Phone: Fax:
E-mail:

Merge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	8/02/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	CD Rd (West of I-4) WB
Junction:	On Ramp from SR 46 EB
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	720	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	340	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	1700	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	1426	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	720	340	1700	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	196	92	462	v
Trucks and buses	9	9	9	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	818	386	1931	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

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

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1204	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} = 818 (Equation 25-8)

Flow Entering Merge Influence Area

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

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 10.3 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 = N/A mph

Space mean speed for all vehicles, S = 51.3 mph

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Phone: Fax:
E-mail:

Merge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 3/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: CD Rd (West of I-4) WB
Junction: On Ramp from I-4 WB
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1060	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	1690	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	340	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)	1060	1690	340	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	294	469	94	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	1178	1878	378	pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ

P = 0.209 Using Equation 0
FM

v = v (P) = 246 pc/h
12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v FO	3056	9000	No

v v 466 pc/h (Equation 25-4 or 25-5)
3 or av34

Is v v > 2700 pc/h? No
3 or av34

Is v v > 1.5 v /2 Yes
3 or av34 12

If yes, v = 471 (Equation 25-8)
12A

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v 12A	471	4600	No

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 13.7 pc/mi/ln
R R 12 A

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

Speed Estimation

Intermediate speed variable, M = 0.253
S

Space mean speed in ramp influence area, S = 51.7 mph
R

Space mean speed in outer lanes, S = 55.0 mph
0

Space mean speed for all vehicles, S = 52.3 mph

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Phone: Fax:
E-mail:

Merge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 3/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: CD Rd (West of I-4) WB
Junction: On Ramp from I-4 WB
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1060	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	1690	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	430	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2851	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1060	1690	430	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	294	469	119	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	1178	1878	478	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.209 Using Equation 0

$v_{12} = v (P_{FM}) = 246$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3056	9000	No

$v_{3 \text{ or } av34}$ = 466 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} = 471 (Equation 25-8)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	471	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{12} + 0.0078\ v_R - 0.00627\ L_A$ = 13.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.253

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

Space mean speed in outer lanes, S_0 = 55.0 mph

Space mean speed for all vehicles, S = 52.3 mph

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Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	8/2/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	CD Rd (West of I-4) WB
Junction:	Off Ramp to SR 417 WB
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2760	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	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	910	vph
Position of adjacent ramp	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)	2760		430		910	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	750		117		247	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 3135 488 1034 pcph

Estimation of V12 Diverge Areas

L_{EQ} = 1189.51 (Equation 25-8 or 25-9)

P_{FD} = 0.659 Using Equation 5

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

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3135	6750	No
$v_{FO} = v_F - v_R$	2647	6750	No
v_R	488	2000	No
v_3 or v_{av34}	902 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, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 19.0 pc/mi/ln

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

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 = 60.3 mph

Space mean speed for all vehicles, S = 51.7 mph

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Phone: Fax:
E-mail:

Diverge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 3/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: CD Rd (West of I-4) WB
Junction: Off Ramp to SR 417 WB
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2750	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	430	vph
Length of first accel/decel lane	730	ft
Length of second accel/decel lane	730	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes
Volume on adjacent ramp	910 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)	2750	430	910	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	764	119	253	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	3056	478	1011	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1638 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3056	6750	No
$v_{FO} = v_F - v_R$	2578	6750	No
v_R	478	3800	No

$v_{3 \text{ or } av34}$ 1418 pc/h (Equation 25-15 or 25-16)

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

Is $v_{3 \text{ or } av34} > 1.5 v_{12}/2$ Yes

If yes, v_{12A} = 1746 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1746	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = -0.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.471

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

Space mean speed in outer lanes, S_R = 59.1 mph

Space mean speed for all vehicles, S_0 = 52.8 mph

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Phone: Fax:
E-mail:

Diverge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 3/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: CD Rd (West of I-4) WB
Junction: Off Ramp to SR 417 EB
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2320	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	910	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	430	vph
Position of adjacent ramp	Upstream	
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)	2320	910	430	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	644	253	119	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	2578	1011	478	pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
EQ
P = 1.000 Using Equation 0
FD
$v_{12} = v_R + (v_F - v_R) P_{FD} = 2578$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v = v_{Fi}$	2578	4500	No
$v = v_{FO} - v_R$	1567	4500	No
v_R	1011	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} = 2578 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2578	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 = 0.519

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

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

Space mean speed for all vehicles, S_0 = 48.3 mph

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Phone: Fax:
E-mail:

Diverge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 3/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: CD Rd (West of I-4) WB
Junction: Off Ramp to SR 417 EB
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2320	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	910	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	470	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)	2320	910	470	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	644	253	131	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	2578	1011	522	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2578 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2578	4500	No
$v_{FO} = v_F - v_R$	1567	4500	No
v_R	1011	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} = 2578 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2578	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 = 0.519

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

Space mean speed in outer lanes,	S_R = N/A	mph
Space mean speed for all vehicles,	S_0 = 48.3	mph

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Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	8/2/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	CD Rd (West of I-4) WB
Junction:	Off Ramp to CR 46A
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development & Environment Study

Freeway Data

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

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	470	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

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

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1420		470		1190		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	386		128		323		v
Trucks and buses	9		9		9		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1613	534	1352	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 1613 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1613	4500	No
$v_{FO} = v - v_F - v_R$	1079	4500	No
v_R	534	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} = 1613 (Equation 25-18)

Flow Entering Diverge Influence Area

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

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable,	D_S = 0.476	
Space mean speed in ramp influence area,	S_R = 48.8	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 48.8	mph

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Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	CTR
Agency/Co.:	HNTB
Date performed:	8/2/2010
Analysis time period:	Build Service Road Concept
Freeway/Dir of Travel:	CD Rd (West of I-4) WB
Junction:	Off Ramp to CR 46A
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development & Environment Study

Freeway Data

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

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	470	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	910	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	4594	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1420		470		910		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	386		128		247		v
Trucks and buses	9		9		9		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	0.957	0.957	0.957	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1613	534	1034	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 1613 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1613	4500	No
$v_{FO} = v - v_F - v_R$	1079	4500	No
v_R	534	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} = 1613 (Equation 25-18)

Flow Entering Diverge Influence Area

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

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, D_S = 0.476

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

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

Space mean speed for all vehicles, S = 48.8 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 3/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: CD Rd (West of I-4) WB
Junction: On Ramp from SR 46 EB
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	940	vph

On Ramp Data

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

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	470	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1320	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	940	1190	470	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	261	331	131	v
Trucks and buses	0	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1044	1322	522	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_{12} (P_{FM})$ = 1044 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2366	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} = 1044 (Equation 25-8)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1044	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R12} + 0.0078\ v_{R12} - 0.00627\ L_A$ = 20.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.328

Space mean speed in ramp influence area, S_R = 50.7 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 50.7 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 3/07/2010
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: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1810	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	360	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane	640	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	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)	1810	360	320	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	503	100	89	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	2011	400	356	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.555 Using Equation 0

$v_{12} = v (P_{FM}) = 1116$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2411	6750	No

$v_{3 \text{ or } av34}$ = 895 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} = 1149 (Equation 25-8)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1149	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{12} + 0.0078\ v_{12} - 0.00627\ L_A$ = 3.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.183

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

Space mean speed in outer lanes, S_0 = 53.7 mph

Space mean speed for all vehicles, S = 53.0 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 3/07/2010
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: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1810	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	360	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane	640	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes
Volume on adjacent Ramp	160 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)	1810	360	160	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	503	100	44	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	2011	400	178	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_{(P)} = v_F P_{FM}$ = 1116 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2411	6750	No

$v_{3 \text{ or } av34}$ = 895 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} = 1149 (Equation 25-8)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1149	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{12} + 0.0078\ v_R - 0.00627\ L_A$ = 3.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.183

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

Space mean speed in outer lanes, S_0 = 53.7 mph

Space mean speed for all vehicles, S = 53.0 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 3/07/2010
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: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2170	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	160	vph
Length of first accel/decel lane	1340	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	360	vph
Position of adjacent ramp	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)	2170	160	360	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	603	44	100	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	2411	178	400	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 3542.17 (Equation 25-8 or 25-9)

P_{FD} = 0.692 Using Equation 5

$v_{12} = v_R + (v - v_F) P_{FD}$ = 1722 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2411	6750	No
$v_{FO} = v - v_F$	2233	6750	No
v_R	178	2000	No
$v_{3 \text{ or } av34} = v_R$	689 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} = 1722 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1722	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 7.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.444

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

Space mean speed in outer lanes, S_R = 60.3 mph

Space mean speed for all vehicles, S_0 = 52.0 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
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: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2170	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	160	vph
Length of first accel/decel lane	1340	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	20	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)	2170	160	20	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	603	44	6	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	2411	178	22	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.692 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1722 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2411	6750	No
$v_{FO} = v_F - v_R$	2233	6750	No
v_R	178	2000	No

$v_{3 \text{ or } av34}$ = 689 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_R /2 No

If yes, v_{12A} = 1722 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1722	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 7.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.444

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

Space mean speed in outer lanes, S_R = 60.3 mph

Space mean speed for all vehicles, S_0 = 52.0 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
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: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2010	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	20	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	160	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2010	20	160	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	558	6	44	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	2233	22	178	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.374 Using Equation 4

$v_{12} = v_{12F} (P_{FM}) =$ 836 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2255	9000	No

$v_{3 \text{ or } av34}$ = 698 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} = 893 (Equation 25-8)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	893	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_{12} + 0.0078\, v_R - 0.00627\, L_A =$ 9.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.296

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

Space mean speed in outer lanes, S_0 = 54.4 mph

Space mean speed for all vehicles, S = 53.0 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: Wekiva Pkwy. EB
Junction: Off Ramp to EB CD
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1190	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	20	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	130	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)	1190	20	130	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	331	6	36	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	1322	22	144	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.726 Using Equation 5

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

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1322	6750	No
$v_{FO} = v_F - v_R$	1300	6750	No
v_R	22	2000	No

$v_{3 \text{ or } av34}$ = 356 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} = 966 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	966	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 8.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.430

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

Space mean speed in outer lanes, S_R = 60.3 mph

Space mean speed for all vehicles, S_0 = 51.9 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: Wekiva Pkwy. EB
Junction: On Ramp from EB CD
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1170	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	130	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	20	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)	1170	130	20	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	325	36	6	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	1300	144	22	pcph

Estimation of V12 Merge Areas

L_{EQ} = -40.78 (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 769 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1444	6750	No

$v_{3 \text{ or } av34}$ = 531 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} = 769 (Equation 25-8)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	769	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 = 0.296

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

Space mean speed in outer lanes, S_0 = 54.9 mph

Space mean speed for all vehicles, S = 52.5 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: Wekiva Pkwy. EB
Junction: On Ramp from EB CD
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1170	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	130	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	300	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	6684	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1170	130	300	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	325	36	83	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	1300	144	333	pcph

Estimation of V12 Merge Areas

L = 2041.69 (Equation 25-2 or 25-3)
EQ
P = 0.591 Using Equation 1
FM
v = v (P) = 769 pc/h
12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v FO	1444	6750	No

v v 531 pc/h (Equation 25-4 or 25-5)
3 or av34

Is v v > 2700 pc/h? No
3 or av34

Is v v > 1.5 v /2 No
3 or av34 12

If yes, v = 769 (Equation 25-8)
12A

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v R12	769	4600	No

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 9.4 pc/mi/ln
R R 12 A

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

Speed Estimation

Intermediate speed variable, M = 0.296
S

Space mean speed in ramp influence area, S = 51.2 mph
R

Space mean speed in outer lanes, S = 54.9 mph
0

Space mean speed for all vehicles, S = 52.5 mph

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Phone: Fax:
E-mail:

Diverge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
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: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1300	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	300	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	130	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)	1300	300	130	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	361	83	36	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	1444	333	144	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 833 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1444	6750	No
$v_{FO} = v_F - v_R$	1111	6750	No
v_R	333	3800	No

$v_{3 \text{ or } av34}$ = 611 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} = 833 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	833	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = -2.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.458

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

Space mean speed in outer lanes, S_R = 60.3 mph

Space mean speed for all vehicles, S_0 = 53.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
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: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1300	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	300	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	320	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)	1300	300	320	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	361	83	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	1444	333	356	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 833 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1444	6750	No
$v_{FO} = v_F - v_R$	1111	6750	No
v_R	333	3800	No

$v_{3 \text{ or } av34}$ = 611 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} = 833 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	833	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = -2.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.458

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

Space mean speed in outer lanes,	S_R = 60.3	mph
Space mean speed for all vehicles,	S_0 = 53.3	mph

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Phone: Fax:
E-mail:

Diverge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: Wekiva Pkwy. WB CD
Junction: Off Ramp to Wekiva Pkwy. WB
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	750	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	360	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	160	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)	750	360	160	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	208	100	44	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	833	400	178	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 833 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	833	4500	No
$v_{FO} = v - v_F$	433	4500	No
v_R	400	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} = 833 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	833	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 6.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.464

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

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

Space mean speed for all vehicles, S_0 = 49.0 mph

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Phone: Fax:
E-mail:

Merge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: Wekiva Pkwy. WB CD
Junction: On Ramp from Wekiva Pkwy. WB
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	290	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	160	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	360	vph
Position of adjacent Ramp	Upstream	
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)	290	160	360	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	81	44	100	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	322	178	400	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v (P_{FM}) =$ 322 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	500	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} = 322 (Equation 25-8)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	322	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_{A} =$ 6.2 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_0 = N/A mph

Space mean speed for all vehicles, S = 51.2 mph

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Phone: Fax:
E-mail:

Merge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: Wekiva Pkwy. WB CD
Junction: On Ramp from Wekiva Pkwy. WB
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	290	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	160	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	20	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)	290	160	20	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	81	44	6	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	322	178	22	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_{12}(P_{FM})$ = 322 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	500	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} = 322 (Equation 25-8)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	322	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_{A}$ = 6.2 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_0 = N/A mph

Space mean speed for all vehicles, S = 51.2 mph

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Phone: Fax:
E-mail:

Diverge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: Wekiva Pkwy. WB CD
Junction: Off Ramp to Wekiva Pkwy. WB
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	410	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	20	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	160	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	410	20	160	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	114	6	44	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	456	22	178	pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
EQ
P = 1.000 Using Equation 0
FD
$v_{12} = v_R + (v_F - v_R) P_{FD} = 456$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v = v_{Fi}$	456	4500	No
$v = v_{FO} - v_R$	434	4500	No
v_R	22	2000	No

$v_{av34} = 0$ pc/h (Equation 25-15 or 25-16)

Is $v_{av34} > 2700$ pc/h? No

Is $v_{av34} > 1.5\, v_R / 2$ No

If yes, $v_{12A} = 456$ (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	456	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 3.7$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable, $D_S = 0.430$

Space mean speed in ramp influence area, $S = 49.4$ mph

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

Space mean speed for all vehicles, S_0 = 49.4 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: Wekiva Pkwy. EB CD
Junction: On Ramp from Wekiva Pkwy. EB
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	320	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	20	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	130	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)	320	20	130	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	89	6	36	v
Trucks and buses	0	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	356	22	144	pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 356 pc/h
12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v FO	378	4500	No

v v 0 pc/h (Equation 25-4 or 25-5)
3 or av34

Is v v > 2700 pc/h? No
3 or av34

Is v v > 1.5 v /2 No
3 or av34 12

If yes, v = 356 (Equation 25-8)
12A

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v R12	356	4600	No

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 5.3 pc/mi/ln
R R 12 A

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

Speed Estimation

Intermediate speed variable, M = 0.292
S

Space mean speed in ramp influence area, S = 51.2 mph
R

Space mean speed in outer lanes, S = N/A mph
0

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: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: Wekiva Pkwy. EB CD
Junction: Off Ramp to Wekiva Pkwy. EB
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Pkwy. PD&E

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	370	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	130	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	20	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)	370	130	20	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	103	36	6	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	411	144	22	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 411 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	411	4500	No
$v_{FO} = v_F - v_R$	267	4500	No
v_R	144	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} = 411 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	411	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 3.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.441

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

Space mean speed in outer lanes, S_{R0} = N/A mph

Space mean speed for all vehicles, S_0 = 49.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: Wekiva Pkwy. EB CD
Junction: Off Ramp to Wekiva Pkwy. EB
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Pkwy. PD&E

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	370	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	130	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	300	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	6684	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	370	130	300	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	103	36	83	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	411	144	333	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 411 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	411	4500	No
$v_{FO} = v - v_F$	267	4500	No
v_R	144	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} = 411 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	411	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 3.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.441

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

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

Space mean speed for all vehicles, S_0 = 49.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 03/07/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: Wekiva Pkwy. EB CD
Junction: On Ramp from Wekiva Pkwy. EB
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Pkwy. PD&E

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	320	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	300	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	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)	320	300		vph
Peak-hour factor, PHF	0.90	0.90		

Peak 15-min volume, v15	89	83	v
Trucks and buses	0	0	%
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	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	356	333	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 356 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	689	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} = 356 (Equation 25-8)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	356	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{12} + 0.0078\ v_R - 0.00627\ L_A$ = 1.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.224

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

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 52.1 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 3/05/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: SR 417 EB
Junction: Off Ramp to Rinehart Rd
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1960	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	220	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?	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)	1960	220		vph
Peak-hour factor, PHF	0.96	0.96		

Peak 15-min volume, v15	510	57	v
Trucks and buses	0	0	%
Recreational vehicles	0	0	%
Terrain type:	Level	Level	
Grade	0.00 %	0.00 %	%
Length	0.00 mi	0.00 mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	
Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2042	229	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v - v_F) P_{FD}$ = 1019 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2042	9000	No
$v_{FO} = v - v_R$	1813	9000	No
v_R	229	2000	No
$v_{3 \text{ or } av34}$	511 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} = 1019 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1019	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 4.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.449

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

Space mean speed in outer lanes, S_R = 60.3 mph

Space mean speed for all vehicles, S_0 = 54.2 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 3/5/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: SR 417 EB
Junction: On Ramp from Rinehart Rd
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1740	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	790	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	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)	1740	790		vph
Peak-hour factor, PHF	0.95	0.95		

Peak 15-min volume, v15	458	208	v
Trucks and buses	0	0	%
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	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1832	832	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.605 Using Equation 1

$v_{12} = v\ (P_{FM})$ = 1109 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2664	6750	No

$v_{3\text{ or }av34}$ = 723 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} = 1109 (Equation 25-8)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1109	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 14.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.278

Space mean speed in ramp influence area, S_R = 51.4 mph

Space mean speed in outer lanes, S_0 = 54.2 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: CTRR
Agency/Co.: HNTB
Date performed: 3/5/2010
Analysis time period: ' Build Service Road Concept
Freeway/Dir of Travel: SR 417 WB
Junction: Off Ramp to Rinehart Rd
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3370	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	860	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)	3370	860		vph
Peak-hour factor, PHF	0.95	0.95		

Peak 15-min volume, v15	887	226	v
Trucks and buses	0	0	%
Recreational vehicles	0	0	%
Terrain type:	Level	Level	
Grade	0.00 %	0.00 %	%
Length	0.00 mi	0.00 mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	
Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3547	905	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 2094 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3547	6750	No
$v_{FO} = v - v_F$	2642	6750	No
v_R	905	3800	No

$v_{3 \text{ or } av34}$ = 1453 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} = 2094 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2094	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 8.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.509

