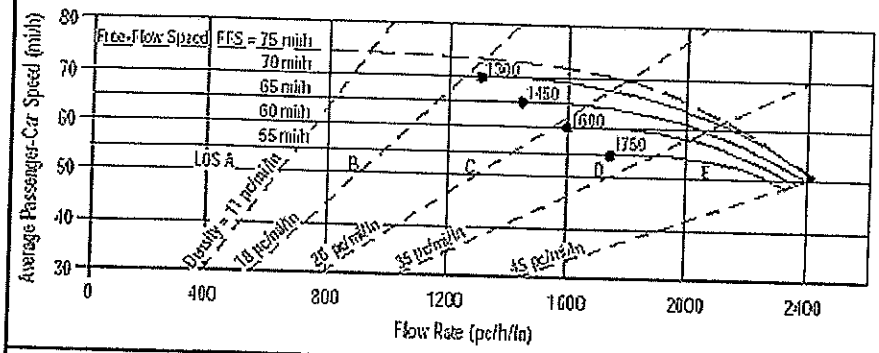
2022 Build - Preferred Alternative

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	*2022 Build*

Project Description Wekiva Parkway PD&E

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

Flow Inputs

Volume, V	*6000*	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*	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)	*2200*	pc/h/ln
S	*58.3*	mi/h
D = v_p / S	*37.8*	pc/mi/ln
LOS	*E*	

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	

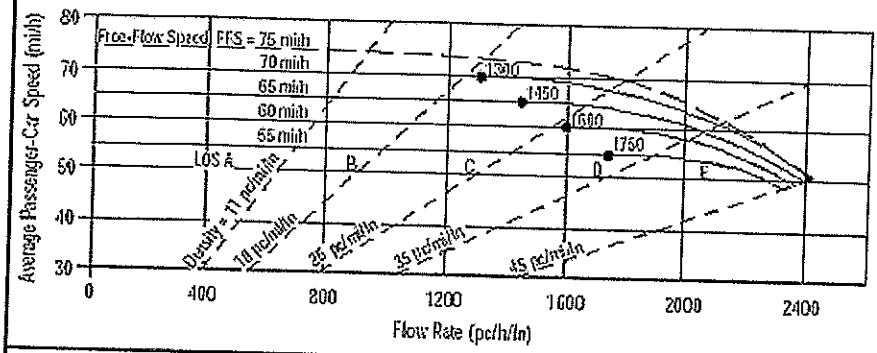
Glossary

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	*2022 Build*

Project Description Wekiva Parkway PD&E

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

Flow Inputs

Volume, V	*4520*	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)	*1657*	pc/h/ln
S	*66.3*	mi/h
D = v_p / S	*25.0*	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

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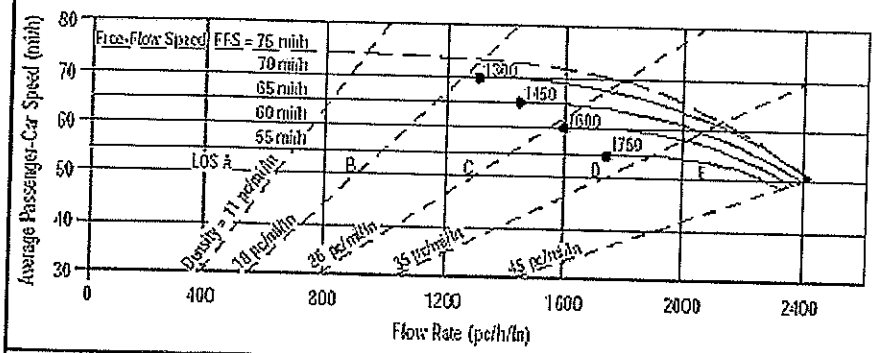
BASIC FREEWAY SEGMENTS WORKSHEET



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	*2022 Build*

Project Description Wekiva Parkway PD&E

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

Flow Inputs

Volume, V	*6390*	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*	l/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)	*1757*	pc/h/ln
S	*66.4*	mi/h
D = v_p / S	*26.5*	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

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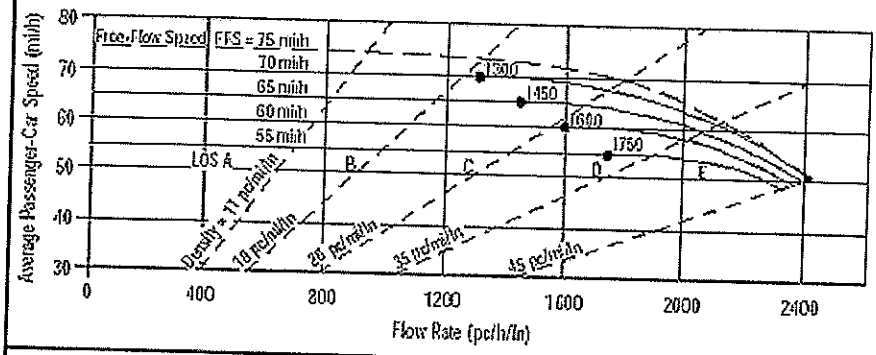
BASIC FREEWAY SEGMENTS WORKSHEET



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	*2022 Build*

Project Description Wekiva Parkway PD&E

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

Flow Inputs

Volume, V	*5950*	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*	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)	*2182*	pc/h/ln
S	*54.2*	mi/h
D = v_p / S	*40.3*	pc/mi/ln
LOS	*E*	

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

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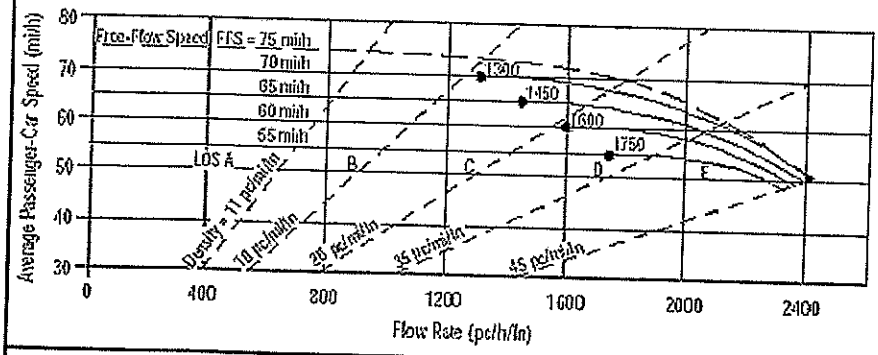
BASIC FREEWAY SEGMENTS WORKSHEET



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	*2022 Build*

Project Description Wekiva Parkway PD&E

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

Flow Inputs

Volume, V	*4770*	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)	*1757*	pc/h/ln
S	*65.9*	mi/h
D = v_p / S	*26.7*	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

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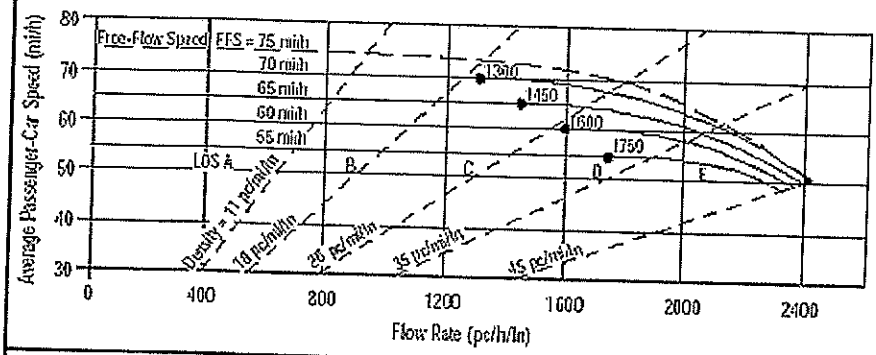
BASIC FREEWAY SEGMENTS WORKSHEET



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

General Information

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

Site Information

Highway/Direction of Travel	*SR 417/Westbound*
From/To	*Rinehart Rd to I-4*
Jurisdiction	
Analysis Year	*2022 Build*

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

Flow Inputs

Volume, V	*4140*	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)	*1525*	pc/h/ln
S	*59.5*	mi/h
D = v_p / S	*25.6*	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

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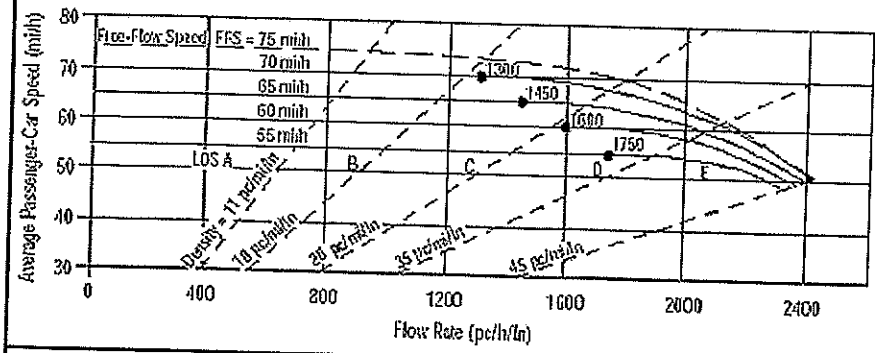
BASIC FREEWAY SEGMENTS WORKSHEET



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

General Information

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

Project Description Wekiva Parkway PD&E

Site Information

Highway/Direction of Travel	*SR 417/Westbound*
From/To	*I-4 to CD Road*
Jurisdiction	
Analysis Year	*2022 Build*

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

Flow Inputs

Volume, V	*3260*	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)	*1201*	pc/h/ln
S	*59.5*	mi/h
D = v_p / S	*20.2*	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: 3/26/2008 5:17 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 Service Road Concept
Freeway/Direction:	SR 417 WB
From/To:	On Ramp from I-4 EB & WB
Jurisdiction:	Seminole County
Analysis Year:	2022
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	2610	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	709	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	748	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	748	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	12.3	pc/mi/ln
Level of service, LOS	B	

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
Freeway/Direction:	I-4 WB
From/To:	On Ramp from CR 46A & SR 46
Jurisdiction:	Seminole County
Analysis Year:	2022
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	6000	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1630	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	1704	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	1704	pc/h/ln
Free-flow speed, FFS	66.5	mi/h
Average passenger-car speed, S	65.8	mi/h
Number of lanes, N	4	
Density, D	25.9	pc/mi/ln
Level of service, LOS	C	

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:	09/2010
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:	2022
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	6390	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1736	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	1815	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	1815	pc/h/ln
Free-flow speed, FFS	68.3	mi/h
Average passenger-car speed, S	66.4	mi/h
Number of lanes, N	4	
Density, D	27.3	pc/mi/ln
Level of service, LOS	D	

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 SR 417 WB
Jurisdiction:	Seminole County
Analysis Year:	2022
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	3750	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1019	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	1420	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	1420	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	21.3	pc/mi/ln
Level of service, LOS	C	

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

2022 Build I-4 WB On from US1792.txt

HCS+: Basic Freeway Segments Release 5.4

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	CTR
Agency or Company:	HNTB
Date Performed:	08/02/10
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:	2022
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	6390	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1736	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	1815	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	1815	pc/h/ln
Free-flow speed, FFS	67.6	mi/h
Average passenger-car speed, S	65.8	mi/h
Number of lanes, N	4	
Density, D	27.6	pc/mi/ln
Level of service, LOS	D	

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:	2022
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	1830	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	497	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	693	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	693	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	10.4	pc/mi/ln
Level of service, LOS	A	

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:	2022
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	3690	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	450	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	1080	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)	3690	450	1080	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1003	122	293	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 4211 514 1233 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1105.35 (Equation 25-2 or 25-3)

P_{FM} = 0.619 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2609 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4725	6750	No
v_3 or v_{av34}	1602 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} = 2609		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2609	4600	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, M_S = 0.305

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

Space mean speed in outer lanes, S_O = 51.0 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 Service Road Concept
Freeway/Dir of Travel:	SR 417 EB
Junction:	Off Ramp to Rinehart Rd
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	55.0	mph
Volume on freeway	4140	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	450	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	1080	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)	4140		450		1080		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1125		122		293		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 4725 514 1227 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2350 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4725	9000	No
$v_{FO} = v_F - v_R$	4211	9000	No
v_R	514	2000	No
v_3 or v_{av34}	1187 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} = 2350		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2350	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 24.5 pc/mi/ln

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

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 = 59.6 mph

Space mean speed for all vehicles, S = 53.7 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 Rinehart Rd
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	55.0	mph
Volume on freeway	4140	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	450	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	1600	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)	4140		450		1600	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	1125		122		435	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 4725 514 1817 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2350 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4725	9000	No
$v_{FO} = v_F - v_R$	4211	9000	No
v_R	514	2000	No
v_3 or v_{av34}	1187 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} = 2350		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2350	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 24.5 pc/mi/ln

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

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 = 59.6 mph

Space mean speed for all vehicles, S = 53.7 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:	2022
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	3690	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	1080	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	450	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)	3690	1080	450	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1003	293	122	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 4211 1233 514 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1037.22 (Equation 25-2 or 25-3)

P_{FM} = 0.605 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2550 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5444	6750	No
v_3 or v_{av34}	1661 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} = 2550		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2550	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 28.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.422	
Space mean speed in ramp influence area,	S_R = 49.5	mph
Space mean speed in outer lanes,	S_O = 50.8	mph
Space mean speed for all vehicles,	S = 49.9	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 Service Road Concept
Freeway/Dir of Travel:	SR 417 WB
Junction:	Off Ramp to Rinehart Rd
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	4770	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	1080	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	450	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)	4770		1080		450	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	1296		293		122	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 5444 1233 514 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3128 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5444	6750	No
$v_{FO} = v_F - v_R$	4211	6750	No
v_R	1233	3800	No
v_3 or v_{av34}	2316 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} = 3128		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3128	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 22.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.539

Space mean speed in ramp influence area, S_R = 48.0 mph

Space mean speed in outer lanes, S_O = 55.2 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:	SR 417 EB
Junction:	On Ramp from I-4 EB & WB
Jurisdiction:	Seminole County
Analysis Year:	2022
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	2520	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	1600	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	840	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)	2520	1600	840	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	685	435	228	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 2890 1817 963 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1604 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4707	6750	No
$v_{3 \text{ or } av34}$	1286 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} = 1651		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1651	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 11.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.215	
Space mean speed in ramp influence area,	S_R = 52.2	mph
Space mean speed in outer lanes,	S_O = 52.3	mph
Space mean speed for all vehicles,	S = 52.2	mph

I-4 EB CD Road OFF Ramp to WB 417_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:	CD Rd (East of I-4) EB
Junction:	Off Ramp to SR 417 WB
Jurisdiction:	Seminole County
Analysis Year:	2022
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	1300	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	210	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	720	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)	1300		210		720		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	353		57		196		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 1477 239 818 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1477 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1477	4500	No
$v_{FO} = v_F - v_R$	1238	4500	No
v_R	239	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} = 1477		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1477	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.450

