4500	No
$v_{3 \text{ or } av34}$		0 pc/h	(Equation 25-4 or 25-5)	
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} = 11			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	11	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 4.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.291

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 51.2 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. EB
Junction:	On Ramp from EB CD
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	2260	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	120	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	200	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2260	120	200	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	614	33	54	v
Trucks and buses	11	9	11	%
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	0.948	0.957	0.948	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, v_p 2592 136 229 pcph

Estimation of V12 Merge Areas

L_{EQ} = 233.99 (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1533 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2728	6750	No
v_3 or v_{av34}	1059 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} = 1533		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1533	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 15.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.307

Space mean speed in ramp influence area, S_R = 51.0 mph

Space mean speed in outer lanes, S_O = 53.0 mph

Space mean speed for all vehicles, S = 51.8 mph

Wekiva Pkwy EB CD Off Ramp to Wekiva Pkwy EB_Upstream.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. EB CD
Junction:	Off Ramp to Wekiva Pkwy. EB
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Pkwy. PD&E

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	290	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	260	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	200	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	290		260		200	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	79		71		54	v
Trucks and buses	9		9		11	%
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		0.948	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, v_p 329 295 229 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 329 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	329	4500	No
$v_{FO} = v_F - v_R$	34	4500	No
v_R	295	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} = 329 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	329	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 2.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.455

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 49.1 mph

Wekiva Pkwy EB CD On Ramp from Wekiva Pkwy EB.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. EB CD
Junction:	On Ramp from Wekiva Pkwy. EB
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Pkwy. PD&E

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	180	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	300	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	120	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	180	300	120	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	49	82	33	v
Trucks and buses	9	11	11	%
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	0.948	0.948	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 204 344 138 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 204 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		548	4500	No
$v_{3 \text{ or } av34}$	$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-4 or 25-5)	
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} = 204			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	204	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 0.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.223

Space mean speed in ramp influence area, S_R = 52.1 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 52.1 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. EB
Junction:	Off Ramp to SR 46
Jurisdiction:	Seminole County
Analysis Year:	2032
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	2410	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	300	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	120	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	6684	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2410		300		120	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	655		82		33	v
Trucks and buses	11		11		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	0.948		0.948		0.957	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp 2764 344 136 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1433 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2764	6750	No
$v_{FO} = v_F - v_R$	2420	6750	No
v_R	344	3800	No
v_3 or v_{av34}	1331 pc/h	(Equation 25-15 or 25-16)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12}/2	Yes	
If yes, v_{12A} = 1579		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1579	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 4.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.459

Space mean speed in ramp influence area, S_R = 49.0 mph

Space mean speed in outer lanes, S_O = 59.6 mph

Space mean speed for all vehicles, S = 53.1 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNm
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. WB
Junction:	On Ramp from SR 46
Jurisdiction:	Seminole County
Analysis Year:	2032
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	2050	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	360	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane	640	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	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2050	360	410	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	557	98	111	v
Trucks and buses	11	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	0.948	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2351 409 466 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1305 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2760	6750	No
v_3 or v_{av34}	1046 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	Yes	
If yes, v_{12A} = 1343		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1343	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 4.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.187	
Space mean speed in ramp influence area,	S_R = 52.6	mph
Space mean speed in outer lanes,	S_O = 53.2	mph
Space mean speed for all vehicles,	S = 52.8	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. WB CD
Junction:	Off Ramp to Wekiva Pkwy. WB
Jurisdiction:	Seminole County
Analysis Year:	2032

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	540	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	360	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	150	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	6684	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	540		360		150		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	147		98		41		v
Trucks and buses	9		9		11		%
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		0.948		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 613 409 172 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 613 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	613	4500	No
$v_{FO} = v_F - v_R$	204	4500	No
v_R	409	3800	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} = 613		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	613	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 5.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.465

Space mean speed in ramp influence area, S_R = 49.0 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 49.0 mph

Wekiva Pkwy WB CD On Ramp from Wekiva Pkwy WB_Upstream.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. WB CD
Junction:	On Ramp from Wekiva Pkwy. 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	140	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	150	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	360	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	6684	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	140	150	360	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	38	41	98	v
Trucks and buses	9	11	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	0.948	0.957	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, v_p 159 172 409 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 159 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	331	4500	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-4 or 25-5)	
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} = 159		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	159	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 4.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.292

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 51.2 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. WB
Junction:	Off Ramp to WB CD
Jurisdiction:	Seminole County
Analysis Year:	2032

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	2410	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	150	vph
Length of first accel/decel lane	1340	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	240	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	6684	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2410		150		240		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	655		41		65		v
Trucks and buses	11		11		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	0.948		0.948		0.957		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2764 172 273 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 2246.91 (Equation 25-8 or 25-9)

P_{FD} = 0.683 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1942 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2764	6750	No
$v_{FO} = v_F - v_R$	2592	6750	No
v_R	172	2000	No
v_3 or v_{av34}	822 pc/h	(Equation 25-15 or 25-16)	
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} = 1942		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1942	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 8.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.443

Space mean speed in ramp influence area, S_R = 49.2 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 52.1 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. WB
Junction:	On Ramp from WB CD
Jurisdiction:	Seminole County
Analysis Year:	2032

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	2260	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	240	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	150	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2260	240	150	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	614	65	41	v
Trucks and buses	11	9	11	%
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	0.948	0.957	0.948	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2592 273 172 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.184 Using Equation 4

$v_{12} = v_F (P_{FM})$ = 476 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		2865	9000	No
v_3 or v_{av34}		1058 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		Yes	
If yes, v_{12A} = 1036			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1036	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 12.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.300	
Space mean speed in ramp influence area,	S_R = 51.1	mph
Space mean speed in outer lanes,	S_O = 54.0	mph
Space mean speed for all vehicles,	S = 52.6	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. WB CD
Junction:	Off Ramp to Wekiva Pkwy. 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	250	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	240	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	150	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	250		240		150		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	68		65		41		v
Trucks and buses	9		9		11		%
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		0.948		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 284 273 172 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 284 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	284	4500	No
$v_{FO} = v_F - v_R$	11	4500	No
v_R	273	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 25-15 or 25-16)	
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} = 284 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	284	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 2.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.453

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 49.1 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. EB
Junction:	On Ramp from EB CD
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	2260	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	120	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	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	6684	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2260	120	300	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	614	33	82	v
Trucks and buses	11	9	11	%
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	0.948	0.957	0.948	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2592 136 344 pcph

Estimation of V12 Merge Areas

L_{EQ} = 2109.14 (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1533 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2728	6750	No
$v_{3 \text{ or } av34}$	1059 pc/h	(Equation 25-4 or 25-5)	
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} = 1533		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1533	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 15.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.307

Space mean speed in ramp influence area, S_R = 51.0 mph

Space mean speed in outer lanes, S_O = 53.0 mph

Space mean speed for all vehicles, S = 51.8 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. WB
Junction:	Off Ramp to WB CD
Jurisdiction:	Seminole County
Analysis Year:	2032
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	2410	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	150	vph
Length of first accel/decel lane	1340	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	360	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2410		150		360	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	655		41		98	v
Trucks and buses	11		11		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	0.948		0.948		0.957	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp 2764 172 409 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.683 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1942 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2764	6750	No
$v_{FO} = v_F - v_R$	2592	6750	No
v_R	172	2000	No
v_3 or v_{av34}	822 pc/h	(Equation 25-15 or 25-16)	
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} = 1942		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1942	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 8.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.443

Space mean speed in ramp influence area, S_R = 49.2 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 52.1 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. WB CD
Junction:	On Ramp from Wekiva Pkwy. WB
Jurisdiction:	Seminole County
Analysis Year:	2032

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	140	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	150	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	240	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	140	150	240	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	38	41	65	v
Trucks and buses	9	11	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	0.948	0.957	
Driver population factor, fP	1.00	1.00	1.00	

Wekiva Pkwy WB CD On Ramp from Wekiva Pkwy WB_Downstream.txt

Flow rate, v_p 159 172 273 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 159 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	331	4500	No
v_3 or v_{av34}	0 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} = 159		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	159	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 4.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.292

Space mean speed in ramp influence area, S_R = 51.2 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 51.2 mph

Wekiva Pkwy WB On Ramp from SR 46_Downstream.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. WB
Junction:	On Ramp from SR 46
Jurisdiction:	Seminole County
Analysis Year:	2032
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	2050	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	360	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane	640	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	150	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	6684	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2050	360	150	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	557	98	41	v
Trucks and buses	11	9	11	%
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	0.948	0.957	0.948	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, v_p 2351 409 172 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1305 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2760	6750	No
v_3 or v_{av34}	1046 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	Yes	
If yes, v_{12A} = 1343		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1343	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 4.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.187

Space mean speed in ramp influence area, S_R = 52.6 mph

Space mean speed in outer lanes, S_O = 53.2 mph

Space mean speed for all vehicles, S = 52.8 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. EB CD
Junction:	Off Ramp to Wekiva Pkwy. EB
Jurisdiction:	Seminole County
Analysis Year:	2032
Description:	Wekiva Pkwy. PD&E

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	290	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	120	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	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	6684	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	290		120		300	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	79		33		82	v
Trucks and buses	9		9		11	%
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		0.948	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp 329 136 344 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 329 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	329	4500	No
$v_{FO} = v_F - v_R$	193	4500	No
v_R	136	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 25-15 or 25-16)	
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} = 329		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	329	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 2.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.440

Space mean speed in ramp influence area, S_R = 49.3 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 49.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. EB
Junction:	Off Ramp to SR 46
Jurisdiction:	Seminole County
Analysis Year:	2032
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	2410	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	300	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	410	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2410		300		410		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	655		82		111		v
Trucks and buses	11		11		11		%
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	0.948		0.948		0.948		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2764 344 470 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1433 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2764	6750	No
$v_{FO} = v_F - v_R$	2420	6750	No
v_R	344	3800	No
v_3 or v_{av34}	1331 pc/h	(Equation 25-15 or 25-16)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12}/2	Yes	
If yes, v_{12A} = 1579		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1579	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 4.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.459

Space mean speed in ramp influence area, S_R = 49.0 mph

Space mean speed in outer lanes, S_O = 59.6 mph

Space mean speed for all vehicles, S = 53.1 mph

SR 417 EB OFF Ramp to I-4 EB& WB_Downstream Analysis.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	SR 417 EB
Junction:	Off Ramp to I-4 EB & 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	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1640	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	590	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	540	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1964	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	1640		590		540	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	446		160		147	v
Trucks and buses	11		11		11	%
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	0.948		0.948		0.948	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp 1881 677 619 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.682 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1498 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1881	6750	No
$v_{FO} = v_F - v_R$	1204	6750	No
v_R	677	2000	No
v_3 or v_{av34}	383 pc/h	(Equation 25-15 or 25-16)	
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} = 1498		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1498	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.489

Space mean speed in ramp influence area, S_R = 48.6 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 50.6 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	SR 417 WB
Junction:	Off Ramp to I-4 EB/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	4	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2810	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	1210	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	550	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	3765	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2810		1210		550		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	764		329		149		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	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	0.952		0.952		0.952		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 3207 1381 628 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1856 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3207	9000	No
$v_{FO} = v_F - v_R$	1826	9000	No
v_R	1381	3800	No
v_3 or v_{av34}	675 pc/h	(Equation 25-15 or 25-16)	
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} = 1856		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1856	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 6.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.552

Space mean speed in ramp influence area, S_R = 47.8 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 52.4 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	I-4 EB
Junction:	On Ramp from SR 417 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	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	4220	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	460	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	460	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	1976	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4220	460	460	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1147	125	125	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, v_p 4793 522 522 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2889 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5315	6750	No
$v_{3 \text{ or } av34}$	1904 pc/h	(Equation 25-4 or 25-5)	
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} = 2889		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2889	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 26.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.376	
Space mean speed in ramp influence area,	S_R = 50.1	mph
Space mean speed in outer lanes,	S_O = 49.9	mph
Space mean speed for all vehicles,	S = 50.1	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
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	2950	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	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	860	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)	2950	410	860	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	802	111	234	v
Trucks and buses	9	9	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	0.957	0.957	0.952	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, v_p 3351 466 982 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.597 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2001 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3817	6750	No
$v_{3 \text{ or } av34}$	1350 pc/h	(Equation 25-4 or 25-5)	
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} = 2001		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2001	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.318	
Space mean speed in ramp influence area,	S_R = 50.9	mph
Space mean speed in outer lanes,	S_O = 51.9	mph
Space mean speed for all vehicles,	S = 51.2	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
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	3360	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	860	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	460	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)	3360	860	460	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	913	234	125	v
Trucks and buses	9	10	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	0.952	0.957	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, v_p 3817 982 522 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2118 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4799	6750	No
$v_{3 \text{ or } av34}$	1699 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$ > 2700 pc/h?		No	
Is $v_{3 \text{ or } av34}$ > 1.5 v_{12} /2		Yes	
If yes, v_{12A} = 2181		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2181	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 9.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.182

Space mean speed in ramp influence area, S_R = 52.6 mph

Space mean speed in outer lanes, S_O = 50.9 mph

Space mean speed for all vehicles, S = 52.0 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	CD Rd (East of I-4) EB
Junction:	Off Ramp to SR 417 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	1040	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	130	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	550	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1584	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1040		130		550		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	283		35		149		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, v_p 1181 148 625 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1181 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1181	4500	No
$v_{FO} = v_F - v_R$	1033	4500	No
v_R	148	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} = 1181 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1181	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 14.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.441

Space mean speed in ramp influence area, S_R = 49.3 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 49.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	CD 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	1370	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	470	vph
Length of first accel/decel lane	0	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	4594	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1370		470		870		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	372		128		236		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 1556 534 988 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1556 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1556	4500	No
$v_{FO} = v_F - v_R$	1022	4500	No
v_R	534	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} = 1556		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1556	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.476

Space mean speed in ramp influence area, S_R = 48.8 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 48.8 mph

I-4 WB CD ON Ramp from CR46A.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	CD Rd (West of I-4) WB
Junction:	On Ramp from CR 46A to CD 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	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	900	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	600	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	470	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)	900	1190	470	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	245	323	128	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 1022 1352 534 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1022 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2374	4500	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-4 or 25-5)	
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} = 1022		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1022	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.321	
Space mean speed in ramp influence area,	S_R = 50.8	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 50.8	mph

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	KNM
Agency or Company	HNTB
Date Performed	03/24/08
Analysis Time Period	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
☒ Yes ☒ On
☒ No ☒ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☒ Yes ☒ On
☒ No ☒ Off
L_{down} = 1948 ft
V_D = 660 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	4930	0.95	Level	9	0	0.957	1.00	5423
Ramp	360	0.95	Level	9	0	0.957	1.00	396
UpStream								
DownStream	660	0.95	Level	9	0	0.957	1.00	726