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

Space mean speed in outer lanes,	S_R = 58.6	mph
Space mean speed for all vehicles,	S_0 = 52.1	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 3/5/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: SR 417 WB
Junction: On Ramp from Rinehart Rd
Jurisdiction: Seminole County
Analysis Year: 2012
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2510	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	220	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

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

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2510	220		vph
Peak-hour factor, PHF	0.90	0.90		

Peak 15-min volume, v15	697	61	v
Trucks and buses	0	0	%
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	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2789	244	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.591 Using Equation 1

$v_{I2} = v\ (P_{FM}) =$ 1650 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3033	6750	No

$v_{3 \text{ or } av34}$ = 1139 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} = 1650 (Equation 25-8)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1650	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_{R} + 0.0078\ v_{12} - 0.00627\ L_A$ = 17.0 pc/mi/ln

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

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_0 = 52.7 mph

Space mean speed for all vehicles, S = 51.6 mph

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

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

Site Information

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

Project Description: Wekiva Parkway Project Development & Environment Study

Inputs

Upstream Adj Ramp
☒ Yes ☒ On
☒ No ☒ Off
L_{up} = ft
V_u = veh/h

Terrain: Level

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

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

Downstream Adj Ramp
☒ Yes ☒ On
☒ No ☒ Off
L_{down} = 1948 ft
V_D = 660 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	4930	0.95	Level	9	0	0.957	1.00	5423
Ramp	360	0.95	Level	9	0	0.957	1.00	396
UpStream								
DownStream	660	0.95	Level	9	0	0.957	1.00	726

Merge Areas

Estimation of v_{12}

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

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

Capacity Checks

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

Flow Entering Merge Influence Area

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

Level of Service Determination (if not F)

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

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

Speed Determination

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

Diverge Areas

Estimation of v_{12}

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

L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} = 0.606 using Equation (Exhibit 25-12)
V_{12} = 3443 pc/h
V_3 or V_{av34} 1980 pc/h (Equation 25-15 or 25-16)
Is V_3 or V_{av34} > 2,700 pc/h? ☒ Yes ☒ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☒ Yes ☒ No
If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	5423	Exhibit 25-14	7200	No
$V_{FO} = V_F - V_R$	5027	Exhibit 25-14	7200	No
V_R	396	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

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

Level of Service Determination (if not F)

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

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

Speed Determination

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

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

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

Site Information

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

Project Description: Wekiva Parkway Project Development & Environment Study

Inputs

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

Terrain: Level

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

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

Downstream Adj Ramp
☐ Yes ☒ On
☒ No ☒ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4570	0.95	Level	9	0	0.957	1.00	5027
Ramp	660	0.95	Level	9	0	0.957	1.00	726
UpStream	360	0.95	Level	9	0	0.957	1.00	396
DownStream								

Merge Areas

Estimation of v_{12}

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

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

P_{FM} = 0.286 using Equation (Exhibit 25-5)

V_{12} = 1439 pc/h

V_3 or V_{av34} 1794 pc/h (Equation 25-4 or 25-5)

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

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

If Yes, V_{12a} = 2010 pc/h (Equation 25-8)

Capacity Checks

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

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2736	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

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

D_R = 23.3 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.346 (Exibit 25-19)

S_R = 50.5 mph (Exhibit 25-19)

Diverge Areas

Estimation of v_{12}

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

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

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

V_{12} = pc/h

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

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

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

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

Capacity Checks

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

Flow Entering Merge Influence Area

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

Level of Service Determination (if not F)

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

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R = mph (Exhibit 25-19)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

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

Site Information

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

Project Description: Wekiva Parkway Project Development & Environment Study

Inputs

Upstream Adj Ramp

☒ Yes ☒ On

☒ No ☒ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

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

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

Downstream Adj Ramp

☒ Yes ☒ On

☒ No ☒ Off

L_{down} = 1948 ft

V_D = 360 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5640	0.95	Level	9	0	0.957	1.00	6204
Ramp	660	0.95	Level	9	0	0.957	1.00	726
UpStream								
DownStream	360	0.95	Level	9	0	0.957	1.00	396

Merge Areas

Estimation of v_{12}

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

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

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

V_{12} = pc/h

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

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

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

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

Capacity Checks

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

Flow Entering Merge Influence Area

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

Level of Service Determination (if not F)

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

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R = mph (Exhibit 25-19)

Diverge Areas

Estimation of v_{12}

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

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

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

V_{12} = 3114 pc/h

V_3 or V_{av34} 1545 pc/h (Equation 25-15 or 25-16)

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

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

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

Capacity Checks

	Actual	Capacity		LOS F?
V_F	6204	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	5478	Exhibit 25-14	9600	No
V_R	726	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

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

Level of Service Determination (if not F)

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

D_R = 21.6 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.493 (Exhibit 25-19)

S_R = 56.2 mph (Exhibit 25-19)

74.7 mph (Exhibit 25-19)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

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

Site Information

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

Project Description: Wekiva Parkway Project Development & Environment Study

Inputs

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

Terrain: Level

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

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

Downstream Adj Ramp
☒ Yes ☒ On
☒ No ☒ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4980	0.95	Level	9	0	0.957	1.00	5478
Ramp	360	0.95	Level	9	0	0.957	1.00	396
UpStream	660	0.95	Level	9	0	0.957	1.00	726
DownStream								

Merge Areas

Estimation of v_{12}

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

L_{EQ} = 907.24 (Equation 25-2 or 25-3)
P_{FM} = 0.591 using Equation (Exhibit 25-5)
V_{12} = 3240 pc/h
V_3 or V_{av34} 2238 pc/h (Equation 25-4 or 25-5)
Is V_3 or V_{av34} > 2,700 pc/h? ☒ Yes ☒ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☒ Yes ☒ No
If Yes, V_{12a} = pc/h (Equation 25-8)

Capacity Checks

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

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3636	Exhibit 25-7	4600:All	No

Level of Service Determination (if not F)

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

D_R = 30.5 (pc/mi/ln)
LOS = D (Exhibit 25-4)

Speed Determination

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

Diverge Areas

Estimation of v_{12}

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

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

Capacity Checks

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

Flow Entering Merge Influence Area

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

Level of Service Determination (if not F)

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

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

Speed Determination

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

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	SB On Ramp from US 441
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1370	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1040	vph
Length of first accel/decel lane	530	ft
Length of second accel/decel lane	530	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	240	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1370	1040	240	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	372	283	65	v
Trucks and buses	11	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.948	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1571 1187 274 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 872 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2758	6750	No
$v_{3 \text{ or } av34}$	699 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} = 897		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	897	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 11.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.241	
Space mean speed in ramp influence area,	S_R = 51.9	mph
Space mean speed in outer lanes,	S_O = 54.4	mph
Space mean speed for all vehicles,	S = 52.5	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	SB Off Ramp to US 441
Jurisdiction:	Orange County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1610	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	240	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1040	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1610		240		1040		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	437		65		283		v
Trucks and buses	11		10		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		
Heavy vehicle adjustment, fHV	0.948		0.952		0.952		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 1846 274 1187 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1846 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1846	4500	No
$v_{FO} = v_F - v_R$	1572	4500	No
v_R	274	2000	No
$v_{3 \text{ or } av34}$	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} = 1846		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1846	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 15.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.453

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

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

Space mean speed for all vehicles, S = 49.1 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	NB On Ramp from US 441
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1370	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	240	vph
Length of first accel/decel lane	530	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1040	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1370	240	1040	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	372	65	283	v
Trucks and buses	11	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.948	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1571 274 1187 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1571 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1845	4500	No
$v_{3 \text{ or } av34}$	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} = 1571		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1571	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 16.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.309

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

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

Space mean speed for all vehicles, S = 51.0 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	NB Off Ramp to US 441
Jurisdiction:	Orange County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2410	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	1040	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	240	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2410		1040		240		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	655		283		65		v
Trucks and buses	11		10		10		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		
Heavy vehicle adjustment, fHV	0.948		0.952		0.952		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 2764 1187 274 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1897 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2764	6750	No
$v_{FO} = v_F - v_R$	1577	6750	No
v_R	1187	3800	No
v_3 or v_{av34}	867 pc/h	(Equation 25-15 or 25-16)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 $v_{12}/2$	No	
If yes, v_{12A} = 1897		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1897	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 7.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.535

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

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 51.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	NB Off Ramp to Kelly Park Rd
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1610	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	230	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	270	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1610		230		270		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	437		62		73		v
Trucks and buses	11		2		2		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		
Heavy vehicle adjustment, fHV	0.948		0.990		0.990		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 1846 252 296 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1846 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1846	4500	No
$v_{FO} = v_F - v_R$	1594	4500	No
v_R	252	2000	No
$v_{3 \text{ or } av34}$	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} = 1846		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1846	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 15.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.451

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

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

Space mean speed for all vehicles, S = 49.1 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	NB On Ramp from Kelly Park Rd
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1380	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	270	vph
Length of first accel/decel lane	1140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	230	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1380	270	230	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	375	73	62	v
Trucks and buses	11	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.948	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1583 296 252 pcph

Estimation of V12 Merge Areas

L_{EQ} = 336.47 (Equation 25-2 or 25-3)

P_{FM} = 0.609 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 965 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1879	6750	No
v_3 or v_{av34}	618 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} = 965		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	965	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 8.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.255

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

Space mean speed in outer lanes, S_O = 54.6 mph

Space mean speed for all vehicles, S = 52.6 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	SB Off Ramp to Kelly Park Rd
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1650	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	270	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	230	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1650		270		230		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	448		73		62		v
Trucks and buses	11		2		2		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		
Heavy vehicle adjustment, fHV	0.948		0.990		0.990		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 1892 296 252 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.699 Using Equation 5

$V_{12} = V_R + (V_F - V_R) P_{FD}$ = 1412 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{Fi} = V_F$	1892	6750	No
$V_{FO} = V_F - V_R$	1596	6750	No
V_R	296	2000	No
$V_{3 \text{ or } av34}$	480 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} = 1412		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V_{12}	1412	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ = 11.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.455

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

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 51.5 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	SB On Ramp from Kelly Park Rd
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1380	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	230	vph
Length of first accel/decel lane	1140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	270	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1380	230	270	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	375	62	73	v
Trucks and buses	11	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.948	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 1583 252 296 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1583 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1835	4500	No
v_3 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} = 1583		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1583	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 12.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.266

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

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

Space mean speed for all vehicles, S = 51.5 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	On Ramp from SR 429
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	730	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	770	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	270	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	730	770	270	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	198	209	73	v
Trucks and buses	11	11	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.948	0.948	0.948	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp 837 883 310 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 837 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		1720	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} = 837			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	837	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 = 0.238

Space mean speed in ramp influence area, S_R = 51.9 mph

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

Space mean speed for all vehicles, S = 51.9 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	On Ramp from SR 429
Jurisdiction:	Lake County
Analysis Year:	2012

Description: Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	880	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	730	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	770	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	880	730	770	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	239	198	209	v
Trucks and buses	11	11	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.948	0.948	0.948	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp	1009	837	883	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1009 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1846	4500	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$ > 2700 pc/h?		No	
Is $v_{3 \text{ or } av34}$ > 1.5 v_{12} /2		No	
If yes, v_{12A} = 1009		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1009	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 10.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.241	
Space mean speed in ramp influence area,	S_R = 51.9	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 51.9	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	Off Ramp from SR 46 Bypass
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1500	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	770	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	770	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1500		770		770		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	408		209		209		v
Trucks and buses	11		11		11		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, E_T	1.5		1.5		1.5		
Recreational vehicle PCE, E_R	1.2		1.2		1.2		
Heavy vehicle adjustment, f_{HV}	0.948		0.948		0.948		
Driver population factor, f_P	1.00		1.00		1.00		

Flow rate, v_p 1720 883 883 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1720 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1720	4500	No
$v_{FO} = v_F - v_R$	837	4500	No
v_R	883	3800	No
v_3 or v_{av34}	0 pc/h	(Equation 25-15 or 25-16)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12}/2	No	
If yes, v_{12A} = 1720		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1720	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 5.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.507

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

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

Space mean speed for all vehicles, S = 48.4 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/14/2007
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:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	880	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	730	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	770	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	880		730		770		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	239		198		209		v
Trucks and buses	11		11		11		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		
Heavy vehicle adjustment, fHV	0.948		0.948		0.948		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 1009 837 883 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1009 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1009	4500	No
$v_{FO} = v_F - v_R$	172	4500	No
v_R	837	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} = 1009		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1009	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = -0.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.503

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:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	Off Ramp from SR 46 Bypass
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1500	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	770	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	270	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1500		770		270		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	408		209		73		v
Trucks and buses	11		11		11		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		
Heavy vehicle adjustment, fHV	0.948		0.948		0.948		
Driver population factor, fP	1.00		1.00		1.00		

Flow rate, vp 1720 883 310 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1720 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1720	4500	No
$v_{FO} = v_F - v_R$	837	4500	No
v_R	883	3800	No
v_3 or v_{av34}	0 pc/h	(Equation 25-15 or 25-16)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12}/2	No	
If yes, v_{12A} = 1720		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1720	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 5.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.507	
Space mean speed in ramp influence area,	S_R = 48.4	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 48.4	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	On Ramp from SR 46 (Existing)
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1450	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	580	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	160	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)	1450	580	160	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	394	158	43	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 1663 665 183 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 923 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2328	6750	No
$v_{3 \text{ or } av34}$	740 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} = 950		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	950	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 8.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.236	
Space mean speed in ramp influence area,	S_R = 51.9	mph
Space mean speed in outer lanes,	S_O = 54.2	mph
Space mean speed for all vehicles,	S = 52.6	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway EB
Junction:	Off Ramp to SR 46 (Existing)
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1610	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	160	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	580	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1610		160		580		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	437		43		158		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	1846	183	665	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1846 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1846	4500	No
$v_{FO} = v_F - v_R$	1663	4500	No
v_R	183	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} = 1846		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1846	4400	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable,	D_S = 0.444	
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

WP WB 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:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	On Ramp from SR 46 (Existing)
Jurisdiction:	Lake County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1450	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	160	vph
Length of first accel/decel lane	1350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	580	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)	1450	160	580	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	394	43	158	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 1663 183 665 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1663 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1846	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} = 1663		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1663	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 = 0.251

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

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

Space mean speed for all vehicles, S = 51.7 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	3/10/2010
Analysis time period:	Build I-4 Connection @ SR 417
Freeway/Dir of Travel:	Wekiva Parkway WB
Junction:	Off Ramp to SR 46 (Existing)
Jurisdiction:	Lake County
Analysis Year:	2012 Build
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2030	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	580	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	160	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)	2030		580		160		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	552		158		43		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 2328 665 183 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.671 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1781 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2328	6750	No
$v_{FO} = v_F - v_R$	1663	6750	No
v_R	665	2000	No
$v_{3 \text{ or } av34}$	547 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} = 1781		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1781	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 = 0.488

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

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 51.0 mph

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	CTRR
Agency/Co.:	HNTB
Date Performed:	3/05/2010
Analysis Time Period:	Build Service Road Concept
Freeway/Dir of Travel:	I-4 WB
Weaving Location:	Off Ramp w/CD Road
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development & Environment Study

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	4	
Weaving segment length, L	2500	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	Multilane or C-D
Volume ratio, VR	0.54	
Weaving ratio, R	0.29	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V o1	V o2	V w1	V w2	
Volume, V	1260	0	1060	430	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	350	0	294	119	v
Trucks and buses	0	0	0	0	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	1.000	1.000	1.000	1.000	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	1400	0	1177	477	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	0.43	0.41
Weaving and non-weaving speeds, Si	53.40	54.01
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	2.20
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	53.68	mph
Weaving segment density, D	14.22	pc/mi/ln
Level of service, LOS	B	
Capacity of base condition, cb	7295	pc/h
Capacity as a 15-minute flow rate, c	7295	pc/h
Capacity as a full-hour volume, ch	6565	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	1654	4000	a
Average flow rate (pcphpl)	763	2350	b
Volume ratio, VR	0.54	0.80	c
Weaving ratio, R	0.29	N/A	d
Weaving length (ft)	2500	2500	e

Notes:

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

FREEWAY WEAVING WORKSHEET

General Information

Analyst	KNM
Agency/Company	HNTB
Date Performed	8/6/2007
Analysis Time Period	

Site Information

Freeway/Dir of Travel	Wekiva Parkway EB
Weaving Seg Location	SB Wekiva Parkway
Jurisdiction	Orange County
Analysis Year	2012 Build

Inputs

Freeway free-flow speed, S_{FF} (mi/h)	65	Weaving type	A
Weaving number of lanes, N	3	Volume ratio, VR	0.93
Weaving seg length, L (ft)	1500	Weaving ratio, R	0.22
Terrain	Level		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	f_{HV}	f_p	v
V_{o1}	0	0.90	11	0	1.5	1.2	0.948	1.00	0
V_{o2}	70	0.90	11	0	1.5	1.2	0.948	1.00	82
V_{w1}	200	0.90	11	0	1.5	1.2	0.948	1.00	234
V_{w2}	700	0.90	11	0	1.5	1.2	0.948	1.00	820
V_w				1054	V_{nw}				82
V									1136

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)			0.35	0.0020
b (Exhibit 24-6)			2.20	4.00
c (Exhibit 24-6)			0.97	1.30
d (Exhibit 24-6)			0.80	0.75
Weaving intensity factor, Wi			1.35	0.26
Weaving and non-weaving speeds, Si (mi/h)			38.38	58.73

Number of lanes required for unconstrained operation, Nw 2.13
Maximum number of lanes, Nw (max) 1.40

☐ If Nw < Nw(max) unconstrained operation ☑ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	39.36
Weaving segment density, D (pc/mi/ln)	9.62
Level of service, LOS	A
Capacity of base condition, c_b (pc/h)	4870
Capacity as a 15-minute flow rate, c (veh/h)	4616
Capacity as a full-hour volume, c_h (veh/h)	4154

Notes

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

FREEWAY WEAVING WORKSHEET

General Information

Analyst	KNM
Agency/Company	HNTB
Date Performed	8/6/2007
Analysis Time Period	

Site Information

Freeway/Dir of Travel	Wekiva Parkway WB
Weaving Seg Location	NB Wekiva Parkway
Jurisdiction	Orange County
Analysis Year	2012 Build

Inputs

Freeway free-flow speed, S_{FF} (mi/h)	65	Weaving type	A
Weaving number of lanes, N	3	Volume ratio, VR	0.06
Weaving seg length, L (ft)	1500	Weaving ratio, R	0.00
Terrain	Level		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	f_{HV}	fp	v
V_{o1}	880	0.90	11	0	1.5	1.2	0.948	1.00	1031
V_{o2}	670	0.90	11	0	1.5	1.2	0.948	1.00	785
V_{w1}	100	0.90	11	0	1.5	1.2	0.948	1.00	117
V_{w2}	0	0.90	11	0	1.5	1.2	0.948	1.00	0
V_w				117	V_{nw}				1816
V									1933

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)	0.15	0.0035		
b (Exhibit 24-6)	2.20	4.00		
c (Exhibit 24-6)	0.97	1.30		
d (Exhibit 24-6)	0.80	0.75		
Weaving intensity factor, Wi	0.26	0.08		
Weaving and non-weaving speeds, Si (mi/h)	58.63	65.81		