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

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

Space mean speed for all vehicles, S = 49.2 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:	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	2610	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	930	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	650	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)	2610		930		650		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	709		253		177		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, v_p 2993 1066 745 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.636 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2292 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2993	6750	No
$v_{FO} = v_F - v_R$	1927	6750	No
v_R	1066	2000	No
v_3 or v_{av34}	701 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} = 2292		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2292	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 24.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.524

Space mean speed in ramp influence area, S_R = 48.2 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 WB
Junction:	On Ramp from SR 417
Jurisdiction:	Seminole County
Analysis Year:	2022
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	640	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	2350	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)	3010	640	2350	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	818	174	639	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 3419 727 2669 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1898 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		4146	6750	No
v_3 or v_{av34}		1521 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} = 1953			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1953	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 9.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.189	
Space mean speed in ramp influence area,	S_R = 52.5	mph
Space mean speed in outer lanes,	S_O = 51.5	mph
Space mean speed for all vehicles,	S = 52.2	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 WB
Junction:	Off Ramp to I-4 EB/WB
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	55.0	mph
Volume on freeway	4140	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	1590	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	870	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)	4140		1590		870		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1125		432		236		v
Trucks and buses	10		10		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	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 4725 1815 993 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2572 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4725	9000	No
$v_{FO} = v_F - v_R$	2910	9000	No
v_R	1815	3800	No
v_3 or v_{av34}	1076 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} = 2572		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2572	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 12.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.591

Space mean speed in ramp influence area, S_R = 47.3 mph

Space mean speed in outer lanes, S_O = 60.0 mph

Space mean speed for all vehicles, S = 52.4 mph

I-4 EB On Ramp from WB SR 417_Downstream Analysis.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:	I-4 EB
Junction:	On Ramp from SR 417 WB
Jurisdiction:	Seminole County
Analysis Year:	2022
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	1160	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	720	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	1160	720	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	913	315	196	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 1324 818 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}	5141	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, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 11.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.220	
Space mean speed in ramp influence area,	S_R = 52.1	mph
Space mean speed in outer lanes,	S_O = 50.9	mph
Space mean speed for all vehicles,	S = 51.7	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:	CD Rd (West of I-4) WB
Junction:	Off Ramp to SR 417 EB
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	2690	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	1170	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	720	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)	2690		1170		720	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	731		318		196	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 3055 1329 818 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2106 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3055	6750	No
$v_{FO} = v_F - v_R$	1726	6750	No
v_R	1329	3800	No
v_3 or v_{av34}	949 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} = 2106		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2106	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 = 0.548

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:	CD Rd (West of I-4) WB
Junction:	Off Ramp to SR 417 WB
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	3410	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	720	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	1170	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)	3410		720		1170		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	927		196		318		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 3873 818 1329 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 1836.15 (Equation 25-8 or 25-9)

P_{FD} = 0.643 Using Equation 7

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2782 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3873	6750	No
$v_{FO} = v_F - v_R$	3055	6750	No
v_R	818	2000	No
v_3 or v_{av34}	1091 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} = 2782		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2782	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 23.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.502

Space mean speed in ramp influence area, S_R = 48.5 mph

Space mean speed in outer lanes, S_O = 60.0 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:	I-4 EB
Junction:	Off Ramp to CR 46A
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	55.0	mph
Volume on freeway	6000	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	1520	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	1730	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)	6000		1520		1730		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1630		413		470		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 6815 1727 1965 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3050 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6815	9000	No
$v_{FO} = v_F - v_R$	5088	9000	No
v_R	1727	3800	No
v_3 or v_{av34}	1882 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} = 3050		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3050	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 17.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.583

Space mean speed in ramp influence area, S_R = 47.4 mph

Space mean speed in outer lanes, S_O = 56.9 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:	2022
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	790	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	390	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	2230	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)	790	390	2230	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	215	106	606	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 897 443 2533 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 897 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1340	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} = 897		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	897	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 11.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.287

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

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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:	2022

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	2750	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	610	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1160	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)	2750	610	1160	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	747	166	315	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, vp 3124 693 1324 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.597 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1865 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3817	6750	No
$v_{3 \text{ or } av34}$	1259 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} = 1865		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1865	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.322	
Space mean speed in ramp influence area,	S_R = 50.8	mph
Space mean speed in outer lanes,	S_O = 52.3	mph
Space mean speed for all vehicles,	S = 51.3	mph

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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:	2022
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	1520	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	690	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	1520	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)	1520		690		1520		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	413		187		413		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 1727 784 1727 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1727 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1727	4500	No
$v_{FO} = v_F - v_R$	943	4500	No
v_R	784	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}	= 1727	(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1727	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 19.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.499

Space mean speed in ramp influence area, S_R = 48.5 mph

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

Space mean speed for all vehicles, S = 48.5 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 Service Road Concept
Freeway/Dir of Travel:	I-4 EB
Junction:	On Ramp from SR 417 EB
Jurisdiction:	Seminole County
Analysis Year:	2022
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	660	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	720	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	720	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)	660	720	720	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	179	196	196	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 750 818 818 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 452 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1568	6750	No
v_3 or v_{av34}	298 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} = 452		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	452	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 = 0.272

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

Space mean speed in outer lanes, S_O = 55.0 mph

Space mean speed for all vehicles, S = 52.1 mph

SR 417 WB OFF Ramp to Int'l Pkwy_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 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	2550	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	870	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	930	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)	2550		870		930	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	693		236		253	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, v_p	2924	998	1056	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.641 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2233 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2924	6750	No
$v_{FO} = v_F - v_R$	1926	6750	No
v_R	998	2000	No
v_3 or v_{av34}	691 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} = 2233		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2233	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 23.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.518

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 Service Road Concept
Freeway/Dir of Travel:	SR 417 EB
Junction:	On Ramp from International Pky
Jurisdiction:	Seminole County
Analysis Year:	2022
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	1680	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	840	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	650	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)	1680	840	650	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	457	228	177	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 1927 959 742 pcph

Estimation of V12 Merge Areas

L_{EQ} = 578.60 (Equation 25-2 or 25-3)

P_{FM} = 0.611 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1178 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2886	6750	No
v_3 or v_{av34}	749 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} = 1178		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1178	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 14.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.270	
Space mean speed in ramp influence area,	S_R = 51.5	mph
Space mean speed in outer lanes,	S_O = 54.1	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:	SR 417 WB
Junction:	On Ramp from International Pwy
Jurisdiction:	Seminole County
Analysis Year:	2022
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	2610	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	650	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	930	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)	2610	650	930	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	709	177	253	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 2993 738 1056 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.126 Using Equation 4

$v_{12} = v_F (P_{FM})$ = 376 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3731	9000	No
v_3 or v_{av34}	1308 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} = 1197		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1197	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 14.6 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 = 53.6	mph
Space mean speed for all vehicles,	S = 52.4	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:	SR 417 EB
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	3260	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	650	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	930	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)	3260		650		930		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	886		177		253		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 3738 745 1066 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 1411.79 (Equation 25-8 or 25-9)

P_{FD} = 0.644 Using Equation 7

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2672 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3738	6750	No
$v_{FO} = v_F - v_R$	2993	6750	No
v_R	745	2000	No
v_3 or v_{av34}	1066 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} = 2672		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2672	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 27.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.495

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

Space mean speed in outer lanes, S_O = 60.1 mph

Space mean speed for all vehicles, S = 51.4 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:	Wekiva Pkwy. EB
Junction:	Off Ramp to EB 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	3970	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	320	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	190	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)	3970		320		190	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	1079		87		52	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	4553	367	216	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 248.74 (Equation 25-8 or 25-9)

P_{FD} = 0.629 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3001 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4553	6750	No
$v_{FO} = v_F - v_R$	4186	6750	No
v_R	367	2000	No
v_3 or v_{av34}	1552 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} = 3001		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3001	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 25.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.461

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

Space mean speed in outer lanes, S_O = 58.2 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. EB CD
Junction:	Off Ramp to Wekiva Pkwy. EB
Jurisdiction:	Seminole County
Analysis Year:	2022
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	3970	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	320	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	190	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)	3970		320		190		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1079		87		52		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 4509 363 218 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4509 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4509	4500	Yes
$v_{FO} = v_F - v_R$	4146	4500	No
v_R	363	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} = 4509		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4509	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 38.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.461

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

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	640	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	430	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)	640		260		430	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	174		71		117	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 727 295 493 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 727 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	727	4500	No
$v_{FO} = v_F - v_R$	432	4500	No
v_R	295	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} = 727		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	727	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 6.0 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 On Ramp from EB CD_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. EB
Junction:	On Ramp from EB 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	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3590	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	190	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	320	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)	3590	190	320	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	976	52	87	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 4117 216 367 pcph

Estimation of V12 Merge Areas

L_{EQ} = 577.46 (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2435 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4333	6750	No
v_3 or v_{av34}	1682 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} = 2435		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2435	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.341

Space mean speed in ramp influence area, S_R = 50.6 mph

Space mean speed in outer lanes, S_O = 50.7 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:	Wekiva Pkwy. EB CD
Junction:	On Ramp from Wekiva Pkwy. EB
Jurisdiction:	Seminole County
Analysis Year:	2022

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	320	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	190	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	320	190	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	3	87	52	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	367	216	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}	378	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)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 5.1 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. EB
Junction:	Off Ramp to SR 46
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	3830	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	470	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	650	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)	3830		470		650		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1041		128		177		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 4392 539 745 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2273 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4392	6750	No
$v_{FO} = v_F - v_R$	3853	6750	No
v_R	539	3800	No
v_3 or v_{av34}	2119 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} = 2509		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2509	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 12.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.477

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

Space mean speed in outer lanes, S_O = 56.9 mph

Space mean speed for all vehicles, S = 52.0 mph

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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:	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	3830	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	470	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	250	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)	3830		470		250		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1041		128		68		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 4392 539 284 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2273 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4392	6750	No
$v_{FO} = v_F - v_R$	3853	6750	No
v_R	539	3800	No
v_3 or v_{av34}	2119 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} = 2509		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2509	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 12.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.477

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

Space mean speed in outer lanes, S_O = 56.9 mph

Space mean speed for all vehicles, S = 52.0 mph

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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	4460	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	780	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	330	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)	4460	780	330	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1212	212	90	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 5114 886 378 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2838 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6000	6750	No
v_3 or v_{av34}	2276 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} = 2922		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2922	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.340

Space mean speed in ramp influence area, S_R = 50.6 mph

Space mean speed in outer lanes, S_O = 48.9 mph

Space mean speed for all vehicles, S = 50.0 mph

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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:	On Ramp from SR 46
Jurisdiction:	Seminole County
Analysis Year:	2022
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	860	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	570	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	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)	860		570		240		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	234		155		65		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 977 647 275 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 977 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	977	4500	No
$v_{FO} = v_F - v_R$	330	4500	No
v_R	647	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} = 977		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	977	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 8.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.486

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

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

Space mean speed for all vehicles, S = 48.7 mph

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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:	2022
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	390	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	380	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	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)	390		380		240	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	106		103		65	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 443 432 275 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 443 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	443	4500	No
$v_{FO} = v_F - v_R$	11	4500	No
v_R	432	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} = 443		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	443	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 3.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.467

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

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

Space mean speed for all vehicles, S = 48.9 mph

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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	1180	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	780	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	330	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)	1180		780		330		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	321		212		90		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 1340 886 378 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1340 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1340	4500	No
$v_{FO} = v_F - v_R$	454	4500	No
v_R	886	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} = 1340		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1340	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 11.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.508

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

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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:	20222
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	3830	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	1340	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	570	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)	3830		240		570		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1041		65		155		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 4392 275 647 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 4281.48 (Equation 25-8 or 25-9)

P_{FD} = 0.638 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2900 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4392	6750	No
$v_{FO} = v_F - v_R$	4117	6750	No
v_R	275	2000	No
v_3 or v_{av34}	1492 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} = 2900		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2900	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 = 0.453

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

Space mean speed in outer lanes, S_O = 58.4 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 Service Road Concept
Freeway/Dir of Travel:	Wekiva Pkwy. WB
Junction:	Off Ramp to WB CD
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	3830	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	1340	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	380	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)	3830		240		380		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1041		65		103		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 4392 275 432 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.638 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2900 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4392	6750	No
$v_{FO} = v_F - v_R$	4117	6750	No
v_R	275	2000	No
$v_{3 \text{ or } av34}$	1492 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} = 2900		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2900	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 = 0.453

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

Space mean speed in outer lanes, S_O = 58.4 mph

Space mean speed for all vehicles, S = 51.9 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	2/16/07
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Pkwy. WB CD
Junction:	Off Ramp to Wekiva Pkwy. WB
Jurisdiction:	Seminole County
Analysis Year:	2022
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	390	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	380	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	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)	390		380		240		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	108		106		67		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, 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, vp	433		422		267		pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 433 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
$v_{Fi} = v_F$		433	4500	No
$v_{FO} = v - v_R$		11	4500	No
v_R		422	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} = v_{av34} or v_{12} (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	433	4600	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 3.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.466	
Space mean speed in ramp influence area,	S_R = 48.9	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 48.9	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	3/12/07
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:	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	1810	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	720	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	720	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)	1810		720		720		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	503		200		200		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	2011		800		800		pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 1345 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
$v_{Fi} = v_F$		2011	6750	No
$v_{FO} = v - v_R$		1211	6750	No
v_R		800	3800	No
v_3 or v_{av34}		666 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} = (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?	
v_{12}	1345	4600	No	!

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 2.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.500	
Space mean speed in ramp influence area,	S_R = 48.5	mph
Space mean speed in outer lanes,	S_O = 60.3	mph
Space mean speed for all vehicles,	S = 51.5	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	3/12/07
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:	2022
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	790	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	390	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	2230	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	
Volume, V (vph)		790	390	2230 vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	219	108	619	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	878	433	2478	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 878 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		1311	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}	878	4400	No	!

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 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 = N/A	mph
Space mean speed for all vehicles,	S = 51.1	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:	I-4 EB
Junction:	On Ramp from SR 46
Jurisdiction:	Seminole County
Analysis Year:	2022
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	5240	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	1150	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	720	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)	5240	1150	720	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1456	319	200	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	5822	1278	800	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.209 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1217 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		7100	9000	No
$v_{3 \text{ or } av34}$	v	2302 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		Yes	
If yes, v_{12A} = 2328			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2328	4400	No

!