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = using Equation (Exhibit 25-5)
V_{12} = pc/h
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)

Capacity Checks

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

Flow Entering Merge Influence Area

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

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)

Speed Determination

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

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.606 using Equation (Exhibit 25-12)
V_{12} = 3443 pc/h
V_3 or V_{av34} 1980 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_F	5423	Exhibit 25-14	7200	No
$V_{FO} = V_F - V_R$	5027	Exhibit 25-14	7200	No
V_R	396	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3443	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

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

D_R = 28.5 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.464 (Exhibit 25-19)
S_R = 57.0 mph (Exhibit 25-19)
73.0 mph (Exhibit 25-19)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	KNM
Agency or Company	HNTB
Date Performed	03/24/08
Analysis Time Period	Build

Site Information

Freeway/Dir of Travel	I-4 WB
Junction	On Ramp from US 1792
Jurisdiction	Seminole County
Analysis Year	2012

Project Description: Wekiva Parkway Project Development & Environment Study

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☑ Off
L_{up} = 1948 ft
V_u = 360 veh/h

Terrain: Level

S_{FF} = 55.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☑ Yes ☑ On
☑ No ☑ 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	4570	0.95	Level	9	0	0.957	1.00	5027
Ramp	660	0.95	Level	9	0	0.957	1.00	726
UpStream	360	0.95	Level	9	0	0.957	1.00	396
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.286 using Equation (Exhibit 25-5)
V_{12} = 1439 pc/h
V_3 or V_{av34} 1794 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} = 2010 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5753	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2736	Exhibit 25-7	4600: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 = 23.3 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.346 (Exibit 25-19)
S_R = 50.5 mph (Exhibit 25-19)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

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

	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

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

Level of Service Determination (if not F)

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

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

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	03/24/08
Analysis Time Period	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
- ☒ Yes ☒ On
- ☒ No ☐ Off
- L_{up} = ft
- V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
- ☒ Yes ☒ On
- ☐ No ☐ Off
- L_{down} = 1948 ft
- V_D = 360 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	5640	0.95	Level	9	0	0.957	1.00	6204
Ramp	660	0.95	Level	9	0	0.957	1.00	726
UpStream								
DownStream	360	0.95	Level	9	0	0.957	1.00	396

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

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

V_{12} = pc/h

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)

Capacity Checks

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

Flow Entering Merge Influence Area

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

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)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 using Equation (Exhibit 25-12)

V_{12} = 3114 pc/h

V_3 or V_{av34} 1545 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_F	6204	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	5478	Exhibit 25-14	9600	No
V_R	726	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3114	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

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

D_R = 21.6 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.493 (Exhibit 25-19)

S_R = 56.2 mph (Exhibit 25-19)

74.7 mph (Exhibit 25-19)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	KNM
Agency or Company	HNTB
Date Performed	03/24/08
Analysis Time Period	Build

Site Information

Freeway/Dir of Travel	I-4 EB
Junction	On Ramp from US 1792
Jurisdiction	Seminole County
Analysis Year	2012

Project Description: Wekiva Parkway Project Development & Environment Study

Inputs

Upstream Adj Ramp
☑ Yes ☑ On
☐ No ☑ Off
L_{up} = 1948 ft
V_u = 660 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ 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 x f_{HV} x f_p
Freeway	4980	0.95	Level	9	0	0.957	1.00	5478
Ramp	360	0.95	Level	9	0	0.957	1.00	396
UpStream	660	0.95	Level	9	0	0.957	1.00	726
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = 907.24 (Equation 25-2 or 25-3)
P_{FM} = 0.591 using Equation (Exhibit 25-5)
V_{12} = 3240 pc/h
V_3 or V_{av34} 2238 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)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	5874	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3636	Exhibit 25-7	4600: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 = 30.5 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.434 (Exibit 25-19)
S_R = 57.8 mph (Exhibit 25-19)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

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

	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

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

Level of Service Determination (if not F)

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

D_R = (pc/mi/ln)
LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)
S_R = mph (Exhibit 25-19)

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	Off Ramp to Wekiva River Rd.
Jurisdiction:	Lake County
Analysis Year:	2012 Build
Description:	Wekiva Parkway Project Development and 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	2500	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	80	vph
Length of first accel/decel lane	920	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	40	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2500		80		40		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	679		22		11		v
Trucks and buses	11		2		2		%
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	0.948		0.990		0.990		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2867 88 44 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 337.80 (Equation 25-8 or 25-9)

P_{FD} = 0.684 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1990 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2867	6750	No
$v_{FO} = v_F - v_R$	2779	6750	No
v_R	88	2000	No
v_3 or v_{av34}	877 pc/h	(Equation 25-15 or 25-16)	
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} = 1990		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1990	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 13.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.436

Space mean speed in ramp influence area, S_R = 49.3 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 52.2 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	On Ramp from Wekiva River Rd
Jurisdiction:	Lake County
Analysis Year:	2012 Build
Description:	Wekiva Parkway Project Development and 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	2420	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	40	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	80	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2420	40	80	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	658	11	22	v
Trucks and buses	11	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, E_T	1.5	1.5	1.5	
Recreational vehicle PCE, E_R	1.2	1.2	1.2	
Heavy vehicle adjustment, f_{HV}	0.948	0.990	0.990	
Driver population factor, f_P	1.00	1.00	1.00	

Flow rate, vp 2775 44 88 pcph

Estimation of V12 Merge Areas

L_{EQ} = 427.39 (Equation 25-2 or 25-3)

P_{FM} = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1672 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		2819	6750	No
$v_{3 \text{ or } av34}$	$v_{3 \text{ or } av34}$	1103 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$	$v_{3 \text{ or } av34}$	> 2700 pc/h?	No	
Is $v_{3 \text{ or } av34}$	$v_{3 \text{ or } av34}$	> 1.5 v_{12} /2	No	
If yes, v_{12A} = 1672			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1672	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 13.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.280	
Space mean speed in ramp influence area,	S_R = 51.4	mph
Space mean speed in outer lanes,	S_O = 52.8	mph
Space mean speed for all vehicles,	S = 51.9	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	Off Ramp to CR46 (Old)
Jurisdiction:	Lake County
Analysis Year:	2012 Build
Description:	Wekiva Parkway Project Development and 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	2460	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	60	vph
Length of first accel/decel lane	920	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	40	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2460		60		40		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	668		16		11		v
Trucks and buses	11		2		2		%
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	0.948		0.990		0.990		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp	2821	66	44	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 336.22 (Equation 25-8 or 25-9)

P_{FD} = 0.686 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1957 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2821	6750	No
$v_{FO} = v_F - v_R$	2755	6750	No
v_R	66	2000	No
v_3 or v_{av34}	864 pc/h	(Equation 25-15 or 25-16)	
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} = 1957		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1957	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 12.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.434

Space mean speed in ramp influence area, S_R = 49.4 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 52.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	On Ramp from CR 46A (Old)
Jurisdiction:	Lake County
Analysis Year:	2012 Build
Description:	Wekiva Parkway Project Development and 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	2400	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	40	vph
Length of first accel/decel lane	820	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	60	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2400	40	60	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	652	11	16	v
Trucks and buses	11	2	2	%
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	0.948	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2752 44 66 pcph

Estimation of V12 Merge Areas

L_{EQ} = 334.45 (Equation 25-2 or 25-3)

P_{FM} = 0.600 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1652 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2796	6750	No
v_3 or v_{av34}	1100 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} = 1652		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1652	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 13.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.285

Space mean speed in ramp influence area, S_R = 51.3 mph

Space mean speed in outer lanes, S_O = 52.8 mph

Space mean speed for all vehicles, S = 51.9 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	Off Ramp to SR 46 (Existing)
Jurisdiction:	Lake County
Analysis Year:	2012 Build
Description:	Wekiva Parkway Project Development and 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	2440	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	820	vph
Length of first accel/decel lane	1190	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	50	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2440		820		50		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	663		223		14		v
Trucks and buses	11		11		11		%
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	0.948		0.948		0.948		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp	2798	940	57	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.647 Using Equation 5

$V_{12} = V_R + (V_F - V_R) P_{FD}$ = 2142 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{Fi} = V_F$	2798	6750	No
$V_{FO} = V_F - V_R$	1858	6750	No
V_R	940	2000	No
$V_{3 \text{ or } av34}$	656 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} = 2142		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V_{12}	2142	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$ = 12.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.513

Space mean speed in ramp influence area, S_R = 48.3 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 50.7 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	On Ramp from SR 46 (Existing)
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and 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	1620	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	50	vph
Length of first accel/decel lane	1350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	820	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1620	50	820	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	440	14	223	v
Trucks and buses	11	11	11	%
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	0.948	0.948	0.948	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp	1858	57	940	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1858 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1915	4500	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-4 or 25-5)	
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} = 1858		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1858	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 11.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.253	
Space mean speed in ramp influence area,	S_R = 51.7	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 51.7	mph

Wekiva Parkway WB Off ramp to SR 46 Bypass.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	Off Ramp to SR 46 Bypass
Jurisdiction:	Lake County
Analysis Year:	2032

Description: Wekiva Parkway Project Development and 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	1670	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	790	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	770	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1670		790		770		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	454		215		209		v
Trucks and buses	11		11		11		%
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	0.948		0.948		0.948		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 1915 906 883 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1915 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1915	4500	No
$v_{FO} = v_F - v_R$	1009	4500	No
v_R	906	3800	No
v_3 or v_{av34}	0 pc/h	(Equation 25-15 or 25-16)	
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} = 1915		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1915	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 7.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.510

Space mean speed in ramp influence area, S_R = 48.4 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 48.4 mph

SB SR 429 from SB SR 46 Bypass.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	SR 429 SB
Junction:	On Ramp from SR 46 Bypass
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and 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	1560	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	770	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	270	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1560		770		270		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	424		209		73		v
Trucks and buses	11		11		11		%
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	0.948		0.948		0.948		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 1789 883 310 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1789 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1789	4500	No
$v_{FO} = v_F - v_R$	906	4500	No
v_R	883	3800	No
v_3 or v_{av34}	0 pc/h	(Equation 25-15 or 25-16)	
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} = 1789		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1789	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 6.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.507

Space mean speed in ramp influence area, S_R = 48.4 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 48.4 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	SB On Ramp from US 441
Jurisdiction:	Lake County
Analysis Year:	2012

Description: Wekiva Parkway Project Development and 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	1370	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	1040	vph
Length of first accel/decel lane	530	ft
Length of second accel/decel lane	530	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	240	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1370	1040	240	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	372	283	65	v
Trucks and buses	11	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	0.948	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1571 1187 274 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 872 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		2758	6750	No
$v_{3 \text{ or } av34}$	$v_{3 \text{ or } av34}$	699 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$	$v_{3 \text{ or } av34}$	> 2700 pc/h?	No	
Is $v_{3 \text{ or } av34}$	$v_{3 \text{ or } av34}$	> 1.5 v_{12}/2	Yes	
If yes, v_{12A} = 897			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	897	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 11.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.241	
Space mean speed in ramp influence area,	S_R = 51.9	mph
Space mean speed in outer lanes,	S_O = 54.4	mph
Space mean speed for all vehicles,	S = 52.5	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	SB Off Ramp to US 441
Jurisdiction:	Orange County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and 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	1610	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	240	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	1040	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1610		240		1040		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	437		65		283		v
Trucks and buses	11		10		10		%
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	0.948		0.952		0.952		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 1846 274 1187 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1846 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1846	4500	No
$v_{FO} = v_F - v_R$	1572	4500	No
v_R	274	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 25-15 or 25-16)	
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} = 1846		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1846	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 15.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.453

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 49.1 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	NB On Ramp from US 441
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and 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	1370	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	240	vph
Length of first accel/decel lane	530	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1040	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1370	240	1040	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	372	65	283	v
Trucks and buses	11	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	0.948	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp	1571	274	1187	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1571 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1845	4500	No
v_3 or v_{av34}	0 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} = 1571		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1571	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 16.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.309	
Space mean speed in ramp influence area,	S_R = 51.0	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 51.0	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	NB Off Ramp to US 441
Jurisdiction:	Orange County
Analysis Year:	2012

Description: Wekiva Parkway Project Development and 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	2410	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	1040	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	240	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2410		1040		240		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	655		283		65		v
Trucks and buses	11		10		10		%
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	0.948		0.952		0.952		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2764 1187 274 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1897 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2764	6750	No
$v_{FO} = v_F - v_R$	1577	6750	No
v_R	1187	3800	No
v_3 or v_{av34}	867 pc/h	(Equation 25-15 or 25-16)	
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} = 1897		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1897	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 7.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.535

Space mean speed in ramp influence area, S_R = 48.0 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 51.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	NB Off Ramp to Kelly Park Rd
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and 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	1610	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	230	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	270	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1610		230		270		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	437		62		73		v
Trucks and buses	11		2		2		%
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	0.948		0.990		0.990		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 1846 252 296 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1846 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
$v_{Fi} = v_F$		1846	4500	No
$v_{FO} = v_F - v_R$		1594	4500	No
v_R		252	2000	No
v_3 or v_{av34}		0 pc/h	(Equation 25-15 or 25-16)	
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} = 1846			(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1846	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 15.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.451

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 49.1 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	NB On Ramp from Kelly Park Rd
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and 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	1380	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	270	vph
Length of first accel/decel lane	1140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	230	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1380	270	230	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	375	73	62	v
Trucks and buses	11	2	2	%
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	0.948	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1583 296 252 pcph

Estimation of V12 Merge Areas

L_{EQ} = 336.47 (Equation 25-2 or 25-3)

P_{FM} = 0.609 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 965 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		1879	6750	No
$v_{3 \text{ or } av34}$		618 pc/h	(Equation 25-4 or 25-5)	
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} = 965			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	965	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 8.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.255	
Space mean speed in ramp influence area,	S_R = 51.7	mph
Space mean speed in outer lanes,	S_O = 54.6	mph
Space mean speed for all vehicles,	S = 52.6	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	SB Off Ramp to Kelly Park Rd
Jurisdiction:	Lake County
Analysis Year:	2012

Description: Wekiva Parkway Project Development and 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	1650	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	270	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	230	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1650		270		230		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	448		73		62		v
Trucks and buses	11		2		2		%
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	0.948		0.990		0.990		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 1892 296 252 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.699 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1412 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1892	6750	No
$v_{FO} = v_F - v_R$	1596	6750	No
v_R	296	2000	No
v_3 or v_{av34}	480 pc/h	(Equation 25-15 or 25-16)	
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} = 1412 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1412	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 11.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.455