Number of lanes required for unconstrained operation, Nw	0.42
Maximum number of lanes, Nw (max)	1.40

☑ If Nw < Nw(max) unconstrained operation ☐ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	65.33
Weaving segment density, D (pc/mi/ln)	9.86
Level of service, LOS	A
Capacity of base condition, c_b (pc/h)	6620
Capacity as a 15-minute flow rate, c (veh/h)	6275
Capacity as a full-hour volume, c_h (veh/h)	5647

Notes

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date Performed:	8/6/2007
Analysis Time Period:	
Freeway/Dir of Travel:	Wekiva Parkway EB
Weaving Location:	SB Wekiva Parkway
Jurisdiction:	Orange County
Analysis Year:	2012 Build
Description:	Wekiva Parkway PD&E

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	3	
Weaving segment length, L	1500	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	
Volume ratio, VR	0.93	
Weaving ratio, R	0.22	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	0	70	200	700	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	0	19	56	194	v
Trucks and buses	11	11	11	11	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.948	0.948	0.948	0.948	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	0	82	234	820	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.35	0.0020
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	1.35	0.26
Weaving and non-weaving speeds, Si	38.38	58.73
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	2.13
Maximum number of lanes, Nw (max) (Exhibit 24-7)	1.40
Type of operation is	Constrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	39.36	mph
Weaving segment density, D	9.62	pc/mi/ln
Level of service, LOS	A	
Capacity of base condition, cb	4870	pc/h
Capacity as a 15-minute flow rate, c	4616	pc/h
Capacity as a full-hour volume, ch	4154	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	1054	2800	a
Average flow rate (pcphpl)	378	2350	b
Volume ratio, VR	0.93	0.45	c
Weaving ratio, R	0.22	N/A	d
Weaving length (ft)	1500	2500	e

Notes:

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

HCS+: Freeway Weaving Release 5.4

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	Kacia Monts
Agency/Co.:	HNTB
Date Performed:	7/27/2010
Analysis Time Period:	Build I-4 Connection @ SR417
Freeway/Dir of Travel:	I-4 CD Road (WB)
Weaving Location:	SR 46 to SR 417
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development & Environment Study

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	3	
Weaving segment length, L	2000	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	Multilane or C-D
Volume ratio, VR	0.54	
Weaving ratio, R	0.29	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V o1	V o2	V w1	V w2	
Volume, V	1270	0	430	1060	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	345	0	117	288	v
Trucks and buses	9	9	9	9	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.957	0.957	0.957	0.957	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	1442	0	488	1204	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	0.60	0.62
Weaving and non-weaving speeds, Si	49.37	48.89
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		1.77
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	49.15	mph
Weaving segment density, D	21.26	pc/mi/ln
Level of service, LOS	B	
Capacity of base condition, cb	5518	pc/h
Capacity as a 15-minute flow rate, c	5280	pc/h
Capacity as a full-hour volume, ch	4858	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	1692	4000	a
Average flow rate (pcphpl)	1044	2350	b
Volume ratio, VR	0.54	0.80	c
Weaving ratio, R	0.29	N/A	d
Weaving length (ft)	2000	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.

HCS+: Freeway Weaving Release 5.4

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	Kacia Monts
Agency/Co.:	HNTB
Date Performed:	6/25/2010
Analysis Time Period:	Build I-4 Connection @ SR417
Freeway/Dir of Travel:	SR 417 WB
Weaving Location:	Rinehart On to I-4 EB & WB On
Jurisdiction:	Seminole County
Analysis Year:	2012
Description:	Wekiva Parkway Project Development & Environment Study

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	4	
Weaving segment length, L	2220	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	B	Multilane or C-D
Volume ratio, VR	0.47	
Weaving ratio, R	0.12	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V o1	V o2	V w1	V w2	
Volume, V	1368	68	1142	152	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	372	18	310	41	v
Trucks and buses	10	10	10	10	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	0.952	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	1561	77	1303	173	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.08	0.0020
b (Exhibit 24-6)	2.20	6.00
c (Exhibit 24-6)	0.70	1.00
d (Exhibit 24-6)	0.50	0.50
Weaving intensity factor, Wi	0.42	0.34
Weaving and non-weaving speeds, Si	53.70	56.08
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	1.92
Maximum number of lanes, Nw (max) (Exhibit 24-7)	3.50
Type of operation is	Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	54.93	mph
Weaving segment density, D	14.17	pc/mi/ln
Level of service, LOS	B	
Capacity of base condition, cb	7772	pc/h
Capacity as a 15-minute flow rate, c	7402	pc/h
Capacity as a full-hour volume, ch	6810	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	1476	4000	a
Average flow rate (pcphpl)	778	2350	b
Volume ratio, VR	0.47	0.80	c
Weaving ratio, R	0.12	N/A	d
Weaving length (ft)	2220	2500	e

Notes:

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date Performed:	8/6/2007
Analysis Time Period:	
Freeway/Dir of Travel:	Wekiva Parkway WB
Weaving Location:	NB Wekiva Parkway
Jurisdiction:	Orange County
Analysis Year:	2012 Build
Description:	Wekiva Parkway PD&E

Inputs

Freeway free-flow speed, SFF	65	mph
Weaving number of lanes, N	3	
Weaving segment length, L	1500	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	
Volume ratio, VR	0.06	
Weaving ratio, R	0.00	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V A-C	V B-D	V A-D	V B-C	
Volume, V	880	670	100	0	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	244	186	28	0	v
Trucks and buses	11	11	11	11	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.948	0.948	0.948	0.948	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	1031	785	117	0	pc/h

Weaving and Non-Weaving Speeds

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.0035
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.26	0.08
Weaving and non-weaving speeds, Si	58.63	65.81
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	0.42
Maximum number of lanes, Nw (max) (Exhibit 24-7)	1.40
Type of operation is	Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	65.33	mph
Weaving segment density, D	9.86	pc/mi/ln
Level of service, LOS	A	
Capacity of base condition, cb	6620	pc/h
Capacity as a 15-minute flow rate, c	6275	pc/h
Capacity as a full-hour volume, ch	5647	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	117	2800	a
Average flow rate (pcphpl)	644	2350	b
Volume ratio, VR	0.06	0.45	c
Weaving ratio, R	0.00	N/A	d
Weaving length (ft)	1500	2500	e

Notes:

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

SHORT REPORT

General Information		Site Information	
Analyst	KNM	Intersection	Wekiva Parkway@Connector SPUI
Agency or Co.	HNTB	Area Type	All other areas
Date Performed	8/2010	Jurisdiction	Orange County
Time Period	Build I-4 Connection @ SR 417	Analysis Year	2012 Build

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	2	2	2	1	2		1	1		1
Lane Group	L	T	R	L	T	R	L		R	L		R
Volume (vph)	120	61	761	279	55	120	676		364	60		180
% Heavy Vehicles	2	2	2	2	2	2	11		11	11		11
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95		0.95	0.95		0.95
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A		A	A		A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0
Arrival Type	3	3	3	3	3	3	3		3	3		3
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0		0	0		0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	NS Perm	06	07	08
Timing	G = 25.0	G = 20.0	G =	G =	G = 60.0	G =	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25 | Cycle Length C = 120.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	126	64	801	294	58	126	712		383	63		189
Lane Group Capacity	369	591	1985	716	591	1121	1579		1091	813		1091
v/c Ratio	0.34	0.11	0.40	0.41	0.10	0.11	0.45		0.35	0.08		0.17
Green Ratio	0.21	0.17	0.71	0.21	0.17	0.71	0.50		0.75	0.50		0.75
Uniform Delay d_1	40.5	42.4	7.1	41.1	42.4	5.5	19.4		5.1	15.6		4.3
Delay Factor k	0.11	0.11	0.11	0.11	0.11	0.11	0.11		0.11	0.11		0.11
Incremental Delay d_2	0.6	0.1	0.1	0.4	0.1	0.0	0.2		0.2	0.0		0.1
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000		1.000
Control Delay	41.0	42.5	7.3	41.5	42.4	5.6	19.6		5.3	15.6		4.4
Lane Group LOS	D	D	A	D	D	A	B		A	B		A
Approach Delay	13.8			32.2			14.6			7.2		
Approach LOS	B			C			B			A		
Intersection Delay	16.6			Intersection LOS						B		

SHORT REPORT

General Information		Site Information	
Analyst	KNM	Intersection	US 441 at CR 437
Agency or Co.	HNTB	Area Type	All other areas
Date Performed	9/28/07	Jurisdiction	Orange County
Time Period	Build I-4 Connection @ SR 417	Analysis Year	2012 Build

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2			2	1				1		1
Lane Group	L	T			T	R				L		R
Volume (vph)	96	1264			1576	410				140		39
% Heavy Vehicles	10	10			10	10				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	0	0
Lane Width	12.0	12.0			12.0	12.0				12.0		12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0			0	0				0		0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	EW Perm	03	04	SB Only	06	07	08
Timing	G = 16.0	G = 76.0	G =	G =	G = 16.0	G =	G =	G =
	Y = 4	Y = 4	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 120.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	101	1331			1659	432				147		41
Lane Group Capacity	302	2631			2083	1174				236		1583
v/c Ratio	0.33	0.51			0.80	0.37				0.62		0.03
Green Ratio	0.80	0.80			0.63	0.80				0.13		1.00
Uniform Delay d_1	14.3	4.0			16.3	3.4				49.1		0.0
Delay Factor k	0.11	0.11			0.34	0.11				0.21		0.11
Incremental Delay d_2	0.7	0.2			2.3	0.2				5.0		0.0
PF Factor	1.000	1.000			1.000	1.000				1.000		0.950
Control Delay	14.9	4.2			18.5	3.6				54.2		0.0
Lane Group LOS	B	A			B	A				D		A
Approach Delay	4.9			15.4						42.4		
Approach LOS	A			B						D		
Intersection Delay	12.8			Intersection LOS						B		

SHORT REPORT

General Information		Site Information	
Analyst	*CTR*	Intersection	*CR 437 at Ponkan Road*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*2/23/2007*	Jurisdiction	*Orange County*
Time Period	*Build I-4 Connection @ SR 417*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*2*	*1*	*1*	*1*	*1*
Lane Group	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
Volume (vph)	*35*	*110*	*55*	*26*	*147*	*67*	*51*	*610*	*19*	*48*	*275*	*27*
% Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Pretimed/Actuated (P/A)	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Startup Lost Time	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
Extension of Effective Green	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
Arrival Type	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Unit Extension	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = *10.6*	G =	G =	G =	G = *28.5*	G =	G =	G =
	Y = *5.6*	Y =	Y =	Y =	Y = *5.3*	Y =	Y =	Y =
Duration of Analysis (hrs) = *0.25*					Cycle Length C = *50.0*			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*37*	*116*	*58*	*27*	*155*	*71*	*54*	*642*	*20*	*51*	*289*	*28*
Lane Group Capacity	*260*	*395*	*336*	*269*	*395*	*336*	*619*	*2022*	*902*	*434*	*1062*	*902*
v/c Ratio	*0.14*	*0.29*	*0.17*	*0.10*	*0.39*	*0.21*	*0.09*	*0.32*	*0.02*	*0.12*	*0.27*	*0.03*
Green Ratio	*0.21*	*0.21*	*0.21*	*0.21*	*0.21*	*0.21*	*0.57*	*0.57*	*0.57*	*0.57*	*0.57*	*0.57*
Uniform Delay d_1	*16.0*	*16.6*	*16.1*	*15.9*	*16.9*	*16.3*	*4.9*	*5.6*	*4.7*	*5.0*	*5.5*	*4.7*
Delay Factor k	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*
Incremental Delay d_2	*0.3*	*0.4*	*0.2*	*0.2*	*0.6*	*0.3*	*0.1*	*0.1*	*0.0*	*0.1*	*0.1*	*0.0*
PF Factor	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*
Control Delay	*16.3*	*17.0*	*16.4*	*16.0*	*17.6*	*16.6*	*4.9*	*5.7*	*4.7*	*5.1*	*5.6*	*4.7*
Lane Group LOS	*B*	*B*	*B*	*B*	*B*	*B*	*A*	*A*	*A*	*A*	*A*	*A*
Approach Delay	*16.7*			*17.1*			*5.6*			*5.5*		
Approach LOS	*B*			*B*			*A*			*A*		
Intersection Delay	*9.0*			Intersection LOS						*A*		

SHORT REPORT

General Information		Site Information	
Analyst	*CTR*	Intersection	*CR 437 at Kelly Park Road*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*2/23/2007*	Jurisdiction	*Orange County*
Time Period	*Build I-4 Connection @ SR 417*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	*1*	*2*	*1*	*1*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Lane Group	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
Volume (vph)	*139*	*227*	*86*	*56*	*157*	*77*	*48*	*433*	*69*	*48*	*157*	*195*
% Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Pretimed/Actuated (P/A)	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Startup Lost Time	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
Extension of Effective Green	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
Arrival Type	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Unit Extension	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = *18.0*	G =	G =	G =	G = *29.7*	G =	G =	G =
	Y = *7*	Y =	Y =	Y =	Y = *5.3*	Y =	Y =	Y =

Duration of Analysis (hrs) = *0.25* | Cycle Length C = *60.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*146*	*239*	*91*	*59*	*165*	*81*	*51*	*456*	*73*	*51*	*165*	*205*
Lane Group Capacity	*362*	*1064*	*475*	*337*	*1064*	*475*	*602*	*922*	*784*	*384*	*922*	*784*
v/c Ratio	*0.40*	*0.22*	*0.19*	*0.18*	*0.16*	*0.17*	*0.08*	*0.49*	*0.09*	*0.13*	*0.18*	*0.26*
Green Ratio	*0.30*	*0.30*	*0.30*	*0.30*	*0.30*	*0.30*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*	*0.50*
Uniform Delay d_1	*16.7*	*15.8*	*15.6*	*15.5*	*15.4*	*15.5*	*8.0*	*10.1*	*8.0*	*8.2*	*8.4*	*8.8*
Delay Factor k	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*
Incremental Delay d_2	*0.7*	*0.1*	*0.2*	*0.2*	*0.1*	*0.2*	*0.1*	*0.4*	*0.1*	*0.2*	*0.1*	*0.2*
PF Factor	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.00*
Control Delay	*17.5*	*15.9*	*15.8*	*15.8*	*15.5*	*15.7*	*8.0*	*10.6*	*8.1*	*8.3*	*8.5*	*9.0*
Lane Group LOS	*B*	*B*	*B*	*B*	*B*	*B*	*A*	*B*	*A*	*A*	*A*	*A*
Approach Delay	*16.3*			*15.6*			*10.0*			*8.7*		
Approach LOS	*B*			*B*			*B*			*A*		
Intersection Delay	*12.4*			Intersection LOS			*B*					

SHORT REPORT

General Information		Site Information	
Analyst	KNM	Intersection	US 441 at Wekiva Parkway
Agency or Co.	HNTB	Area Type	All other areas
Date Performed	9/14/07	Jurisdiction	Orange County
Time Period	Build I-4 Connection @ SR 417	Analysis Year	2012 Build

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	2	2	2	1	2		1	1		1
Lane Group	L	T	R	L	T	R	L		R	L		R
Volume (vph)	120	61	761	279	55	120	676		364	60		180
% Heavy Vehicles	0	2	2	2	2	0	0		0	2		2
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95		0.95	0.95		0.95
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A		A	A		A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0
Arrival Type	3	3	3	3	3	3	3		3	3		3
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0		0	0		0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	NS Perm	06	07	08
Timing	G = 25.0	G = 20.0	G =	G =	G = 60.0	G =	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25 | Cycle Length C = 120.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	126	64	801	294	58	126	712		383	63		189
Lane Group Capacity	376	591	1985	716	591	1144	1753		1211	885		1187
v/c Ratio	0.34	0.11	0.40	0.41	0.10	0.11	0.41		0.32	0.07		0.16
Green Ratio	0.21	0.17	0.71	0.21	0.17	0.71	0.50		0.75	0.50		0.75
Uniform Delay d_1	40.4	42.4	7.1	41.1	42.4	5.5	18.8		4.9	15.6		4.3
Delay Factor k	0.11	0.11	0.11	0.11	0.11	0.11	0.11		0.11	0.11		0.11
Incremental Delay d_2	0.5	0.1	0.1	0.4	0.1	0.0	0.2		0.2	0.0		0.1
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000		1.000
Control Delay	41.0	42.5	7.3	41.5	42.4	5.6	19.0		5.1	15.6		4.3
Lane Group LOS	D	D	A	D	D	A	B		A	B		A
Approach Delay	13.8			32.1			14.1			7.1		
Approach LOS	B			C			B			A		
Intersection Delay	16.5			Intersection LOS						B		

SHORT REPORT

General Information		Site Information	
Analyst	KNM	Intersection	US 441 West of WP Interchange
Agency or Co.	HNTB	Area Type	All other areas
Date Performed	09/28/07	Jurisdiction	Orange County
Time Period	Build I-4 Connection @ SR417	Analysis Year	2012 Build

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		2			2	1				1		2
Lane Group		T			T	R				L		R
Volume (vph)		637			738	135				218		693
% Heavy Vehicles		10			10	10				2		2
PHF		0.95			0.95	0.95				0.95		0.95
Pretimed/Actuated (P/A)		A			A	A				A		A
Startup Lost Time		2.0			2.0	2.0				2.0		2.0
Extension of Effective Green		2.0			2.0	2.0				2.0		2.0
Arrival Type		3			3	3				3		3
Unit Extension		3.0			3.0	3.0				3.0		3.0
Ped/Bike/RTOR Volume	0	0		0	0	0	0	0		0	0	0
Lane Width		12.0			12.0	12.0				12.0		12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0			0	0				0		0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Thru & RT	02	03	04	SB Only	06	07	08
Timing	G = 35.0	G =	G =	G =	G = 25.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		671			777	142				229		729
Lane Group Capacity		1645			1645	1468				632		2803
v/c Ratio		0.41			0.47	0.10				0.36		0.26
Green Ratio		0.50			0.50	1.00				0.36		1.00
Uniform Delay d_1		11.0			11.5	0.0				16.6		0.0
Delay Factor k		0.11			0.11	0.11				0.11		0.11
Incremental Delay d_2		0.2			0.2	0.0				0.4		0.0
PF Factor		1.000			1.000	0.950				1.000		0.950
Control Delay		11.2			11.7	0.0				17.0		0.0
Lane Group LOS		B			B	A				B		A
Approach Delay	11.2			9.9						4.1		
Approach LOS	B			A						A		
Intersection Delay	8.0			Intersection LOS						A		

SHORT REPORT

General Information		Site Information	
Analyst	*CTR*	Intersection	*CR 437 East of WP Interchange*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*09/28/07*	Jurisdiction	*Orange County*
Time Period	*Build I-4 Connection @ SR417*	Analysis Year	*2012 Build*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	*2*		*1*				*1*	*1*			*1*	*1*
Lane Group	*L*		*R*				*L*	*T*			*T*	*R*
Volume (vph)	*441*		*44*				*138*	*368*			*135*	*316*
% Heavy Vehicles	*2*		*2*				*2*	*2*			*2*	*2*
PHF	*0.95*		*0.95*				*0.95*	*0.95*			*0.95*	*0.95*
Pretimed/Actuated (P/A)	*A*		*A*				*A*	*A*			*A*	*A*
Startup Lost Time	*2.0*		*2.0*				*2.0*	*2.0*			*2.0*	*2.0*
Extension of Effective Green	*2.0*		*2.0*				*2.0*	*2.0*			*2.0*	*2.0*
Arrival Type	*3*		*3*				*3*	*3*			*3*	*3*
Unit Extension	*3.0*		*3.0*				*3.0*	*3.0*			*3.0*	*3.0*
Ped/Bike/RTOR Volume	*0*	*0*	*0*				*0*	*0*		*0*	*0*	*0*
Lane Width	*12.0*		*12.0*				*12.0*	*12.0*			*12.0*	*12.0*
Parking/Grade/Parking	*N*	*0*	*N*				*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*		*0*				*0*	*0*			*0*	*0*
Minimum Pedestrian Time		*3.2*						*3.2*			*3.2*	