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 23.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.360	
Space mean speed in ramp influence area,	S_R = 50.3	mph
Space mean speed in outer lanes,	S_O = 50.5	mph
Space mean speed for all vehicles,	S = 50.4	mph

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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:	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	55.0	mph
Volume on freeway	6390	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	1150	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	2230	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)	6390		1150		2230		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1736		312		606		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 7258 1306 2533 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.260 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2854 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	7258	9000	No
$v_{FO} = v_F - v_R$	5952	9000	No
v_R	1306	3800	No
v_3 or v_{av34}	2202 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} = 2903		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2903	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 24.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.546

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

Space mean speed in outer lanes, S_O = 55.7 mph

Space mean speed for all vehicles, S = 52.3 mph

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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:	2022
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	1730	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	430	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	160	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)	1730		430		160	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	470		117		43	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 1965 488 182 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1965 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1965	4500	No
$v_{FO} = v_F - v_R$	1477	4500	No
v_R	488	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} = 1965		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1965	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 21.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.472

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

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

Space mean speed for all vehicles, S = 48.9 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	3/12/07
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:	2022
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	1090	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	720	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	210	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)	1090	720	210	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	303	200	58	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	1211	800	233	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1211 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		2011	4500	No
$v_{3 \text{ or } av34}$	v_{av34}	0 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$	v_{av34}	> 2700 pc/h?	No	
Is $v_{3 \text{ or } av34}$	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}	1211	4400	No	!

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 11.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.250	
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:

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:	2022
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	1300	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	210	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	430	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)	1300		210		430		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	353		57		117		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 1477 239 488 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1477 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1477	4500	No
$v_{FO} = v_F - v_R$	1238	4500	No
v_R	239	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} = 1477		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1477	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.450

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

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

Space mean speed for all vehicles, S = 49.2 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:	2022
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	830	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	1520	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	690	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)	830	1520	690	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	226	413	187	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	943	1727	784	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 943 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2670	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} = 943		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	943	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 21.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.335

Space mean speed in ramp influence area, S_R = 50.6 mph

Space mean speed in outer lanes, S_O = N/A 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:	CD Rd (West of I-4) WB
Junction:	Off Ramp to CR 46A
Jurisdiction:	Seminole County
Analysis Year:	2022
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	1520	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	690	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	1170	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)	1520		690		1170	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	413		187		318	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 1727 784 1329 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1727 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1727	4500	No
$v_{FO} = v_F - v_R$	943	4500	No
v_R	784	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} = 1727		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1727	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 19.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.499

Space mean speed in ramp influence area, S_R = 48.5 mph

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

Space mean speed for all vehicles, S = 48.5 mph

HCS+: Ramps and Ramp Junctions Release 5.21

Phone: Fax:
E-mail:

Diverge 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 WB
Junction:	Off Ramp to I-4 EB
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	4140	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	1590	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	870	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)	4140		1590		870		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	1150		442		242		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	4600		1767		967		pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3042 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
$v_{Fi} = v_F$		4600	6750	No
$v_{FO} = v_F - v_R$		2833	6750	No
v_R		1767	3800	No
v_3 or v_{av34}		1558 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} = (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3042	4600	No

!

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable,	D_S = 0.587	
Space mean speed in ramp influence area,	S_R = 47.4	mph
Space mean speed in outer lanes,	S_O = 58.2	mph
Space mean speed for all vehicles,	S = 50.5	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:	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	2610	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	930	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	840	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)	2610		930		840		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	709		253		228		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 2993 1066 963 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.636 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2292 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2993	6750	No
$v_{FO} = v_F - v_R$	1927	6750	No
v_R	1066	2000	No
v_3 or v_{av34}	701 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} = 2292		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2292	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 24.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.524

Space mean speed in ramp influence area, S_R = 48.2 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:	SR 417 EB
Junction:	On Ramp from International Pky
Jurisdiction:	Seminole County
Analysis Year:	2022
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	1680	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	840	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	1600	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)	1680	840	1600	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	457	228	435	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 1927 959 1817 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.611 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1178 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2886	6750	No
v_3 or v_{av34}	749 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}	= 1178	(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1178	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 14.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.270	
Space mean speed in ramp influence area,	S_R = 51.5	mph
Space mean speed in outer lanes,	S_O = 54.1	mph
Space mean speed for all vehicles,	S = 52.1	mph

SR 417 WB OFF Ramp to Int'l Pkwy_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 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	2550	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	870	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	1590	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)	2550		870		1590		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	693		236		432		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 2924 998 1823 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.641 Using Equation 5

$v_{12} = v_R + (v - v_F) P_{FD}$ = 2233 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2924	6750	No
$v_{FO} = v - v_R$	1926	6750	No
v_R	998	2000	No
v_3 or v_{av34}	691 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} = 2233		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2233	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 23.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.518

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

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

2022 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:	2022
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	5450	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	500	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	940	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)	5450	500	940	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1481	136	255	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 6190 568 1068 pcph

Estimation of V12 Merge Areas

L_{EQ} = 1274.01 (Equation 25-2 or 25-3)

P_{FM} = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 3731 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6758	7200	No
v_3 or v_{av34}	2459 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} = 3731		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3731	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 33.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.545

Space mean speed in ramp influence area, S_R = 54.7 mph

Space mean speed in outer lanes, S_O = 62.5 mph

Space mean speed for all vehicles, S = 57.3 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 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

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:	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	70.0	mph
Volume on freeway	5950	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	500	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	940	vph
Position of adjacent ramp	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)	5950		500		940	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	1617		136		255	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 6758 568 1068 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.565 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4065 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6758	7200	No
$v_{FO} = v_F - v_R$	6190	7200	No
v_R	568	2000	No
v_3 or v_{av34}	2693 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} = 4065		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4065	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 34.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.479

Space mean speed in ramp influence area, S_R = 56.6 mph

Space mean speed in outer lanes, S_O = 70.2 mph

Space mean speed for all vehicles, S = 61.3 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 EB
Junction:	Off Ramp to SR 417 & SR 46
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	4480	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	1730	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	1520	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)	4480		1730		1520		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	1244		481		422		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, 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	4978		1922		1689		pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 3297 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4978	6750	No
$v_{FO} = v - v_F - v_R$	3056	6750	No
v_R	1922	3800	No
v_3 or v_{av34}	1681 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} = (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3297	4600	No

!

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 11.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.601	
Space mean speed in ramp influence area,	S_R = 47.2	mph
Space mean speed in outer lanes,	S_O = 57.7	mph
Space mean speed for all vehicles,	S = 50.3	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	3/12/07
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:	2022
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	1180	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	2230	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	390	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)	1180	2230	390	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	328	619	108	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	1311	2478	433	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.209 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 274 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		3789	9000	No
$v_{3 \text{ or } av34}$	v	518 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		Yes	
If yes, v_{12A} = 524			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	524	4400	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 18.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.293	
Space mean speed in ramp influence area,	S_R = 51.2	mph
Space mean speed in outer lanes,	S_O = 55.0	mph
Space mean speed for all vehicles,	S = 51.8	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	3/12/07
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:	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	55.0	mph
Volume on freeway	4760	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	2230	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	1150	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)	4760		2230		1150		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	1322		619		319		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	5289		2478		1278		pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.260 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 3209 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
$v_{Fi} = v_F$		5289	9000	No
$v_{FO} = v - v_R$		2811	9000	No
v_R		2478	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_{12}/2		No	

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

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3209	4600	No

!

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 18.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.651	
Space mean speed in ramp influence area,	S_R = 46.5	mph
Space mean speed in outer lanes,	S_O = 60.2	mph
Space mean speed for all vehicles,	S = 51.1	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	2/16/07
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Pkwy. EB CD
Junction:	Off Ramp to Wekiva Pkwy. EB
Jurisdiction:	Seminole County
Analysis Year:	2022
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	380	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	190	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	320	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)	380		190		320		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	106		53		89		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	422		211		356		pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD} = 422$ pc/h

Capacity Checks

		Actual		Maximum	LOS F?
$v_{Fi} = v_F$		422		4500	No
$v_{FO} = v_F - v_R$		211		4500	No
v_R		211		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} = (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?	
v_{12}	422	4600	No	!

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 3.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.447	
Space mean speed in ramp influence area,	S_R = 49.2	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 49.2	mph

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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:	2022
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	2750	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	610	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1730	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)	2750	610	1730	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	747	166	470	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 3124 693 1965 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.597 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1865 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3817	6750	No
v_3 or v_{av34}	1259 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} = 1865		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1865	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.322	
Space mean speed in ramp influence area,	S_R = 50.8	mph
Space mean speed in outer lanes,	S_O = 52.3	mph
Space mean speed for all vehicles,	S = 51.3	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 EB
Junction:	On Ramp from SR 417 EB
Jurisdiction:	Seminole County
Analysis Year:	2022
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	660	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	720	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	720	vph
Position of adjacent Ramp	Downstream	
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)	660	720	720	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	179	196	196	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 750 818 818 pcph

Estimation of V12 Merge Areas

L_{EQ} = 3972.80 (Equation 25-2 or 25-3)

P_{FM} = 0.616 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 462 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		1568	6750	No
v_3 or v_{av34}		288 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} = 462			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	462	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 9.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.273

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

Space mean speed in outer lanes, S_O = 55.0 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:	I-4 EB
Junction:	On Ramp from SR 417 WB
Jurisdiction:	Seminole County
Analysis Year:	2022
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	1160	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	450	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	1160	450	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	913	315	122	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 1324 511 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}	5141	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, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 11.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.220

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

Space mean speed in outer lanes, S_O = 50.9 mph

Space mean speed for all vehicles, S = 51.7 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 Service Road Concept
Freeway/Dir of Travel:	I-4 WB
Junction:	On Ramp from SR 417
Jurisdiction:	Seminole County
Analysis Year:	2022
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	640	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	2230	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)	3010	640	2230	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	818	174	606	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 3419 727 2533 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1898 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4146	6750	No
v_3 or v_{av34}	1521 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} = 1953		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1953	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 9.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.189	
Space mean speed in ramp influence area,	S_R = 52.5	mph
Space mean speed in outer lanes,	S_O = 51.5	mph
Space mean speed for all vehicles,	S = 52.2	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. EB
Junction:	On Ramp from Wekiva Pkw.EB CD
Jurisdiction:	Seminole County
Analysis Year:	2022
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	460	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	190	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	320	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)	460		190		320	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	125		52		87	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 522 216 367 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 522 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	522	4500	No
$v_{FO} = v_F - v_R$	306	4500	No
v_R	216	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} = 522		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	522	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 4.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.447

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

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

Space mean speed for all vehicles, S = 49.2 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:	CTR
Agency/Co.:	HNTB
Date performed:	8/2/2010
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:	2032
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	400	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	650	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?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	400	650		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	109	177		v
Trucks and buses	9	11		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.957	0.948		
Driver population factor, fP	1.00	1.00		

Flow rate, vp 454 745 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 454 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1199	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} = 454		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	454	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 5.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.230

Space mean speed in ramp influence area, S_R = 52.0 mph

Space mean speed in outer lanes, S_O = N/A 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
Junction:	On Ramp from EB CD
Jurisdiction:	Seminole County
Analysis Year:	2022
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	3590	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	190	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	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)	3590	190	470	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	976	52	128	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 4117 216 539 pcph

Estimation of V12 Merge Areas

L_{EQ} = 3304.72 (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2435 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		4333	6750	No
v_3 or v_{av34}		1682 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}	= 2435		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2435	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.341

Space mean speed in ramp influence area, S_R = 50.6 mph

Space mean speed in outer lanes, S_O = 50.7 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:	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	310	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	330	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	520	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)	310	330	520	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	84	90	141	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 352 378 591 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 352 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	730	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} = 352		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	352	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 7.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.294

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. 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	220	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	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	570	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)	220	240	570	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	60	65	155	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 250 275 647 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 250 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	525	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} = 250		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	250	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 6.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.293

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. 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	4460	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	780	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	890	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)	4460	780	890	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1212	212	242	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 5114 886 1011 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2838 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6000	6750	No
v_3 or v_{av34}	2276 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} = 2922		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2922	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.340

Space mean speed in ramp influence area, S_R = 50.6 mph

Space mean speed in outer lanes, S_O = 48.9 mph

Space mean speed for all vehicles, S = 50.0 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. 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	4910	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	520	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	330	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)	4910	520	330	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1334	141	90	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 5630 591 378 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.144 Using Equation 4

$v_{12} = v_F (P_{FM})$ = 810 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6221	9000	No
v_3 or v_{av34}	2410 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} = 2252		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2252	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 24.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.353

Space mean speed in ramp influence area, S_R = 50.4 mph

Space mean speed in outer lanes, S_O = 50.7 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:	Wekiva Pkwy. WB CD
Junction:	On from Wekiva Pkwy WB
Jurisdiction:	Seminole County
Analysis Year:	2022
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	3590	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	380	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	Off	
Distance to adjacent Ramp	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3590	380	240	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	976	103	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	

Flow rate, vp 4078 436 273 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4078 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4514	4500	Yes
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} = 4078		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4078	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 37.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.867	
Space mean speed in ramp influence area,	S_R = 43.7	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 43.7	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	2022

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 = 940 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	5500	0.95	Level	9	0	0.957	1.00	6050
Ramp	500	0.95	Level	9	0	0.957	1.00	550
UpStream								
DownStream	940	0.95	Level	9	0	0.957	1.00	1034

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} = 0.583 using Equation (Exhibit 25-12)
V_{12} = 3759 pc/h
V_3 or V_{av34} 2291 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	6050	Exhibit 25-14	7200	No
$V_{FO} = V_F - V_R$	5500	Exhibit 25-14	7200	No
V_R	550	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3759	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 = 31.2 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.478 (Exhibit 25-19)
S_R = 56.6 mph (Exhibit 25-19)
71.8 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	2022

Project Description: Wekiva Parkway Project Development & Environment Study

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☑ No ☐ Off
L_{up} = 1948 ft
V_u = 500 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

	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5000	0.95	Level	9	0	0.957	1.00	5500
Ramp	940	0.95	Level	9	0	0.957	1.00	1034
UpStream	500	0.95	Level	9	0	0.957	1.00	550
DownStream								

Merge Areas

Estimation of v_{12}

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

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.248 using Equation (Exhibit 25-5)
V_{12} = 1363 pc/h
V_3 or V_{av34} 2068 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} = 2200 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	6534	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3234	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 = 27.1 (pc/mi/ln)
LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.385 (Exibit 25-19)
S_R = 50.0 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	2022

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 = 500 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	6390	0.95	Level	9	0	0.957	1.00	7029
Ramp	940	0.95	Level	9	0	0.957	1.00	1034
UpStream								
DownStream	500	0.95	Level	9	0	0.957	1.00	550

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} = 3648 pc/h

V_3 or V_{av34} 1690 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	7029	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	5995	Exhibit 25-14	9600	No
V_R	1034	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3648	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 = 26.2 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.521 (Exhibit 25-19)