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 51.5 mph

SR 429 SB On Ramp Merge from Kelly Park Rd.txt

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	SB On Ramp from Kelly Park Rd
Jurisdiction:	Lake County
Analysis Year:	2012

Description: Wekiva Parkway Project Development and 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	1380	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	230	vph
Length of first accel/decel lane	1140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	270	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1380	230	270	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	375	62	73	v
Trucks and buses	11	2	2	%
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	0.948	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1583 252 296 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1583 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1835	4500	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-4 or 25-5)	
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} = 1583		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1583	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 12.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.266	
Space mean speed in ramp influence area,	S_R = 51.5	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 51.5	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	On Ramp from SR 429
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and 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	770	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	770	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	270	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	770	770	270	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	209	209	73	v
Trucks and buses	11	11	11	%
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	0.948	0.948	0.948	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp		883	883	310	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 883 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1766	4500	No
v_3 or v_{av34}	0 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} = 883		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	883	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 9.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.239	
Space mean speed in ramp influence area,	S_R = 51.9	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 51.9	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway EB
Junction:	Off Ramp to Wekiva River Rd.
Jurisdiction:	Lake County
Analysis Year:	2012 Build
Description:	Wekiva Parkway Project Development and 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	2460	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	40	vph
Length of first accel/decel lane	920	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	80	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2460		40		80		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	668		11		22		v
Trucks and buses	11		2		2		%
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	0.948		0.990		0.990		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, v_p 2821 44 88 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 663.96 (Equation 25-8 or 25-9)

P_{FD} = 0.687 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1953 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2821	6750	No
$v_{FO} = v_F - v_R$	2777	6750	No
v_R	44	2000	No
v_3 or v_{av34}	868 pc/h	(Equation 25-15 or 25-16)	
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} = 1953		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1953	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 12.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.432

Space mean speed in ramp influence area, S_R = 49.4 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 52.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway EB
Junction:	On Ramp from SR 429
Jurisdiction:	Lake County
Analysis Year:	2012

Description: Wekiva Parkway Project Development and 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	880	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	790	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	770	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	880	790	770	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	239	215	209	v
Trucks and buses	11	11	11	%
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	0.948	0.948	0.948	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, v_p 1009 906 883 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1009 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1915	4500	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-4 or 25-5)	
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} = 1009		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1009	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 10.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.242

Space mean speed in ramp influence area, S_R = 51.8 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 51.8 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway EB
Junction:	On Ramp from Wekiva River Rd
Jurisdiction:	Lake County
Analysis Year:	2032 Build

Description: Wekiva Parkway Project Development and 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	2420	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	80	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	40	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2420	80	40	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	658	22	11	v
Trucks and buses	11	2	2	%
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	0.948	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, v_p	2775	88	44	pcph

Estimation of V12 Merge Areas

L_{EQ} = 213.70 (Equation 25-2 or 25-3)

P_{FM} = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1672 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2863	6750	No
$v_{3 \text{ or } av34}$	1103 pc/h	(Equation 25-4 or 25-5)	
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} = 1672		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1672	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 13.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.281	
Space mean speed in ramp influence area,	S_R = 51.4	mph
Space mean speed in outer lanes,	S_O = 52.8	mph
Space mean speed for all vehicles,	S = 51.9	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway EB
Junction:	Off Ramp to CR46 (Old)
Jurisdiction:	Lake County
Analysis Year:	2032 Build

Description: Wekiva Parkway Project Development and 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	2440	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	40	vph
Length of first accel/decel lane	920	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	60	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2440		40		60		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	663		11		16		v
Trucks and buses	11		2		2		%
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	0.948		0.990		0.990		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp	2798	44	66	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 499.96 (Equation 25-8 or 25-9)

P_{FD} = 0.688 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1939 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2798	6750	No
$v_{FO} = v_F - v_R$	2754	6750	No
v_R	44	2000	No
v_3 or v_{av34}	859 pc/h	(Equation 25-15 or 25-16)	
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} = 1939		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1939	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 12.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.432

Space mean speed in ramp influence area, S_R = 49.4 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 52.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway EB
Junction:	Off Ramp to SR 46 (Existing)
Jurisdiction:	Lake County
Analysis Year:	2012

Description: Wekiva Parkway Project Development and 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	1670	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	50	vph
Length of first accel/decel lane	1190	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	820	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1670		50		820		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	454		14		223		v
Trucks and buses	11		11		11		%
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	0.948		0.948		0.948		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 1915 57 940 pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1915 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1915	4500	No
$v_{FO} = v_F - v_R$	1858	4500	No
v_R	57	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 25-15 or 25-16)	
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} = 1915		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1915	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 10.0+ pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.433

Space mean speed in ramp influence area, S_R = 49.4 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 49.4 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway EB
Junction:	On Ramp from CR 46A (Old)
Jurisdiction:	Lake County
Analysis Year:	2022 Build

Description: Wekiva Parkway Project Development and 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	2400	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	60	vph
Length of first accel/decel lane	820	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	40	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2400	60	40	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	652	16	11	v
Trucks and buses	11	2	2	%
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	0.948	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 2752 66 44 pcph

Estimation of V12 Merge Areas

L_{EQ} = 222.97 (Equation 25-2 or 25-3)

P_{FM} = 0.600 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1652 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		2818	6750	No
$v_{3 \text{ or } av34}$	v	1100 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$	v	> 2700 pc/h?	No	
Is $v_{3 \text{ or } av34}$	v	> 1.5 v_{12} /2	No	
If yes, v_{12A} = 1652			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1652	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 13.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.285	
Space mean speed in ramp influence area,	S_R = 51.3	mph
Space mean speed in outer lanes,	S_O = 52.8	mph
Space mean speed for all vehicles,	S = 51.9	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	09/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway EB
Junction:	On Ramp from SR 46 (Existing)
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and 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	1620	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	820	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	50	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1620	820	50	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	440	223	14	v
Trucks and buses	11	11	11	%
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	0.948	0.948	0.948	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1858 940 57 pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1031 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2798	6750	No
$v_{3 \text{ or } av34}$	827 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$ > 2700 pc/h?		No	
Is $v_{3 \text{ or } av34}$ > 1.5 v_{12}/2		Yes	
If yes, v_{12A} = 1061		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1061	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 11.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.245	
Space mean speed in ramp influence area,	S_R = 51.8	mph
Space mean speed in outer lanes,	S_O = 53.9	mph
Space mean speed for all vehicles,	S = 52.4	mph

HCS+: Freeway Weaving Release 5.21

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date Performed:	3/12/2007
Analysis Time Period:	Build I-4 Connection @ SR417
Freeway/Dir of Travel:	I-4 SB
Weaving Location:	Off Ramp 16 w/Frontage Road
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development & Environment Study

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	4	
Weaving segment length, L	2500	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	Multilane or C-D
Volume ratio, VR	0.53	
Weaving ratio, R	0.32	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	1260	0	460	980	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	350	0	128	272	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	1400	0	511	1088	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	0.42	0.39
Weaving and non-weaving speeds, Si	53.69	54.58
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		2.15
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	54.10	mph
Weaving segment density, D	13.86	pc/mi/ln
Level of service, LOS	B	
Capacity of base condition, cb	7385	pc/h
Capacity as a 15-minute flow rate, c	7385	pc/h
Capacity as a full-hour volume, ch	6646	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	1599	4000	a
Average flow rate (pcphpl)	749	2350	b
Volume ratio, VR	0.53	0.80	c
Weaving ratio, R	0.32	N/A	d
Weaving length (ft)	2500	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.

FREEWAY WEAVING WORKSHEET

General Information

Analyst	KNM
Agency/Company	HNTB
Date Performed	8/6/2007
Analysis Time Period	

Site Information

Freeway/Dir of Travel	Wekiva Parkway EB
Weaving Seg Location	SB Wekiva Parkway
Jurisdiction	Orange County
Analysis Year	2012 Build

Inputs

Freeway free-flow speed, S_{FF} (mi/h)	65	Weaving type	A
Weaving number of lanes, N	3	Volume ratio, VR	0.93
Weaving seg length, L (ft)	1500	Weaving ratio, R	0.22
Terrain	Level		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	f_{HV}	f_p	v
V_{o1}	0	0.90	11	0	1.5	1.2	0.948	1.00	0
V_{o2}	70	0.90	11	0	1.5	1.2	0.948	1.00	82
V_{w1}	200	0.90	11	0	1.5	1.2	0.948	1.00	234
V_{w2}	700	0.90	11	0	1.5	1.2	0.948	1.00	820
V_w				1054	V_{nw}				82
V									1136

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)			0.35	0.0020
b (Exhibit 24-6)			2.20	4.00
c (Exhibit 24-6)			0.97	1.30
d (Exhibit 24-6)			0.80	0.75
Weaving intensity factor, Wi			1.35	0.26
Weaving and non-weaving speeds, Si (mi/h)			38.38	58.73

Number of lanes required for unconstrained operation, Nw 2.13
Maximum number of lanes, Nw (max) 1.40

☐ If Nw < Nw(max) unconstrained operation ☑ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	39.36
Weaving segment density, D (pc/mi/ln)	9.62
Level of service, LOS	A
Capacity of base condition, c_b (pc/h)	4870
Capacity as a 15-minute flow rate, c (veh/h)	4616
Capacity as a full-hour volume, c_h (veh/h)	4154

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.

FREEWAY WEAVING WORKSHEET

General Information

Analyst	KNM
Agency/Company	HNTB
Date Performed	8/6/2007
Analysis Time Period	

Site Information

Freeway/Dir of Travel	Wekiva Parkway WB
Weaving Seg Location	NB Wekiva Parkway
Jurisdiction	Orange County
Analysis Year	2012 Build

Inputs

Freeway free-flow speed, S_{FF} (mi/h)	65	Weaving type	A
Weaving number of lanes, N	3	Volume ratio, VR	0.06
Weaving seg length, L (ft)	1500	Weaving ratio, R	0.00
Terrain	Level		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	f_{HV}	fp	v
V_{o1}	880	0.90	11	0	1.5	1.2	0.948	1.00	1031
V_{o2}	670	0.90	11	0	1.5	1.2	0.948	1.00	785
V_{w1}	100	0.90	11	0	1.5	1.2	0.948	1.00	117
V_{w2}	0	0.90	11	0	1.5	1.2	0.948	1.00	0
V_w				117	V_{nw}				1816
V									1933

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)	0.15	0.0035		
b (Exhibit 24-6)	2.20	4.00		
c (Exhibit 24-6)	0.97	1.30		
d (Exhibit 24-6)	0.80	0.75		
Weaving intensity factor, Wi	0.26	0.08		
Weaving and non-weaving speeds, Si (mi/h)	58.63	65.81		

Number of lanes required for unconstrained operation, Nw 0.42
Maximum number of lanes, Nw (max) 1.40

☑ If Nw < Nw(max) unconstrained operation ☐ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	65.33
Weaving segment density, D (pc/mi/ln)	9.86
Level of service, LOS	A
Capacity of base condition, c_b (pc/h)	6620
Capacity as a 15-minute flow rate, c (veh/h)	6275
Capacity as a full-hour volume, c_h (veh/h)	5647

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.

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date Performed:	8/6/2007
Analysis Time Period:	
Freeway/Dir of Travel:	Wekiva Parkway EB
Weaving Location:	SB Wekiva Parkway
Jurisdiction:	Orange County
Analysis Year:	2012 Build
Description:	Wekiva Parkway PD&E

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	3	
Weaving segment length, L	1500	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	
Volume ratio, VR	0.93	
Weaving ratio, R	0.22	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	0	70	200	700	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	0	19	56	194	v
Trucks and buses	11	11	11	11	%
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	0.948	0.948	0.948	0.948	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	0	82	234	820	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.35	0.0020
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	1.35	0.26
Weaving and non-weaving speeds, Si	38.38	58.73
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	2.13
Maximum number of lanes, Nw (max) (Exhibit 24-7)	1.40
Type of operation is	Constrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	39.36	mph
Weaving segment density, D	9.62	pc/mi/ln
Level of service, LOS	A	
Capacity of base condition, cb	4870	pc/h
Capacity as a 15-minute flow rate, c	4616	pc/h
Capacity as a full-hour volume, ch	4154	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	1054	2800	a
Average flow rate (pcphpl)	378	2350	b
Volume ratio, VR	0.93	0.45	c
Weaving ratio, R	0.22	N/A	d
Weaving length (ft)	1500	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.

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date Performed:	8/6/2007
Analysis Time Period:	
Freeway/Dir of Travel:	Wekiva Parkway WB
Weaving Location:	NB Wekiva Parkway
Jurisdiction:	Orange County
Analysis Year:	2012 Build
Description:	Wekiva Parkway PD&E

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	3	
Weaving segment length, L	1500	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	
Volume ratio, VR	0.06	
Weaving ratio, R	0.00	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	880	670	100	0	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	244	186	28	0	v
Trucks and buses	11	11	11	11	%
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	0.948	0.948	0.948	0.948	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	1031	785	117	0	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.0035
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.26	0.08
Weaving and non-weaving speeds, Si	58.63	65.81
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	0.42
Maximum number of lanes, Nw (max) (Exhibit 24-7)	1.40
Type of operation is	Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	65.33	mph
Weaving segment density, D	9.86	pc/mi/ln
Level of service, LOS	A	
Capacity of base condition, cb	6620	pc/h
Capacity as a 15-minute flow rate, c	6275	pc/h
Capacity as a full-hour volume, ch	5647	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	117	2800	a
Average flow rate (pcphpl)	644	2350	b
Volume ratio, VR	0.06	0.45	c
Weaving ratio, R	0.00	N/A	d
Weaving length (ft)	1500	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.