Phasing	EB Only	02	03	04	NS Perm	06	07	08
Timing	G = *20.0*	G =	G =	G =	G = *30.0*	G =	G =	G =
	Y = *5*	Y =	Y =	Y =	Y = *5*	Y =	Y =	Y =

Duration of Analysis (hrs) = *0.25* | Cycle Length C = *60.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*464*		*46*				*145*	*387*			*142*	*333*
Lane Group Capacity	*1146*		*1583*				*621*	*932*			*932*	*1583*
v/c Ratio	*0.40*		*0.03*				*0.23*	*0.42*			*0.15*	*0.21*
Green Ratio	*0.33*		*1.00*				*0.50*	*0.50*			*0.50*	*1.00*
Uniform Delay d_1	*15.4*		*0.0*				*8.5*	*9.5*			*8.1*	*0.0*
Delay Factor k	*0.11*		*0.11*				*0.11*	*0.11*			*0.11*	*0.11*
Incremental Delay d_2	*0.2*		*0.0*				*0.2*	*0.3*			*0.1*	*0.1*
PF Factor	*1.000*		*0.950*				*1.000*	*1.000*			*1.000*	*0.950*
Control Delay	*15.6*		*0.0*				*8.7*	*9.8*			*8.2*	*0.1*
Lane Group LOS	*B*		*A*				*A*	*A*			*A*	*A*
Approach Delay	*14.2*						*9.5*			*2.5*		
Approach LOS	*B*						*A*			*A*		
Intersection Delay	*8.9*			Intersection LOS						*A*		

SHORT REPORT

General Information		Site Information	
Analyst	*CTR*	Intersection	*Kelly Park Rd at Wekiva Pkwy*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*2/22/2007*	Jurisdiction	*Orange County*
Time Period	*Build I-4 Connection @ SR 417*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		*2*	*1*	*1*	*2*					*1*		*1*
Lane Group		*T*	*R*	*L*	*T*					*L*		*R*
Volume (vph)		*140*	*75*	*155*	*90*					*197*		*73*
% Heavy Vehicles		*2*	*2*	*2*	*2*					*2*		*2*
PHF		*0.95*	*0.95*	*0.95*	*0.95*					*0.95*		*0.95*
Pretimed/Actuated (P/A)		*A*	*A*	*A*	*A*					*A*		*A*
Startup Lost Time		*2.0*	*2.0*	*2.0*	*2.0*					*2.0*		*2.0*
Extension of Effective Green		*2.0*	*2.0*	*2.0*	*2.0*					*2.0*		*2.0*
Arrival Type		*3*	*3*	*3*	*3*					*3*		*3*
Unit Extension		*3.0*	*3.0*	*3.0*	*3.0*					*3.0*		*3.0*
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*					*0*	*0*	*0*
Lane Width		*12.0*	*12.0*	*12.0*	*12.0*					*12.0*		*12.0*
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*				*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour		*0*	*0*	*0*	*0*					*0*		*0*
Minimum Pedestrian Time		*3.2*			*3.2*						*3.2*	

Phasing	WB Only	EW Perm	03	04	SB Only	06	07	08
Timing	G = *15.0*	G = *15.0*	G =	G =	G = *31.0*	G =	G =	G =
	Y = *7*	Y = *7*	Y =	Y =	Y = *5*	Y =	Y =	Y =
Duration of Analysis (hrs) = *0.25*						Cycle Length C = *80.0*		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		*147*	*79*	*163*	*95*					*207*		*77*
Lane Group Capacity		*665*	*1049*	*625*	*1640*					*686*		*158*
v/c Ratio		*0.22*	*0.08*	*0.26*	*0.06*					*0.30*		*0.05*
Green Ratio		*0.19*	*0.66*	*0.46*	*0.46*					*0.39*		*1.00*
Uniform Delay d_1		*27.5*	*4.8*	*12.8*	*11.9*					*17.0*		*0.0*
Delay Factor k		*0.11*	*0.11*	*0.11*	*0.11*					*0.11*		*0.11*
Incremental Delay d_2		*0.2*	*0.0*	*0.2*	*0.0*					*0.2*		*0.0*
PF Factor		*1.000*	*1.000*	*1.000*	*1.000*					*1.000*		*0.95*
Control Delay		*27.7*	*4.8*	*13.0*	*11.9*					*17.2*		*0.0*
Lane Group LOS		*C*	*A*	*B*	*B*					*B*		*A*
Approach Delay		*19.7*			*12.6*						*12.6*	
Approach LOS		*B*			*B*						*B*	
Intersection Delay		*14.7*			Intersection LOS						*B*	

SHORT REPORT

General Information		Site Information	
Analyst	*CTR*	Intersection	*Kelly Park Rd at Wekiva Pkwy*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*2/22/2007*	Jurisdiction	*Orange County*
Time Period	*Build I-4 Connection @ SR 417*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	*1*	*2*			*2*	*1*	*1*		*1*			
Lane Group	*L*	*T*			*T*	*R*	*L*		*R*			
Volume (vph)	*65*	*272*			*195*	*205*	*50*		*180*			
% Heavy Vehicles	*2*	*2*			*2*	*2*	*2*		*2*			
PHF	*0.95*	*0.95*			*0.95*	*0.95*	*0.95*		*0.95*			
Pretimed/Actuated (P/A)	*A*	*A*			*A*	*A*	*A*		*A*			
Startup Lost Time	*2.0*	*2.0*			*2.0*	*2.0*	*2.0*		*2.0*			
Extension of Effective Green	*2.0*	*2.0*			*2.0*	*2.0*	*2.0*		*2.0*			
Arrival Type	*3*	*3*			*3*	*3*	*3*		*3*			
Unit Extension	*3.0*	*3.0*			*3.0*	*3.0*	*3.0*		*3.0*			
Ped/Bike/RTOR Volume	*0*	*0*		*0*	*0*	*0*	*0*	*0*	*0*			
Lane Width	*12.0*	*12.0*			*12.0*	*12.0*	*12.0*		*12.0*			
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*			
Parking/Hour												
Bus Stops/Hour	*0*	*0*			*0*	*0*	*0*		*0*			
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*				

Phasing	EB Only	EW Perm	03	04	NB Only	06	07	08
Timing	G = *15.0*	G = *30.0*	G =	G =	G = *16.0*	G =	G =	G =
	Y = *7*	Y = *7*	Y =	Y =	Y = *5*	Y =	Y =	Y =
Duration of Analysis (hrs) = *0.25*					Cycle Length C = *80.0*			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*68*	*286*			*205*	*216*	*53*		*189*			
Lane Group Capacity	*823*	*2306*			*1330*	*1049*	*354*		*1583*			
v/c Ratio	*0.08*	*0.12*			*0.15*	*0.21*	*0.15*		*0.12*			
Green Ratio	*0.65*	*0.65*			*0.38*	*0.66*	*0.20*		*1.00*			
Uniform Delay d_1	*5.2*	*5.3*			*16.6*	*5.3*	*26.4*		*0.0*			
Delay Factor k	*0.11*	*0.11*			*0.11*	*0.11*	*0.11*		*0.11*			
Incremental Delay d_2	*0.0*	*0.0*			*0.1*	*0.1*	*0.2*		*0.0*			
PF Factor	*1.000*	*1.000*			*1.000*	*1.000*	*1.000*		*0.950*			
Control Delay	*5.2*	*5.4*			*16.6*	*5.4*	*26.6*		*0.0*			
Lane Group LOS	*A*	*A*			*B*	*A*	*C*		*A*			
Approach Delay	*5.3*			*10.9*			*5.8*					
Approach LOS	*A*			*B*			*A*					
Intersection Delay	*7.7*			Intersection LOS			*A*					

SHORT REPORT

General Information		Site Information	
Analyst	*CTR*	Intersection	*SR 46 and US 441*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*2/15/2007*	Jurisdiction	*Lake County*
Time Period	*Build I-4 Connection @ SR 417*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	*1*	*2*	*1*	*2*	*2*	*1*	*1*	*3*	*1*	*1*	*3*	*1*
Lane Group	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
Volume (vph)	*43*	*284*	*33*	*107*	*220*	*3*	*134*	*741*	*275*	*3*	*309*	*28*
% Heavy Vehicles	*11*	*11*	*11*	*11*	*11*	*11*	*10*	*10*	*10*	*10*	*10*	*10*
PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Pretimed/Actuated (P/A)	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*		*A*	*A*	*A*
Startup Lost Time	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
Extension of Effective Green	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
Arrival Type	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Unit Extension	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	Excl. Left	Thru & RT	03	04	Excl. Left	NS Perm	07	08
Timing	G = *10.0*	G = *20.0*	G =	G =	G = *15.0*	G = *25.0*	G =	G =
	Y = *4*	Y = *4*	Y =	Y =	Y = *4*	Y = *4*	Y =	Y =

Duration of Analysis (hrs) = *0.25* | Cycle Length C = *86.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*45*	*299*	*35*	*113*	*232*	*3*	*141*	*780*	*289*	*3*	*325*	*29*
Lane Group Capacity	*189*	*758*	*660*	*378*	*796*	*660*	*570*	*1506*	*580*	*286*	*1506*	*1075*
v/c Ratio	*0.24*	*0.39*	*0.05*	*0.30*	*0.29*	*0.00*	*0.25*	*0.52*	*0.50*	*0.01*	*0.22*	*0.03*
Green Ratio	*0.12*	*0.23*	*0.45*	*0.12*	*0.23*	*0.45*	*0.51*	*0.29*	*0.40*	*0.17*	*0.29*	*0.73*
Uniform Delay d_1	*34.5*	*27.9*	*13.2*	*34.8*	*27.2*	*12.9*	*11.3*	*25.5*	*19.6*	*29.4*	*23.1*	*3.1*
Delay Factor k	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.12*	*0.11*	*0.11*	*0.11*	*0.11*
Incremental Delay d_2	*0.7*	*0.3*	*0.0*	*0.4*	*0.2*	*0.0*	*0.2*	*0.3*	*0.7*	*0.0*	*0.1*	*0.0*
PF Factor	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*
Control Delay	*35.2*	*28.2*	*13.2*	*35.2*	*27.4*	*12.9*	*11.6*	*25.8*	*20.3*	*29.4*	*23.2*	*3.1*
Lane Group LOS	*D*	*C*	*B*	*D*	*C*	*B*	*B*	*C*	*C*	*C*	*C*	*A*
Approach Delay	*27.7*			*29.8*			*22.8*			*21.6*		
Approach LOS	*C*			*C*			*C*			*C*		
Intersection Delay	*24.5*			Intersection LOS						*C*		

SHORT REPORT

General Information		Site Information	
Analyst	*KNM*	Intersection	*SR 46 at Round Lake Road*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*2/7/2007*	Jurisdiction	*Lake County*
Time Period	*Build I-4 Connection @ SR 417*	Analysis Year	*2012 Build*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	*1*	*3*	*1*	*1*	*3*	*1*	*1*	*2*	*1*	*1*	*2*	*1*
Lane Group	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
Volume (vph)	*37*	*787*	*76*	*65*	*1406*	*379*	*53*	*65*	*92*	*62*	*152*	*66*
% Heavy Vehicles	*11*	*11*	*11*	*11*	*11*	*11*	*2*	*2*	*2*	*2*	*2*	*2*
PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Pretimed/Actuated (P/A)	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Startup Lost Time	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
Extension of Effective Green	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
Arrival Type	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Unit Extension	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	Excl. Left	Thru & RT	03	04	Excl. Left	NS Perm	07	08
Timing	G = *10.0*	G = *76.0*	G =	G =	G = *10.0*	G = *20.0*	G =	G =
	Y = *4*	Y = *4*	Y =	Y =	Y = *4*	Y = *4*	Y =	Y =
Duration of Analysis (hrs) = *0.25*					Cycle Length C = *132.0*			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*39*	*828*	*80*	*68*	*1480*	*399*	*56*	*68*	*97*	*65*	*160*	*69*
Lane Group Capacity	*123*	*2685*	*1257*	*123*	*2685*	*1257*	*304*	*537*	*1367*	*352*	*537*	*1367*
v/c Ratio	*0.32*	*0.31*	*0.06*	*0.55*	*0.55*	*0.32*	*0.18*	*0.13*	*0.07*	*0.18*	*0.30*	*0.05*
Green Ratio	*0.08*	*0.58*	*0.86*	*0.08*	*0.58*	*0.86*	*0.26*	*0.15*	*0.86*	*0.26*	*0.15*	*0.86*
Uniform Delay d_1	*57.8*	*14.4*	*1.3*	*58.8*	*17.4*	*1.7*	*37.7*	*48.4*	*1.3*	*37.8*	*49.8*	*1.3*
Delay Factor k	*0.11*	*0.11*	*0.11*	*0.15*	*0.15*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*
Incremental Delay d_2	*1.5*	*0.1*	*0.0*	*5.3*	*0.2*	*0.1*	*0.3*	*0.1*	*0.0*	*0.3*	*0.3*	*0.0*
PF Factor	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*
Control Delay	*59.3*	*14.5*	*1.3*	*64.2*	*17.6*	*1.8*	*38.0*	*48.6*	*1.3*	*38.0*	*50.1*	*1.3*
Lane Group LOS	*E*	*B*	*A*	*E*	*B*	*A*	*D*	*D*	*A*	*D*	*D*	*A*
Approach Delay	*15.2*			*16.0*			*25.1*			*36.0*		
Approach LOS	*B*			*B*			*C*			*D*		
Intersection Delay	*18.1*			Intersection LOS						*B*		

SHORT REPORT

General Information		Site Information	
Analyst	*KNM*	Intersection	*SR 46 Bypass at SR 46 West*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*03/09/2010*	Jurisdiction	*Lake County*
Time Period	*Build Service Road Concept*	Analysis Year	*2012 Build*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes		2		1	1			3	1			
Lane Group		T		L	T			T	R			
Volume (vph)		167		66	584			1266	234			
% Heavy Vehicles		11		11	11			9	9			
PHF		0.95		0.95	0.95			0.95	0.95			
Pretimed/Actuated (P/A)		A		A	A			A	A			
Startup Lost Time		2.0		2.0	2.0			2.0	2.0			
Extension of Effective Green		2.0		2.0	2.0			2.0	2.0			
Arrival Type		3		3	3			3	3			
Unit Extension		3.0		3.0	3.0			3.0	3.0			
Ped/Bike/RTOR Volume	0	0		0	0		0	0	0	0	0	
Lane Width		12.0		12.0	12.0			12.0	12.0			
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour		0		0	0			0	0			
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EW Perm	02	03	04	NB Only	06	07	08
Timing	G = *40.0*	G =	G =	G =	G = *70.0*	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		176		69	615			1333	246			
Lane Group Capacity		1105		370	580			2817	1482			
v/c Ratio		0.16		0.19	1.06			0.47	0.17			
Green Ratio		0.34		0.34	0.34			0.59	1.00			
Uniform Delay d_1		27.3		27.5	39.0			13.6	0.0			
Delay Factor k		0.11		0.11	0.50			0.11	0.11			
Incremental Delay d_2		0.1		0.2	54.4			0.1	0.1			
PF Factor		1.000		1.000	1.000			1.000	0.950			
Control Delay		27.3		27.8	93.4			13.7	0.1			
Lane Group LOS		C		C	F			B	A			
Approach Delay		27.3			86.8			11.6				
Approach LOS		C			F			B				
Intersection Delay		33.8			Intersection LOS						C	

SHORT REPORT

General Information		Site Information	
Analyst	KNM	Intersection	SR 46 at CR 437
Agency or Co.	HNTB	Area Type	All other areas
Date Performed	2/7/2007	Jurisdiction	Lake County
Time Period	Build I-4 Connection @ SR 417	Analysis Year	2012

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	139	284	87	149	387	324	165	134	241	267	48	105
% Heavy Vehicles	11	11	11	11	11	11	2	2	2	2	2	2
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3	3	3	3	3	3	3	3	3	3
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	NS Perm	06	07	08
Timing	G = 15.0	G = 20.0	G =	G =	G = 20.0	G =	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25 | Cycle Length C = 70.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	146	299	92	157	407	341	174	141	254	281	51	111
Lane Group Capacity	348	489	416	348	489	416	385	532	905	355	532	905
v/c Ratio	0.42	0.61	0.22	0.45	0.83	0.82	0.45	0.27	0.28	0.79	0.10	0.12
Green Ratio	0.21	0.29	0.29	0.21	0.29	0.29	0.29	0.29	0.57	0.29	0.29	0.57
Uniform Delay d_1	23.7	21.6	19.1	23.9	23.4	23.3	20.5	19.3	7.7	23.1	18.4	6.9
Delay Factor k	0.11	0.20	0.11	0.11	0.37	0.36	0.11	0.11	0.11	0.34	0.11	0.11
Incremental Delay d_2	0.8	2.3	0.3	0.9	11.7	12.3	0.8	0.3	0.2	11.6	0.1	0.1
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control Delay	24.6	23.9	19.3	24.9	35.1	35.6	21.4	19.6	7.8	34.6	18.4	7.0
Lane Group LOS	C	C	B	C	D	D	C	B	A	C	B	A
Approach Delay	23.3			33.5			14.9			25.8		
Approach LOS	C			C			B			C		
Intersection Delay	25.6			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	3/8/10	Jurisdiction	Lake County
Time Period	Build I-4 Connection @ SR 417	Analysis Year	2012

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	0
Lane Group	L	T	R	L	T	R	L	T	R	L	TR	
Volume (vph)	3	511	176	327	676	17	240	12	178	8	15	5
% Heavy Vehicles	11	11	11	11	11	11	2	2	2	2	2	2
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Arrival Type	3	3	3	3	3	3	3	3	3	3	3	
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	WB Only	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 15.0	G = 50.0	G =	G =	G = 25.0	G =	G =	G =
	Y = 5.5	Y = 5.5	Y =	Y =	Y = 5.5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25 | Cycle Length C = 106.5

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	3	538	185	344	712	18	253	13	187	8	21	
Lane Group Capacity	317	804	683	463	1133	963	325	437	676	327	422	
v/c Ratio	0.01	0.67	0.27	0.74	0.63	0.02	0.78	0.03	0.28	0.02	0.05	
Green Ratio	0.47	0.47	0.47	0.66	0.66	0.66	0.23	0.23	0.43	0.23	0.23	
Uniform Delay d_1	15.1	21.9	17.2	12.5	10.4	6.2	38.2	31.4	19.8	31.4	31.6	
Delay Factor k	0.11	0.24	0.11	0.30	0.21	0.11	0.33	0.11	0.11	0.11	0.11	
Incremental Delay d_2	0.0	2.2	0.2	6.4	1.1	0.0	11.4	0.0	0.2	0.0	0.0	
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Control Delay	15.1	24.0	17.4	18.9	11.5	6.2	49.6	31.4	20.0	31.4	31.6	
Lane Group LOS	B	C	B	B	B	A	D	C	C	C	C	
Approach Delay	22.3			13.8			36.9			31.5		
Approach LOS	C			B			D			C		
Intersection Delay	21.3			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	3/8/10	Jurisdiction	Lake County
Time Period	Build I-4 Connection @ SR 417	Analysis Year	2012