S_R = 55.4 mph (Exhibit 25-19)

74.1 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	2022

Project Description: Wekiva Parkway Project Development & Environment Study

Inputs

Upstream Adj Ramp
☑ Yes ☐ On
☐ No ☑ Off
L_{up} = 1948 ft
V_u = 940 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	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5450	0.95	Level	9	0	0.957	1.00	5995
Ramp	500	0.95	Level	9	0	0.957	1.00	550
UpStream	940	0.95	Level	9	0	0.957	1.00	1034
DownStream								

Merge Areas

Estimation of v_{12}

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

L_{EQ} = 1050.83 (Equation 25-2 or 25-3)

P_{FM} = 0.591 using Equation (Exhibit 25-5)

V_{12} = 3546 pc/h

V_3 or V_{av34} 2449 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}	6545	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4096	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 = 34.0 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.520 (Exibit 25-19)

S_R = 55.4 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:	2022 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	3970	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	140	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)	3970		140		60		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1079		38		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, v_p 4553 154 66 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 402.40 (Equation 25-8 or 25-9)

P_{FD} = 0.639 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2965 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4553	6750	No
$v_{FO} = v_F - v_R$	4399	6750	No
v_R	154	2000	No
v_3 or v_{av34}	1588 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} = 2965 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2965	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 21.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.442

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

Space mean speed in outer lanes, S_O = 58.0 mph

Space mean speed for all vehicles, S = 52.0 mph

Wekiva Parkway WB On from Wekiva River 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:	On Ramp from Wekiva River Rd
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	3830	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	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	140	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)	3830	60	140	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1041	16	38	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 4392 66 154 pcph

Estimation of V12 Merge Areas

L_{EQ} = 747.94 (Equation 25-2 or 25-3)

P_{FM} = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2647 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4458	6750	No
v_3 or v_{av34}	1745 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} = 2647		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2647	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 21.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.317

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

Space mean speed in outer lanes, S_O = 50.5 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 I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	Off Ramp to CR46 (Old)
Jurisdiction:	Lake County
Analysis Year:	2022 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	3890	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	90	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	50	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)	3890		90		50		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1057		24		14		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	4461	99	55	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 331.17 (Equation 25-8 or 25-9)

P_{FD} = 0.644 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2908 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4461	6750	No
$v_{FO} = v_F - v_R$	4362	6750	No
v_R	99	2000	No
v_3 or v_{av34}	1553 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} = 2908		(Equation 25-18)	

Flow Entering Diverge Influence Area

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

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 21.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.437	
Space mean speed in ramp influence area,	S_R = 49.3	mph
Space mean speed in outer lanes,	S_O = 58.2	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 I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
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	3800	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	820	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	90	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)	3800	50	90	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1033	14	24	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 4358 55 99 pcph

Estimation of V12 Merge Areas

L_{EQ} = 501.67 (Equation 25-2 or 25-3)

P_{FM} = 0.600 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2617 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		4413	6750	No
$v_{3 \text{ or } av34}$		1741 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} = 2617			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2617	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 21.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.320

Space mean speed in ramp influence area, S_R = 50.8 mph

Space mean speed in outer lanes, S_O = 50.5 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 I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	Off Ramp to SR 46 (Existing)
Jurisdiction:	Lake County
Analysis Year:	2022 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	3850	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	1310	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	80	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)	3850		1310		80		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1046		356		22		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	4415	1502	92	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.581 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3193 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4415	6750	No
$v_{FO} = v_F - v_R$	2913	6750	No
v_R	1502	2000	No
v_3 or v_{av34}	1222 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} = 3193		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3193	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 21.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.563

Space mean speed in ramp influence area, S_R = 47.7 mph

Space mean speed in outer lanes, S_O = 59.5 mph

Space mean speed for all vehicles, S = 50.4 mph

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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:	2022
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	2540	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	1350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1310	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)	2540	80	1310	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	690	22	356	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 2913 92 1502 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2913 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3005	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} = 2913		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2913	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.305

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

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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:	2022
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	2620	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	1250	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	1230	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)	2620		1250		1230		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	712		340		334		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 3004 1433 1410 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3004 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3004	4500	No
$v_{FO} = v_F - v_R$	1571	4500	No
v_R	1433	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} = 3004		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3004	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 16.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.557

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

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

Space mean speed for all vehicles, S = 47.8 mph

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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:	SR 46 Byp on ramp from SR 429
Jurisdiction:	Lake County
Analysis Year:	2022
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	1250	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	1230	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	420	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)	1250	1230	420	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	340	334	114	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, f_{HV}	0.948	0.948	0.948	
Driver population factor, f_P	1.00	1.00	1.00	

Flow rate, vp 1433 1410 482 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1433 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2843	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} = 1433		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1433	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 17.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.283	
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 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:	2022

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	2540	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	420	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)	2540		360		420		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	690		98		114		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	2913	395	461	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2913 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2913	4500	No
$v_{FO} = v_F - v_R$	2518	4500	No
v_R	395	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} = 2913		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2913	4400	No

Level of Service Determination (if not F)

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

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

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

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:	2022
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	2180	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	420	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	360	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)	2180	420	360	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	592	114	98	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 2500 461 395 pcph

Estimation of V12 Merge Areas

L_{EQ} = 568.01 (Equation 25-2 or 25-3)

P_{FM} = 0.609 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1524 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2961	6750	No
v_3 or v_{av34}	976 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} = 1524		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1524	4600	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, M_S = 0.270

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

Space mean speed in outer lanes, S_O = 53.3 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 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:	2022
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	2600	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	420	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	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)	2600		420		360		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	707		114		98		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 2982 461 395 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.664 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2136 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2982	6750	No
$v_{FO} = v_F - v_R$	2521	6750	No
v_R	461	2000	No
v_3 or v_{av34}	846 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} = 2136		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2136	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 18.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.469

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 = 51.7 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:	SB On Ramp from Kelly Park Rd
Jurisdiction:	Lake County
Analysis Year:	2022
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	2180	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	1140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	420	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)	2180	360	420	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	592	98	114	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 2500 395 461 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2500 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2895	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} = 2500		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2500	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.312	
Space mean speed in ramp influence area,	S_R = 50.9	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 50.9	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:	NB Off Ramp to US 441
Jurisdiction:	Orange County
Analysis Year:	2022
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	3810	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	1650	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	380	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)	3810		1650		380		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1035		448		103		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	4369	1883	434	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3002 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4369	6750	No
$v_{FO} = v_F - v_R$	2486	6750	No
v_R	1883	3800	No
v_3 or v_{av34}	1367 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} = 3002		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3002	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 16.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.597

Space mean speed in ramp influence area, S_R = 47.2 mph

Space mean speed in outer lanes, S_O = 58.9 mph

Space mean speed for all vehicles, S = 50.4 mph

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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:	2022
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	2160	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	1650	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	380	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)	2160	1650	380	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	587	448	103	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	2477	1883	434	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1375 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4360	6750	No
$v_{3 \text{ or } av34}$	1102 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} = 1415		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1415	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.315	
Space mean speed in ramp influence area,	S_R = 50.9	mph
Space mean speed in outer lanes,	S_O = 53.0	mph
Space mean speed for all vehicles,	S = 51.4	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 I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	SB Off Ramp to US 441
Jurisdiction:	Orange County
Analysis Year:	2022
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	2540	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	380	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	1650	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)	2540		380		1650		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	690		103		448		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 2913 434 1883 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2913 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2913	4500	No
$v_{FO} = v_F - v_R$	2479	4500	No
v_R	434	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} = 2913 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2913	4400	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, D_S = 0.467

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

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

Space mean speed for all vehicles, S = 48.9 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 WB
Junction:	NB On Ramp from US 441
Jurisdiction:	Lake County
Analysis Year:	2022
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	2160	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	380	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	1650	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)	2160	380	1650	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	587	103	448	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	2477	434	1883	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2477 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2911	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} = 2477		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2477	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 24.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.356	
Space mean speed in ramp influence area,	S_R = 50.4	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 50.4	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 I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	Off Ramp to SR 46 (Existing)
Jurisdiction:	Lake County
Analysis Year:	2022

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	2620	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	1190	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1310	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)	2620		80		1310		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	712		22		356		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	3004	92	1502	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3004 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3004	4500	No
$v_{FO} = v_F - v_R$	2912	4500	No
v_R	92	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} = 3004		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3004	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 19.4 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 = 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 I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway EB
Junction:	Off Ramp to Wekiva River Rd.
Jurisdiction:	Lake County
Analysis Year:	2022 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	3890	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	90	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)	3890		60		90		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1057		16		24		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 4461 66 99 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 587.23 (Equation 25-8 or 25-9)

P_{FD} = 0.645 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2903 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4461	6750	No
$v_{FO} = v_F - v_R$	4395	6750	No
v_R	66	2000	No
v_3 or v_{av34}	1558 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} = 2903		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2903	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 20.9 pc/mi/ln

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

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 = 58.2 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 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	3800	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	90	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	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)	3800	90	50	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1033	24	14	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	4358	99	55	pcph

Estimation of V12 Merge Areas

L_{EQ} = 278.71 (Equation 25-2 or 25-3)

P_{FM} = 0.600 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2617 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4457	6750	No
$v_{3 \text{ or } av34}$	1741 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} = 2617		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2617	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 21.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.323	
Space mean speed in ramp influence area,	S_R = 50.8	mph
Space mean speed in outer lanes,	S_O = 50.5	mph
Space mean speed for all vehicles,	S = 50.7	mph

WP EB On ramp from SR 46.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 EB
Junction:	On Ramp from SR 46 (Existing)
Jurisdiction:	Lake County
Analysis Year:	2022

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	2540	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	1310	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	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)	2540	1310	80	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	690	356	22	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	2913	1502	92	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1617 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4415	6750	No
v_3 or v_{av34}	1296 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} = 1664		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1664	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 = 0.308	
Space mean speed in ramp influence area,	S_R = 51.0	mph
Space mean speed in outer lanes,	S_O = 52.3	mph
Space mean speed for all vehicles,	S = 51.4	mph

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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:	2022 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	3850	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	1310	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	80	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)	3850		1310		80		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1046		356		22		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 4415 1502 92 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.581 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3193 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4415	6750	No
$v_{FO} = v_F - v_R$	2913	6750	No
v_R	1502	2000	No
v_3 or v_{av34}	1222 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} = 3193		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3193	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 21.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.563

Space mean speed in ramp influence area, S_R = 47.7 mph

Space mean speed in outer lanes, S_O = 59.5 mph

Space mean speed for all vehicles, S = 50.4 mph

WP EB On ramp from SR 46.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 EB
Junction:	On Ramp from SR 46 (Existing)
Jurisdiction:	Lake County
Analysis Year:	2022
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	2540	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	1310	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	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)	2540	1310	80	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	690	356	22	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	

WP EB On ramp from SR 46.txt

Flow rate, vp	2913	1502	92	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1617 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4415	6750	No
v_3 or v_{av34}	1296 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} = 1664		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1664	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.1 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_O = 52.3	mph
Space mean speed for all vehicles,	S = 51.4	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 I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	Off Ramp to CR46 (Old)
Jurisdiction:	Lake County
Analysis Year:	2022 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	3890	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	90	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	50	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)	3890		90		50		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1057		24		14		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	4461	99	55	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 331.17 (Equation 25-8 or 25-9)

P_{FD} = 0.644 Using Equation 5

$v_{12} = v_R + (v - v_F) P_{FD}$ = 2908 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4461	6750	No
$v_{FO} = v - v_R$	4362	6750	No
v_R	99	2000	No
v_3 or v_{av34}	1553 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} = 2908		(Equation 25-18)	

Flow Entering Diverge Influence Area

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

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 21.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.437

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

Space mean speed in outer lanes, S_O = 58.2 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 I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
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	3800	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	820	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	90	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)	3800	50	90	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1033	14	24	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 4358 55 99 pcph

Estimation of V12 Merge Areas

L_{EQ} = 501.67 (Equation 25-2 or 25-3)

P_{FM} = 0.600 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2617 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4413	6750	No
v_3 or v_{av34}	1741 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} = 2617		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2617	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 21.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.320

Space mean speed in ramp influence area, S_R = 50.8 mph

Space mean speed in outer lanes, S_O = 50.5 mph

Space mean speed for all vehicles, S = 50.7 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	Cristina Torres-Reyes
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:	2022
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	0.56	
Weaving ratio, R	0.38	

Conversion to pc/h Under Base Conditions

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V	1510	0	720	1180	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	419	0	200	328	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	1677	0	800	1311	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	0.51	0.54
Weaving and non-weaving speeds, Si	51.33	50.71
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		2.33
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	51.05	mph
Weaving segment density, D	18.55	pc/mi/ln
Level of service, LOS	B	
Capacity of base condition, cb	7127	pc/h
Capacity as a 15-minute flow rate, c	7127	pc/h
Capacity as a full-hour volume, ch	6414	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note
Weaving flow rate, Vw	2111	4000	a
Average flow rate (pcphpl)	947	2350	b
Volume ratio, VR	0.56	0.80	c
Weaving ratio, R	0.38	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	2022 Build

Inputs

Freeway free-flow speed, S_{FF} (mi/h)	65	Weaving type	A
Weaving number of lanes, N	3	Volume ratio, VR	0.92
Weaving seg length, L (ft)	1500	Weaving ratio, R	0.21
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}	0	0.90	11	0	1.5	1.2	0.948	1.00	0
V_{o2}	120	0.90	11	0	1.5	1.2	0.948	1.00	140
V_{w1}	300	0.90	11	0	1.5	1.2	0.948	1.00	351
V_{w2}	1110	0.90	11	0	1.5	1.2	0.948	1.00	1301
V_w				1652	V_{nw}				140
V									1792

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			2.09	0.46
Weaving and non-weaving speeds, Si (mi/h)			32.79	52.67

Number of lanes required for unconstrained operation, Nw 2.24
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)	33.79
Weaving segment density, D (pc/mi/ln)	17.68
Level of service, LOS	B
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	2022 Build

Inputs

Freeway free-flow speed, S_{FF} (mi/h)	65	Weaving type	A
Weaving number of lanes, N	3	Volume ratio, VR	0.05
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}	1370	0.90	11	0	1.5	1.2	0.948	1.00	1605
V_{o2}	1110	0.90	11	0	1.5	1.2	0.948	1.00	1301
V_{w1}	120	0.90	11	0	1.5	1.2	0.948	1.00	140
V_{w2}	0	0.90	11	0	1.5	1.2	0.948	1.00	0
V_w				140	V_{nw}				2906
V									3046

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	0.39	0.14		
Weaving and non-weaving speeds, Si (mi/h)	54.48	63.21		

Number of lanes required for unconstrained operation, Nw 0.37
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)	62.75
Weaving segment density, D (pc/mi/ln)	16.18
Level of service, LOS	B
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.