SHORT REPORT

General Information		Site Information	
Analyst	*KNM*	Intersection	*US 441 at CR 437*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*9/28/07*	Jurisdiction	*Orange County*
Time Period	*Build I-4 Connection @ SR 417*	Analysis Year	*2012 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*			*2*	*1*				*1*		*1*
Lane Group	*L*	*T*			*T*	*R*				*L*		*R*
Volume (vph)	*96*	*1264*			*1576*	*410*				*140*		*39*
% 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*				*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	EW Perm	03	04	SB Only	06	07	08
Timing	G = *16.0*	G = *76.0*	G =	G =	G = *16.0*	G =	G =	G =
	Y = *4*	Y = *4*	Y =	Y =	Y = *4*	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	*101*	*1331*			*1659*	*432*				*147*		*41*
Lane Group Capacity	*299*	*2607*			*2064*	*1164*				*236*		*1583*
v/c Ratio	*0.34*	*0.51*			*0.80*	*0.37*				*0.62*		*0.03*
Green Ratio	*0.80*	*0.80*			*0.63*	*0.80*				*0.13*		*1.00*
Uniform Delay d_1	*14.3*	*4.1*			*16.4*	*3.4*				*49.1*		*0.0*
Delay Factor k	*0.11*	*0.12*			*0.35*	*0.11*				*0.21*		*0.11*
Incremental Delay d_2	*0.7*	*0.2*			*2.4*	*0.2*				*5.0*		*0.0*
PF Factor	*1.000*	*1.000*			*1.000*	*1.000*				*1.000*		*0.950*
Control Delay	*15.0*	*4.2*			*18.8*	*3.6*				*54.2*		*0.0*
Lane Group LOS	*B*	*A*			*B*	*A*				*D*		*A*
Approach Delay	*5.0*			*15.7*						*42.4*		
Approach LOS	*A*			*B*						*D*		
Intersection Delay	*12.9*			Intersection LOS						*B*		

SHORT REPORT

General Information		Site Information	
Analyst	*CTR*	Intersection	*CR 437 at Ponkan Road*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*2/23/2007*	Jurisdiction	*Orange County*
Time Period	*Build I-4 Connection @ SR 417*	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*	*1*	*1*	*1*	*1*	*1*	*2*	*1*	*1*	*1*	*1*
Lane Group	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
Volume (vph)	*35*	*110*	*55*	*26*	*147*	*67*	*51*	*610*	*19*	*48*	*275*	*27*
% 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*	*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	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = *10.6*	G =	G =	G =	G = *28.5*	G =	G =	G =
	Y = *5.6*	Y =	Y =	Y =	Y = *5.3*	Y =	Y =	Y =
Duration of Analysis (hrs) = *0.25*						Cycle Length C = *50.0*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*37*	*116*	*58*	*27*	*155*	*71*	*54*	*642*	*20*	*51*	*289*	*28*
Lane Group Capacity	*260*	*395*	*336*	*269*	*395*	*336*	*619*	*2022*	*902*	*434*	*1062*	*902*
v/c Ratio	*0.14*	*0.29*	*0.17*	*0.10*	*0.39*	*0.21*	*0.09*	*0.32*	*0.02*	*0.12*	*0.27*	*0.03*
Green Ratio	*0.21*	*0.21*	*0.21*	*0.21*	*0.21*	*0.21*	*0.57*	*0.57*	*0.57*	*0.57*	*0.57*	*0.57*
Uniform Delay d_1	*16.0*	*16.6*	*16.1*	*15.9*	*16.9*	*16.3*	*4.9*	*5.6*	*4.7*	*5.0*	*5.5*	*4.7*
Delay Factor k	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*
Incremental Delay d_2	*0.3*	*0.4*	*0.2*	*0.2*	*0.6*	*0.3*	*0.1*	*0.1*	*0.0*	*0.1*	*0.1*	*0.0*
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	*16.3*	*17.0*	*16.4*	*16.0*	*17.6*	*16.6*	*4.9*	*5.7*	*4.7*	*5.1*	*5.6*	*4.7*
Lane Group LOS	*B*	*B*	*B*	*B*	*B*	*B*	*A*	*A*	*A*	*A*	*A*	*A*
Approach Delay	*16.7*			*17.1*			*5.6*			*5.5*		
Approach LOS	*B*			*B*			*A*			*A*		
Intersection Delay	*9.0*			Intersection LOS			*A*					

SHORT REPORT

General Information		Site Information	
Analyst	*CTR*	Intersection	*CR 437 at Kelly Park Road*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*2/23/2007*	Jurisdiction	*Orange County*
Time Period	*Build I-4 Connection @ SR 417*	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*	*2*	*1*	*1*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Lane Group	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
Volume (vph)	*139*	*227*	*86*	*56*	*157*	*77*	*48*	*433*	*69*	*48*	*157*	*195*
% 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*	*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	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = *18.0*	G =	G =	G =	G = *29.7*	G =	G =	G =
	Y = *7*	Y =	Y =	Y =	Y = *5.3*	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		
Adjusted Flow Rate	*146*	*239*	*91*	*59*	*165*	*81*	*51*	*456*	*73*	*51*	*165*	*205*
Lane Group Capacity	*362*	*1064*	*475*	*337*	*1064*	*475*	*602*	*922*	*784*	*384*	*922*	*784*
v/c Ratio	*0.40*	*0.22*	*0.19*	*0.18*	*0.16*	*0.17*	*0.08*	*0.49*	*0.09*	*0.13*	*0.18*	*0.26*
Green Ratio	*0.30*	*0.30*	*0.30*	*0.30*	*0.30*	*0.30*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*
Uniform Delay d_1	*16.7*	*15.8*	*15.6*	*15.5*	*15.4*	*15.5*	*8.0*	*10.1*	*8.0*	*8.2*	*8.4*	*8.8*
Delay Factor k	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*
Incremental Delay d_2	*0.7*	*0.1*	*0.2*	*0.2*	*0.1*	*0.2*	*0.1*	*0.4*	*0.1*	*0.2*	*0.1*	*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	*17.5*	*15.9*	*15.8*	*15.8*	*15.5*	*15.7*	*8.0*	*10.6*	*8.1*	*8.3*	*8.5*	*9.0*
Lane Group LOS	*B*	*B*	*B*	*B*	*B*	*B*	*A*	*B*	*A*	*A*	*A*	*A*
Approach Delay	*16.3*			*15.6*			*10.0*			*8.7*		
Approach LOS	*B*			*B*			*B*			*A*		
Intersection Delay	*12.4*			Intersection LOS						*B*		

SHORT REPORT

General Information		Site Information	
Analyst	*KNM*	Intersection	*US 441 at Wekiva Parkway*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*9/14/07*	Jurisdiction	*Orange County*
Time Period	*Build I-4 Connection @ SR 417*	Analysis Year	*2012 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*	*2*	*2*	*2*	*1*	*2*		*1*	*1*		*1*
Lane Group	*L*	*T*	*R*	*L*	*T*	*R*	*L*		*R*	*L*		*R*
Volume (vph)	*120*	*61*	*761*	*279*	*55*	*120*	*676*		*364*	*60*		*180*
% Heavy Vehicles	*0*	*2*	*2*	*2*	*2*	*0*	*0*		*0*	*2*		*2*
PHF	*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*
Startup Lost Time	*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*
Arrival Type	*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*
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*
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*
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	Excl. Left	Thru & RT	03	04	NS Perm	06	07	08
Timing	G = *25.0*	G = *20.0*	G =	G =	G = *60.0*	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	*126*	*64*	*801*	*294*	*58*	*126*	*712*		*383*	*63*		*189*
Lane Group Capacity	*376*	*591*	*1985*	*716*	*591*	*1144*	*1753*		*1211*	*885*		*1187*
v/c Ratio	*0.34*	*0.11*	*0.40*	*0.41*	*0.10*	*0.11*	*0.41*		*0.32*	*0.07*		*0.16*
Green Ratio	*0.21*	*0.17*	*0.71*	*0.21*	*0.17*	*0.71*	*0.50*		*0.75*	*0.50*		*0.75*
Uniform Delay d_1	*40.4*	*42.4*	*7.1*	*41.1*	*42.4*	*5.5*	*18.8*		*4.9*	*15.6*		*4.3*
Delay Factor k	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*		*0.11*	*0.11*		*0.11*
Incremental Delay d_2	*0.5*	*0.1*	*0.1*	*0.4*	*0.1*	*0.0*	*0.2*		*0.2*	*0.0*		*0.1*
PF Factor	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*		*1.000*	*1.000*		*1.000*
Control Delay	*41.0*	*42.5*	*7.3*	*41.5*	*42.4*	*5.6*	*19.0*		*5.1*	*15.6*		*4.3*
Lane Group LOS	*D*	*D*	*A*	*D*	*D*	*A*	*B*		*A*	*B*		*A*
Approach Delay	*13.8*			*32.1*			*14.1*			*7.1*		
Approach LOS	*B*			*C*			*B*			*A*		
Intersection Delay	*16.5*			Intersection LOS						*B*		

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 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)		*637*			*738*	*135*				*218*		*693*
% Heavy Vehicles		*2*			*0*	*2*				*0*		*0*
PHF		*0.95*			*0.90*	*0.95*				*0.90*		*0.90*
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*
Lane Width		*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*
Minimum Pedestrian Time		*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		
Adjusted Flow Rate		*671*			*820*	*142*				*242*		*770*
Lane Group Capacity		*1774*			*1809*	*1583*				*645*		*2859*
v/c Ratio		*0.38*			*0.45*	*0.09*				*0.38*		*0.27*
Green Ratio		*0.50*			*0.50*	*1.00*				*0.36*		*1.00*
Uniform Delay d_1		*10.8*			*11.3*	*0.0*				*16.7*		*0.0*
Delay Factor k		*0.11*			*0.11*	*0.11*				*0.11*		*0.11*
Incremental Delay d_2		*0.1*			*0.2*	*0.0*				*0.4*		*0.1*
PF Factor		*1.000*			*1.000*	*0.950*				*1.000*		*0.950*
Control Delay		*10.9*			*11.5*	*0.0*				*17.1*		*0.1*
Lane Group LOS		*B*			*B*	*A*				*B*		*A*
Approach Delay		*10.9*			*9.8*					*4.1*		
Approach LOS		*B*			*A*					*A*		
Intersection Delay		*7.9*			Intersection LOS					*A*		

SHORT REPORT

General Information		Site Information	
Analyst	*CTR*	Intersection	*CR 437 East 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 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*		*1*				*1*	*1*			*1*	*1*
Lane Group	*L*		*R*				*L*	*T*			*T*	*R*
Volume (vph)	*441*		*44*				*138*	*368*			*135*	*316*
% 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		
Adjusted Flow Rate	*464*		*46*				*145*	*387*			*142*	*333*
Lane Group Capacity	*1146*		*1583*				*621*	*932*			*932*	*1583*
v/c Ratio	*0.40*		*0.03*				*0.23*	*0.42*			*0.15*	*0.21*
Green Ratio	*0.33*		*1.00*				*0.50*	*0.50*			*0.50*	*1.00*
Uniform Delay d_1	*15.4*		*0.0*				*8.5*	*9.5*			*8.1*	*0.0*
Delay Factor k	*0.11*		*0.11*				*0.11*	*0.11*			*0.11*	*0.11*
Incremental Delay d_2	*0.2*		*0.0*				*0.2*	*0.3*			*0.1*	*0.1*
PF Factor	*1.000*		*0.950*				*1.000*	*1.000*			*1.000*	*0.950*
Control Delay	*15.6*		*0.0*				*8.7*	*9.8*			*8.2*	*0.1*
Lane Group LOS	*B*		*A*				*A*	*A*			*A*	*A*
Approach Delay	*14.2*						*9.5*			*2.5*		
Approach LOS	*B*						*A*			*A*		
Intersection Delay	*8.9*			Intersection LOS			*A*					

SHORT REPORT

General Information		Site Information	
Analyst	*CTR*	Intersection	*Kelly Park Rd at Wekiva Pkwy*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*2/22/2007*	Jurisdiction	*Orange County*
Time Period	*Build I-4 Connection @ SR 417*	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		*2*	*1*	*1*	*2*					*1*		*1*
Lane Group		*T*	*R*	*L*	*T*					*L*		*R*
Volume (vph)		*140*	*75*	*155*	*90*					*197*		*73*
% 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	WB Only	EW Perm	03	04	SB Only	06	07	08
Timing	G = *15.0*	G = *15.0*	G =	G =	G = *31.0*	G =	G =	G =
	Y = *7*	Y = *7*	Y =	Y =	Y = *5*	Y =	Y =	Y =

Duration of Analysis (hrs) = *0.25* | Cycle Length C = *80.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		*147*	*79*	*163*	*95*					*207*		*77*
Lane Group Capacity		*665*	*1049*	*625*	*1640*					*686*		*1583*
v/c Ratio		*0.22*	*0.08*	*0.26*	*0.06*					*0.30*		*0.05*
Green Ratio		*0.19*	*0.66*	*0.46*	*0.46*					*0.39*		*1.00*
Uniform Delay d_1		*27.5*	*4.8*	*12.8*	*11.9*					*17.0*		*0.0*
Delay Factor k		*0.11*	*0.11*	*0.11*	*0.11*					*0.11*		*0.11*
Incremental Delay d_2		*0.2*	*0.0*	*0.2*	*0.0*					*0.2*		*0.0*
PF Factor		*1.000*	*1.000*	*1.000*	*1.000*					*1.000*		*0.950*
Control Delay		*27.7*	*4.8*	*13.0*	*11.9*					*17.2*		*0.0*
Lane Group LOS		*C*	*A*	*B*	*B*					*B*		*A*
Approach Delay		*19.7*			*12.6*						*12.6*	
Approach LOS		*B*			*B*						*B*	
Intersection Delay		*14.7*			Intersection LOS						*B*	

SHORT REPORT

General Information		Site Information	
Analyst	*CTR*	Intersection	*Kelly Park Rd at Wekiva Pkwy*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*2/22/2007*	Jurisdiction	*Orange County*
Time Period	*Build I-4 Connection @ SR 417*	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*	*2*			*2*	*1*	*1*		*1*			
Lane Group	*L*	*T*			*T*	*R*	*L*		*R*			
Volume (vph)	*65*	*272*			*195*	*205*	*50*		*180*			
% 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	EW Perm	03	04	NB Only	06	07	08
Timing	G = *15.0*	G = *30.0*	G =	G =	G = *16.0*	G =	G =	G =
	Y = *7*	Y = *7*	Y =	Y =	Y = *5*	Y =	Y =	Y =

Duration of Analysis (hrs) = *0.25* | Cycle Length C = *80.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*68*	*286*			*205*	*216*	*53*		*189*			
Lane Group Capacity	*823*	*2306*			*1330*	*1049*	*354*		*1583*			
v/c Ratio	*0.08*	*0.12*			*0.15*	*0.21*	*0.15*		*0.12*			
Green Ratio	*0.65*	*0.65*			*0.38*	*0.66*	*0.20*		*1.00*			
Uniform Delay d_1	*5.2*	*5.3*			*16.6*	*5.3*	*26.4*		*0.0*			
Delay Factor k	*0.11*	*0.11*			*0.11*	*0.11*	*0.11*		*0.11*			
Incremental Delay d_2	*0.0*	*0.0*			*0.1*	*0.1*	*0.2*		*0.0*			
PF Factor	*1.000*	*1.000*			*1.000*	*1.000*	*1.000*		*0.950*			
Control Delay	*5.2*	*5.4*			*16.6*	*5.4*	*26.6*		*0.0*			
Lane Group LOS	*A*	*A*			*B*	*A*	*C*		*A*			
Approach Delay	*5.3*			*10.9*			*5.8*					
Approach LOS	*A*			*B*			*A*					
Intersection Delay	*7.7*			Intersection LOS			*A*					