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1			2	1				2		1
Lane Group	L	T			T	R				L		R
Volume (vph)	5	825			835	545				432		18
% Heavy Vehicles	11	11			11	11				2		2
PHF	0.95	0.95			0.95	0.95				0.95		0.95
Pretimed/Actuated (P/A)	A	A			A	A				A		A
Startup Lost Time	2.0	2.0			2.0	2.0				2.0		2.0
Extension of Effective Green	2.0	2.0			2.0	2.0				2.0		2.0
Arrival Type	3	3			3	3				3		3
Unit Extension	3.0	3.0			3.0	3.0				3.0		3.0
Ped/Bike/RTOR Volume	0	0		0	0	0	0	0		0	0	0
Lane Width	12.0	12.0			12.0	12.0				12.0		12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0			0	0				0		0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = 80.1	G =	G =	G =	G = 27.9	G =	G =	G =
	Y = 7	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 120.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	5	868			879	574				455		19
Lane Group Capacity	338	1143			2175	1455				799		368
v/c Ratio	0.01	0.76			0.40	0.39				0.57		0.05
Green Ratio	0.67	0.67			0.67	1.00				0.23		0.23
Uniform Delay d_1	6.7	13.5			9.1	0.0				40.7		35.8
Delay Factor k	0.11	0.31			0.11	0.11				0.16		0.11
Incremental Delay d_2	0.0	3.0			0.1	0.2				1.0		0.1
PF Factor	1.000	1.000			1.000	0.950				1.000		1.000
Control Delay	6.7	16.5			9.2	0.2				41.7		35.8
Lane Group LOS	A	B			A	A				D		D
Approach Delay	16.4			5.6						41.5		
Approach LOS	B			A						D		
Intersection Delay	15.1			Intersection LOS						B		

SHORT REPORT

General Information		Site Information	
Analyst	*Kacia Monts*	Intersection	*WB Frontage Rd@SR 46*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*3/8/10*	Jurisdiction	*Seminole County*
Time Period	*Build*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	*1*	*2*			*2*	*1*				*1*		*1*
Lane Group	*L*	*T*			*T*	*R*				*L*		*R*
Volume (vph)	*190*	*630*			*630*	*110*				*110*		*250*
% Heavy Vehicles	*11*	*11*			*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*		*0*	*0*	*0*	*0*	*0*		*0*	*0*	*0*
Lane Width	*12.0*	*12.0*			*12.0*	*12.0*				*12.0*		*12.0*
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*	*0*			*0*	*0*				*0*		*0*
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	EB Only	EW Perm	03	04	SB Only	06	07	08
Timing	G = *20.0*	G = *43.0*	G =	G =	G = *12.0*	G =	G =	G =
	Y = *5*	Y = *5*	Y =	Y =	Y = *5*	Y =	Y =	Y =

Duration of Analysis (hrs) = *0.25* | Cycle Length C = *90.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*200*	*663*			*663*	*116*				*116*		*263*
Lane Group Capacity	*640*	*1557*			*1557*	*970*				*217*		*598*
v/c Ratio	*0.31*	*0.43*			*0.43*	*0.12*				*0.53*		*0.44*
Green Ratio	*0.76*	*0.48*			*0.48*	*0.67*				*0.13*		*0.41*
Uniform Delay d_1	*4.1*	*15.4*			*15.4*	*5.4*				*36.4*		*19.0*
Delay Factor k	*0.11*	*0.11*			*0.11*	*0.11*				*0.14*		*0.11*
Incremental Delay d_2	*0.3*	*0.2*			*0.2*	*0.1*				*2.6*		*0.5*
PF Factor	*1.000*	*1.000*			*1.000*	*1.000*				*1.000*		*1.000*
Control Delay	*4.3*	*15.6*			*15.6*	*5.5*				*39.0*		*19.6*
Lane Group LOS	*A*	*B*			*B*	*A*				*D*		*B*
Approach Delay	*13.0*			*14.1*						*25.5*		
Approach LOS	*B*			*B*						*C*		
Intersection Delay	*15.8*			Intersection LOS						*B*		

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	3/8/10	Jurisdiction	Lake County
Time Period	Build I-4 Connection @ SR 417	Analysis Year	2012

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes						2		2			2	1
Lane Group						R		T			T	R
Volume (vph)						580		160			580	160
% Heavy Vehicles						11		11			11	11
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	0	0
Lane Width						12.0		12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour						0		0			0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	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						611		168			611	168
Lane Group Capacity						2575		2444			2444	1455
v/c Ratio						0.24		0.07			0.25	0.12
Green Ratio						1.00		0.75			0.75	1.00
Uniform Delay d_1						0.0		2.6			3.1	0.0
Delay Factor k						0.11		0.11			0.11	0.11
Incremental Delay d_2						0.0		0.0			0.1	0.0
PF Factor						0.950		1.000			1.000	0.950
Control Delay						0.0		2.6			3.1	0.0
Lane Group LOS						A		A			A	A
Approach Delay				0.0			2.6			2.5		
Approach LOS				A			A			A		
Intersection Delay	1.5			Intersection LOS						A		

SHORT REPORT

General Information		Site Information	
Analyst	CTRR	Intersection	SR 46 Existing at Wekiva Pkwy
Agency or Co.	HNTB	Area Type	All other areas
Date Performed	03/09/2010	Jurisdiction	Lake County
Time Period	Build Service Road Concept	Analysis Year	2012

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1									2		
Lane Group	L									L		
Volume (vph)	160									580		
% Heavy Vehicles	11									11		
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		0	0		0	0	
Lane Width	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		
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	02	03	04	SB Only	06	07	08
Timing	G = 19.0	G =	G =	G =	G = 51.0	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	168									611		
Lane Group Capacity	386									2013		
v/c Ratio	0.44									0.30		
Green Ratio	0.24									0.64		
Uniform Delay d_1	25.9									6.5		
Delay Factor k	0.11									0.11		
Incremental Delay d_2	0.8									0.1		
PF Factor	1.000									1.000		
Control Delay	26.7									6.6		
Lane Group LOS	C									A		
Approach Delay	26.7									6.6		
Approach LOS	C									A		
Intersection Delay	10.9			Intersection LOS						B		

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SHORT REPORT

General Information		Site Information	
Analyst	*Kacia Monts*	Intersection	*WB Frontage Rd@Old CR 46A West*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*03/03/2010*	Jurisdiction	*Seminole County*
Time Period	*Build*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	*1*	*1*			*1*	*1*				*1*		*1*
Lane Group	*L*	*T*			*T*	*R*				*L*		*R*
Volume (vph)	*22*	*278*			*310*	*5*				*6*		*50*
% Heavy Vehicles	*11*	*11*			*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*		*0*	*0*	*0*	*0*	*0*		*0*	*0*	*0*
Lane Width	*12.0*	*12.0*			*12.0*	*12.0*				*12.0*		*12.0*
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*	*0*			*0*	*0*				*0*		*0*
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = *60.0*	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 = *95.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*23*	*293*			*326*	*5*				*6*		*53*
Lane Group Capacity	*581*	*1081*			*1081*	*919*				*428*		*383*
v/c Ratio	*0.04*	*0.27*			*0.30*	*0.01*				*0.01*		*0.14*
Green Ratio	*0.63*	*0.63*			*0.63*	*0.63*				*0.26*		*0.26*
Uniform Delay d_1	*6.6*	*7.8*			*8.0*	*6.5*				*25.9*		*26.8*
Delay Factor k	*0.11*	*0.11*			*0.11*	*0.11*				*0.11*		*0.11*
Incremental Delay d_2	*0.0*	*0.1*			*0.2*	*0.0*				*0.0*		*0.2*
PF Factor	*1.000*	*1.000*			*1.000*	*1.000*				*1.000*		*1.000*
Control Delay	*6.6*	*7.9*			*8.1*	*6.5*				*25.9*		*26.9*
Lane Group LOS	*A*	*A*			*A*	*A*				*C*		*C*
Approach Delay	*7.8*			*8.1*						*26.8*		
Approach LOS	*A*			*A*						*C*		
Intersection Delay	*9.5*			Intersection LOS						*A*		

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SHORT REPORT

General Information		Site Information	
Analyst	*Kacia Monts*	Intersection	*WB Frontage Rd@OldCR46A*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*08/20/2010*	Jurisdiction	*Seminole County*
Time Period	*Build*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	7	264	13	8	287	65	22	30	48	8	18	6
% Heavy Vehicles	11	11	11	11	11	11	11	11	11	11	11	11
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	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 10.0	G = 51.0	G =	G =	G = 20.0	G =	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25 | Cycle Length C = 95.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	7	278	14	8	302	68	23	32	51	8	19	6
Lane Group Capacity	660	919	1164	680	919	1164	268	360	536	265	360	536
v/c Ratio	0.01	0.30	0.01	0.01	0.33	0.06	0.09	0.09	0.10	0.03	0.05	0.01
Green Ratio	0.69	0.54	0.80	0.69	0.54	0.80	0.21	0.21	0.37	0.21	0.21	0.37
Uniform Delay d_1	4.9	12.2	1.9	4.8	12.4	2.0	30.1	30.2	19.6	29.8	29.9	19.0
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	0.0	0.2	0.0	0.0	0.2	0.0	0.1	0.1	0.1	0.0	0.1	0.0
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control Delay	4.9	12.4	1.9	4.8	12.6	2.0	30.3	30.3	19.7	29.8	30.0	19.0
Lane Group LOS	A	B	A	A	B	A	C	C	B	C	C	B
Approach Delay	11.7			10.5			25.2			28.0		
Approach LOS	B			B			C			C		
Intersection Delay	13.6			Intersection LOS						B		

SHORT REPORT

General Information		Site Information	
Analyst	*Kacia Monts*	Intersection	*WB Frontage Rd@Wekiva Pines Bl*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*03/03/2010*	Jurisdiction	*Seminole County*
Time Period	*Build*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	*1*	*1*			*1*	*1*				*1*		*1*
Lane Group	*L*	*T*			*T*	*R*				*L*		*R*
Volume (vph)	*30*	*290*			*319*	*62*				*42*		*41*
% 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*	*0*	*0*
Lane Width	*12.0*	*12.0*			*12.0*	*12.0*				*12.0*		*12.0*
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*	*0*			*0*	*0*				*0*		*0*
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = *60.0*	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 = *95.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*32*	*305*			*336*	*65*				*44*		*43*
Lane Group Capacity	*573*	*1081*			*1081*	*919*				*466*		*417*
v/c Ratio	*0.06*	*0.28*			*0.31*	*0.07*				*0.09*		*0.10*
Green Ratio	*0.63*	*0.63*			*0.63*	*0.63*				*0.26*		*0.26*
Uniform Delay d_1	*6.7*	*7.8*			*8.0*	*6.7*				*26.4*		*26.5*
Delay Factor k	*0.11*	*0.11*			*0.11*	*0.11*				*0.11*		*0.11*
Incremental Delay d_2	*0.0*	*0.1*			*0.2*	*0.0*				*0.1*		*0.1*
PF Factor	*1.000*	*1.000*			*1.000*	*1.000*				*1.000*		*1.000*
Control Delay	*6.7*	*8.0*			*8.2*	*6.8*				*26.5*		*26.6*
Lane Group LOS	*A*	*A*			*A*	*A*				*C*		*C*
Approach Delay	*7.9*			*8.0*						*26.6*		
Approach LOS	*A*			*A*						*C*		
Intersection Delay	*9.9*			Intersection LOS						*A*		

SHORT REPORT

General Information		Site Information	
Analyst	*Kacia Monts*	Intersection	*WB Frontage Rd@Wekiva River Rd*
Agency or Co.	*HNTB*	Area Type	*All other areas*
Date Performed	*3/8/2010*	Jurisdiction	*Seminole County*
Time Period	*Build*	Analysis Year	*2012*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Lane Group	L	T	R	L	T	R	L	T	R	L	T	R
Volume (vph)	12	241	79	53	313	4	56	3	62	17	3	12
% 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	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 10.0	G = 51.0	G =	G =	G = 20.0	G =	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 95.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	13	254	83	56	329	4	59	3	65	18	3	13
Lane Group Capacity	638	919	1164	700	919	1164	296	392	583	296	392	583
v/c Ratio	0.02	0.28	0.07	0.08	0.36	0.00	0.20	0.01	0.11	0.06	0.01	0.02
Green Ratio	0.69	0.54	0.80	0.69	0.54	0.80	0.21	0.21	0.37	0.21	0.21	0.37
Uniform Delay d_1	5.0	12.0	2.0	4.9	12.6	1.9	30.9	29.7	19.8	30.0	29.7	19.1
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	0.0	0.2	0.0	0.0	0.2	0.0	0.3	0.0	0.1	0.1	0.0	0.0
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control Delay	5.0	12.1	2.0	4.9	12.9	1.9	31.2	29.7	19.8	30.1	29.7	19.1
Lane Group LOS	A	B	A	A	B	A	C	C	B	C	C	B
Approach Delay	9.5			11.6			25.4			25.9		
Approach LOS	A			B			C			C		
Intersection Delay	13.3			Intersection 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	2012 Build

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1		2				1	2			2	1
Lane Group	L		R				L	T			T	R
Volume (vph)	18		342				107	1836			547	553
% Heavy Vehicles	9		9				11	11			11	11
PHF	0.95		0.95				0.95	0.95			0.95	0.95
Pretimed/Actuated (P/A)	A		A				A	A			A	A
Startup Lost Time	2.0		2.0				2.0	2.0			2.0	2.0
Extension of Effective Green	2.0		2.0				2.0	2.0			2.0	2.0
Arrival Type	3		3				3	3			3	3
Unit Extension	3.0		3.0				3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0	40				0	0		0	0	0
Lane Width	12.0		12.0				12.0	12.0			12.0	12.0
Parking/Grade/Parking	N	0	N				N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0				0	0			0	0
Minimum Pedestrian Time		3.2						3.2			3.2	

Phasing	EB Only	02	03	04	NS Perm	06	07	08
Timing	G = 20.0	G =	G =	G =	G = 90.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =

Duration of Analysis (hrs) = 0.25 — Cycle Length C = 120.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	19		318				113	1933			576	582
Lane Group Capacity	276		2623				553	2444			2444	1455
v/c Ratio	0.07		0.12				0.20	0.79			0.24	0.40
Green Ratio	0.17		1.00				0.75	0.75			0.75	1.00
Uniform Delay d_1	42.2		0.0				4.4	9.2			4.6	0.0
Delay Factor k	0.11		0.11				0.11	0.34			0.11	0.11
Incremental Delay d_2	0.1		0.0				0.2	1.8			0.0	0.2
PF Factor	1.000		0.950				1.000	1.000			1.000	0.950
Control Delay	42.3		0.0				4.6	11.1			4.6	0.2
Lane Group LOS	D		A				A	B			A	A
Approach Delay	2.4						10.7			2.4		
Approach LOS	A						B			A		
Intersection Delay	7.2			Intersection LOS						A		

SHORT REPORT

General Information

Analyst	*KNM*
Agency or Co.	*HNTB*
Date Performed	*03/24/08*
Time Period	*Build I-4 Connection @ SR 417*

Site Information

Intersection	*US 17/92 and I-4 EB Ramps*
Area Type	*All other areas*
Jurisdiction	*Seminole County*
Analysis Year	*2012 Build*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2			1	1	1	1	2			2	1
Lane Group	L			L	T	R	L	T			T	R
Volume (vph)	863			46	33	58	211	499			459	430
% Heavy Vehicles	2			9	9	9	11	11			11	11
PHF	0.95			0.95	0.95	0.95	0.95	0.95			0.95	0.95
Pretimed/Actuated (P/A)	A			A	A	A	A	A			A	A
Startup Lost Time	2.0			2.0	2.0	2.0	2.0	2.0			2.0	2.0
Extension of Effective Green	2.0			2.0	2.0	2.0	2.0	2.0			2.0	2.0
Arrival Type	3			3	3	3	3	3			3	3
Unit Extension	3.0			3.0	3.0	3.0	3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0		0	0	0	0	0		0	0	0
Lane Width	12.0			12.0	12.0	12.0	12.0	12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0			0	0	0	0	0			0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	WB Only	03	04	NB Only	NS Perm	07	08
Timing	G = 40.0	G = 15.0	G =	G =	G = 20.0	G = 30.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 0	Y = 5	Y =	Y =

Duration of Analysis (hrs) = 0.25 — Cycle Length C = 120.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	908			48	35	61	222	525			483	453
Lane Group Capacity	1146			828	218	864	409	1358			815	1152
v/c Ratio	0.79			0.06	0.16	0.07	0.54	0.39			0.59	0.39
Green Ratio	0.33			0.50	0.13	0.58	0.46	0.42			0.25	0.79
Uniform Delay d_1	36.2			15.4	46.9	10.9	21.6	24.3			39.6	3.8
Delay Factor k	0.34			0.11	0.11	0.11	0.14	0.11			0.18	0.11
Incremental Delay d_2	3.9			0.0	0.3	0.0	1.5	0.2			1.2	0.2
PF Factor	1.000			1.000	1.000	1.000	1.000	1.000			1.000	1.000
Control Delay	40.1			15.5	47.2	10.9	23.1	24.5			40.8	4.0
Lane Group LOS	D			B	D	B	C	C			D	A
Approach Delay	40.1			21.3			24.1			23.0		
Approach LOS	D			C			C			C		
Intersection Delay	28.9			Intersection LOS						C		

SHORT REPORT

General Information		Site Information	
Analyst	KNM	Intersection	CR 15 @ Orange Blvd
Agency or Co.	HNTB	Area Type	All other areas
Date Performed	3/24/08	Jurisdiction	Seminole County
Time Period	Build I-4 Connection @ SR 417	Analysis Year	2012 Build

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1		1				1	2			2	1
Lane Group	L		R				L	T			T	R
Volume (vph)	356		64				72	828			386	153
% Heavy Vehicles	2		2				2	2			2	2
PHF	0.95		0.95				0.95	0.95			0.95	0.95
Pretimed/Actuated (P/A)	A		A				A	A			A	A
Startup Lost Time	2.0		2.0				2.0	2.0			2.0	2.0
Extension of Effective Green	2.0		2.0				2.0	2.0			2.0	2.0
Arrival Type	3		3				3	3			3	3
Unit Extension	3.0		3.0				3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0	40				0	0		0	0	0
Lane Width	12.0		12.0				12.0	12.0			12.0	12.0
Parking/Grade/Parking	N	0	N				N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0				0	0			0	0
Minimum Pedestrian Time		3.2						3.2			3.2	