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	*2022 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)	*178*	*1272*			*1641*	*471*				*223*		*62*
% 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	*187*	*1339*			*1727*	*496*				*235*		*65*
Lane Group Capacity	*286*	*2607*			*2064*	*1164*				*236*		*1583*
v/c Ratio	*0.65*	*0.51*			*0.84*	*0.43*				*1.00*		*0.04*
Green Ratio	*0.80*	*0.80*			*0.63*	*0.80*				*0.13*		*1.00*
Uniform Delay d_1	*31.5*	*4.1*			*17.2*	*3.6*				*52.0*		*0.0*
Delay Factor k	*0.23*	*0.12*			*0.37*	*0.11*				*0.50*		*0.11*
Incremental Delay d_2	*5.3*	*0.2*			*3.2*	*0.3*				*57.3*		*0.0*
PF Factor	*1.000*	*1.000*			*1.000*	*1.000*				*1.000*		*0.950*
Control Delay	*36.8*	*4.2*			*20.4*	*3.9*				*109.3*		*0.0*
Lane Group LOS	*D*	*A*			*C*	*A*				*F*		*A*
Approach Delay	*8.2*			*16.7*						*85.6*		
Approach LOS	*A*			*B*						*F*		
Intersection Delay	*18.6*			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	*2022*

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)	*47*	*149*	*74*	*31*	*178*	*81*	*68*	*826*	*26*	*55*	*314*	*31*
% 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 = *10.2*	G =	G =	G =	G = *28.9*	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	*49*	*157*	*78*	*33*	*187*	*85*	*72*	*869*	*27*	*58*	*331*	*33*
Lane Group Capacity	*243*	*380*	*323*	*250*	*380*	*323*	*604*	*2050*	*915*	*329*	*1077*	*915*
v/c Ratio	*0.20*	*0.41*	*0.24*	*0.13*	*0.49*	*0.26*	*0.12*	*0.42*	*0.03*	*0.18*	*0.31*	*0.04*
Green Ratio	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.58*	*0.58*	*0.58*	*0.58*	*0.58*	*0.58*
Uniform Delay d_1	*16.5*	*17.3*	*16.7*	*16.3*	*17.6*	*16.7*	*4.8*	*5.9*	*4.5*	*5.0*	*5.4*	*4.5*
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	*0.4*	*0.7*	*0.4*	*0.2*	*1.0*	*0.4*	*0.1*	*0.1*	*0.0*	*0.3*	*0.2*	*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	*16.9*	*18.0*	*17.1*	*16.5*	*18.6*	*17.2*	*4.9*	*6.0*	*4.5*	*5.2*	*5.6*	*4.6*
Lane Group LOS	*B*	*B*	*B*	*B*	*B*	*B*	*A*	*A*	*A*	*A*	*A*	*A*
Approach Delay	*17.6*			*18.0*			*5.9*			*5.4*		
Approach LOS	*B*			*B*			*A*			*A*		
Intersection Delay	*9.3*			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	*2022*

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)	*222*	*364*	*137*	*58*	*242*	*80*	*100*	*457*	*73*	*52*	*171*	*287*
% 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 = *24.3*	G =	G =	G =	G = *23.4*	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	*234*	*383*	*144*	*61*	*255*	*84*	*105*	*481*	*77*	*55*	*180*	*302*
Lane Group Capacity	*448*	*1437*	*641*	*396*	*1437*	*641*	*468*	*727*	*617*	*233*	*727*	*617*
v/c Ratio	*0.52*	*0.27*	*0.22*	*0.15*	*0.18*	*0.13*	*0.22*	*0.66*	*0.12*	*0.24*	*0.25*	*0.49*
Green Ratio	*0.41*	*0.41*	*0.41*	*0.41*	*0.41*	*0.41*	*0.39*	*0.39*	*0.39*	*0.39*	*0.39*	*0.39*
Uniform Delay d_1	*13.5*	*11.9*	*11.7*	*11.3*	*11.4*	*11.2*	*12.2*	*15.0*	*11.7*	*12.3*	*12.4*	*13.8*
Delay Factor k	*0.13*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.24*	*0.11*	*0.11*	*0.11*	*0.11*
Incremental Delay d_2	*1.1*	*0.1*	*0.2*	*0.2*	*0.1*	*0.1*	*0.2*	*2.3*	*0.1*	*0.5*	*0.2*	*0.6*
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	*14.6*	*12.0*	*11.9*	*11.5*	*11.5*	*11.3*	*12.5*	*17.3*	*11.8*	*12.8*	*12.5*	*14.4*
Lane Group LOS	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*
Approach Delay	*12.8*			*11.5*			*15.9*			*13.6*		
Approach LOS	*B*			*B*			*B*			*B*		
Intersection Delay	*13.6*			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	*2022 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)	*190*	*96*	*1207*	*443*	*87*	*190*	*1072*		*578*	*95*		*285*
% 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	*200*	*101*	*1271*	*466*	*92*	*200*	*1128*		*608*	*100*		*300*
Lane Group Capacity	*376*	*591*	*1985*	*716*	*591*	*1144*	*1753*		*1211*	*885*		*1187*
v/c Ratio	*0.53*	*0.17*	*0.64*	*0.65*	*0.16*	*0.17*	*0.64*		*0.50*	*0.11*		*0.25*
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	*42.3*	*42.9*	*9.3*	*43.5*	*42.8*	*5.8*	*22.1*		*6.0*	*15.9*		*4.6*
Delay Factor k	*0.13*	*0.11*	*0.22*	*0.23*	*0.11*	*0.11*	*0.22*		*0.11*	*0.11*		*0.11*
Incremental Delay d_2	*1.5*	*0.1*	*0.7*	*2.1*	*0.1*	*0.1*	*0.8*		*0.3*	*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*
Control Delay	*43.7*	*43.0*	*10.0*	*45.6*	*42.9*	*5.9*	*22.9*		*6.3*	*16.0*		*4.7*
Lane Group LOS	*D*	*D*	*B*	*D*	*D*	*A*	*C*		*A*	*B*		*A*
Approach Delay	*16.5*			*34.8*			*17.1*			*7.5*		
Approach LOS	*B*			*C*			*B*			*A*		
Intersection Delay	*19.0*			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	*2022 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)		*1013*			*1172*	*214*				*346*		*1098*
% 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		*1066*			*1302*	*225*				*384*		*1220*
Lane Group Capacity		*1774*			*1809*	*1583*				*645*		*2859*
v/c Ratio		*0.60*			*0.72*	*0.14*				*0.60*		*0.43*
Green Ratio		*0.50*			*0.50*	*1.00*				*0.36*		*1.00*
Uniform Delay d_1		*12.5*			*13.7*	*0.0*				*18.4*		*0.0*
Delay Factor k		*0.19*			*0.28*	*0.11*				*0.18*		*0.11*
Incremental Delay d_2		*0.6*			*1.4*	*0.0*				*1.5*		*0.1*
PF Factor		*1.000*			*1.000*	*0.950*				*1.000*		*0.950*
Control Delay		*13.1*			*15.1*	*0.0*				*19.9*		*0.1*
Lane Group LOS		*B*			*B*	*A*				*B*		*A*
Approach Delay	*13.1*			*12.9*						*4.8*		
Approach LOS	*B*			*B*						*A*		
Intersection Delay	*9.9*			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	*2022 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)	*699*		*70*				*218*	*431*			*215*	*502*
% 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	*736*		*74*				*229*	*454*			*226*	*528*
Lane Group Capacity	*1146*		*1583*				*575*	*932*			*932*	*1583*
v/c Ratio	*0.64*		*0.05*				*0.40*	*0.49*			*0.24*	*0.33*
Green Ratio	*0.33*		*1.00*				*0.50*	*0.50*			*0.50*	*1.00*
Uniform Delay d_1	*17.0*		*0.0*				*9.4*	*9.9*			*8.5*	*0.0*
Delay Factor k	*0.22*		*0.11*				*0.11*	*0.11*			*0.11*	*0.11*
Incremental Delay d_2	*1.2*		*0.0*				*0.5*	*0.4*			*0.1*	*0.1*
PF Factor	*1.000*		*0.950*				*1.000*	*1.000*			*1.000*	*0.950*
Control Delay	*18.2*		*0.0*				*9.8*	*10.3*			*8.7*	*0.1*
Lane Group LOS	*B*		*A*				*A*	*B*			*A*	*A*
Approach Delay	*16.5*						*10.2*			*2.7*		
Approach LOS	*B*						*B*			*A*		
Intersection Delay	*9.9*			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	*2022*

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)		*232*	*106*	*254*	*131*					*307*		*113*
% 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		*244*	*112*	*267*	*138*					*323*		*119*
Lane Group Capacity		*665*	*1049*	*570*	*1640*					*686*		*1583*
v/c Ratio		*0.37*	*0.11*	*0.47*	*0.08*					*0.47*		*0.08*
Green Ratio		*0.19*	*0.66*	*0.46*	*0.46*					*0.39*		*1.00*
Uniform Delay d_1		*28.4*	*4.9*	*13.8*	*12.0*					*18.4*		*0.0*
Delay Factor k		*0.11*	*0.11*	*0.11*	*0.11*					*0.11*		*0.11*
Incremental Delay d_2		*0.3*	*0.0*	*0.6*	*0.0*					*0.5*		*0.0*
PF Factor		*1.000*	*1.000*	*1.000*	*1.000*					*1.000*		*0.950*
Control Delay		*28.7*	*4.9*	*14.4*	*12.0*					*18.9*		*0.0*
Lane Group LOS		*C*	*A*	*B*	*B*					*B*		*A*
Approach Delay		*21.2*			*13.6*					*13.8*		
Approach LOS		*C*			*B*					*B*		
Intersection Delay		*15.9*			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	*2022*

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)	*101*	*438*			*310*	*319*	*75*		*285*			
% 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	*106*	*461*			*326*	*336*	*79*		*300*			
Lane Group Capacity	*742*	*2306*			*1330*	*1049*	*354*		*1583*			
v/c Ratio	*0.14*	*0.20*			*0.25*	*0.32*	*0.22*		*0.19*			
Green Ratio	*0.65*	*0.65*			*0.38*	*0.66*	*0.20*		*1.00*			
Uniform Delay d_1	*5.4*	*5.6*			*17.2*	*5.8*	*26.8*		*0.0*			
Delay Factor k	*0.11*	*0.11*			*0.11*	*0.11*	*0.11*		*0.11*			
Incremental Delay d_2	*0.1*	*0.0*			*0.1*	*0.2*	*0.3*		*0.1*			
PF Factor	*1.000*	*1.000*			*1.000*	*1.000*	*1.000*		*0.950*			
Control Delay	*5.5*	*5.7*			*17.3*	*6.0*	*27.1*		*0.1*			
Lane Group LOS	*A*	*A*			*B*	*A*	*C*		*A*			
Approach Delay	*5.6*			*11.5*			*5.7*					
Approach LOS	*A*			*B*			*A*					
Intersection Delay	*8.1*			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	*2022*

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)	*61*	*403*	*46*	*186*	*380*	*5*	*190*	*1050*	*390*	*5*	*546*	*50*
% 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*	*A*
Startup Lost Time	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
Extension of Effective Green	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
Arrival Type	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Unit Extension	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	Excl. Left	Thru & RT	03	04	Excl. Left	Thru & RT	07	08
Timing	G = *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	*64*	*424*	*48*	*196*	*400*	*5*	*200*	*1105*	*411*	*5*	*575*	*53*
Lane Group Capacity	*189*	*758*	*660*	*378*	*796*	*660*	*286*	*1506*	*1075*	*286*	*1506*	*1075*
v/c Ratio	*0.34*	*0.56*	*0.07*	*0.52*	*0.50*	*0.01*	*0.70*	*0.73*	*0.38*	*0.02*	*0.38*	*0.05*
Green Ratio	*0.12*	*0.23*	*0.45*	*0.12*	*0.23*	*0.45*	*0.17*	*0.29*	*0.73*	*0.17*	*0.29*	*0.73*
Uniform Delay d_1	*35.0*	*29.1*	*13.3*	*35.7*	*28.7*	*12.9*	*33.4*	*27.5*	*4.3*	*29.4*	*24.3*	*3.2*
Delay Factor k	*0.11*	*0.16*	*0.11*	*0.12*	*0.11*	*0.11*	*0.27*	*0.29*	*0.11*	*0.11*	*0.11*	*0.11*
Incremental Delay d_2	*1.1*	*0.9*	*0.0*	*1.3*	*0.5*	*0.0*	*7.4*	*1.9*	*0.2*	*0.0*	*0.2*	*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	*36.0*	*30.1*	*13.3*	*37.0*	*29.2*	*12.9*	*40.7*	*29.4*	*4.5*	*29.4*	*24.5*	*3.2*
Lane Group LOS	*D*	*C*	*B*	*D*	*C*	*B*	*D*	*C*	*A*	*C*	*C*	*A*
Approach Delay	*29.3*			*31.6*			*24.8*			*22.8*		
Approach LOS	*C*			*C*			*C*			*C*		
Intersection Delay	*26.3*			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	*2022 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)	*65*	*1382*	*133*	*71*	*1998*	*591*	*60*	*75*	*105*	*127*	*309*	*134*
% 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	*68*	*1455*	*140*	*75*	*2103*	*622*	*63*	*79*	*111*	*134*	*325*	*141*
Lane Group Capacity	*123*	*2685*	*1257*	*123*	*2685*	*1257*	*230*	*537*	*1367*	*346*	*537*	*1367*
v/c Ratio	*0.55*	*0.54*	*0.11*	*0.61*	*0.78*	*0.49*	*0.27*	*0.15*	*0.08*	*0.39*	*0.61*	*0.10*
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	*58.8*	*17.3*	*1.4*	*59.1*	*21.6*	*2.1*	*38.3*	*48.6*	*1.3*	*39.4*	*52.3*	*1.3*
Delay Factor k	*0.15*	*0.14*	*0.11*	*0.20*	*0.33*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.19*	*0.11*
Incremental Delay d_2	*5.3*	*0.2*	*0.0*	*8.5*	*1.6*	*0.3*	*0.6*	*0.1*	*0.0*	*0.7*	*2.0*	*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*	*1.000*
Control Delay	*64.2*	*17.5*	*1.4*	*67.6*	*23.2*	*2.5*	*38.9*	*48.7*	*1.3*	*40.1*	*54.3*	*1.4*
Lane Group LOS	*E*	*B*	*A*	*E*	*C*	*A*	*D*	*D*	*A*	*D*	*D*	*A*
Approach Delay	*18.0*			*19.8*			*25.5*			*38.7*		
Approach LOS	*B*			*B*			*C*			*D*		
Intersection Delay	*21.6*			Intersection LOS						*C*		