SHORT REPORT

General Information		Site Information	
Analyst	CTR	Intersection	SR 46 and US 441
Agency or Co.	HNTB	Area Type	All other areas
Date Performed	2/15/2007	Jurisdiction	Lake County
Time Period	Build I-4 Connection @ SR 417	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	2	1	2	2	1	1	3	1	1	3	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	43	284	33	107	220	3	134	741	275	3	309	28
% Heavy Vehicles	11	11	11	11	11	11	10	10	10	10	10	10
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
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	NS Perm	07	08
Timing	G = 10.0	G = 20.0	G =	G =	G = 15.0	G = 25.0	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 4	Y = 4	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 86.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	45	299	35	113	232	3	141	780	289	3	325	29
Lane Group Capacity	189	758	660	378	796	660	570	1506	580	286	1506	1075
v/c Ratio	0.24	0.39	0.05	0.30	0.29	0.00	0.25	0.52	0.50	0.01	0.22	0.03
Green Ratio	0.12	0.23	0.45	0.12	0.23	0.45	0.51	0.29	0.40	0.17	0.29	0.73
Uniform Delay d_1	34.5	27.9	13.2	34.8	27.2	12.9	11.3	25.5	19.6	29.4	23.1	3.1
Delay Factor k	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.11	0.11	0.11	0.11
Incremental Delay d_2	0.7	0.3	0.0	0.4	0.2	0.0	0.2	0.3	0.7	0.0	0.1	0.0
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	35.2	28.2	13.2	35.2	27.4	12.9	11.6	25.8	20.3	29.4	23.2	3.1
Lane Group LOS	D	C	B	D	C	B	B	C	C	C	C	A
Approach Delay	27.7			29.8			22.8			21.6		
Approach LOS	C			C			C			C		
Intersection Delay	24.5			Intersection LOS						C		

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	*2/7/2007*	Jurisdiction	*Lake County*
Time Period	*Build I-4 Connection @ SR 417*	Analysis Year	*2012 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*	*3*	*1*	*1*	*3*	*1*	*1*	*2*	*1*	*1*	*2*	*1*
Lane Group	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
Volume (vph)	*37*	*787*	*76*	*65*	*1406*	*379*	*53*	*65*	*92*	*62*	*152*	*66*
% 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	NS Perm	07	08
Timing	G = *10.0*	G = *76.0*	G =	G =	G = *10.0*	G = *20.0*	G =	G =
	Y = *4*	Y = *4*	Y =	Y =	Y = *4*	Y = *4*	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	*39*	*828*	*80*	*68*	*1480*	*399*	*56*	*68*	*97*	*65*	*160*	*69*
Lane Group Capacity	*123*	*2685*	*1257*	*123*	*2685*	*1257*	*304*	*537*	*1367*	*352*	*537*	*1367*
v/c Ratio	*0.32*	*0.31*	*0.06*	*0.55*	*0.55*	*0.32*	*0.18*	*0.13*	*0.07*	*0.18*	*0.30*	*0.05*
Green Ratio	*0.08*	*0.58*	*0.86*	*0.08*	*0.58*	*0.86*	*0.26*	*0.15*	*0.86*	*0.26*	*0.15*	*0.86*
Uniform Delay d_1	*57.8*	*14.4*	*1.3*	*58.8*	*17.4*	*1.7*	*37.7*	*48.4*	*1.3*	*37.8*	*49.8*	*1.3*
Delay Factor k	*0.11*	*0.11*	*0.11*	*0.15*	*0.15*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*
Incremental Delay d_2	*1.5*	*0.1*	*0.0*	*5.3*	*0.2*	*0.1*	*0.3*	*0.1*	*0.0*	*0.3*	*0.3*	*0.0*
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	*59.3*	*14.5*	*1.3*	*64.2*	*17.6*	*1.8*	*38.0*	*48.6*	*1.3*	*38.0*	*50.1*	*1.3*
Lane Group LOS	*E*	*B*	*A*	*E*	*B*	*A*	*D*	*D*	*A*	*D*	*D*	*A*
Approach Delay	*15.2*			*16.0*			*25.1*			*36.0*		
Approach LOS	*B*			*B*			*C*			*D*		
Intersection Delay	*18.1*			Intersection LOS						*B*		

SHORT REPORT

General Information		Site Information	
Analyst	*Kacia Monts*	Intersection	*SR 46 Bypass at SR 46 West*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*1/25/2007*	Jurisdiction	*Lake County*
Time Period	*Build I-4 Connection @ SR 417*	Analysis Year	*2012 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*		*1*	*1*			*3*	*1*			
Lane Group		*T*		*L*	*T*			*T*	*R*			
Volume (vph)		*137*		*66*	*524*			*1326*	*234*			
% Heavy Vehicles		*2*		*2*	*2*			*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*			
Lane Width		*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*			
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*				

Phasing	EW Perm	02	03	04	NB Only	06	07	08
Timing	G = *35.0*	G =	G =	G =	G = *75.0*	G =	G =	G =
	Y = *4*	Y =	Y =	Y =	Y = *4*	Y =	Y =	Y =
Duration of Analysis (hrs) = *0.25*						Cycle Length C = *118.0*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		*144*		*69*	*552*			*1396*	*246*			
Lane Group Capacity		*1052*		*365*	*553*			*3225*	*1583*			
v/c Ratio		*0.14*		*0.19*	*1.00*			*0.43*	*0.16*			
Green Ratio		*0.30*		*0.30*	*0.30*			*0.64*	*1.00*			
Uniform Delay d_1		*30.4*		*30.9*	*41.5*			*10.8*	*0.0*			
Delay Factor k		*0.11*		*0.11*	*0.50*			*0.11*	*0.11*			
Incremental Delay d_2		*0.1*		*0.3*	*37.8*			*0.1*	*0.0*			
PF Factor		*1.000*		*1.000*	*1.000*			*1.000*	*0.950*			
Control Delay		*30.5*		*31.2*	*79.2*			*10.9*	*0.0*			
Lane Group LOS		*C*		*C*	*E*			*B*	*A*			
Approach Delay		*30.5*			*73.9*			*9.3*				
Approach LOS		*C*			*E*			*A*				
Intersection Delay		*27.2*			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	*2/7/2007*	Jurisdiction	*Lake County*
Time Period	*Build I-4 Connection @ SR 417*	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*	*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)	*139*	*254*	*87*	*149*	*327*	*324*	*165*	*134*	*241*	*267*	*48*	*105*
% 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	NS Perm	06	07	08
Timing	G = *15.0*	G = *20.0*	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 = *70.0*			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*146*	*267*	*92*	*157*	*344*	*341*	*174*	*141*	*254*	*281*	*51*	*111*
Lane Group Capacity	*348*	*489*	*416*	*348*	*489*	*416*	*385*	*532*	*905*	*355*	*532*	*905*
v/c Ratio	*0.42*	*0.55*	*0.22*	*0.45*	*0.70*	*0.82*	*0.45*	*0.27*	*0.28*	*0.79*	*0.10*	*0.12*
Green Ratio	*0.21*	*0.29*	*0.29*	*0.21*	*0.29*	*0.29*	*0.29*	*0.29*	*0.57*	*0.29*	*0.29*	*0.57*
Uniform Delay d_1	*23.7*	*21.2*	*19.1*	*23.9*	*22.3*	*23.3*	*20.5*	*19.3*	*7.7*	*23.1*	*18.4*	*6.9*
Delay Factor k	*0.11*	*0.15*	*0.11*	*0.11*	*0.27*	*0.36*	*0.11*	*0.11*	*0.11*	*0.34*	*0.11*	*0.11*
Incremental Delay d_2	*0.8*	*1.3*	*0.3*	*0.9*	*4.5*	*12.3*	*0.8*	*0.3*	*0.2*	*11.6*	*0.1*	*0.1*
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	*24.6*	*22.4*	*19.3*	*24.9*	*26.9*	*35.6*	*21.4*	*19.6*	*7.8*	*34.6*	*18.4*	*7.0*
Lane Group LOS	*C*	*C*	*B*	*C*	*C*	*D*	*C*	*B*	*A*	*C*	*B*	*A*
Approach Delay	*22.5*			*30.0*			*14.9*			*25.8*		
Approach LOS	*C*			*C*			*B*			*C*		
Intersection Delay	*24.0*			Intersection LOS						*C*		

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	*2/7/2007*	Jurisdiction	*Lake County*
Time Period	*Build I-4 Connection @ SR 417*	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*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*0*
Lane Group	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*TR*	
Volume (vph)	*3*	*481*	*176*	*327*	*616*	*17*	*240*	*12*	*178*	*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*	*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*	
Arrival Type	*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*	
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*	
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*	
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 = *15.0*	G = *50.0*	G =	G =	G = *25.0*	G =	G =	G =
	Y = *5.5*	Y = *5.5*	Y =	Y =	Y = *5.5*	Y =	Y =	Y =
Duration of Analysis (hrs) = *0.25*						Cycle Length C = *106.5*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*3*	*506*	*185*	*344*	*648*	*18*	*253*	*13*	*187*	*8*	*21*	
Lane Group Capacity	*337*	*804*	*683*	*485*	*1133*	*963*	*325*	*437*	*676*	*327*	*422*	
v/c Ratio	*0.01*	*0.63*	*0.27*	*0.71*	*0.57*	*0.02*	*0.78*	*0.03*	*0.28*	*0.02*	*0.05*	
Green Ratio	*0.47*	*0.47*	*0.47*	*0.66*	*0.66*	*0.66*	*0.23*	*0.23*	*0.43*	*0.23*	*0.23*	
Uniform Delay d_1	*15.0*	*21.3*	*17.2*	*11.7*	*9.8*	*6.2*	*38.2*	*31.4*	*19.8*	*31.4*	*31.6*	
Delay Factor k	*0.11*	*0.21*	*0.11*	*0.27*	*0.17*	*0.11*	*0.33*	*0.11*	*0.11*	*0.11*	*0.11*	
Incremental Delay d_2	*0.0*	*1.6*	*0.2*	*4.8*	*0.7*	*0.0*	*11.4*	*0.0*	*0.2*	*0.0*	*0.0*	
PF Factor	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	
Control Delay	*15.1*	*22.9*	*17.4*	*16.4*	*10.5*	*6.2*	*49.6*	*31.4*	*20.0*	*31.4*	*31.6*	
Lane Group LOS	*B*	*C*	*B*	*B*	*B*	*A*	*D*	*C*	*C*	*C*	*C*	
Approach Delay	*21.4*			*12.4*			*36.9*			*31.5*		
Approach LOS	*C*			*B*			*D*			*C*		
Intersection Delay	*20.6*			Intersection LOS						*C*		

SHORT REPORT

General Information		Site Information	
Analyst	*KNM*	Intersection	*SR 46 at CR 46A*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*02/07/2007*	Jurisdiction	*Lake County*
Time Period	*Build I-4 Connection @ SR 417*	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*			*2*	*1*				*2*		*1*
Lane Group	*L*	*T*			*T*	*R*				*L*		*R*
Volume (vph)	*5*	*795*			*775*	*545*				*432*		*18*
% 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*				*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	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = *80.1*	G =	G =	G =	G = *27.9*	G =	G =	G =
	Y = *7*	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	*5*	*837*			*816*	*574*				*455*		*19*
Lane Group Capacity	*366*	*1143*			*2175*	*1455*				*799*		*368*
v/c Ratio	*0.01*	*0.73*			*0.38*	*0.39*				*0.57*		*0.05*
Green Ratio	*0.67*	*0.67*			*0.67*	*1.00*				*0.23*		*0.23*
Uniform Delay d_1	*6.7*	*13.0*			*8.8*	*0.0*				*40.7*		*35.8*
Delay Factor k	*0.11*	*0.29*			*0.11*	*0.11*				*0.16*		*0.11*
Incremental Delay d_2	*0.0*	*2.5*			*0.1*	*0.2*				*1.0*		*0.1*
PF Factor	*1.000*	*1.000*			*1.000*	*0.950*				*1.000*		*1.000*
Control Delay	*6.7*	*15.4*			*9.0*	*0.2*				*41.7*		*35.8*
Lane Group LOS	*A*	*B*			*A*	*A*				*D*		*D*
Approach Delay	*15.4*			*5.3*						*41.5*		
Approach LOS	*B*			*A*						*D*		
Intersection Delay	*14.8*			Intersection LOS						*B*		

SHORT REPORT

General Information		Site Information	
Analyst	*CTR/KNM*	Intersection	*SR 46 Existing at Wekiva Pkwy*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*2/21/2007*	Jurisdiction	*Lake County*
Time Period	*Build I-4 Connection @ SR 417*	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						*2*		*2*			*2*	*1*
Lane Group						*R*		*T*			*T*	*R*
Volume (vph)						*820*		*50*			*820*	*50*
% Heavy Vehicles						*2*		*2*			*2*	*2*
PHF						*0.95*		*0.95*			*0.95*	*0.95*
Pretimed/Actuated (P/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	WB Only	02	03	04	Thru & RT	06	07	08
Timing	G = *10.0*	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 = *80.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate						*863*		*53*			*863*	*53*
Lane Group Capacity						*2803*		*2660*			*2660*	*1583*
v/c Ratio						*0.31*		*0.02*			*0.32*	*0.03*
Green Ratio						*1.00*		*0.75*			*0.75*	*1.00*
Uniform Delay d_1						*0.0*		*2.5*			*3.3*	*0.0*
Delay Factor k						*0.11*		*0.11*			*0.11*	*0.11*
Incremental Delay d_2						*0.1*		*0.0*			*0.1*	*0.0*
PF Factor						*0.950*		*1.000*			*1.000*	*0.950*
Control Delay						*0.1*		*2.5*			*3.4*	*0.0*
Lane Group LOS						*A*		*A*			*A*	*A*
Approach Delay				*0.1*			*2.5*			*3.2*		
Approach LOS				*A*			*A*			*A*		
Intersection Delay	*1.7*			Intersection LOS						*A*		