Phasing	EB Only	02	03	04	NS Perm	06	07	08
Timing	G = 30.0	G =	G =	G =	G = 60.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 100.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	375		25				76	872			406	161
Lane Group Capacity	531		1583				571	2128			2128	950
v/c Ratio	0.71		0.02				0.13	0.41			0.19	0.17
Green Ratio	0.30		1.00				0.60	0.60			0.60	0.60
Uniform Delay d_1	31.1		0.0				8.7	10.6			9.0	8.9
Delay Factor k	0.27		0.11				0.11	0.11			0.11	0.11
Incremental Delay d_2	4.3		0.0				0.1	0.1			0.0	0.1
PF Factor	1.000		0.950				1.000	1.000			1.000	1.000
Control Delay	35.4		0.0				8.8	10.7			9.1	9.0
Lane Group LOS	D		A				A	B			A	A
Approach Delay	33.2						10.6			9.1		
Approach LOS	C						B			A		
Intersection Delay	14.8			Intersection LOS						B		

HCS+: Signalized Intersections Release 5.4

Analyst: KNM
Agency: HNTB
Date: 6/28/2010
Period: Build I-4 Connection @ SR 417
Project ID: Wekiva Parkway Project Development and Environment Study
E/W St: I-4 EB Ramps/CR 15

Inter.: US 17/92 at I-4 EB Ramps/CR 15
Area Type: All other areas
Jurisd: Seminole County
Year : 2012 Build
N/S St: US 17/92

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	0	1	0	1	0	1	2	0	0	2	0
LGConfig	L		R		LT		L	T			T	
Volume	863		96	46	33		211	499			459	
Lane Width	12.0		12.0		12.0		12.0	12.0			12.0	
RTOR Vol			0									

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A	A		
Thru					Thru	A	A		
Right	A	A			Right				
Peds					Peds				
WB Left		A			SB Left				
Thru		A			Thru		A		
Right					Right				
Peds					Peds				
NB Right					EB Right		A		
SB Right					WB Right				
Green	51.0	10.0				14.0	30.0		
Yellow	4.0	4.0				0.0	4.0		
All Red	1.0	1.0				0.0	1.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	1461	3437	0.62	0.43	27.8	C		
							25.2	C
R	1332	1583	0.08	0.84	1.6	A		
Westbound								
LT	141	1694	0.59	0.08	59.3	E	59.3	E
Northbound								
L	328	1626	0.68	0.41	31.1	C		
T	1195	3259	0.44	0.37	28.9	C	29.6	C
Southbound								
T	815	3259	0.59	0.25	40.8	D	40.8	D

Intersection Delay = 31.1 (sec/veh) Intersection LOS = C

HCS+: Signalized Intersections Release 5.4

Analyst: KNM
Agency: HNTB
Date: 6/28/10
Period: Build I-4 Connection @ SR 417
Project ID: Wekiva Parkway Project Development and Environment Study
E/W St: I-4 WB Ramps

Inter.: US 17/92 and I-4 WB Ramps
Area Type: All other areas
Jurisd: Seminole County
Year : 2012 Build
N/S St: US 17/92

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	1	0	1	0	1	2	0	1	2	1
LGConfig		LT	R		LTR		L	TR		L	T	R
Volume	18	1	341	2	1	2	106	1834	3	1	546	553
Lane Width		12.0	12.0		12.0		12.0	12.0		12.0	12.0	12.0
RTOR Vol			40			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A	A		
Thru	A				Thru	A	A		
Right	A				Right	A	A		
Peds					Peds				
WB Left	A				SB Left		A		
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
NB Right					EB Right	A			
SB Right	A				WB Right				
Green	10.0					21.0	79.0		
Yellow	4.0					0.0	4.0		
All Red	1.0					0.0	1.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LT	108	1290	0.19	0.08	52.0	D	43.3	D
R	445	1482	0.71	0.30	42.7	D		
Westbound								
LTR	126	1507	0.04	0.08	50.7	D	50.7	D
Northbound								
L	756	1626	0.15	0.88	1.4	A		
TR	2715	3258	0.71	0.83	5.0	A	4.8	A
Southbound								
L	126	191	0.01	0.66	7.1	A		
T	2146	3259	0.27	0.66	8.6	A	6.8	A
R	1140	1455	0.51	0.78	5.1	A		

Intersection Delay = 9.2 (sec/veh) Intersection LOS = A

HCS+: Signalized Intersections Release 5.4

Analyst: KNM
Agency: HNTB
Date: 6/28/2010
Period: Build I-4 Connection @ SR 417
Project ID: Wekiva Parkway Project Development and Environment Study
E/W St: I-4 EB Ramps/CR 15

Inter.: US 17/92 at I-4 EB Ramps/CR 15
Area Type: All other areas
Jurisd: Seminole County
Year : 2022 Build
N/S St: US 17/92

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	0	1	0	1	0	1	2	0	0	2	0
LGConfig	L		R		LT		L	T			T	
Volume	946		106	65	47		247	583			571	
Lane Width	12.0		12.0		12.0		12.0	12.0			12.0	
RTOR Vol			0									

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A	A		
	Thru						Thru	A	A		
	Right	A	A				Right				
	Peds						Peds				
WB	Left		A			SB	Left				
	Thru		A				Thru		A		
	Right						Right				
	Peds						Peds				
NB	Right					EB	Right		A		
SB	Right					WB	Right				
Green		41.0	12.0					13.0	39.0		
Yellow		4.0	4.0					0.0	4.0		
All Red		1.0	1.0					0.0	1.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	1174	3437	0.85	0.34	42.6	D		
							38.5	D
R	1346	1583	0.08	0.85	1.5	A		
Westbound								
LT	169	1694	0.69	0.10	63.7	E	63.7	E
Northbound								
L	338	1626	0.77	0.48	31.9	C		
T	1412	3259	0.43	0.43	24.0	C	26.3	C
Southbound								
T	1059	3259	0.57	0.32	34.2	C	34.2	C

Intersection Delay = 34.7 (sec/veh) Intersection LOS = C

HCS+: Signalized Intersections Release 5.4

Analyst: KNM
Agency: HNTB
Date: 6/28/10
Period: Build I-4 Connection @ SR 417
Project ID: Wekiva Parkway Project Development and Environment Study
E/W St: I-4 WB Ramps

Inter.: US 17/92 and I-4 WB Ramps
Area Type: All other areas
Jurisd: Seminole County
Year : 2022 Build
N/S St: US 17/92

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	1	0	1	0	1	2	0	1	2	1
LGConfig		LT	R		LTR		L	TR		L	T	R
Volume	25	1	474	2	1	2	281	2073	3	1	631	658
Lane Width		12.0	12.0		12.0		12.0	12.0		12.0	12.0	12.0
RTOR Vol			40			0			0			0

Duration : 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A	A		
Thru	A					Thru	A	A		
Right	A					Right	A	A		
Peds						Peds				
WB Left	A				SB	Left		A		
Thru	A					Thru		A		
Right	A					Right		A		
Peds						Peds				
NB Right					EB	Right	A			
SB Right	A				WB	Right				
Green	10.0						30.0	70.0		
Yellow	4.0						0.0	4.0		
All Red	1.0						0.0	1.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LT	106	1274	0.25	0.08	52.8	D	44.0	D
R	556	1482	0.82	0.38	43.5	D		
Westbound								
LTR	125	1504	0.04	0.08	50.7	D	50.7	D
Northbound								
L	766	1626	0.39	0.88	2.5	A		
TR	2715	3258	0.80	0.83	6.9	A	6.4	A
Southbound								
L	86	147	0.01	0.58	10.5	B		
T	1901	3259	0.35	0.58	13.2	B	12.3	B
R	1031	1455	0.67	0.71	11.5	B		

Intersection Delay = 12.5 (sec/veh) Intersection LOS = B

HCS+: Signalized Intersections Release 5.4

Analyst: KNM
Agency: HNTB
Date: 6/28/2010
Period: Build I-4 Connection @ SR 417
Project ID: Wekiva Parkway Project Development and Environment Study
E/W St: I-4 EB Ramps/CR 15

Inter.: US 17/92 at I-4 EB Ramps/CR 15
Area Type: All other areas
Jurisd: Seminole County
Year : 2032 Build
N/S St: US 17/92

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	0	1	0	1	0	1	2	0	0	2	0
LGConfig	L		R		LT		L	T			T	
Volume	976		120	85	61		285	675			701	
Lane Width	12.0		12.0		12.0		12.0	12.0			12.0	
RTOR Vol			0									

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A	A		
	Thru						Thru	A	A		
	Right	A	A				Right				
	Peds						Peds				
WB	Left		A			SB	Left				
	Thru		A				Thru		A		
	Right						Right				
	Peds						Peds				
NB	Right					EB	Right		A		
SB	Right					WB	Right				
Green		41.0	13.0					18.0	33.0		
Yellow		4.0	4.0					0.0	4.0		
All Red		1.0	1.0					0.0	1.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	1174	3437	0.87	0.34	44.7	D		
							40.1	D
R	1280	1583	0.10	0.81	2.4	A		
Westbound								
LT	184	1694	0.83	0.11	78.8	E	78.8	E
Northbound								
L	319	1626	0.94	0.47	65.5	E		
T	1385	3259	0.51	0.43	25.7	C	37.5	D
Southbound								
T	896	3259	0.82	0.28	47.1	D	47.1	D

Intersection Delay = 42.9 (sec/veh) Intersection LOS = D

HCS+: Signalized Intersections Release 5.4

Analyst: KNM
Agency: HNTB
Date: 6/28/10
Period: Build I-4 Connection @ SR 417
Project ID: Wekiva Parkway Project Development and Environment Study
E/W St: I-4 WB Ramps

Inter.: US 17/92 and I-4 WB Ramps
Area Type: All other areas
Jurisd: Seminole County
Year : 2032 Build
N/S St: US 17/92

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	1	0	1	0	1	2	0	1	2	1
LGConfig		LT	R		LTR		L	TR		L	T	R
Volume	33	1	616	2	1	2	470	2252	3	1	740	749
Lane Width		12.0	12.0		12.0		12.0	12.0		12.0	12.0	12.0
RTOR Vol			40			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A	A		
	Thru	A					Thru	A	A		
	Right	A					Right	A	A		
	Peds						Peds				
WB	Left	A				SB	Left		A		
	Thru	A					Thru		A		
	Right	A					Right		A		
	Peds						Peds				
NB	Right					EB	Right	A			
SB	Right	A				WB	Right				
Green		10.0						34.0	66.0		
Yellow		4.0						0.0	4.0		
All Red		1.0						0.0	1.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LT	106	1271	0.34	0.08	53.8	D	71.4	E
R	605	1482	1.00	0.41	72.5	E		
Westbound								
LTR	125	1499	0.04	0.08	50.7	D	50.7	D
Northbound								
L	742	1626	0.67	0.88	9.5	A		
TR	2715	3258	0.87	0.83	9.6	A	9.6	A
Southbound								
L	61	110	0.02	0.55	12.4	B		
T	1792	3259	0.43	0.55	16.1	B	17.4	B
R	982	1455	0.80	0.68	18.7	B		

Intersection Delay = 19.9 (sec/veh) Intersection LOS = B

HCS+: Signalized Intersections Release 5.4

Analyst: KNM
Agency: HNTB
Date: 6/28/10
Period: Build I-4 Connection @ SR 417
Project ID: Wekiva Parkway Project Development and Environment Study
E/W St: I-4 EB Ramps/CR 15

Inter.: US 17/92 at I-4 EB Ramps/CR 15
Area Type: All other areas
Jurisd: Seminole County
Year : 2012 No Build
N/S St: US 17/92

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	0	1	0	1	0	1	2	0	0	2	0
LGConfig	L		R		LT		L	T			T	
Volume	880		92	43	31		199	471			417	
Lane Width	12.0		12.0		12.0		12.0	12.0			12.0	
RTOR Vol			0									

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A	A		
Thru						Thru	A	A		
Right	A	A				Right				
Peds						Peds				
WB Left		A			SB	Left				
Thru		A				Thru		A		
Right						Right				
Peds						Peds				
NB Right					EB	Right		A		
SB Right					WB	Right				
Green	44.0	10.0					11.0	40.0		
Yellow	4.0	4.0					0.0	4.0		
All Red	1.0	1.0					0.0	1.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	1260	3437	0.73	0.37	35.2	D		
							32.0	C
R	1372	1583	0.07	0.87	1.2	A		
Westbound								
LT	141	1694	0.55	0.08	57.5	E	57.5	E
Northbound								
L	385	1626	0.54	0.47	21.9	C		
T	1385	3259	0.36	0.43	23.6	C	23.1	C
Southbound								
T	1086	3259	0.40	0.33	31.1	C	31.1	C

Intersection Delay = 29.9 (sec/veh) Intersection LOS = C

HCS+: Signalized Intersections Release 5.4

Analyst: KNM
Agency: HNTB
Date: 6/28/10
Period: Build I-4 Connection @ SR 417
Project ID: Wekiva Parkway Project Development and Environment Study
E/W St: I-4 WB Ramps

Inter.: US 17/92 and I-4 WB Ramps
Area Type: All other areas
Jurisd: Seminole County
Year : 2012 No Build
N/S St: US 17/92

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	1	0	1	0	1	2	0	1	2	1
LGConfig		LT	R		LTR		L	TR		L	T	R
Volume	15	1	284	2	1	2	96	1798	3	1	516	523
Lane Width		12.0	12.0		12.0		12.0	12.0		12.0	12.0	12.0
RTOR Vol			40			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A	A		
	Thru	A					Thru	A	A		
	Right	A					Right	A	A		
	Peds						Peds				
WB	Left	A				SB	Left		A		
	Thru	A					Thru		A		
	Right	A					Right		A		
	Peds						Peds				
NB	Right					EB	Right	A			
SB	Right	A				WB	Right				
Green		10.0						24.0	76.0		
Yellow		4.0						0.0	4.0		
All Red		1.0						0.0	1.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LT	109	1310	0.16	0.08	51.8	D	35.3	D
R	482	1482	0.53	0.32	34.2	C		
Westbound								
LTR	126	1508	0.04	0.08	50.7	D	50.7	D
Northbound								
L	791	1626	0.13	0.88	1.4	A		
TR	2715	3258	0.70	0.83	4.8	A	4.6	A
Southbound								
L	126	199	0.01	0.63	8.1	A		
T	2064	3259	0.26	0.63	9.7	A	7.9	A
R	1103	1455	0.50	0.76	6.0	A		

Intersection Delay = 8.2 (sec/veh) Intersection LOS = A

HCS+: Signalized Intersections Release 5.4

Analyst: KNM
Agency: HNTB
Date: 6/28/10
Period: Build I-4 Connection @ SR 417
Project ID: Wekiva Parkway Project Development and Environment Study
E/W St: I-4 EB Ramps/CR 15

Inter.: US 17/92 at I-4 EB Ramps/CR 15
Area Type: All other areas
Jurisd: Seminole County
Year : 2022 No Build
N/S St: US 17/92

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	0	1	0	1	0	1	2	0	0	2	0
LGConfig	L		R		LT		L	T			T	
Volume	953		109	58	41		220	520			469	
Lane Width	12.0		12.0		12.0		12.0	12.0			12.0	
RTOR Vol			0									

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A	A		
	Thru						Thru	A	A		
	Right	A	A				Right				
	Peds						Peds				
WB	Left		A			SB	Left				
	Thru		A				Thru		A		
	Right						Right				
	Peds						Peds				
NB	Right					EB	Right		A		
SB	Right					WB	Right				
Green		41.0	11.0					13.0	40.0		
Yellow		4.0	4.0					0.0	4.0		
All Red		1.0	1.0					0.0	1.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	1174	3437	0.85	0.34	43.1	D		
							38.8	D
R	1346	1583	0.09	0.85	1.5	A		
Westbound								
LT	155	1693	0.67	0.09	63.5	E	63.5	E
Northbound								
L	388	1626	0.60	0.48	22.3	C		
T	1439	3259	0.38	0.44	22.6	C	22.5	C
Southbound								
T	1086	3259	0.45	0.33	31.7	C	31.7	C

Intersection Delay = 33.3 (sec/veh) Intersection LOS = C

HCS+: Signalized Intersections Release 5.4

Analyst: KNM
Agency: HNTB
Date: 6/28/10
Period: Build I-4 Connection @ SR 417
Project ID: Wekiva Parkway Project Development and Environment Study
E/W St: I-4 WB Ramps

Inter.: US 17/92 and I-4 WB Ramps
Area Type: All other areas
Jurisd: Seminole County
Year : 2022 No Build
N/S St: US 17/92

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	1	0	1	0	1	2	0	1	2	1
LGConfig		LT	R		LTR		L	TR		L	T	R
Volume	18	1	341	2	1	2	248	1953	3	1	558	581
Lane Width		12.0	12.0		12.0		12.0	12.0		12.0	12.0	12.0
RTOR Vol			40			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A	A		
Thru	A				Thru	A	A		
Right	A				Right	A	A		
Peds					Peds				
WB Left	A				SB Left		A		
Thru	A				Thru		A		
Right	A				Right		A		
Peds					Peds				
NB Right					EB Right	A			
SB Right	A				WB Right				
Green	10.0					24.0	76.0		
Yellow	4.0					0.0	4.0		
All Red	1.0					0.0	1.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LT	108	1290	0.19	0.08	52.0	D	38.9	D
R	482	1482	0.66	0.32	38.0	D		
Westbound								
LTR	126	1507	0.04	0.08	50.7	D	50.7	D
Northbound								
L	767	1626	0.34	0.88	1.9	A		
TR	2715	3258	0.76	0.83	5.8	A	5.4	A
Southbound								
L	104	165	0.01	0.63	8.2	A		
T	2064	3259	0.28	0.63	9.9	A	8.3	A
R	1103	1455	0.55	0.76	6.7	A		

Intersection Delay = 9.3 (sec/veh) Intersection LOS = A

HCS+: Signalized Intersections Release 5.4

Analyst: KNM
Agency: HNTB
Date: 6/28/10
Period: Build I-4 Connection @ SR 417
Project ID: Wekiva Parkway Project Development and Environment Study
E/W St: I-4 EB Ramps/CR 15

Inter.: US 17/92 at I-4 EB Ramps/CR 15
Area Type: All other areas
Jurisd: Seminole County
Year : 2032 No Build
N/S St: US 17/92

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	0	1	0	1	0	1	2	0	0	2	0
LGConfig	L		R		LT		L	T			T	
Volume	1057		118	73	52		238	562			527	
Lane Width	12.0		12.0		12.0		12.0	12.0			12.0	
RTOR Vol			0									

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A	A		
Thru					Thru	A	A		
Right	A	A			Right				
Peds					Peds				
WB Left		A			SB Left				
Thru		A			Thru		A		
Right					Right				
Peds					Peds				
NB Right					EB Right		A		
SB Right					WB Right				
Green	44.0	14.0				14.0	33.0		
Yellow	4.0	4.0				0.0	4.0		
All Red	1.0	1.0				0.0	1.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	1260	3437	0.88	0.37	43.3	D		
							39.1	D
R	1332	1583	0.09	0.84	1.7	A		
Westbound								
LT	198	1694	0.67	0.12	59.0	E	59.0	E
Northbound								
L	324	1626	0.77	0.43	35.7	D		
T	1276	3259	0.46	0.39	27.4	C	29.9	C
Southbound								
T	896	3259	0.62	0.28	39.3	D	39.3	D