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	*2022 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)		*302*		*68*	*552*			*2108*	*372*			
% 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		*318*		*72*	*581*			*2219*	*392*			
Lane Group Capacity		*1052*		*269*	*553*			*3225*	*1583*			
v/c Ratio		*0.30*		*0.27*	*1.05*			*0.69*	*0.25*			
Green Ratio		*0.30*		*0.30*	*0.30*			*0.64*	*1.00*			
Uniform Delay d_1		*32.1*		*31.7*	*41.5*			*13.9*	*0.0*			
Delay Factor k		*0.11*		*0.11*	*0.50*			*0.26*	*0.11*			
Incremental Delay d_2		*0.1*		*0.5*	*52.2*			*0.6*	*0.1*			
PF Factor		*1.000*		*1.000*	*1.000*			*1.000*	*0.950*			
Control Delay		*32.2*		*32.2*	*93.7*			*14.6*	*0.1*			
Lane Group LOS		*C*		*C*	*F*			*B*	*A*			
Approach Delay		*32.2*			*87.0*			*12.4*				
Approach LOS		*C*			*F*			*B*				
Intersection Delay		*27.7*			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	*2022*

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)	*148*	*269*	*93*	*136*	*299*	*295*	*168*	*136*	*246*	*273*	*49*	*108*
% Heavy Vehicles	*11*	*11*	*11*	*11*	*11*	*11*	*2*	*2*	*2*	*2*	*2*	*2*
PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Pretimed/Actuated (P/A)	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Startup Lost Time	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
Extension of Effective Green	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
Arrival Type	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Unit Extension	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	Excl. Left	Thru & RT	03	04	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	*156*	*283*	*98*	*143*	*315*	*311*	*177*	*143*	*259*	*287*	*52*	*114*
Lane Group Capacity	*348*	*489*	*416*	*348*	*489*	*416*	*385*	*532*	*905*	*354*	*532*	*905*
v/c Ratio	*0.45*	*0.58*	*0.24*	*0.41*	*0.64*	*0.75*	*0.46*	*0.27*	*0.29*	*0.81*	*0.10*	*0.13*
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	*23.9*	*21.4*	*19.1*	*23.7*	*21.9*	*22.7*	*20.6*	*19.3*	*7.7*	*23.2*	*18.4*	*6.9*
Delay Factor k	*0.11*	*0.17*	*0.11*	*0.11*	*0.22*	*0.30*	*0.11*	*0.11*	*0.11*	*0.35*	*0.11*	*0.11*
Incremental Delay d_2	*0.9*	*1.7*	*0.3*	*0.8*	*2.9*	*7.3*	*0.9*	*0.3*	*0.2*	*13.3*	*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	*24.8*	*23.1*	*19.4*	*24.5*	*24.8*	*30.0*	*21.4*	*19.6*	*7.9*	*36.5*	*18.5*	*7.0*
Lane Group LOS	*C*	*C*	*B*	*C*	*C*	*C*	*C*	*B*	*A*	*D*	*B*	*A*
Approach Delay	*22.9*			*26.8*			*14.9*			*27.0*		
Approach LOS	*C*			*C*			*B*			*C*		
Intersection Delay	*23.0*			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	*2022*

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*	*437*	*160*	*402*	*757*	*21*	*295*	*15*	*220*	*9*	*16*	*6*
% 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*	*460*	*168*	*423*	*797*	*22*	*311*	*16*	*232*	*9*	*23*	
Lane Group Capacity	*277*	*804*	*683*	*518*	*1133*	*963*	*325*	*437*	*676*	*327*	*420*	
v/c Ratio	*0.01*	*0.57*	*0.25*	*0.82*	*0.70*	*0.02*	*0.96*	*0.04*	*0.34*	*0.03*	*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	*15.1*	*20.5*	*16.9*	*11.7*	*11.4*	*6.2*	*40.2*	*31.5*	*20.5*	*31.4*	*31.6*	
Delay Factor k	*0.11*	*0.17*	*0.11*	*0.36*	*0.27*	*0.11*	*0.47*	*0.11*	*0.11*	*0.11*	*0.11*	
Incremental Delay d_2	*0.0*	*1.0*	*0.2*	*9.9*	*2.0*	*0.0*	*38.5*	*0.0*	*0.3*	*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*	*1.000*	
Control Delay	*15.1*	*21.5*	*17.1*	*21.6*	*13.4*	*6.2*	*78.7*	*31.5*	*20.8*	*31.4*	*31.6*	
Lane Group LOS	*B*	*C*	*B*	*C*	*B*	*A*	*E*	*C*	*C*	*C*	*C*	
Approach Delay	*20.3*			*16.1*			*53.3*			*31.6*		
Approach LOS	*C*			*B*			*D*			*C*		
Intersection Delay	*25.8*			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	*2022*

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)	*6*	*974*			*869*	*611*				*595*		*25*
% 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	*6*	*1025*			*915*	*643*				*626*		*26*
Lane Group Capacity	*323*	*1143*			*2175*	*1455*				*799*		*368*
v/c Ratio	*0.02*	*0.90*			*0.42*	*0.44*				*0.78*		*0.07*
Green Ratio	*0.67*	*0.67*			*0.67*	*1.00*				*0.23*		*0.23*
Uniform Delay d_1	*6.7*	*16.5*			*9.2*	*0.0*				*43.2*		*35.9*
Delay Factor k	*0.11*	*0.42*			*0.11*	*0.11*				*0.33*		*0.11*
Incremental Delay d_2	*0.0*	*9.5*			*0.1*	*0.2*				*5.1*		*0.1*
PF Factor	*1.000*	*1.000*			*1.000*	*0.950*				*1.000*		*1.000*
Control Delay	*6.7*	*26.0*			*9.4*	*0.2*				*48.3*		*36.0*
Lane Group LOS	*A*	*C*			*A*	*A*				*D*		*D*
Approach Delay	*25.9*			*5.6*						*47.9*		
Approach LOS	*C*			*A*						*D*		
Intersection Delay	*20.6*			Intersection LOS						*C*		

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	*2022*

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)						*1310*		*80*			*1310*	*80*
% 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						*1379*		*84*			*1379*	*84*
Lane Group Capacity						*2803*		*2660*			*2660*	*1583*
v/c Ratio						*0.49*		*0.03*			*0.52*	*0.05*
Green Ratio						*1.00*		*0.75*			*0.75*	*1.00*
Uniform Delay d_1						*0.0*		*2.6*			*4.1*	*0.0*
Delay Factor k						*0.11*		*0.11*			*0.12*	*0.11*
Incremental Delay d_2						*0.1*		*0.0*			*0.2*	*0.0*
PF Factor						*0.950*		*1.000*			*1.000*	*0.950*
Control Delay						*0.1*		*2.6*			*4.3*	*0.0*
Lane Group LOS						*A*		*A*			*A*	*A*
Approach Delay				*0.1*			*2.6*			*4.0*		
Approach LOS				*A*			*A*			*A*		
Intersection Delay	*2.2*			Intersection LOS						*A*		

SHORT REPORT

General Information		Site Information	
Analyst	*CTR*	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	*2022*

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)	*80*									*1310*		
% 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	*84*									*1379*		
Lane Group Capacity	*221*									*2578*		
v/c Ratio	*0.38*									*0.53*		
Green Ratio	*0.13*									*0.75*		
Uniform Delay d_1	*32.2*									*4.2*		
Delay Factor k	*0.11*									*0.14*		
Incremental Delay d_2	*1.1*									*0.2*		
PF Factor	*1.000*									*1.000*		
Control Delay	*33.2*									*4.4*		
Lane Group LOS	*C*									*A*		
Approach Delay	*33.2*									*4.4*		
Approach LOS	*C*									*A*		
Intersection Delay	*6.1*			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	*2022 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)				*9*		*81*	*8*	*86*			*98*	*42*
% 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				*9*		*85*	*8*	*91*			*103*	*44*
Lane Group Capacity				*226*		*1583*	*984*	*1397*			*1397*	*1583*
v/c Ratio				*0.04*		*0.05*	*0.01*	*0.07*			*0.07*	*0.03*
Green Ratio				*0.13*		*1.00*	*0.75*	*0.75*			*0.75*	*1.00*
Uniform Delay d_1				*30.8*		*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				*0.1*		*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				*30.9*		*0.0*	*2.5*	*2.6*			*2.7*	*0.0*
Lane Group LOS				*C*		*A*	*A*	*A*			*A*	*A*
Approach Delay				*3.0*			*2.6*			*1.9*		
Approach LOS				*A*			*A*			*A*		
Intersection Delay	*2.4*			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	2022 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)	34		17					61	79	11	96	
% 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	36		19					68	88	12	107	
Lane Group Capacity	221		202					1425	1211	996	1425	
v/c Ratio	0.16		0.09					0.05	0.07	0.01	0.08	
Green Ratio	0.13		0.13					0.75	0.75	0.75	0.75	
Uniform Delay d_1	31.3		31.0					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		0.2					0.0	0.0	0.0	0.0	
PF Factor	1.000		1.000					1.000	1.000	1.000	1.000	
Control Delay	31.6		31.2					2.6	2.7	2.5	2.7	
Lane Group LOS	C		C					A	A	A	A	
Approach Delay	31.5						2.6			2.7		
Approach LOS	C						A			A		
Intersection Delay	7.5			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	

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)	30	111			170	30
Peak-Hour Factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Hourly Flow Rate, HFR (veh/h)	31	116	0	0	178	31
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)				84		56
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	88	0	58
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)	31		88		58			
C (m) (veh/h)	1362		615		936			
v/c	0.02		0.14		0.06			
95% queue length	0.07		0.50		0.20			
Control Delay (s/veh)	7.7		11.8		9.1			
LOS	A		B		A			
Approach Delay (s/veh)	--	--	10.7					
Approach LOS	--	--	B					

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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	*2022 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)		*110*	*90*	*51*	*203*	
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*115*	*94*	*53*	*213*	*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)	*31*		*29*			
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*32*	*0*	*30*	*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)		*53*				*32*		*30*
C (m) (veh/h)		*1362*				*507*		*805*
v/c		*0.04*				*0.06*		*0.04*
95% queue length		*0.12*				*0.20*		*0.12*
Control Delay (s/veh)		*7.8*				*12.6*		*9.6*
LOS		*A*				*B*		*A*
Approach Delay (s/veh)	--	--				*11.2*		
Approach LOS	--	--				*B*		

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	2022 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)	25		475				282	2075			632	658
% 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	26		458				297	2184			665	693
Lane Group Capacity	276		2623				500	2444			2444	1455
v/c Ratio	0.09		0.17				0.59	0.89			0.27	0.48
Green Ratio	0.17		1.00				0.75	0.75			0.75	1.00
Uniform Delay d_1	42.3		0.0				6.8	11.4			4.7	0.0
Delay Factor k	0.11		0.11				0.18	0.42			0.11	0.11
Incremental Delay d_2	0.1		0.0				1.9	4.7			0.1	0.2
PF Factor	1.000		0.950				1.000	1.000			1.000	0.950
Control Delay	42.5		0.0				8.7	16.1			4.8	0.2
Lane Group LOS	D		A				A	B			A	A
Approach Delay	2.3						15.2			2.5		
Approach LOS	A						B			A		
Intersection Delay	9.7			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	3/24/08	Area Type	All other areas
Time Period	Build I-4 Connection @ SR 417	Jurisdiction	Seminole County
		Analysis Year	2022 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)	946			65	47	82	247	583			571	536
% 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	996			68	49	86	260	614			601	564
Lane Group Capacity	1146			828	218	864	367	1358			815	1152
v/c Ratio	0.87			0.08	0.22	0.10	0.71	0.45			0.74	0.49
Green Ratio	0.33			0.50	0.13	0.58	0.46	0.42			0.25	0.79
Uniform Delay d_1	37.5			15.6	47.3	11.1	23.3	25.2			41.4	4.3
Delay Factor k	0.40			0.11	0.11	0.11	0.27	0.11			0.30	0.11
Incremental Delay d_2	7.4			0.0	0.5	0.1	6.2	0.2			3.6	0.3
PF Factor	1.000			1.000	1.000	1.000	1.000	1.000			1.000	1.000
Control Delay	44.9			15.7	47.8	11.1	29.5	25.4			44.9	4.6
Lane Group LOS	D			B	D	B	C	C			D	A
Approach Delay	44.9			21.5			26.6			25.4		
Approach LOS	D			C			C			C		
Intersection Delay	31.5			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	2022 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)	423		77				80	930			452	179
% 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

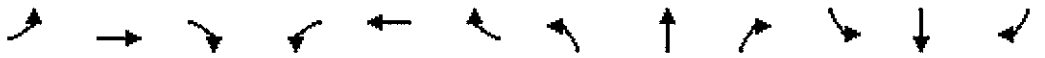
	EB			WB			NB			SB		
Adjusted Flow Rate	445		39				84	979			476	188
Lane Group Capacity	531		1583				463	1118			1118	950
v/c Ratio	0.84		0.02				0.18	0.88			0.43	0.20
Green Ratio	0.30		1.00				0.60	0.60			0.60	0.60
Uniform Delay d_1	32.7		0.0				9.0	16.9			10.7	9.1
Delay Factor k	0.37		0.11				0.11	0.40			0.11	0.11
Incremental Delay d_2	11.3		0.0				0.2	8.0			0.3	0.1
PF Factor	1.000		0.950				1.000	1.000			1.000	1.000
Control Delay	44.1		0.0				9.2	24.9			11.0	9.2
Lane Group LOS	D		A				A	C			B	A
Approach Delay	40.5						23.6			10.5		
Approach LOS	D						C			B		
Intersection Delay	23.4			Intersection LOS						C		

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	17	0	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	18	0	9
Lane Group Flow (vph)	0	0	0	18	0	9
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	175	285	105	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	190	310	114	0
Lane Group Flow (vph)	0	0	190	310	114	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 41.0%		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)	2	201	127	0	0	0	0	103	57	102	73	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)	2	218	138	0	0	0	0	112	62	111	79	0
Lane Group Flow (vph)	2	218	138	0	0	0	0	112	62	111	79	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	12	110	68	0	0	0	0	68	62	18	102	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	13	120	74	0	0	0	0	74	67	20	111	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									19			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			193			201	146	60	123	220	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			193			201	146	60	123	220	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	90	93	97	84	100
cM capacity (veh/h)	1622			1377			642	739	993	718	672	1084

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	NE 1	SW 1	SW 2
Volume Total	13	60	60	74	141	20	111
Volume Left	13	0	0	0	0	20	0
Volume Right	0	0	0	74	67	0	0
cSH	1622	1700	1700	1700	1412	718	672
Volume to Capacity	0.01	0.04	0.04	0.04	0.10	0.03	0.16
Queue Length 95th (ft)	1	0	0	0	8	2	15
Control Delay (s)	7.2	0.0	0.0	0.0	9.7	10.2	11.4
Lane LOS	A				A	B	B
Approach Delay (s)	0.5				9.7	11.2	
Approach LOS					A	B	