SHORT REPORT

General Information		Site Information	
Analyst	*CTR/KNM*	Intersection	*SR 46 Existing at Wekiva Pkwy*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*2/21/2007*	Jurisdiction	*Lake County*
Time Period	*Build I-4 Connection @ SR 417*	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*									*2*		
Lane Group	*L*									*L*		
Volume (vph)	*50*									*820*		
% Heavy Vehicles	*2*									*2*		
PHF	*0.95*									*0.95*		
Pretimed/Actuated (P/A)	*A*									*A*		
Startup Lost Time	*2.0*									*2.0*		
Extension of Effective Green	*2.0*									*2.0*		
Arrival Type	*3*									*3*		
Unit Extension	*3.0*									*3.0*		
Ped/Bike/RTOR Volume	*0*	*0*								*0*	*0*	
Lane Width	*12.0*									*12.0*		
Parking/Grade/Parking	*N*	*0*	*N*							*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*									*0*		
Minimum Pedestrian Time		*3.2*									*3.2*	

Phasing	EB Only	02	03	04	SB Only	06	07	08
Timing	G = *10.0*	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 = *80.0*			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*53*									*863*		
Lane Group Capacity	*221*									*2578*		
v/c Ratio	*0.24*									*0.33*		
Green Ratio	*0.13*									*0.75*		
Uniform Delay d_1	*31.6*									*3.3*		
Delay Factor k	*0.11*									*0.11*		
Incremental Delay d_2	*0.6*									*0.1*		
PF Factor	*1.000*									*1.000*		
Control Delay	*32.1*									*3.4*		
Lane Group LOS	*C*									*A*		
Approach Delay	*32.1*									*3.4*		
Approach LOS	*C*									*A*		
Intersection Delay	*5.1*			Intersection LOS						*A*		

SHORT REPORT

General Information		Site Information	
Analyst	KNM	Intersection	CR 46A at Wekiva Pkwy
Agency or Co.	HNTB	Area Type	All other areas
Date Performed	7/17/07	Jurisdiction	Lake County
Time Period	Build I-4 Connection @ SR 417	Analysis Year	2012 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)				6		54	7	66			68	32
% Heavy Vehicles				0		2	0	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	WB Only	02	03	04	NS Perm	06	07	08
Timing	G = 10.0	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 = 80.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate				6		57	7	69			72	34
Lane Group Capacity				226		1583	1012	1397			1397	1583
v/c Ratio				0.03		0.04	0.01	0.05			0.05	0.02
Green Ratio				0.13		1.00	0.75	0.75			0.75	1.00
Uniform Delay d_1				30.7		0.0	2.5	2.6			2.6	0.0
Delay Factor k				0.11		0.11	0.11	0.11			0.11	0.11
Incremental Delay d_2				0.0		0.0	0.0	0.0			0.0	0.0
PF Factor				1.000		0.950	1.000	1.000			1.000	0.950
Control Delay				30.8		0.0	2.5	2.6			2.6	0.0
Lane Group LOS				C		A	A	A			A	A
Approach Delay				2.9			2.6			1.8		
Approach LOS				A			A			A		
Intersection Delay	2.3			Intersection LOS						A		

SHORT REPORT

General Information		Site Information	
Analyst	KNM	Intersection	SR 46 Existing at Wekiva Pkwy
Agency or Co.	HNTB	Area Type	All other areas
Date Performed	7/17/07	Jurisdiction	Lake County
Time Period	Build I-4 Connection @ SR 417	Analysis Year	2012 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					T	R	L	T	
Volume (vph)	27		13					47	53	7	67	
% Heavy Vehicles	2		0					0	0	2	0	
PHF	0.95		0.90					0.90	0.90	0.95	0.90	
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 = 10.0	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 = 80.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	28		14					52	59	7	74	
Lane Group Capacity	221		202					1425	1211	1010	1425	
v/c Ratio	0.13		0.07					0.04	0.05	0.01	0.05	
Green Ratio	0.13		0.13					0.75	0.75	0.75	0.75	
Uniform Delay d_1	31.1		30.9					2.6	2.6	2.5	2.6	
Delay Factor k	0.11		0.11					0.11	0.11	0.11	0.11	
Incremental Delay d_2	0.3		0.1					0.0	0.0	0.0	0.0	
PF Factor	1.000		1.000					1.000	1.000	1.000	1.000	
Control Delay	31.4		31.0					2.6	2.6	2.5	2.6	
Lane Group LOS	C		C					A	A	A	A	
Approach Delay	31.3						2.6			2.6		
Approach LOS	C						A			A		
Intersection Delay	7.7			Intersection LOS						A		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	KNM
Agency/Co.	HNTB
Date Performed	7/17/07
Analysis Time Period	Build I-4 Connection @ SR 417

Site Information

Intersection	Wekiva River Rd at Wekiva Pkwy
Jurisdiction	Lake County
Analysis Year	2012 Build

Project Description: *Wekiva Parkway Project Development and Environment Study*

East/West Street: *Wekiva Parkway WB Ramps* | North/South Street: *Wekiva River Rd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	22	69			102	18
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	23	72	0	0	107	18
Percent Heavy Vehicles	2	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	1
Configuration	L	T			T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				48		32
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	0	0	50	0	33
Percent Heavy Vehicles	0	0	0	2	0	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	0	1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L		L		R			
v (veh/h)	23		50		33			
C (m) (veh/h)	1462		742		990			
v/c	0.02		0.07		0.03			
95% queue length	0.05		0.22		0.10			
Control Delay (s/veh)	7.5		10.2		8.8			
LOS	A		B		A			
Approach Delay (s/veh)	--	--	9.6					
Approach LOS	--	--	A					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	KNM
Agency/Co.	HNTB
Date Performed	7/17/07
Analysis Time Period	Build I-4 Connection @ SR 417

Site Information

Intersection	Wekiva River Rd at Wekiva Pkwy
Jurisdiction	Lake County
Analysis Year	2012 Build

Project Description: Wekiva Parkway Project Development and Environment Study

East/West Street: Wekiva Parkway EB Ramps | North/South Street: Wekiva River Rd

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		70	50	30	120	
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	0	73	52	31	126	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	1	1	1	0
Configuration		T	R	L	T	
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	21		20			
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	22	0	21	0	0	0
Percent Heavy Vehicles	11	0	11	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	1	0	1	0	0	0
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L				L		R
v (veh/h)		31				22		21
C (m) (veh/h)		1462				670		901
v/c		0.02				0.03		0.02
95% queue length		0.06				0.10		0.07
Control Delay (s/veh)		7.5				10.6		9.1
LOS		A				B		A
Approach Delay (s/veh)	--	--				9.8		
Approach LOS	--	--				A		

SHORT REPORT

General Information		Site Information	
Analyst	KNM	Intersection	US 17/92 and I-4 WBW Ramps
Agency or Co.	HNTB	Area Type	All other areas
Date Performed	3/24/08	Jurisdiction	Seminole County
Time Period	Build I-4 Connection @ SR 417	Analysis Year	2012 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)	18		342				107	1836			547	553
% 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	19		318				113	1933			576	582
Lane Group Capacity	276		2623				553	2444			2444	1455
v/c Ratio	0.07		0.12				0.20	0.79			0.24	0.40
Green Ratio	0.17		1.00				0.75	0.75			0.75	1.00
Uniform Delay d_1	42.2		0.0				4.4	9.2			4.6	0.0
Delay Factor k	0.11		0.11				0.11	0.34			0.11	0.11
Incremental Delay d_2	0.1		0.0				0.2	1.8			0.0	0.2
PF Factor	1.000		0.950				1.000	1.000			1.000	0.950
Control Delay	42.3		0.0				4.6	11.1			4.6	0.2
Lane Group LOS	D		A				A	B			A	A
Approach Delay	2.4						10.7			2.4		
Approach LOS	A						B			A		
Intersection Delay	7.2			Intersection LOS						A		

SHORT REPORT

General Information		Site Information	
Analyst	KNM	Intersection	US 17/92 and I-4 EB Ramps
Agency or Co.	HNTB		
Date Performed	03/24/08	Area Type	All other areas
Time Period	Build I-4 Connection @ SR 417	Jurisdiction	Seminole County
		Analysis Year	2012 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			1	1	1	1	2			2	1
Lane Group	L			L	T	R	L	T			T	R
Volume (vph)	863			46	33	58	211	499			459	430
% 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		
Adjusted Flow Rate	908			48	35	61	222	525			483	453
Lane Group Capacity	1146			828	218	864	409	1358			815	1152
v/c Ratio	0.79			0.06	0.16	0.07	0.54	0.39			0.59	0.39
Green Ratio	0.33			0.50	0.13	0.58	0.46	0.42			0.25	0.79
Uniform Delay d_1	36.2			15.4	46.9	10.9	21.6	24.3			39.6	3.8
Delay Factor k	0.34			0.11	0.11	0.11	0.14	0.11			0.18	0.11
Incremental Delay d_2	3.9			0.0	0.3	0.0	1.5	0.2			1.2	0.2
PF Factor	1.000			1.000	1.000	1.000	1.000	1.000			1.000	1.000
Control Delay	40.1			15.5	47.2	10.9	23.1	24.5			40.8	4.0
Lane Group LOS	D			B	D	B	C	C			D	A
Approach Delay	40.1			21.3			24.1			23.0		
Approach LOS	D			C			C			C		
Intersection Delay	28.9			Intersection LOS						C		

SHORT REPORT

General Information		Site Information	
Analyst	KNM	Intersection	CR 15 @ Orange Blvd
Agency or Co.	HNTB	Area Type	All other areas
Date Performed	3/24/08	Jurisdiction	Seminole County
Time Period	Build I-4 Connection @ SR 417	Analysis Year	2012 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)	356		64				72	828			386	153
% 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	375		25				76	872			406	161
Lane Group Capacity	531		1583				571	2128			2128	950
v/c Ratio	0.71		0.02				0.13	0.41			0.19	0.17
Green Ratio	0.30		1.00				0.60	0.60			0.60	0.60
Uniform Delay d_1	31.1		0.0				8.7	10.6			9.0	8.9
Delay Factor k	0.27		0.11				0.11	0.11			0.11	0.11
Incremental Delay d_2	4.3		0.0				0.1	0.1			0.0	0.1
PF Factor	1.000		0.950				1.000	1.000			1.000	1.000
Control Delay	35.4		0.0				8.8	10.7			9.1	9.0
Lane Group LOS	D		A				A	B			A	A
Approach Delay	33.2						10.6			9.1		
Approach LOS	C						B			A		
Intersection Delay	14.8			Intersection LOS						B		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			264	0	0
Storage Lanes	0			1	0	1
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	0	1863	1583	0	1611
Flt Permitted						
Satd. Flow (perm)	0	0	1863	1583	0	1611
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		1207	2029		2084	
Travel Time (s)		27.4	46.1		47.4	
Volume (vph)	0	0	0	14	0	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	15	0	8
Lane Group Flow (vph)	0	0	0	15	0	8
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 6.7%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	0
Storage Lanes		0	1		1	0
Turning Speed (mph)		9	15		15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected			0.950		0.950	
Satd. Flow (prot)	0	0	1770	1863	1770	0
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	0	0	1770	1863	1770	0
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	1311			3299	287	
Travel Time (s)	29.8			75.0	6.5	
Volume (vph)	0	0	130	160	90	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	141	174	98	0
Lane Group Flow (vph)	0	0	141	174	98	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.2%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	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
Storage Length (ft)	0		422	0		0	0		264	0		0
Storage Lanes	1		1	0		0	0		1	1		0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	1863	1583	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	1863	1583	0	0	0	0	1863	1583	1770	1863	0
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1310			3279			7917			287	
Travel Time (s)		29.8			74.5			179.9			6.5	
Volume (vph)	1	91	108	0	0	0	0	89	51	68	62	0
Peak Hour Factor	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)	1	99	117	0	0	0	0	97	55	74	67	0
Lane Group Flow (vph)	1	99	117	0	0	0	0	97	55	74	67	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	19.8%	ICU Level of Service	A
Analysis Period (min) 15			

Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	475		0	0
Storage Lanes		0	1		1	0
Turning Speed (mph)		9	15		15	9
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt						
Flt Protected			0.950		0.950	
Satd. Flow (prot)	0	0	1770	3539	1770	0
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	0	0	1770	3539	1770	0
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	1735			3514	371	
Travel Time (s)	39.4			79.9	8.4	
Volume (vph)	0	0	80	80	60	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	87	87	65	0
Lane Group Flow (vph)	0	0	87	87	65	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.7%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	264		264	0		0	0		475	0		0
Storage Lanes	1		1	0		0	0		1	1		0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.850			
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	3539	1583	0	0	0	0	1863	1583	1770	1863	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	3539	1583	0	0	0	0	1863	1583	1770	1863	0
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1516			3539			1303			371	
Travel Time (s)		34.5			80.4			29.6			8.4	
Volume (vph)	9	67	44	0	0	0	0	51	49	14	66	0
Peak Hour Factor	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)	10	73	48	0	0	0	0	55	53	15	72	0
Lane Group Flow (vph)	10	73	48	0	0	0	0	55	53	15	72	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 21.3%		ICU Level of Service A	
Analysis Period (min) 15			

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	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	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	5085	1583	1770	5085	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.58	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1084	1863	1583	1249	1863	1583
Volume (vph)	81	781	28	97	1206	157	231	124	76	99	57	74
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)	88	849	30	105	1311	171	251	135	83	108	62	80
RTOR Reduction (vph)	0	0	20	0	0	111	0	0	60	0	0	63
Lane Group Flow (vph)	88	849	10	105	1311	60	251	135	23	108	62	17
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)	5.2	23.0	23.0	6.2	24.0	24.0	28.6	20.1	20.1	18.0	14.8	14.8
Effective Green, g (s)	7.7	27.0	27.0	8.7	28.0	28.0	32.3	22.6	22.6	23.0	17.3	17.3
Actuated g/C Ratio	0.10	0.34	0.34	0.11	0.35	0.35	0.40	0.28	0.28	0.29	0.22	0.22
Clearance Time (s)	6.5	8.0	8.0	6.5	8.0	8.0	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)	170	1716	534	192	1780	554	532	526	447	396	403	342
v/s Ratio Prot	0.05	0.17		c0.06	c0.26		c0.06	0.07		0.02	0.03	
v/s Ratio Perm			0.01			0.04	c0.13		0.01	0.06		0.01
v/c Ratio	0.52	0.49	0.02	0.55	0.74	0.11	0.47	0.26	0.05	0.27	0.15	0.05
Uniform Delay, d1	34.4	21.1	17.7	33.8	22.8	17.6	16.7	22.2	20.9	21.6	25.4	24.8
Progression Factor	1.00	1.00	1.00	1.53	0.29	0.21	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	1.0	0.1	2.7	2.4	0.3	0.7	1.2	0.2	0.4	0.8	0.3
Delay (s)	37.0	22.1	17.7	54.3	9.0	4.0	17.4	23.4	21.1	22.0	26.2	25.1
Level of Service	D	C	B	D	A	A	B	C	C	C	C	C
Approach Delay (s)		23.3			11.4			19.8			24.0	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