Intersection Delay = 37.3 (sec/veh) Intersection LOS = D

HCS+: Signalized Intersections Release 5.4

Analyst: KNM
Agency: HNTB
Date: 6/28/10
Period: Build I-4 Connection @ SR 417
Project ID: Wekiva Parkway Project Development and Environment Study
E/W St: I-4 WB Ramps

Inter.: US 17/92 and I-4 WB Ramps
Area Type: All other areas
Jurisd: Seminole County
Year : 2032 No Build
N/S St: US 17/92

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	1	0	1	0	1	2	0	1	2	1
LGConfig		LT	R		LTR		L	TR		L	T	R
Volume	22	1	417	2	1	2	412	2119	3	1	602	627
Lane Width		12.0	12.0		12.0		12.0	12.0		12.0	12.0	12.0
RTOR Vol			40			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A	A		
	Thru	A					Thru	A	A		
	Right	A					Right	A	A		
	Peds						Peds				
WB	Left	A				SB	Left		A		
	Thru	A					Thru		A		
	Right	A					Right		A		
	Peds						Peds				
NB	Right					EB	Right	A			
SB	Right	A				WB	Right				
Green		10.0						27.0	73.0		
Yellow		4.0						0.0	4.0		
All Red		1.0						0.0	1.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LT	106	1276	0.23	0.08	52.5	D	42.0	D
R	519	1482	0.76	0.35	41.3	D		
Westbound								
LTR	125	1505	0.04	0.08	50.7	D	50.7	D
Northbound								
L	761	1626	0.57	0.88	3.5	A		
TR	2715	3258	0.82	0.83	7.5	A	6.8	A
Southbound								
L	79	130	0.01	0.61	9.3	A		
T	1983	3259	0.32	0.61	11.5	B	10.2	B
R	1067	1455	0.62	0.73	8.9	A		

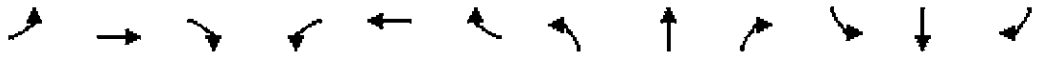
Intersection Delay = 11.2 (sec/veh) Intersection LOS = B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	108	584	51	293	624	365	141	604	1121	187	349	79
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
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	635	55	318	678	397	153	657	1218	203	379	86
RTOR Reduction (vph)	0	0	45	0	0	134	0	0	4	0	0	48
Lane Group Flow (vph)	117	635	10	318	678	263	153	657	1214	203	379	38
Turn Type	Prot		Perm	Prot		pt+ov	Prot		pt+ov	Prot		Perm
Protected Phases	5	2		1	6	67	3	8	81	7	4	
Permitted Phases			2									4
Actuated Green, G (s)	4.5	18.0	18.0	7.5	21.0	32.0	13.0	54.0	68.0	4.5	45.5	45.5
Effective Green, g (s)	7.0	20.5	20.5	10.0	23.5	34.5	15.5	56.5	70.5	7.0	48.0	48.0
Actuated g/C Ratio	0.06	0.19	0.19	0.09	0.21	0.31	0.14	0.51	0.64	0.06	0.44	0.44
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)	113	660	295	312	756	496	249	1818	1015	218	1544	691
v/s Ratio Prot	0.07	0.18		0.09	c0.19	0.17	0.09	0.19	c0.77	c0.06	0.11	
v/s Ratio Perm			0.01									0.02
v/c Ratio	1.04	0.96	0.03	1.02	0.90	0.53	0.61	0.36	1.20	0.93	0.25	0.05
Uniform Delay, d1	51.5	44.4	36.6	50.0	42.1	31.1	44.4	16.0	19.8	51.3	19.6	17.9
Progression Factor	1.00	1.00	1.00	0.81	0.61	0.87	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	94.5	26.9	0.2	49.0	12.2	0.8	4.4	0.6	98.0	42.1	0.4	0.1
Delay (s)	146.0	71.2	36.9	89.6	38.0	28.0	48.9	16.5	117.7	93.3	19.9	18.0
Level of Service	F	E	D	F	D	C	D	B	F	F	B	B
Approach Delay (s)		79.7			46.9			79.8			42.0	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM Average Control Delay	65.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

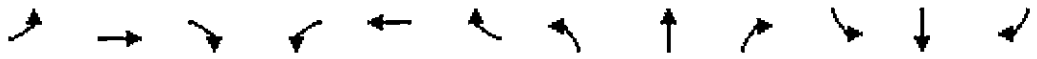
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	1501	451	499	1326	62	119	33	318	248	240	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. 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
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	1632	490	542	1441	67	129	36	346	270	261	32
RTOR Reduction (vph)	0	0	114	0	0	26	0	0	44	0	0	27
Lane Group Flow (vph)	30	1632	376	542	1441	41	81	84	302	270	261	5
Turn Type	Prot		Perm	Prot		Perm	Split		pt+ov	Split		Perm
Protected Phases	5	2		1	6		8	8	8 1	4	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	2.8	50.1	50.1	16.9	64.2	64.2	4.5	4.5	26.9	15.5	15.5	15.5
Effective Green, g (s)	4.3	52.6	52.6	18.4	66.7	66.7	6.0	6.0	28.4	17.0	17.0	17.0
Actuated g/C Ratio	0.04	0.48	0.48	0.17	0.61	0.61	0.05	0.05	0.26	0.15	0.15	0.15
Clearance Time (s)	5.5	6.5	6.5	5.5	6.5	6.5	5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	69	1692	757	574	2146	960	92	94	720	274	288	245
v/s Ratio Prot	0.02	c0.46		c0.16	0.41		0.05	c0.05	0.11	c0.15	0.14	
v/s Ratio Perm			0.24			0.03						0.00
v/c Ratio	0.43	0.96	0.50	0.94	0.67	0.04	0.88	0.89	0.42	0.99	0.91	0.02
Uniform Delay, d1	51.7	27.8	19.6	45.3	14.4	8.7	51.6	51.7	33.9	46.4	45.7	39.4
Progression Factor	0.94	1.06	1.11	1.09	0.41	0.36	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	2.3	0.2	16.1	0.9	0.0	65.2	67.0	0.4	49.9	29.8	0.0
Delay (s)	48.8	31.6	21.9	65.4	6.9	3.2	116.8	118.7	34.3	96.3	75.5	39.5
Level of Service	D	C	C	E	A	A	F	F	C	F	E	D
Approach Delay (s)		29.7			22.2			61.3			83.4	
Approach LOS		C			C			E			F	

Intersection Summary			
HCM Average Control Delay	35.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	246	1821	0	0	1477	300	410	0	780	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0		4.0			
Lane Util. Factor	0.97	0.95			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			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	267	1979	0	0	1605	326	446	0	848	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	139	0	0	17	0	0	0
Lane Group Flow (vph)	267	1979	0	0	1605	187	446	0	831	0	0	0
Turn Type	Prot					Perm	Prot		custom			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	8.5	65.0			51.0	51.0	32.5		32.5			
Effective Green, g (s)	10.0	68.0			54.0	54.0	34.0		34.0			
Actuated g/C Ratio	0.09	0.62			0.49	0.49	0.31		0.31			
Clearance Time (s)	5.5	7.0			7.0	7.0	5.5		5.5			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	312	2188			1737	777	1061		861			
v/s Ratio Prot	0.08	c0.56			0.45		0.13					
v/s Ratio Perm						0.12			c0.30			
v/c Ratio	0.86	0.90			0.92	0.24	0.42		0.97			
Uniform Delay, d1	49.3	18.2			26.1	16.2	30.2		37.4			
Progression Factor	1.19	0.65			0.22	0.00	1.00		1.00			
Incremental Delay, d2	9.8	3.2			3.5	0.2	0.3		22.4			
Delay (s)	68.6	14.9			9.2	0.2	30.4		59.9			
Level of Service	E	B			A	A	C		E			
Approach Delay (s)		21.3			7.6			49.7			0.0	
Approach LOS		C			A			D			A	

Intersection Summary			
HCM Average Control Delay	23.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	841	1178	581	276	577	106	808	787	395	105	618	392
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
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	914	1280	632	300	627	115	878	855	429	114	672	426
RTOR Reduction (vph)	0	0	322	0	0	95	0	0	141	0	0	343
Lane Group Flow (vph)	914	1280	310	300	627	20	878	855	288	114	672	83
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)	27.5	36.5	36.5	7.5	16.5	16.5	25.5	34.5	34.5	7.5	16.5	16.5
Effective Green, g (s)	29.0	39.0	39.0	9.0	19.0	19.0	27.0	37.0	37.0	9.0	19.0	19.0
Actuated g/C Ratio	0.26	0.35	0.35	0.08	0.17	0.17	0.25	0.34	0.34	0.08	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)	905	1255	561	281	611	273	843	1190	532	145	611	273
v/s Ratio Prot	c0.27	c0.36		0.09	0.18		c0.26	0.24		0.06	c0.19	
v/s Ratio Perm			0.20			0.01			0.18			0.05
v/c Ratio	1.01	1.02	0.55	1.07	1.03	0.07	1.04	0.72	0.54	0.79	1.10	0.30
Uniform Delay, d1	40.5	35.5	28.5	50.5	45.5	38.1	41.5	31.9	29.6	49.6	45.5	39.7
Progression Factor	1.03	1.07	1.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.8	20.8	1.5	72.7	43.2	0.5	42.3	2.1	1.1	23.9	66.8	0.6
Delay (s)	62.4	58.7	47.1	123.2	88.7	38.6	83.8	34.0	30.8	73.4	112.3	40.3
Level of Service	E	E	D	F	F	D	F	C	C	E	F	D
Approach Delay (s)		57.3			93.1			53.6			83.3	
Approach LOS		E			F			D			F	

Intersection Summary			
HCM Average Control Delay	65.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	115	0	205	0	0	0	0	543	405	135	507	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0					4.0	4.0	4.0	4.0	
Lane Util. Factor	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	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	0	223	0	0	0	0	590	440	147	551	0
RTOR Reduction (vph)	0	0	192	0	0	0	0	0	297	0	0	0
Lane Group Flow (vph)	125	0	31	0	0	0	0	590	143	147	551	0
Turn Type	Prot		custom						Perm	Prot		
Protected Phases	8							2		1	6	
Permitted Phases			8						2			
Actuated Green, G (s)	11.0		11.0					23.5	23.5	28.5	58.5	
Effective Green, g (s)	11.0		11.0					26.0	26.0	31.0	61.0	
Actuated g/C Ratio	0.14		0.14					0.32	0.32	0.39	0.76	
Clearance Time (s)	4.0		4.0					6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	243		383					1150	514	1330	2698	
v/s Ratio Prot	c0.07							c0.17		0.04	c0.16	
v/s Ratio Perm			0.01						0.09			
v/c Ratio	0.51		0.08					0.51	0.28	0.11	0.20	
Uniform Delay, d1	32.0		30.1					21.9	20.0	15.7	2.7	
Progression Factor	1.00		1.00					1.00	1.00	1.17	0.16	
Incremental Delay, d2	1.8		0.1					1.6	1.3	0.2	0.2	
Delay (s)	33.9		30.2					23.5	21.4	18.5	0.6	
Level of Service	C		C					C	C	B	A	
Approach Delay (s)		31.5			0.0			22.6			4.4	
Approach LOS		C			A			C			A	

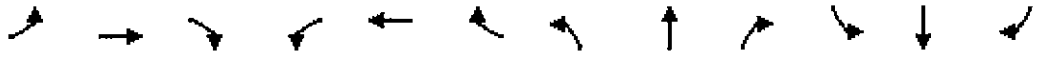
Intersection Summary			
HCM Average Control Delay	18.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Volume (vph)	291	367	0	0	345	29	297	0	253	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		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		
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)	316	399	0	0	375	32	323	0	275	0	0
RTOR Reduction (vph)	0	0	0	0	0	20	0	0	196	0	0
Lane Group Flow (vph)	316	399	0	0	375	12	323	0	79	0	0
Turn Type	Prot					Perm	Prot		custom		
Protected Phases	5	2			6		4				
Permitted Phases						6			4		
Actuated Green, G (s)	12.6	46.5			27.4	27.4	20.5		20.5		
Effective Green, g (s)	15.1	49.0			29.9	29.9	23.0		23.0		
Actuated g/C Ratio	0.19	0.61			0.37	0.37	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)	648	2168			1323	592	987		455		
v/s Ratio Prot	c0.09	0.11			c0.11		c0.09				
v/s Ratio Perm						0.01			0.05		
v/c Ratio	0.49	0.18			0.28	0.02	0.33		0.17		
Uniform Delay, d1	29.0	6.8			17.5	15.8	22.4		21.4		
Progression Factor	0.52	0.17			0.67	0.49	1.02		1.00		
Incremental Delay, d2	0.5	0.2			0.5	0.1	0.9		0.8		
Delay (s)	15.5	1.3			12.3	7.9	23.8		22.2		
Level of Service	B	A			B	A	C		C		
Approach Delay (s)		7.6			12.0			23.1		0.0	
Approach LOS		A			B			C		A	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

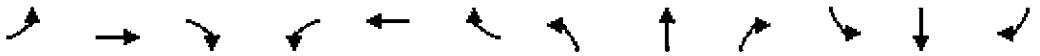
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	71	149	694	546	244	611
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	3539	1583	1770	3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	77	162	754	593	265	664
RTOR Reduction (vph)	0	139	0	317	0	0
Lane Group Flow (vph)	77	23	754	276	265	664
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	8.8	8.8	34.7	34.7	17.0	58.2
Effective Green, g (s)	11.3	11.3	37.2	37.2	19.5	60.7
Actuated g/C Ratio	0.14	0.14	0.47	0.47	0.24	0.76
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	250	224	1646	736	431	2685
v/s Ratio Prot	c0.04		c0.21		c0.15	0.19
v/s Ratio Perm		0.01		0.17		
v/c Ratio	0.31	0.10	0.46	0.37	0.61	0.25
Uniform Delay, d1	30.8	29.9	14.5	13.9	26.9	2.9
Progression Factor	1.00	1.05	0.54	2.58	0.71	0.35
Incremental Delay, d2	0.7	0.2	0.8	1.3	2.4	0.2
Delay (s)	31.6	31.6	8.7	37.0	21.5	1.2
Level of Service	C	C	A	D	C	A
Approach Delay (s)	31.6		21.2			7.0
Approach LOS	C		C			A

Intersection Summary			
HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	11	67	199	22	639	66	678	99	110	589	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.86	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1522	1504	3433	3539	1583	3433	3539	1583
Flt Permitted	0.28	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)	517	1863	1583	1093	1522	1504	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	12	73	216	24	695	72	737	108	120	640	24
RTOR Reduction (vph)	0	0	60	0	243	243	0	0	67	0	0	15
Lane Group Flow (vph)	25	12	13	216	122	111	72	737	41	120	640	9
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	12.7	10.9	10.9	22.1	15.6	15.6	5.1	27.1	27.1	5.5	27.5	27.5
Effective Green, g (s)	19.7	14.4	14.4	28.4	19.1	19.1	8.6	30.6	30.6	9.0	31.0	31.0
Actuated g/C Ratio	0.25	0.18	0.18	0.35	0.24	0.24	0.11	0.38	0.38	0.11	0.39	0.39
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	210	335	285	473	363	359	369	1354	605	386	1371	613
v/s Ratio Prot	0.01	0.01		c0.06	0.08		0.02	c0.21		c0.03	0.18	
v/s Ratio Perm	0.02		0.01	c0.11		0.07			0.03			0.01
v/c Ratio	0.12	0.04	0.05	0.46	0.34	0.31	0.20	0.54	0.07	0.31	0.47	0.02
Uniform Delay, d1	23.4	27.1	27.1	19.1	25.2	25.0	32.5	19.3	15.7	32.6	18.3	15.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.55	0.29	0.04	0.73	0.76	0.69
Incremental Delay, d2	0.3	0.0	0.1	0.7	0.6	0.5	0.2	1.4	0.2	0.4	1.1	0.0
Delay (s)	23.7	27.1	27.2	19.8	25.8	25.5	50.6	7.1	0.8	24.3	15.1	10.5
Level of Service	C	C	C	B	C	C	D	A	A	C	B	B
Approach Delay (s)		26.4			24.3			9.8			16.3	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.5%	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)	59	130	133	179	115	138	209	799	82	111	433	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	1863	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.68	1.00	1.00	0.49	1.00	1.00	0.39	1.00	1.00	0.22	1.00	1.00
Satd. Flow (perm)	1261	3539	1583	909	1863	1583	1405	3539	1583	806	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)	64	141	145	195	125	150	227	868	89	121	471	84
RTOR Reduction (vph)	0	0	123	0	0	118	0	0	52	0	0	52
Lane Group Flow (vph)	64	141	22	195	125	32	227	868	37	121	471	32
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	14.5	9.7	9.7	24.7	14.8	14.8	38.8	30.8	30.8	34.0	28.4	28.4
Effective Green, g (s)	17.5	12.2	12.2	26.6	17.3	17.3	41.8	33.3	33.3	37.0	30.9	30.9
Actuated g/C Ratio	0.22	0.15	0.15	0.33	0.22	0.22	0.52	0.42	0.42	0.46	0.39	0.39
Clearance Time (s)	5.5	6.5	6.5	5.5	6.5	6.5	5.5	6.5	6.5	5.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	316	540	241	425	403	342	975	1473	659	606	1367	611
v/s Ratio Prot	0.02	0.04		c0.07	0.07		c0.03	c0.25		0.02	0.13	
v/s Ratio Perm	0.03		0.01	c0.09		0.02	0.09		0.02	0.07		0.02
v/c Ratio	0.20	0.26	0.09	0.46	0.31	0.09	0.23	0.59	0.06	0.20	0.34	0.05
Uniform Delay, d1	25.3	29.9	29.1	20.1	26.3	25.1	10.0	18.1	14.0	12.6	17.4	15.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.28	1.07	1.94	0.77	1.08	2.47
Incremental Delay, d2	0.3	0.3	0.2	0.8	0.4	0.1	0.1	1.5	0.1	0.1	0.6	0.1
Delay (s)	25.6	30.2	29.3	20.9	26.8	25.2	13.0	20.9	27.3	9.9	19.3	38.1
Level of Service	C	C	C	C	C	C	B	C	C	A	B	D
Approach Delay (s)		29.0			23.9			19.8			20.0	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	1168	260	367	1310	13	542	71	347	41	37	145
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
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	1270	283	399	1424	14	589	77	377	45	40	158
RTOR Reduction (vph)	0	0	190	0	0	8	0	0	203	0	0	138
Lane Group Flow (vph)	67	1270	93	399	1424	6	589	77	174	45	40	20
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)	4.4	23.7	23.7	11.3	30.6	30.6	14.5	14.5	14.5	4.5	4.5	4.5
Effective Green, g (s)	6.9	26.2	26.2	13.8	33.1	33.1	17.0	17.0	17.0	7.0	7.0	7.0
Actuated g/C Ratio	0.09	0.33	0.33	0.17	0.41	0.41	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)	153	1665	518	592	2104	655	730	396	336	155	163	139
v/s Ratio Prot	0.04	c0.25		c0.12	0.28		c0.17	0.04		c0.03	0.02	
v/s Ratio Perm			0.06			0.00			0.11			0.01
v/c Ratio	0.44	0.76	0.18	0.67	0.68	0.01	0.81	0.19	0.52	0.29	0.25	0.15
Uniform Delay, d1	34.7	24.1	19.2	31.0	19.1	13.8	29.9	25.9	27.9	34.2	34.0	33.7
Progression Factor	1.50	0.44	0.30	1.00	1.00	1.00	0.56	0.50	0.61	1.00	1.00	1.00
Incremental Delay, d2	1.6	2.7	0.6	3.0	1.8	0.0	8.3	1.0	5.0	1.0	0.8	0.5
Delay (s)	53.6	13.3	6.3	34.0	20.9	13.8	24.9	14.0	22.0	35.2	34.8	34.2
Level of Service	D	B	A	C	C	B	C	B	C	D	C	C
Approach Delay (s)		13.7			23.7			23.1			34.5	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.2%	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												
Volume (vph)	232	1228	660	248	1699	108	605	56	199	121	52	168
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
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	252	1335	717	270	1847	117	658	61	216	132	57	183
RTOR Reduction (vph)	0	0	386	0	0	80	0	0	177	0	0	163
Lane Group Flow (vph)	252	1335	331	270	1847	37	658	61	39	132	57	20
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.5	28.0	28.0	6.5	23.0	23.0	14.7	11.8	11.8	7.7	4.8	4.8
Effective Green, g (s)	14.0	30.5	30.5	9.0	25.5	25.5	17.2	14.3	14.3	10.2	7.3	7.3
Actuated g/C Ratio	0.18	0.38	0.38	0.11	0.32	0.32	0.21	0.18	0.18	0.13	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)	310	1939	604	386	2043	505	738	333	283	226	170	144
v/s Ratio Prot	c0.14	0.26		0.08	c0.29		c0.19	0.03		0.07	c0.03	
v/s Ratio Perm			0.21			0.02			0.02			0.01
v/c Ratio	0.81	0.69	0.55	0.70	0.90	0.07	0.89	0.18	0.14	0.58	0.34	0.14
Uniform Delay, d1	31.7	20.8	19.4	34.2	26.1	19.0	30.5	27.9	27.7	32.9	34.1	33.5
Progression Factor	1.11	0.76	0.57	0.75	1.00	2.16	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.1	1.7	3.1	4.1	5.4	0.2	13.0	0.3	0.2	3.8	1.2	0.5
Delay (s)	48.2	17.4	14.1	29.7	31.5	41.2	43.5	28.2	27.9	36.7	35.2	33.9
Level of Service	D	B	B	C	C	D	D	C	C	D	D	C
Approach Delay (s)		19.8			31.8			38.9			35.1	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	28.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.4%	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												
Volume (vph)	245	1501	0	0	1855	755	444	0	506	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0		4.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	3433	5085			5085	1583	3433		2787			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5085			5085	1583	3433		2787			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	266	1632	0	0	2016	821	483	0	550	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	376	0	0	57	0	0	0
Lane Group Flow (vph)	266	1632	0	0	2016	445	483	0	493	0	0	0
Turn Type	Prot					Perm	Prot		custom			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	8.5	51.5			36.5	36.5	15.5		15.5			
Effective Green, g (s)	11.0	54.0			39.0	39.0	18.0		18.0			
Actuated g/C Ratio	0.14	0.68			0.49	0.49	0.22		0.22			
Clearance Time (s)	6.5	6.5			6.5	6.5	6.5		6.5			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	472	3432			2479	772	772		627			
v/s Ratio Prot	c0.08	0.32			c0.40		0.14					
v/s Ratio Perm						0.28			c0.18			
v/c Ratio	0.56	0.48			0.81	0.58	0.63		0.79			
Uniform Delay, d1	32.3	6.2			17.4	14.6	28.0		29.2			
Progression Factor	0.96	0.70			0.55	2.47	1.00		1.00			
Incremental Delay, d2	1.4	0.4			1.7	1.8	3.8		9.6			
Delay (s)	32.5	4.8			11.3	37.8	31.8		38.8			
Level of Service	C	A			B	D	C		D			
Approach Delay (s)		8.7			18.9			35.5			0.0	
Approach LOS		A			B			D			A	