Intersection Summary				
Average Delay	6.1			
Intersection Capacity Utilization	21.2%	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)	12	110	68	0	0	0	0	68	62	18	102	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)	13	120	74	0	0	0	0	74	67	20	111	0
Lane Group Flow (vph)	13	120	74	0	0	0	0	74	67	20	111	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	21.2%	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	0.66	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1073	1863	1583	1232	1863	1583
Volume (vph)	85	820	29	102	1264	164	257	138	85	116	67	87
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)	92	891	32	111	1374	178	279	150	92	126	73	95
RTOR Reduction (vph)	0	0	21	0	0	114	0	0	66	0	0	74
Lane Group Flow (vph)	92	891	11	111	1374	64	279	150	26	126	73	21
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)	4.4	22.7	22.7	6.5	24.8	24.8	28.6	20.1	20.1	18.0	14.8	14.8
Effective Green, g (s)	6.9	26.7	26.7	9.0	28.8	28.8	32.3	22.6	22.6	23.0	17.3	17.3
Actuated g/C Ratio	0.09	0.33	0.33	0.11	0.36	0.36	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)	153	1697	528	199	1831	570	529	526	447	393	403	342
v/s Ratio Prot	0.05	0.18		c0.06	c0.27		c0.07	0.08		0.02	0.04	
v/s Ratio Perm			0.01			0.04	c0.14		0.02	0.07		0.01
v/c Ratio	0.60	0.53	0.02	0.56	0.75	0.11	0.53	0.29	0.06	0.32	0.18	0.06
Uniform Delay, d1	35.2	21.5	17.9	33.6	22.4	17.1	17.0	22.4	20.9	21.9	25.6	24.9
Progression Factor	1.00	1.00	1.00	1.59	0.32	0.11	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.5	1.2	0.1	2.9	2.5	0.3	1.0	1.4	0.2	0.5	1.0	0.3
Delay (s)	41.7	22.7	17.9	56.5	9.7	2.3	18.0	23.8	21.2	22.3	26.6	25.2
Level of Service	D	C	B	E	A	A	B	C	C	C	C	C
Approach Delay (s)		24.3			12.0			20.2			24.3	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
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	0.10	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	183	5085	5085	1583	1770	1583
Volume (vph)	34	1226	1534	306	271	59
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	1333	1667	333	295	64
RTOR Reduction (vph)	0	0	0	137	0	16
Lane Group Flow (vph)	37	1333	1667	196	295	48
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	43.5	43.5	43.5	43.5	22.5	22.5
Effective Green, g (s)	47.0	47.0	47.0	47.0	25.0	25.0
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.31	0.31
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)	108	2987	2987	930	553	495
v/s Ratio Prot		0.26	c0.33		c0.17	
v/s Ratio Perm	0.20			0.12		0.03
v/c Ratio	0.34	0.45	0.56	0.21	0.53	0.10
Uniform Delay, d1	8.5	9.2	10.1	7.8	22.7	19.5
Progression Factor	0.62	0.62	0.71	1.29	1.00	1.00
Incremental Delay, d2	8.1	0.5	0.7	0.5	3.7	0.4
Delay (s)	13.3	6.2	7.9	10.5	26.3	19.9
Level of Service	B	A	A	B	C	B
Approach Delay (s)		6.4	8.3		25.2	
Approach LOS		A	A		C	

Intersection Summary			
HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
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)	1370	150	148	1532	352	308
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1489	163	161	1665	383	335
RTOR Reduction (vph)	0	83	0	0	0	263
Lane Group Flow (vph)	1489	80	161	1665	383	72
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	36.3	36.3	9.0	51.8	14.2	14.2
Effective Green, g (s)	39.3	39.3	11.5	54.8	17.2	17.2
Actuated g/C Ratio	0.49	0.49	0.14	0.68	0.22	0.22
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)	2498	778	493	3483	738	599
v/s Ratio Prot	c0.29		0.05	c0.33	c0.11	
v/s Ratio Perm		0.05				0.03
v/c Ratio	0.60	0.10	0.33	0.48	0.52	0.12
Uniform Delay, d1	14.6	10.9	30.8	5.9	27.7	25.3
Progression Factor	0.46	0.07	1.21	0.86	0.91	1.12
Incremental Delay, d2	1.0	0.2	0.3	0.3	0.6	0.1
Delay (s)	7.8	1.0	37.6	5.4	26.0	28.4
Level of Service	A	A	D	A	C	C
Approach Delay (s)	7.1			8.2	27.1	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.7%	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	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	0.64	1.00	1.00	0.55	0.54	1.00
Satd. Flow (perm)	1770	5084		1770	5085	1583	1195	1863	1583	977	955	1583
Volume (vph)	91	1296	3	52	1671	247	20	84	182	324	16	50
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)	99	1409	3	57	1816	268	22	91	198	352	17	54
RTOR Reduction (vph)	0	0	0	0	0	157	0	0	105	0	0	41
Lane Group Flow (vph)	99	1412	0	57	1816	111	22	91	93	194	175	13
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)	5.2	32.0		2.4	29.2	29.2	14.0	12.6	12.6	22.2	22.2	16.7
Effective Green, g (s)	7.7	36.0		4.9	33.2	33.2	19.0	15.1	15.1	27.1	27.1	19.2
Actuated g/C Ratio	0.10	0.45		0.06	0.42	0.42	0.24	0.19	0.19	0.34	0.34	0.24
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)	170	2288		108	2110	657	312	352	299	401	397	380
v/s Ratio Prot	c0.06	c0.28		0.03	c0.36		0.00	0.05		c0.05	0.04	
v/s Ratio Perm						0.07	0.01		0.06	c0.12	0.11	0.01
v/c Ratio	0.58	0.62		0.53	0.86	0.17	0.07	0.26	0.31	0.48	0.44	0.03
Uniform Delay, d1	34.6	16.8		36.4	21.3	14.7	23.5	27.7	28.0	19.9	20.6	23.3
Progression Factor	1.48	0.26		1.18	0.55	0.16	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.2	1.1		2.8	3.1	0.3	0.1	0.4	0.6	0.9	0.8	0.0
Delay (s)	55.3	5.4		45.9	14.9	2.7	23.6	28.1	28.6	20.8	21.3	23.3
Level of Service	E	A		D	B	A	C	C	C	C	C	C
Approach Delay (s)		8.7			14.2			28.1			21.4	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.4%	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	1150	390	0	1808	0	734	0	416	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	1250	424	0	1965	0	798	0	452	0	0
RTOR Reduction (vph)	0	0	217	0	0	0	0	0	2	0	0
Lane Group Flow (vph)	0	1250	207	0	1965	0	798	0	450	0	0
Turn Type			Perm				Prot		custom		
Protected Phases		2			6		4				
Permitted Phases			2						4		
Actuated Green, G (s)		36.5	36.5		36.5		30.5		30.5		
Effective Green, g (s)		39.0	39.0		39.0		33.0		33.0		
Actuated g/C Ratio		0.49	0.49		0.49		0.41		0.41		
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)		2479	772		2479		1416		653		
v/s Ratio Prot		0.25			c0.39		0.23				
v/s Ratio Perm			0.13						c0.28		
v/c Ratio		0.50	0.27		0.79		0.56		0.69		
Uniform Delay, d1		13.9	12.1		17.1		18.0		19.3		
Progression Factor		0.89	1.86		0.45		1.00		1.00		
Incremental Delay, d2		0.6	0.7		1.3		1.6		5.9		
Delay (s)		13.0	23.2		9.0		19.6		25.1		
Level of Service		B	C		A		B		C		
Approach Delay (s)		15.6			9.0			21.6		0.0	
Approach LOS		B			A			C		A	

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.4%	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			
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			
Volume (vph)	344	1540	0	0	2114	806	484	0	606	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)	374	1674	0	0	2298	876	526	0	659	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	371	0	0	53	0	0	0
Lane Group Flow (vph)	374	1674	0	0	2298	506	526	0	606	0	0	0
Turn Type	Prot					Perm	Prot		custom			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	7.5	51.5			37.5	37.5	15.5		15.5			
Effective Green, g (s)	10.0	54.0			40.0	40.0	18.0		18.0			
Actuated g/C Ratio	0.12	0.68			0.50	0.50	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)	429	3432			2543	792	772		627			
v/s Ratio Prot	c0.11	0.33			c0.45		0.15					
v/s Ratio Perm						0.32			c0.22			
v/c Ratio	0.87	0.49			0.90	0.64	0.68		0.97			
Uniform Delay, d1	34.4	6.3			18.2	14.7	28.4		30.7			
Progression Factor	1.01	1.09			0.53	2.21	1.00		1.00			
Incremental Delay, d2	15.4	0.4			2.8	1.8	4.8		28.7			
Delay (s)	50.1	7.3			12.4	34.2	33.2		59.4			
Level of Service	D	A			B	C	C		E			
Approach Delay (s)		15.1			18.5			47.8			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
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	0.86	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)	264	1396	750	279	1869	122	661	61	244	132	57	184
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)	287	1517	815	303	2032	133	718	66	265	143	62	200
RTOR Reduction (vph)	0	0	366	0	0	89	0	0	162	0	0	151
Lane Group Flow (vph)	287	1517	449	303	2032	44	718	66	103	143	62	49
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	29.7	29.7	5.6	23.8	23.8	15.2	13.7	13.7	5.0	3.5	3.5
Effective Green, g (s)	14.0	32.2	32.2	8.1	26.3	26.3	17.7	16.2	16.2	7.5	6.0	6.0
Actuated g/C Ratio	0.18	0.40	0.40	0.10	0.33	0.33	0.22	0.20	0.20	0.09	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	2047	637	348	2107	520	760	377	321	166	140	119
v/s Ratio Prot	c0.16	0.30		0.09	c0.32		c0.21	0.04		0.08	0.03	
v/s Ratio Perm			0.28			0.03			c0.07			0.03
v/c Ratio	0.93	0.74	0.70	0.87	0.96	0.08	0.94	0.18	0.32	0.86	0.44	0.41
Uniform Delay, d1	32.5	20.4	19.9	35.4	26.4	18.5	30.7	26.4	27.2	35.7	35.4	35.3
Progression Factor	1.14	0.71	0.56	0.75	0.99	2.06	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.6	2.1	5.4	12.3	8.2	0.2	20.2	0.2	0.6	33.9	2.2	2.3
Delay (s)	65.8	16.4	16.5	38.8	34.4	38.3	50.9	26.6	27.8	69.6	37.6	37.6
Level of Service	E	B	B	D	C	D	D	C	C	E	D	D
Approach Delay (s)		21.9			35.1			43.5			48.9	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	32.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
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	1479	329	461	1646	13	632	71	437	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	1608	358	501	1789	14	687	77	475	45	40	158
RTOR Reduction (vph)	0	0	237	0	0	8	0	0	165	0	0	98
Lane Group Flow (vph)	67	1608	121	501	1789	6	687	77	310	45	40	60
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)	3.2	24.5	24.5	10.5	31.8	31.8	14.5	14.5	14.5	4.5	4.5	4.5
Effective Green, g (s)	5.7	27.0	27.0	13.0	34.3	34.3	17.0	17.0	17.0	7.0	7.0	7.0
Actuated g/C Ratio	0.07	0.34	0.34	0.16	0.43	0.43	0.21	0.21	0.21	0.09	0.09	0.09
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)	126	1716	534	558	2180	679	730	396	336	155	163	139
v/s Ratio Prot	0.04	c0.32		c0.15	0.35		c0.20	0.04		0.03	0.02	
v/s Ratio Perm			0.08			0.00			0.20			c0.04
v/c Ratio	0.53	0.94	0.23	0.90	0.82	0.01	0.94	0.19	0.92	0.29	0.25	0.43
Uniform Delay, d1	35.9	25.7	19.0	32.8	20.1	13.1	31.0	25.9	30.8	34.2	34.0	34.6
Progression Factor	1.40	0.50	0.27	1.00	1.00	1.00	0.55	0.48	0.49	1.00	1.00	1.00
Incremental Delay, d2	3.1	8.6	0.7	17.0	3.6	0.0	18.9	0.9	28.5	1.0	0.8	2.2
Delay (s)	53.4	21.5	5.9	49.9	23.8	13.1	36.0	13.3	43.7	35.2	34.8	36.8
Level of Service	D	C	A	D	C	B	D	B	D	D	C	D
Approach Delay (s)		19.8			29.4			37.5			36.2	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
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)	135	596	46	304	648	379	148	766	1145	322	619	136
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)	147	648	50	330	704	412	161	833	1245	350	673	148
RTOR Reduction (vph)	0	0	41	0	0	86	0	0	3	0	0	77
Lane Group Flow (vph)	147	648	9	330	704	327	161	833	1243	350	673	71
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)	7.5	22.5	22.5	10.5	25.5	42.5	16.5	70.5	87.5	10.5	64.5	64.5
Effective Green, g (s)	10.0	25.0	25.0	13.0	28.0	45.0	19.0	73.0	90.0	13.0	67.0	67.0
Actuated g/C Ratio	0.07	0.18	0.18	0.09	0.20	0.32	0.14	0.52	0.64	0.09	0.48	0.48
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)	126	632	283	319	708	509	240	1845	1018	319	1694	758
v/s Ratio Prot	0.08	0.18		0.10	c0.20	0.21	0.09	0.24	c0.78	c0.10	0.19	
v/s Ratio Perm			0.01									0.04
v/c Ratio	1.17	1.03	0.03	1.03	0.99	0.64	0.67	0.45	1.22	1.10	0.40	0.09
Uniform Delay, d1	65.0	57.5	47.5	63.5	55.9	40.6	57.5	21.0	25.0	63.5	23.5	19.9
Progression Factor	1.00	1.00	1.00	0.88	0.71	0.76	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	131.9	42.4	0.2	51.4	27.0	2.0	7.2	0.8	108.2	79.0	0.7	0.2
Delay (s)	196.9	99.9	47.7	107.0	66.7	32.9	64.7	21.8	133.2	142.5	24.2	20.2
Level of Service	F	F	D	F	E	C	E	C	F	F	C	C
Approach Delay (s)		113.7			66.3			86.8			59.0	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM Average Control Delay	79.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	106.6%	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)	29	1555	576	637	1400	65	174	49	467	271	307	32
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)	32	1690	626	692	1522	71	189	53	508	295	334	35
RTOR Reduction (vph)	0	0	183	0	0	30	0	0	33	0	0	30
Lane Group Flow (vph)	32	1690	443	692	1522	41	118	124	475	295	334	6
Turn Type	Prot		Perm	Prot		Perm	Split		pt+ov	Split		Perm
Protected Phases	5	2		1	6		8	8	8 1	4	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	3.2	58.5	58.5	23.5	78.8	78.8	14.5	14.5	43.5	20.5	20.5	20.5
Effective Green, g (s)	4.7	61.0	61.0	25.0	81.3	81.3	16.0	16.0	45.0	22.0	22.0	22.0
Actuated g/C Ratio	0.03	0.44	0.44	0.18	0.58	0.58	0.11	0.11	0.32	0.16	0.16	0.16
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)	59	1542	690	613	2055	919	192	197	896	278	293	249
v/s Ratio Prot	0.02	c0.48		c0.20	0.43		0.07	c0.07	0.17	0.17	c0.18	
v/s Ratio Perm			0.28			0.03						0.00
v/c Ratio	0.54	1.10	0.64	1.13	0.74	0.04	0.61	0.63	0.53	1.06	1.14	0.02
Uniform Delay, d1	66.6	39.5	30.9	57.5	21.6	12.6	59.1	59.2	38.9	59.0	59.0	49.9
Progression Factor	0.91	1.11	1.24	1.14	0.29	0.12	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	44.4	0.4	67.6	1.1	0.0	13.8	14.3	0.6	71.0	95.8	0.0
Delay (s)	61.7	88.1	38.9	133.1	7.4	1.6	72.9	73.5	39.5	130.0	154.8	49.9
Level of Service	E	F	D	F	A	A	E	E	D	F	F	D
Approach Delay (s)		74.6			45.3			50.3			138.3	
Approach LOS		E			D			D			F	