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	0.91	1.00	0.97	0.91	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)	5085	1583	3433	5085	3433	2787
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	3433	2787
Volume (vph)	1307	143	141	1459	266	234
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1421	155	153	1586	289	254
RTOR Reduction (vph)	0	73	0	0	0	208
Lane Group Flow (vph)	1421	82	153	1586	289	46
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	39.1	39.1	9.0	54.6	11.4	11.4
Effective Green, g (s)	42.1	42.1	11.5	57.6	14.4	14.4
Actuated g/C Ratio	0.53	0.53	0.14	0.72	0.18	0.18
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)	2676	833	493	3661	618	502
v/s Ratio Prot	c0.28		0.04	c0.31	c0.08	
v/s Ratio Perm		0.05				0.02
v/c Ratio	0.53	0.10	0.31	0.43	0.47	0.09
Uniform Delay, d1	12.5	9.5	30.7	4.6	29.4	27.3
Progression Factor	0.53	0.15	1.31	0.40	0.78	0.99
Incremental Delay, d2	0.7	0.2	0.3	0.3	0.6	0.1
Delay (s)	7.4	1.6	40.4	2.1	23.4	27.2
Level of Service	A	A	D	A	C	C
Approach Delay (s)	6.8			5.5	25.2	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	8.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

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	0.91	0.91	1.00	1.00	1.00
Frt	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)	1770	5085	5085	1583	1770	1583
Flt Permitted	0.11	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	202	5085	5085	1583	1770	1583
Volume (vph)	32	1178	1459	291	255	55
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	1280	1586	316	277	60
RTOR Reduction (vph)	0	0	0	134	0	18
Lane Group Flow (vph)	35	1280	1586	182	277	42
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	42.5	42.5	42.5	42.5	23.5	23.5
Effective Green, g (s)	46.0	46.0	46.0	46.0	26.0	26.0
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.32	0.32
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	116	2924	2924	910	575	514
v/s Ratio Prot		0.25	c0.31		c0.16	
v/s Ratio Perm	0.17			0.11		0.03
v/c Ratio	0.30	0.44	0.54	0.20	0.48	0.08
Uniform Delay, d1	8.7	9.7	10.5	8.2	21.6	18.7
Progression Factor	0.42	0.40	0.62	1.02	1.00	1.00
Incremental Delay, d2	6.3	0.5	0.7	0.5	2.9	0.3
Delay (s)	10.0	4.3	7.2	8.8	24.5	19.0
Level of Service	A	A	A	A	C	B
Approach Delay (s)		4.5	7.4		23.5	
Approach LOS		A	A		C	

Intersection Summary			
HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	215	1501	0	0	1815	755	404	0	506	0	0	0
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	0.91			0.91	1.00	0.97		0.88			
Frt	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	5085			5085	1583	3433		2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5085			5085	1583	3433		2787			
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)	234	1632	0	0	1973	821	439	0	550	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	380	0	0	57	0	0	0
Lane Group Flow (vph)	234	1632	0	0	1973	441	439	0	493	0	0	0
Turn Type	Prot					Perm	Prot		custom			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	8.3	51.5			36.7	36.7	15.5		15.5			
Effective Green, g (s)	10.8	54.0			39.2	39.2	18.0		18.0			
Actuated g/C Ratio	0.14	0.68			0.49	0.49	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)	463	3432			2492	776	772		627			
v/s Ratio Prot	0.07	c0.32			c0.39		0.13					
v/s Ratio Perm						0.28			c0.18			
v/c Ratio	0.51	0.48			0.79	0.57	0.57		0.79			
Uniform Delay, d1	32.1	6.2			17.0	14.4	27.5		29.2			
Progression Factor	0.98	0.69			0.56	2.67	1.00		1.00			
Incremental Delay, d2	0.8	0.4			1.5	1.7	3.0		9.6			
Delay (s)	32.3	4.7			11.0	40.3	30.6		38.8			
Level of Service	C	A			B	D	C		D			
Approach Delay (s)		8.2			19.6			35.1			0.0	
Approach LOS		A			B			D			A	

Intersection Summary			
HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

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	0.91	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	5085	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	0.55	0.54	1.00
Satd. Flow (perm)	1770	5084		1770	5085	1583	1212	1863	1583	975	955	1583
Volume (vph)	86	1231	3	49	1595	236	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)	93	1338	3	53	1734	257	20	85	183	325	16	50
RTOR Reduction (vph)	0	1	0	0	0	151	0	0	111	0	0	38
Lane Group Flow (vph)	93	1340	0	53	1734	106	20	85	72	181	160	12
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)	4.9	31.7		2.2	29.0	29.0	13.5	12.1	12.1	23.7	23.7	17.2
Effective Green, g (s)	7.4	35.7		4.7	33.0	33.0	18.5	14.6	14.6	27.6	27.6	19.7
Actuated g/C Ratio	0.09	0.45		0.06	0.41	0.41	0.23	0.18	0.18	0.34	0.34	0.25
Clearance Time (s)	6.5	8.0		6.5	8.0	8.0	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
Lane Grp Cap (vph)	164	2269		104	2098	653	307	340	289	416	413	390
v/s Ratio Prot	c0.05	c0.26		0.03	c0.34		0.00	0.05		c0.05	0.04	
v/s Ratio Perm						0.07	0.01		0.05	c0.10	0.09	0.01
v/c Ratio	0.57	0.59		0.51	0.83	0.16	0.07	0.25	0.25	0.44	0.39	0.03
Uniform Delay, d1	34.8	16.7		36.5	20.9	14.8	23.9	28.0	28.0	19.3	19.8	22.9
Progression Factor	1.40	0.36		1.10	0.47	0.30	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.9	1.0		2.9	3.0	0.4	0.1	0.4	0.5	0.7	0.6	0.0
Delay (s)	52.6	7.0		43.0	12.8	4.8	24.0	28.4	28.5	20.1	20.4	22.9
Level of Service	D	A		D	B	A	C	C	C	C	C	C
Approach Delay (s)		10.0			12.6			28.1			20.6	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	13.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑	↱		↑↑↑		↰↰		↱		
Volume (vph)	0	1097	260	0	1499	0	619	0	351	0	0
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		0.91	1.00		0.91		0.97		1.00		
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)		5085	1583		5085		3433		1583		
Flt Permitted		1.00	1.00		1.00		0.95		1.00		
Satd. Flow (perm)		5085	1583		5085		3433		1583		
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	1192	283	0	1629	0	673	0	382	0	0
RTOR Reduction (vph)	0	0	152	0	0	0	0	0	5	0	0
Lane Group Flow (vph)	0	1192	131	0	1629	0	673	0	377	0	0
Turn Type			Perm				Prot		custom		
Protected Phases		2			6		4				
Permitted Phases			2						4		
Actuated Green, G (s)		34.5	34.5		34.5		32.5		32.5		
Effective Green, g (s)		37.0	37.0		37.0		35.0		35.0		
Actuated g/C Ratio		0.46	0.46		0.46		0.44		0.44		
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)		2352	732		2352		1502		693		
v/s Ratio Prot		0.23			c0.32		0.20				
v/s Ratio Perm			0.08						c0.24		
v/c Ratio		0.51	0.18		0.69		0.45		0.54		
Uniform Delay, d1		15.1	12.6		17.0		15.7		16.6		
Progression Factor		0.80	1.51		0.52		1.00		1.00		
Incremental Delay, d2		0.7	0.5		1.1		1.0		3.1		
Delay (s)		12.8	19.6		10.0		16.7		19.7		
Level of Service		B	B		A		B		B		
Approach Delay (s)		14.1			10.0			17.8		0.0	
Approach LOS		B			A			B		A	

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: SR 46 & ~~Hickman~~ TOWN CENTER

Wekiva Parkway
2012 Build I-4 at SR 417 - 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
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	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)	232	1228	660	248	1659	108	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)	252	1335	717	270	1803	117	658	61	216	132	57	183
RTOR Reduction (vph)	0	0	373	0	0	79	0	0	173	0	0	168
Lane Group Flow (vph)	252	1335	344	270	1803	38	658	61	43	132	57	15
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)	11.5	28.7	28.7	6.3	23.5	23.5	15.5	13.5	13.5	5.5	3.5	3.5
Effective Green, g (s)	14.0	31.2	31.2	8.8	26.0	26.0	18.0	16.0	16.0	8.0	6.0	6.0
Actuated g/C Ratio	0.18	0.39	0.39	0.11	0.32	0.32	0.22	0.20	0.20	0.10	0.08	0.08
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)	310	1983	617	378	2083	514	772	373	317	177	140	119
v/s Ratio Prot	c0.14	0.26		0.08	c0.28		c0.19	0.03		0.07	c0.03	
v/s Ratio Perm			0.22			0.02			0.03			0.01
v/c Ratio	0.81	0.67	0.56	0.71	0.87	0.07	0.85	0.16	0.14	0.75	0.41	0.12
Uniform Delay, d1	31.7	20.2	19.0	34.4	25.4	18.7	29.7	26.5	26.3	35.0	35.3	34.5
Progression Factor	1.10	0.75	0.56	0.73	1.02	2.15	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.5	1.7	3.2	4.8	3.9	0.2	9.0	0.2	0.2	15.6	1.9	0.5
Delay (s)	48.4	16.7	13.8	29.8	29.8	40.4	38.7	26.7	26.5	50.7	37.2	35.0
Level of Service	D	B	B	C	C	D	D	C	C	D	D	D
Approach Delay (s)		19.3			30.4			35.1			40.9	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	27.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

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
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	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	1168	260	367	1310	13	502	71	347	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	1270	283	399	1424	14	546	77	377	45	40	158
RTOR Reduction (vph)	0	0	191	0	0	8	0	0	203	0	0	124
Lane Group Flow (vph)	67	1270	92	399	1424	6	546	77	174	45	40	34
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)	3.8	23.5	23.5	10.5	30.2	30.2	14.5	14.5	14.5	5.5	5.5	5.5
Effective Green, g (s)	6.3	26.0	26.0	13.0	32.7	32.7	17.0	17.0	17.0	8.0	8.0	8.0
Actuated g/C Ratio	0.08	0.32	0.32	0.16	0.41	0.41	0.21	0.21	0.21	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)	139	1653	514	558	2078	647	730	396	336	177	186	158
v/s Ratio Prot	0.04	c0.25		c0.12	0.28		c0.16	0.04		c0.03	0.02	
v/s Ratio Perm			0.06			0.00			0.11			0.02
v/c Ratio	0.48	0.77	0.18	0.72	0.69	0.01	0.75	0.19	0.52	0.25	0.22	0.21
Uniform Delay, d1	35.3	24.3	19.4	31.7	19.4	14.0	29.5	25.9	27.9	33.2	33.1	33.1
Progression Factor	1.51	0.46	0.33	1.00	1.00	1.00	0.53	0.48	0.64	1.00	1.00	1.00
Incremental Delay, d2	2.0	2.7	0.6	4.3	1.9	0.0	6.2	1.0	5.0	0.8	0.6	0.7
Delay (s)	55.3	13.7	7.0	36.1	21.3	14.1	22.0	13.5	23.0	34.0	33.7	33.8
Level of Service	E	B	A	D	C	B	C	B	C	C	C	C
Approach Delay (s)		14.3			24.4			21.7			33.8	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	20.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

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)	108	584	41	293	624	365	131	614	1121	187	359	79
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)	117	635	45	318	678	397	142	667	1218	203	390	86
RTOR Reduction (vph)	0	0	37	0	0	145	0	0	3	0	0	45
Lane Group Flow (vph)	117	635	8	318	678	252	142	667	1215	203	390	41
Turn Type	Prot		Perm	Prot		pt+ov	Prot		pt+ov	Prot		Perm
Protected Phases	5	2		1	6	6 7	3	8	8 1	7	4	
Permitted Phases			2									4
Actuated Green, G (s)	6.5	21.5	21.5	9.5	24.5	36.5	14.1	67.5	83.5	5.5	58.9	58.9
Effective Green, g (s)	9.0	24.0	24.0	12.0	27.0	39.0	16.6	70.0	86.0	8.0	61.4	61.4
Actuated g/C Ratio	0.07	0.18	0.18	0.09	0.21	0.30	0.13	0.54	0.66	0.06	0.47	0.47
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)	123	653	292	317	735	475	226	1906	1047	211	1671	748
v/s Ratio Prot	0.07	0.18		0.09	c0.19	0.16	0.08	0.19	c0.77	c0.06	0.11	
v/s Ratio Perm			0.01									0.03
v/c Ratio	0.95	0.97	0.03	1.00	0.92	0.53	0.63	0.35	1.16	0.96	0.23	0.05
Uniform Delay, d1	60.3	52.7	43.4	59.0	50.5	37.9	53.8	17.1	22.0	60.8	20.3	18.6
Progression Factor	1.00	1.00	1.00	0.77	0.63	0.96	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	65.7	29.1	0.2	44.6	15.2	0.9	5.4	0.5	82.9	50.9	0.3	0.1
Delay (s)	126.0	81.7	43.6	90.2	47.2	37.1	59.1	17.6	104.9	111.7	20.7	18.7
Level of Service	F	F	D	F	D	D	E	B	F	F	C	B
Approach Delay (s)		86.1			54.1			72.9			47.6	
Approach LOS		F			D			E			D	

Intersection Summary			
HCM Average Control Delay	66.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

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
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	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)	28	1501	451	499	1326	62	119	33	318	248	240	29
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)	30	1632	490	542	1441	67	129	36	346	270	261	32
RTOR Reduction (vph)	0	0	215	0	0	29	0	0	34	0	0	27
Lane Group Flow (vph)	30	1632	276	542	1441	38	80	85	312	270	261	5
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)	2.9	56.0	56.0	19.0	72.1	72.1	14.5	14.5	39.0	17.5	17.5	17.5
Effective Green, g (s)	4.4	58.5	58.5	20.5	74.6	74.6	16.0	16.0	40.5	19.0	19.0	19.0
Actuated g/C Ratio	0.03	0.45	0.45	0.16	0.57	0.57	0.12	0.12	0.31	0.15	0.15	0.15
Clearance Time (s)	5.5	6.5	6.5	5.5	6.5	6.5	5.5	5.5		5.5	5.5	5.5
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)	60	1593	712	541	2031	908	207	212	868	259	272	231
v/s Ratio Prot	0.02	c0.46		c0.16	0.41		0.05	c0.05	0.11	c0.15	0.14	
v/s Ratio Perm			0.17			0.02						0.00
v/c Ratio	0.50	1.02	0.39	1.00	0.71	0.04	0.39	0.40	0.36	1.04	0.96	0.02
Uniform Delay, d1	61.7	35.8	23.8	54.8	19.9	12.1	52.5	52.6	34.7	55.5	55.1	47.5
Progression Factor	0.91	1.07	1.43	1.08	0.36	0.30	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	14.3	0.1	29.8	1.2	0.1	5.4	5.6	0.3	67.4	43.0	0.0
Delay (s)	56.6	52.4	34.2	88.7	8.4	3.7	57.9	58.1	35.0	122.9	98.1	47.6
Level of Service	E	D	C	F	A	A	E	E	C	F	F	D
Approach Delay (s)		48.4			29.5			42.4			107.1	
Approach LOS		D			C			D			F	