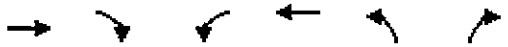
Intersection Summary			
HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↑↑↑	↱		↑↑↑		↰↰		↱		
Volume (vph)	0	1127	340	0	1579	0	619	0	381	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	1225	370	0	1716	0	673	0	414	0	0
RTOR Reduction (vph)	0	0	199	0	0	0	0	0	3	0	0
Lane Group Flow (vph)	0	1225	171	0	1716	0	673	0	411	0	0
Turn Type			Perm				Prot		custom		
Protected Phases		2			6		4				
Permitted Phases			2						4		
Actuated Green, G (s)		34.5	34.5		34.5		32.5		32.5		
Effective Green, g (s)		37.0	37.0		37.0		35.0		35.0		
Actuated g/C Ratio		0.46	0.46		0.46		0.44		0.44		
Clearance Time (s)		6.5	6.5		6.5		6.5		6.5		
Vehicle Extension (s)		3.0	3.0		3.0		3.0		3.0		
Lane Grp Cap (vph)		2352	732		2352		1502		693		
v/s Ratio Prot		0.24			c0.34		0.20				
v/s Ratio Perm			0.11						c0.26		
v/c Ratio		0.52	0.23		0.73		0.45		0.59		
Uniform Delay, d1		15.2	13.0		17.4		15.7		17.1		
Progression Factor		0.87	1.92		0.57		1.00		1.00		
Incremental Delay, d2		0.7	0.6		1.2		1.0		3.7		
Delay (s)		14.0	25.5		11.1		16.7		20.8		
Level of Service		B	C		B		B		C		
Approach Delay (s)		16.7			11.1			18.3		0.0	
Approach LOS		B			B			B		A	

Intersection Summary			
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

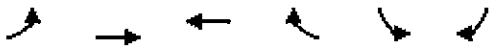
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	86	1341	3	49	1705	236	18	78	168	299	15	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	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	1198	1863	1583	976	954	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)	93	1458	3	53	1853	257	20	85	183	325	16	50
RTOR Reduction (vph)	0	0	0	0	0	151	0	0	104	0	0	38
Lane Group Flow (vph)	93	1461	0	53	1853	106	20	85	79	169	172	12
Turn Type	Prot			Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6	8		8	4		4
Actuated Green, G (s)	4.9	31.6		2.2	28.9	28.9	13.6	12.2	12.2	23.8	23.8	17.3
Effective Green, g (s)	7.4	35.6		4.7	32.9	32.9	18.6	14.7	14.7	27.7	27.7	19.8
Actuated g/C Ratio	0.09	0.45		0.06	0.41	0.41	0.23	0.18	0.18	0.35	0.35	0.25
Clearance Time (s)	6.5	8.0		6.5	8.0	8.0	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	164	2262		104	2091	651	306	342	291	417	413	392
v/s Ratio Prot	c0.05	c0.29		0.03	c0.36		0.00	0.05		0.05	c0.05	
v/s Ratio Perm						0.07	0.01		0.05	0.09	c0.10	0.01
v/c Ratio	0.57	0.65		0.51	0.89	0.16	0.07	0.25	0.27	0.41	0.42	0.03
Uniform Delay, d1	34.8	17.3		36.5	21.8	14.9	23.8	27.9	28.1	19.1	20.0	22.8
Progression Factor	1.33	0.39		1.09	0.51	0.46	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.7	1.2		2.8	4.4	0.4	0.1	0.4	0.5	0.6	0.7	0.0
Delay (s)	50.0	7.9		42.6	15.4	7.2	23.9	28.3	28.6	19.8	20.7	22.9
Level of Service	D	A		D	B	A	C	C	C	B	C	C
Approach Delay (s)		10.4			15.1			28.2			20.6	
Approach LOS		B			B			C			C	

Intersection Summary					
HCM Average Control Delay	14.8	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.69				
Actuated Cycle Length (s)	80.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	63.1%	ICU Level of Service		B	
Analysis Period (min)	15				
c Critical Lane Group					



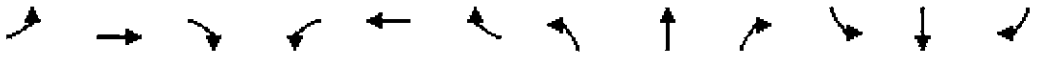
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↱	↰↰	↑↑↑	↰↰	↱↱
Volume (vph)	1417	163	141	1569	346	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	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
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1540	177	153	1705	376	254
RTOR Reduction (vph)	0	89	0	0	0	199
Lane Group Flow (vph)	1540	88	153	1705	376	55
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	36.6	36.6	8.6	51.7	14.3	14.3
Effective Green, g (s)	39.6	39.6	11.1	54.7	17.3	17.3
Actuated g/C Ratio	0.50	0.50	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)	2517	784	476	3477	742	603
v/s Ratio Prot	c0.30		0.04	c0.34	c0.11	
v/s Ratio Perm		0.06				0.02
v/c Ratio	0.61	0.11	0.32	0.49	0.51	0.09
Uniform Delay, d1	14.6	10.8	31.1	6.0	27.6	25.1
Progression Factor	0.54	0.15	1.38	0.38	0.65	1.15
Incremental Delay, d2	1.0	0.3	0.3	0.3	0.5	0.1
Delay (s)	9.0	1.9	43.1	2.6	18.5	28.9
Level of Service	A	A	D	A	B	C
Approach Delay (s)	8.2			5.9	22.7	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



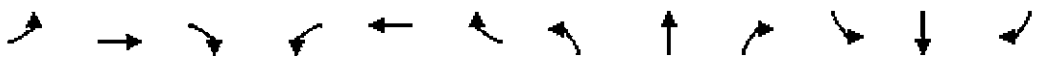
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	32	1308	1649	291	255	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	5085	5085	1583	1770	1583
Flt Permitted	0.09	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	162	5085	5085	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	1422	1792	316	277	60
RTOR Reduction (vph)	0	0	0	134	0	10
Lane Group Flow (vph)	35	1422	1792	182	277	50
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	42.5	42.5	42.5	42.5	23.5	23.5
Effective Green, g (s)	46.0	46.0	46.0	46.0	26.0	26.0
Actuated g/C Ratio	0.58	0.58	0.58	0.58	0.32	0.32
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	93	2924	2924	910	575	514
v/s Ratio Prot		0.28	c0.35		c0.16	
v/s Ratio Perm	0.22			0.11		0.03
v/c Ratio	0.38	0.49	0.61	0.20	0.48	0.10
Uniform Delay, d1	9.2	10.0	11.2	8.2	21.6	18.8
Progression Factor	0.47	0.37	0.68	0.91	1.00	1.00
Incremental Delay, d2	10.6	0.5	0.9	0.4	2.9	0.4
Delay (s)	14.9	4.3	8.5	7.9	24.5	19.2
Level of Service	B	A	A	A	C	B
Approach Delay (s)		4.5	8.4		23.5	
Approach LOS		A	A		C	

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.7%	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												
Volume (vph)	88	909	30	110	1363	177	236	127	78	99	57	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.58	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1084	1863	1583	1246	1863	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)	96	988	33	120	1482	192	257	138	85	108	62	80
RTOR Reduction (vph)	0	0	22	0	0	125	0	0	61	0	0	63
Lane Group Flow (vph)	96	988	11	120	1482	67	257	138	24	108	62	17
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	5.2	23.0	23.0	6.2	24.0	24.0	28.6	20.1	20.1	18.0	14.8	14.8
Effective Green, g (s)	7.7	27.0	27.0	8.7	28.0	28.0	32.3	22.6	22.6	23.0	17.3	17.3
Actuated g/C Ratio	0.10	0.34	0.34	0.11	0.35	0.35	0.40	0.28	0.28	0.29	0.22	0.22
Clearance Time (s)	6.5	8.0	8.0	6.5	8.0	8.0	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	170	1716	534	192	1780	554	532	526	447	396	403	342
v/s Ratio Prot	0.05	0.19		c0.07	c0.29		c0.07	0.07		0.02	0.03	
v/s Ratio Perm			0.01			0.04	c0.13		0.02	0.06		0.01
v/c Ratio	0.56	0.58	0.02	0.62	0.83	0.12	0.48	0.26	0.05	0.27	0.15	0.05
Uniform Delay, d1	34.5	21.8	17.7	34.1	23.8	17.6	16.8	22.2	20.9	21.6	25.4	24.8
Progression Factor	1.00	1.00	1.00	1.52	0.30	0.18	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.2	1.4	0.1	5.0	3.9	0.4	0.7	1.2	0.2	0.4	0.8	0.3
Delay (s)	38.8	23.2	17.8	56.9	10.9	3.6	17.5	23.5	21.1	22.0	26.2	25.1
Level of Service	D	C	B	E	B	A	B	C	C	C	C	C
Approach Delay (s)		24.4			13.2			19.8			24.0	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.0%	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)	365	1034	76	34	714	19	43	12	20	44	14	397
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3503		1770	3525			1793	1583		1794	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.79	1.00
Satd. Flow (perm)	3433	3503		1770	3525			1453	1583		1462	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)	397	1124	83	37	776	21	47	13	22	48	15	432
RTOR Reduction (vph)	0	7	0	0	3	0	0	0	16	0	0	313
Lane Group Flow (vph)	397	1200	0	37	795	0	0	60	6	0	63	119
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)	14.5	38.1		3.9	27.5			19.5	19.5		19.5	19.5
Effective Green, g (s)	16.0	40.6		5.4	30.0			22.0	22.0		22.0	22.0
Actuated g/C Ratio	0.20	0.51		0.07	0.38			0.28	0.28		0.28	0.28
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)	687	1778		119	1322			400	435		402	435
v/s Ratio Prot	c0.12	c0.34		0.02	0.23							
v/s Ratio Perm								0.04	0.00		0.04	c0.08
v/c Ratio	0.58	0.67		0.31	0.60			0.15	0.01		0.16	0.27
Uniform Delay, d1	28.9	14.8		35.5	20.2			21.9	21.1		22.0	22.7
Progression Factor	1.00	1.00		1.05	0.74			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.2	1.0		1.5	0.8			0.8	0.1		0.8	1.5
Delay (s)	30.1	15.8		38.7	15.8			22.7	21.2		22.8	24.3
Level of Service	C	B		D	B			C	C		C	C
Approach Delay (s)		19.3			16.8			22.3			24.1	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	19.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	0	317	15	365	10	3	1	0	0	5	2
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)	3	0	345	16	397	11	3	1	0	0	5	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	408			345			441	447	0	436	780	397
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	408			345			441	447	0	436	780	397
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
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 %	100			99			99	100	100	100	98	100
cM capacity (veh/h)	1151			1214			512	498	1085	523	321	653

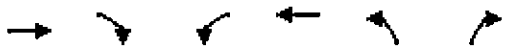
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	3	345	16	397	11	4	8
Volume Left	3	0	16	0	0	3	0
Volume Right	0	345	0	0	11	0	2
cSH	1151	1700	1214	1700	1700	508	376
Volume to Capacity	0.00	0.20	0.01	0.23	0.01	0.01	0.02
Queue Length 95th (ft)	0	0	1	0	0	1	2
Control Delay (s)	8.1	0.0	8.0	0.0	0.0	12.1	14.8
Lane LOS	A		A			B	B
Approach Delay (s)	0.1		0.3			12.1	14.8
Approach LOS						B	B

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	36.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	4	7	0	0	318	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	8	0	0	346	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				16	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				16	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				65	98
cM capacity (veh/h)	1623				999	1085

Direction, Lane #	EB 1	SB 1
Volume Total	12	366
Volume Left	4	346
Volume Right	0	21
cSH	1623	1004
Volume to Capacity	0.00	0.36
Queue Length 95th (ft)	0	42
Control Delay (s)	2.6	10.6
Lane LOS	A	B
Approach Delay (s)	2.6	10.6
Approach LOS		B

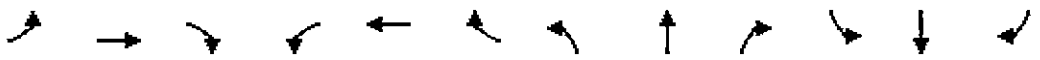
Intersection Summary			
Average Delay	10.4		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			↰	↑↑	↰	
Volume (veh/h)	0	0	150	300	104	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	163	326	113	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		489	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		489	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		75	100
cM capacity (veh/h)			1622		457	1084

Direction, Lane #	WB 1	WB 2	WB 3	NB 1
Volume Total	163	163	163	113
Volume Left	163	0	0	113
Volume Right	0	0	0	0
cSH	1622	1700	1700	457
Volume to Capacity	0.10	0.10	0.10	0.25
Queue Length 95th (ft)	8	0	0	24
Control Delay (s)	7.5	0.0	0.0	15.4
Lane LOS	A			C
Approach Delay (s)	2.5			15.4
Approach LOS				C

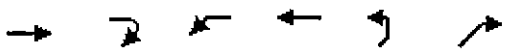
Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	155	188	0	0	0	0	102	58	78	72	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)	2	168	204	0	0	0	0	111	63	85	78	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									11			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			373			212	173	84	144	377	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			373			212	173	84	144	377	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 %	100			100			100	85	93	87	86	100
cM capacity (veh/h)	1622			1182			647	718	958	667	552	1084

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	NB 1	SB 1	SB 2
Volume Total	2	84	84	204	174	85	78
Volume Left	2	0	0	0	0	85	0
Volume Right	0	0	0	204	63	0	0
cSH	1622	1700	1700	1700	1127	667	552
Volume to Capacity	0.00	0.05	0.05	0.12	0.15	0.13	0.14
Queue Length 95th (ft)	0	0	0	0	14	11	12
Control Delay (s)	7.2	0.0	0.0	0.0	10.2	11.2	12.6
Lane LOS	A				B	B	B
Approach Delay (s)	0.0				10.2	11.9	
Approach LOS					B	B	

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	24.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Volume (veh/h)	0	0	100	290	74	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	109	315	80	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		375	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		375	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		86	100
cM capacity (veh/h)			1622		559	1084

Direction, Lane #	WB 1	WB 2	WB 3	NE 1
Volume Total	109	158	158	80
Volume Left	109	0	0	80
Volume Right	0	0	0	0
cSH	1622	1700	1700	559
Volume to Capacity	0.07	0.09	0.09	0.14
Queue Length 95th (ft)	5	0	0	13
Control Delay (s)	7.4	0.0	0.0	12.5
Lane LOS	A			B
Approach Delay (s)	1.9			12.5
Approach LOS				B

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	34.7%	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)	18	134	88	0	0	0	0	56	54	17	83	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)	20	146	96	0	0	0	0	61	59	18	90	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			241			230	185	73	142	280	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			241			230	185	73	142	280	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	91	94	97	85	100
cM capacity (veh/h)	1622			1322			621	700	974	707	619	1084

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	NE 1	SW 1	SW 2
Volume Total	20	73	73	96	120	18	90
Volume Left	20	0	0	0	0	18	0
Volume Right	0	0	0	96	59	0	0
cSH	1622	1700	1700	1700	1375	707	619
Volume to Capacity	0.01	0.04	0.04	0.06	0.09	0.03	0.15
Queue Length 95th (ft)	1	0	0	0	7	2	13
Control Delay (s)	7.2	0.0	0.0	0.0	9.8	10.2	11.8
Lane LOS	A				A	B	B
Approach Delay (s)	0.5				9.8	11.5	
Approach LOS					A	B	

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	21.3%	ICU Level of Service		A
Analysis Period (min)	15			