Intersection Summary			
HCM Average Control Delay	67.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	96.8%	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			
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)	275	2018	0	0	1578	335	524	0	996	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)	299	2193	0	0	1715	364	570	0	1083	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	114	0	0	7	0	0	0
Lane Group Flow (vph)	299	2193	0	0	1715	250	570	0	1076	0	0	0
Turn Type	Prot					Perm	Prot		custom			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	10.5	79.0			63.0	63.0	48.5		48.5			
Effective Green, g (s)	12.0	82.0			66.0	66.0	50.0		50.0			
Actuated g/C Ratio	0.09	0.59			0.47	0.47	0.36		0.36			
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)	294	2073			1668	746	1226		995			
v/s Ratio Prot	0.09	c0.62			0.48		0.17					
v/s Ratio Perm						0.16			c0.39			
v/c Ratio	1.02	1.06			1.03	0.33	0.46		1.08			
Uniform Delay, d1	64.0	29.0			37.0	23.2	34.7		45.0			
Progression Factor	0.95	0.89			0.22	0.01	1.00		1.00			
Incremental Delay, d2	31.3	29.7			18.7	0.3	0.3		53.2			
Delay (s)	91.8	55.5			26.9	0.5	35.0		98.2			
Level of Service	F	E			C	A	C		F			
Approach Delay (s)		59.8			22.3			76.4			0.0	
Approach LOS		E			C			E			A	

Intersection Summary			
HCM Average Control Delay	51.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.3%	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	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)	975	1366	673	285	595	110	913	890	447	109	639	405
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)	1060	1485	732	310	647	120	992	967	486	118	695	440
RTOR Reduction (vph)	0	0	318	0	0	97	0	0	140	0	0	340
Lane Group Flow (vph)	1060	1485	414	310	647	23	992	967	346	118	695	100
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)	36.5	50.5	50.5	10.5	24.5	24.5	33.5	43.9	43.9	11.1	21.5	21.5
Effective Green, g (s)	38.0	53.0	53.0	12.0	27.0	27.0	35.0	46.4	46.4	12.6	24.0	24.0
Actuated g/C Ratio	0.27	0.38	0.38	0.09	0.19	0.19	0.25	0.33	0.33	0.09	0.17	0.17
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)	932	1340	599	294	683	305	858	1173	525	159	607	271
v/s Ratio Prot	c0.31	c0.42		0.09	0.18		c0.29	0.27		0.07	c0.20	
v/s Ratio Perm			0.26			0.01			0.22			0.06
v/c Ratio	1.14	1.11	0.69	1.05	0.95	0.08	1.16	0.82	0.66	0.74	1.14	0.37
Uniform Delay, d1	51.0	43.5	36.6	64.0	55.8	46.3	52.5	43.1	40.0	62.1	58.0	51.3
Progression Factor	1.00	1.15	1.49	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	63.2	49.9	0.6	67.5	23.7	0.5	83.4	4.8	3.0	16.9	83.5	0.9
Delay (s)	114.1	100.0	55.0	131.5	79.5	46.8	135.9	47.9	43.0	79.1	141.5	52.2
Level of Service	F	F	E	F	E	D	F	D	D	E	F	D
Approach Delay (s)		94.5			90.8			82.6			104.3	
Approach LOS		F			F			F			F	

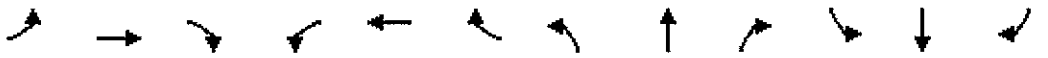
Intersection Summary			
HCM Average Control Delay	91.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	102.9%	ICU Level of Service	G
Analysis Period (min)	15		

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	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	0.66	1.00	1.00	0.49	1.00	1.00	0.38	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	1228	3539	1583	909	1863	1583	1382	3539	1583	554	3539	1583
Volume (vph)	73	159	163	228	142	169	261	947	102	120	467	83
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)	79	173	177	248	154	184	284	1029	111	130	508	90
RTOR Reduction (vph)	0	0	149	0	0	141	0	0	64	0	0	54
Lane Group Flow (vph)	79	173	28	248	154	43	284	1029	47	130	508	36
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)	13.3	10.1	10.1	25.1	16.4	16.4	38.0	31.1	31.1	34.8	29.5	29.5
Effective Green, g (s)	17.3	12.6	12.6	27.6	18.9	18.9	42.0	33.6	33.6	38.8	32.0	32.0
Actuated g/C Ratio	0.22	0.16	0.16	0.34	0.24	0.24	0.52	0.42	0.42	0.48	0.40	0.40
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)	297	557	249	432	440	374	941	1486	665	513	1416	633
v/s Ratio Prot	0.02	0.05		c0.08	0.08		c0.03	c0.29		0.02	0.14	
v/s Ratio Perm	0.04		0.02	c0.12		0.03	0.13		0.03	0.10		0.02
v/c Ratio	0.27	0.31	0.11	0.57	0.35	0.12	0.30	0.69	0.07	0.25	0.36	0.06
Uniform Delay, d1	25.7	29.9	28.9	20.1	25.4	24.0	10.1	19.0	13.9	12.5	16.8	14.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.73	0.67	0.78	0.84	1.14	2.68
Incremental Delay, d2	0.5	0.3	0.2	1.8	0.5	0.1	0.1	2.1	0.2	0.2	0.5	0.1
Delay (s)	26.2	30.2	29.1	21.9	25.9	24.1	7.5	14.7	11.0	10.7	19.7	39.7
Level of Service	C	C	C	C	C	C	A	B	B	B	B	D
Approach Delay (s)		29.0			23.7			13.0			20.6	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.0%	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												
Volume (vph)	38	16	102	271	32	777	96	747	195	239	649	32
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	1525	1504	3433	3539	1583	3433	3539	1583
Flt Permitted	0.27	1.00	1.00	0.59	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	497	1863	1583	1098	1525	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)	41	17	111	295	35	845	104	812	212	260	705	35
RTOR Reduction (vph)	0	0	90	0	190	190	0	0	143	0	0	22
Lane Group Flow (vph)	41	17	21	295	251	249	104	812	69	260	705	13
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)	13.6	11.5	11.5	26.4	17.9	17.9	3.9	22.6	22.6	7.4	26.1	26.1
Effective Green, g (s)	20.6	15.0	15.0	31.0	21.4	21.4	7.4	26.1	26.1	10.9	29.6	29.6
Actuated g/C Ratio	0.26	0.19	0.19	0.39	0.27	0.27	0.09	0.33	0.33	0.14	0.37	0.37
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)	217	349	297	526	408	402	318	1155	516	468	1309	586
v/s Ratio Prot	0.01	0.01		c0.08	0.16		0.03	c0.23		c0.08	c0.20	
v/s Ratio Perm	0.04		0.01	0.13		c0.17			0.04			0.01
v/c Ratio	0.19	0.05	0.07	0.56	0.62	0.62	0.33	0.70	0.13	0.56	0.54	0.02
Uniform Delay, d1	23.2	26.6	26.8	18.1	25.7	25.7	34.0	23.6	19.0	32.3	19.8	16.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.26	0.61	0.73	1.34	0.77	0.71
Incremental Delay, d2	0.4	0.1	0.1	1.4	2.8	3.0	0.5	3.0	0.4	1.3	1.5	0.1
Delay (s)	23.6	26.7	26.9	19.5	28.5	28.7	43.3	17.3	14.4	44.7	16.8	11.4
Level of Service	C	C	C	B	C	C	D	B	B	D	B	B
Approach Delay (s)		26.1			26.3			19.2			23.8	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	139	311	727	673	407	615
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)	151	338	790	732	442	668
RTOR Reduction (vph)	0	280	0	320	0	0
Lane Group Flow (vph)	151	58	790	412	442	668
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	11.3	11.3	28.7	28.7	20.5	55.7
Effective Green, g (s)	13.8	13.8	31.2	31.2	23.0	58.2
Actuated g/C Ratio	0.17	0.17	0.39	0.39	0.29	0.73
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)	305	273	1380	617	509	2575
v/s Ratio Prot	c0.09		0.22		c0.25	0.19
v/s Ratio Perm		0.04		c0.26		
v/c Ratio	0.50	0.21	0.57	0.67	0.87	0.26
Uniform Delay, d1	29.9	28.4	19.2	20.1	27.1	3.7
Progression Factor	1.00	1.00	0.60	1.51	0.73	0.25
Incremental Delay, d2	1.3	0.4	1.4	4.6	13.2	0.2
Delay (s)	31.2	28.8	13.0	35.0	32.8	1.1
Level of Service	C	C	B	D	C	A
Approach Delay (s)	29.6		23.6			13.8
Approach LOS	C		C			B

Intersection Summary			
HCM Average Control Delay	21.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.9%	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
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			1792	1583		1796	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.79	1.00
Satd. Flow (perm)	3433	3503		1770	3525			1450	1583		1463	1583
Volume (vph)	381	1079	80	37	772	21	47	13	22	54	18	425
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)	414	1173	87	40	839	23	51	14	24	59	20	462
RTOR Reduction (vph)	0	6	0	0	3	0	0	0	16	0	0	180
Lane Group Flow (vph)	414	1254	0	40	859	0	0	65	8	0	79	282
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)	12.1	34.9		2.1	24.9			24.5	24.5		24.5	24.5
Effective Green, g (s)	13.6	37.4		3.6	27.4			27.0	27.0		27.0	27.0
Actuated g/C Ratio	0.17	0.47		0.04	0.34			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)	584	1638		80	1207			489	534		494	534
v/s Ratio Prot	c0.12	c0.36		0.02	0.24							
v/s Ratio Perm								0.04	0.01		0.05	c0.18
v/c Ratio	0.71	0.77		0.50	0.71			0.13	0.02		0.16	0.53
Uniform Delay, d1	31.3	17.7		37.3	22.9			18.4	17.6		18.6	21.4
Progression Factor	1.00	1.00		1.19	0.73			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.9	2.2		4.7	2.0			0.6	0.1		0.7	3.7
Delay (s)	35.3	19.9		49.0	18.7			18.9	17.7		19.3	25.1
Level of Service	D	B		D	B			B	B		B	C
Approach Delay (s)		23.7			20.0			18.6			24.2	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	22.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
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)	183	0	467	0	0	0	0	726	630	210	602	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)	199	0	508	0	0	0	0	789	685	228	654	0
RTOR Reduction (vph)	0	0	420	0	0	0	0	0	394	0	0	0
Lane Group Flow (vph)	199	0	88	0	0	0	0	789	291	228	654	0
Turn Type	Prot		custom						Perm	Prot		
Protected Phases	8							2		1	6	
Permitted Phases			8						2			
Actuated Green, G (s)	13.8		13.8					31.5	31.5	17.7	55.7	
Effective Green, g (s)	13.8		13.8					34.0	34.0	20.2	58.2	
Actuated g/C Ratio	0.17		0.17					0.42	0.42	0.25	0.73	
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)	305		481					1504	673	867	2575	
v/s Ratio Prot	c0.11							c0.22		0.07	c0.18	
v/s Ratio Perm			0.03						0.18			
v/c Ratio	0.65		0.18					0.52	0.43	0.26	0.25	
Uniform Delay, d1	30.9		28.3					17.0	16.2	23.9	3.6	
Progression Factor	1.00		1.00					1.00	1.00	1.19	0.03	
Incremental Delay, d2	4.9		0.2					1.3	2.0	0.7	0.2	
Delay (s)	35.8		28.5					18.3	18.2	29.2	0.3	
Level of Service	D		C					B	B	C	A	
Approach Delay (s)		30.5			0.0			18.3			7.8	
Approach LOS		C			A			B			A	

Intersection Summary			
HCM Average Control Delay	18.1	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	65.1%	ICU Level of Service	C
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)	603	306	0	0	343	47	469	0	401	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)	655	333	0	0	373	51	510	0	436	0	0
RTOR Reduction (vph)	0	0	0	0	0	38	0	0	311	0	0
Lane Group Flow (vph)	655	333	0	0	373	13	510	0	125	0	0
Turn Type	Prot					Perm	Prot		custom		
Protected Phases	5	2			6		4				
Permitted Phases						6			4		
Actuated Green, G (s)	22.5	46.5			17.5	17.5	20.5		20.5		
Effective Green, g (s)	25.0	49.0			20.0	20.0	23.0		23.0		
Actuated g/C Ratio	0.31	0.61			0.25	0.25	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)	1073	2168			885	396	987		455		
v/s Ratio Prot	c0.19	0.09			c0.11		c0.15				
v/s Ratio Perm						0.01			0.08		
v/c Ratio	0.61	0.15			0.42	0.03	0.52		0.28		
Uniform Delay, d1	23.4	6.6			25.1	22.7	23.8		22.1		
Progression Factor	0.58	0.20			0.77	0.66	1.00		1.00		
Incremental Delay, d2	0.9	0.1			1.5	0.1	1.9		1.5		
Delay (s)	14.6	1.4			20.9	15.1	25.8		23.6		
Level of Service	B	A			C	B	C		C		
Approach Delay (s)		10.1			20.2			24.8		0.0	
Approach LOS		B			C			C		A	

Intersection Summary			
HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group