Intersection Summary			
HCM Average Control Delay	46.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

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			
Frt	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	1821	0	0	1477	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	1979	0	0	1605	326	446	0	848	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	118	0	0	17	0	0	0
Lane Group Flow (vph)	267	1979	0	0	1605	209	446	0	831	0	0	0
Turn Type	Prot					Perm	Prot		custom			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	10.6	78.1			62.0	62.0	39.4		39.4			
Effective Green, g (s)	12.1	81.1			65.0	65.0	40.9		40.9			
Actuated g/C Ratio	0.09	0.62			0.50	0.50	0.31		0.31			
Clearance Time (s)	5.5	7.0			7.0	7.0	5.5		5.5			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	320	2208			1770	792	1080		877			
v/s Ratio Prot	0.08	c0.56			0.45		0.13					
v/s Ratio Perm						0.13			c0.30			
v/c Ratio	0.83	0.90			0.91	0.26	0.41		0.95			
Uniform Delay, d1	58.0	20.9			29.7	18.7	35.1		43.5			
Progression Factor	1.05	0.72			0.20	0.01	1.00		1.00			
Incremental Delay, d2	6.9	2.4			3.2	0.3	0.3		18.7			
Delay (s)	67.7	17.4			9.0	0.4	35.4		62.2			
Level of Service	E	B			A	A	D		E			
Approach Delay (s)		23.4			7.6			52.9			0.0	
Approach LOS		C			A			D			A	

Intersection Summary			
HCM Average Control Delay	24.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

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
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)	3433	3539	1583	3433	3539	1583	3433	3539	1583	1770	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)	3433	3539	1583	3433	3539	1583	3433	3539	1583	1770	3539	1583
Volume (vph)	841	1178	581	276	577	106	808	787	395	105	618	392
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)	914	1280	632	300	627	115	878	855	429	114	672	426
RTOR Reduction (vph)	0	0	319	0	0	94	0	0	153	0	0	331
Lane Group Flow (vph)	914	1280	313	300	627	21	878	855	276	114	672	95
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)	32.5	43.1	43.1	10.3	20.9	20.9	31.1	42.6	42.6	10.0	21.5	21.5
Effective Green, g (s)	34.0	45.6	45.6	11.8	23.4	23.4	32.6	45.1	45.1	11.5	24.0	24.0
Actuated g/C Ratio	0.26	0.35	0.35	0.09	0.18	0.18	0.25	0.35	0.35	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)	898	1241	555	312	637	285	861	1228	549	157	653	292
v/s Ratio Prot	c0.27	c0.36		0.09	0.18		c0.26	0.24		0.06	c0.19	
v/s Ratio Perm			0.20			0.01			0.17			0.06
v/c Ratio	1.02	1.03	0.56	0.96	0.98	0.07	1.02	0.70	0.50	0.73	1.03	0.33
Uniform Delay, d1	48.0	42.2	34.2	58.9	53.1	44.3	48.7	36.6	33.6	57.7	53.0	46.0
Progression Factor	1.02	1.18	1.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.5	24.8	1.6	40.5	32.0	0.5	35.7	1.7	0.7	15.4	42.9	0.7
Delay (s)	72.4	74.8	61.3	99.3	85.1	44.8	84.4	38.3	34.3	73.1	95.9	46.6
Level of Service	E	E	E	F	F	D	F	D	C	E	F	D
Approach Delay (s)		71.0			84.8			56.2			76.4	
Approach LOS		E			F			E			E	

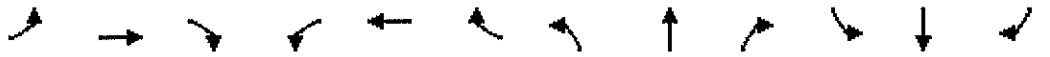
Intersection Summary			
HCM Average Control Delay	69.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

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	0.40	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)	1261	3539	1583	926	1863	1583	1428	3539	1583	879	3539	1583
Volume (vph)	59	130	137	185	115	138	209	759	82	111	433	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)	64	141	149	201	125	150	227	825	89	121	471	84
RTOR Reduction (vph)	0	0	127	0	0	118	0	0	52	0	0	52
Lane Group Flow (vph)	64	141	22	201	125	32	227	825	37	121	471	32
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)	14.3	9.5	9.5	24.7	14.7	14.7	38.6	30.5	30.5	34.4	28.4	28.4
Effective Green, g (s)	18.3	12.0	12.0	27.5	17.2	17.2	42.6	33.0	33.0	38.4	30.9	30.9
Actuated g/C Ratio	0.23	0.15	0.15	0.34	0.22	0.22	0.53	0.41	0.41	0.48	0.39	0.39
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)	329	531	237	440	401	340	1001	1460	653	661	1367	611
v/s Ratio Prot	0.02	0.04		c0.07	0.07		c0.03	c0.23		0.02	0.13	
v/s Ratio Perm	0.03		0.01	c0.09		0.02	0.09		0.02	0.07		0.02
v/c Ratio	0.19	0.27	0.09	0.46	0.31	0.09	0.23	0.57	0.06	0.18	0.34	0.05
Uniform Delay, d1	24.7	30.1	29.3	19.6	26.4	25.2	9.6	18.0	14.1	11.8	17.4	15.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.39	1.13	2.12	0.71	1.06	2.41
Incremental Delay, d2	0.3	0.3	0.2	0.8	0.4	0.1	0.1	1.4	0.1	0.1	0.6	0.1
Delay (s)	25.0	30.4	29.5	20.3	26.9	25.3	13.4	21.8	30.1	8.5	18.9	37.3
Level of Service	C	C	C	C	C	C	B	C	C	A	B	D
Approach Delay (s)		29.0			23.6			20.8			19.3	
Approach LOS		C			C			C			B	

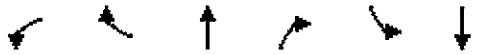
Intersection Summary			
HCM Average Control Delay	22.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	11	67	199	22	569	66	688	99	120	589	22
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	1524	1504	3433	3539	1583	3433	3539	1583
Flt Permitted	0.34	1.00	1.00	0.58	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	628	1863	1583	1084	1524	1504	3433	3539	1583	3433	3539	1583
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	216	24	618	72	748	108	130	640	24
RTOR Reduction (vph)	0	0	60	0	228	245	0	0	67	0	0	15
Lane Group Flow (vph)	25	12	13	216	93	76	72	748	41	130	640	9
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)	12.2	10.4	10.4	21.6	15.1	15.1	5.1	27.2	27.2	5.9	28.0	28.0
Effective Green, g (s)	19.2	13.9	13.9	27.9	18.6	18.6	8.6	30.7	30.7	9.4	31.5	31.5
Actuated g/C Ratio	0.24	0.17	0.17	0.35	0.23	0.23	0.11	0.38	0.38	0.12	0.39	0.39
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)	226	324	275	464	354	350	369	1358	607	403	1393	623
v/s Ratio Prot	0.01	0.01		c0.06	0.06		0.02	c0.21		c0.04	0.18	
v/s Ratio Perm	0.02		0.01	c0.10		0.05			0.03			0.01
v/c Ratio	0.11	0.04	0.05	0.47	0.26	0.22	0.20	0.55	0.07	0.32	0.46	0.02
Uniform Delay, d1	23.6	27.5	27.5	19.4	25.1	24.8	32.5	19.3	15.6	32.4	17.9	14.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.50	0.35	0.08	0.74	0.76	0.68
Incremental Delay, d2	0.2	0.0	0.1	0.7	0.4	0.3	0.2	1.5	0.2	0.4	1.0	0.0
Delay (s)	23.8	27.5	27.6	20.2	25.5	25.1	49.0	8.3	1.4	24.4	14.7	10.0
Level of Service	C	C	C	C	C	C	D	A	A	C	B	B
Approach Delay (s)		26.7			24.0			10.7			16.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	71	159	694	546	244	611
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
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	77	173	754	593	265	664
RTOR Reduction (vph)	0	149	0	317	0	0
Lane Group Flow (vph)	77	24	754	276	265	664
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	8.8	8.8	34.7	34.7	17.0	58.2
Effective Green, g (s)	11.3	11.3	37.2	37.2	19.5	60.7
Actuated g/C Ratio	0.14	0.14	0.47	0.47	0.24	0.76
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)	250	224	1646	736	431	2685
v/s Ratio Prot	c0.04		c0.21		c0.15	0.19
v/s Ratio Perm		0.02		0.17		
v/c Ratio	0.31	0.11	0.46	0.37	0.61	0.25
Uniform Delay, d1	30.8	30.0	14.5	13.9	26.9	2.9
Progression Factor	1.00	1.00	0.30	1.24	0.71	0.34
Incremental Delay, d2	0.7	0.2	0.7	1.2	2.4	0.2
Delay (s)	31.5	30.2	5.0	18.4	21.6	1.2
Level of Service	C	C	A	B	C	A
Approach Delay (s)	30.6		10.9			7.0
Approach LOS	C		B			A

Intersection Summary			
HCM Average Control Delay	11.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

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
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3503		1770	3525			1793	1583		1794	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.80	1.00
Satd. Flow (perm)	3433	3503		1770	3525			1475	1583		1483	1583
Volume (vph)	365	1034	76	34	714	19	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)	397	1124	83	37	776	21	47	13	22	48	15	432
RTOR Reduction (vph)	0	7	0	0	3	0	0	0	15	0	0	208
Lane Group Flow (vph)	397	1200	0	37	794	0	0	60	7	0	63	224
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Actuated Green, G (s)	12.9	34.8		2.1	24.0			24.6	24.6		24.6	24.6
Effective Green, g (s)	14.4	37.3		3.6	26.5			27.1	27.1		27.1	27.1
Actuated g/C Ratio	0.18	0.47		0.04	0.33			0.34	0.34		0.34	0.34
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)	618	1633		80	1168			500	536		502	536
v/s Ratio Prot	c0.12	c0.34		0.02	0.23							
v/s Ratio Perm								0.04	0.00		0.04	c0.14
v/c Ratio	0.64	0.73		0.46	0.68			0.12	0.01		0.13	0.42
Uniform Delay, d1	30.4	17.3		37.3	23.1			18.2	17.6		18.3	20.4
Progression Factor	1.00	1.00		1.12	0.79			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.3	1.8		4.1	1.6			0.5	0.0		0.5	2.4
Delay (s)	32.7	19.1		46.0	20.0			18.7	17.6		18.8	22.8
Level of Service	C	B		D	B			B	B		B	C
Approach Delay (s)		22.5			21.1			18.4			22.3	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
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		4.0		
Lane Util. Factor	0.97	0.95			0.95	1.00	0.97		1.00		
Frt	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		1583		
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00		
Satd. Flow (perm)	3433	3539			3539	1583	3433		1583		
Volume (vph)	381	287	0	0	265	29	297	0	253	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)	414	312	0	0	288	32	323	0	275	0	0
RTOR Reduction (vph)	0	0	0	0	0	21	0	0	196	0	0
Lane Group Flow (vph)	414	312	0	0	288	11	323	0	79	0	0
Turn Type	Prot					Perm	Prot		custom		
Protected Phases	5	2			6		4				
Permitted Phases						6			4		
Actuated Green, G (s)	15.4	46.5			24.6	24.6	20.5		20.5		
Effective Green, g (s)	17.9	49.0			27.1	27.1	23.0		23.0		
Actuated g/C Ratio	0.22	0.61			0.34	0.34	0.29		0.29		
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)	768	2168			1199	536	987		455		
v/s Ratio Prot	c0.12	0.09			c0.08		c0.09				
v/s Ratio Perm						0.01			0.05		
v/c Ratio	0.54	0.14			0.24	0.02	0.33		0.17		
Uniform Delay, d1	27.4	6.6			19.0	17.6	22.4		21.4		
Progression Factor	0.51	0.13			0.59	0.27	1.00		1.00		
Incremental Delay, d2	0.7	0.1			0.5	0.1	0.9		0.8		
Delay (s)	14.5	1.0			11.8	4.9	23.3		22.2		
Level of Service	B	A			B	A	C		C		
Approach Delay (s)		8.7			11.1			22.8		0.0	
Approach LOS		A			B			C		A	

Intersection Summary			
HCM Average Control Delay	14.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
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	1.00		0.88					0.95	1.00	0.97	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		2787					3539	1583	3433	3539	
Flt Permitted	0.95		1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770		2787					3539	1583	3433	3539	
Volume (vph)	115	0	295	0	0	0	0	553	405	135	427	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)	125	0	321	0	0	0	0	601	440	147	464	0
RTOR Reduction (vph)	0	0	278	0	0	0	0	0	297	0	0	0
Lane Group Flow (vph)	125	0	43	0	0	0	0	601	143	147	464	0
Turn Type	Prot		custom						Perm	Prot		
Protected Phases	8							2		1	6	
Permitted Phases			8						2			
Actuated Green, G (s)	10.8		10.8					23.5	23.5	28.7	58.7	
Effective Green, g (s)	10.8		10.8					26.0	26.0	31.2	61.2	
Actuated g/C Ratio	0.14		0.14					0.32	0.32	0.39	0.76	
Clearance Time (s)	4.0		4.0					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)	239		376					1150	514	1339	2707	
v/s Ratio Prot	c0.07							c0.17		0.04	c0.13	
v/s Ratio Perm			0.02						0.09			
v/c Ratio	0.52		0.12					0.52	0.28	0.11	0.17	
Uniform Delay, d1	32.2		30.4					22.0	20.0	15.5	2.5	
Progression Factor	1.00		1.00					1.00	1.00	1.28	0.18	
Incremental Delay, d2	2.1		0.1					1.7	1.3	0.2	0.1	
Delay (s)	34.3		30.5					23.7	21.4	20.1	0.6	
Level of Service	C		C					C	C	C	A	
Approach Delay (s)		31.6			0.0			22.7			5.3	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM Average Control Delay	19.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group