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: Wekiva Pkwy. EB
Junction: On Ramp from EB CD
Jurisdiction: Seminole County
Analysis Year: 2032
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2530	vph

On Ramp Data

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

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	650	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)	2530	300	650	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	703	83	181	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	2811	333	722	pcph

Estimation of V12 Merge Areas

L = 4426.73 (Equation 25-2 or 25-3)
EQ
P = 0.591 Using Equation 1
FM
v = v (P) = 1663 pc/h
12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v FO	3144	6750	No

v v 1148 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 = 1663 (Equation 25-8)
12A

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v R12	1663	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 17.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.315

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

Space mean speed in outer lanes, S_0 = 52.7 mph

Space mean speed for all vehicles, S = 51.5 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 3/5/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: Wekiva Pkwy. EB
Junction: Off Ramp to SR 46
Jurisdiction: Seminole County
Analysis Year: 2032
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2830	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	650	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	300	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)	2830	650	300	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	786	181	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	3144	722	333	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1812 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3144	6750	No
$v_{FO} = v_F - v_R$	2422	6750	No
v_R	722	3800	No

$v_{3 \text{ or } av34}$ = 1332 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} = 1812 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1812	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 6.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.493

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

Space mean speed in outer lanes, S_R = 59.0 mph

Space mean speed for all vehicles, S_0 = 52.5 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: Wekiva Pkwy. EB
Junction: Off Ramp to SR 46
Jurisdiction: Seminole County
Analysis Year: 2032
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2830	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	650	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	680	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)	2830	650	680	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	786	181	189	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	3144	722	756	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1812 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3144	6750	No
$v_{FO} = v_F - v_R$	2422	6750	No
v_R	722	3800	No

$v_{3 \text{ or } av34}$ = 1332 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} = 1812 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1812	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 6.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.493

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

Space mean speed in outer lanes,	S_R = 59.0	mph
Space mean speed for all vehicles,	S_0 = 52.5	mph

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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: Wekiva Pkwy. WB CD
Junction: Off Ramp to Wekiva Pkwy. WB
Jurisdiction: Seminole County
Analysis Year: 2032
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1620	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	780	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	360	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)	1620	780	360	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	450	217	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	1800	867	400	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 1800 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1800	4500	No
$v_{FO} = v - v_F$	933	4500	No
v_R	867	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} = 1800 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1800	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 15.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.506

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

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

Space mean speed for all vehicles, S_0 = 48.4 mph

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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: Wekiva Pkwy. WB CD
Junction: On Ramp from Wekiva Pkwy. WB
Jurisdiction: Seminole County
Analysis Year: 2032
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	620	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	360	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	780	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)	620	360	780	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	172	100	217	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	689	400	867	pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 689 pc/h
12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v FO	1089	4500	No
v v 3 or av34	0 pc/h	(Equation 25-4 or 25-5)	
Is v v 3 or av34 > 2700 pc/h?		No	
Is v v 3 or av34 > 1.5 v 12 /2		No	
If yes, v 12A = 689		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v R12	689	4600	No

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 10.7 pc/mi/ln
R R 12 A
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.299
S
Space mean speed in ramp influence area, S = 51.1 mph
R
Space mean speed in outer lanes, S = N/A mph
0
Space mean speed for all vehicles, S = 51.1 mph

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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: Wekiva Pkwy. WB CD
Junction: On Ramp from Wekiva Pkwy. WB
Jurisdiction: Seminole County
Analysis Year: 2032
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	620	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	360	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	50	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)	620	360	50	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	172	100	14	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	689	400	56	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_{12A} (P_{FM}) = 689$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1089	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} = 689 (Equation 25-8)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	689	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_{R12} + 0.0078\, v_{12A} - 0.00627\, L_A$ = 10.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.299

Space mean speed in ramp influence area, S_R = 51.1 mph

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

Space mean speed for all vehicles, S = 51.1 mph

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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: Wekiva Pkwy. WB CD
Junction: Off Ramp to Wekiva Pkwy. WB
Jurisdiction: Seminole County
Analysis Year: 2032
Description: Wekiva Parkway Project Development & Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	900	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	50	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

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

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	900	50	360	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	250	14	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	1000	56	400	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 1000 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v$	1000	4500	No
$v_{FO} = v - v_F$	944	4500	No
v_R	56	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} = 1000 (Equation 25-18)

Flow Entering Diverge Influence Area

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

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 8.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.433

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: 3/5/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: Wekiva Pkwy. EB CD
Junction: On Ramp from Wekiva Pkwy. EB
Jurisdiction: Seminole County
Analysis Year: 2032
Description: Wekiva 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	710	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	40	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	6336	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	710	40	300	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	197	11	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	789	44	333	pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 789 pc/h
12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v FO	833	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 = 789 (Equation 25-8)
12A

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v R12	789	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 8.8 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 = N/A mph
Space mean speed for all vehicles, S = 51.2 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: CTRR
Agency/Co.: HNTB
Date performed: 3/5/2010
Analysis time period: Build Service Road Concept
Freeway/Dir of Travel: Wekiva Pkwy. EB CD
Junction: Off Ramp to Wekiva Pkwy. EB
Jurisdiction: Seminole County
Analysis Year: 2032
Description: Wekiva Pkwy. PD&E

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	810	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	300	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	40	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)	810	300	40	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	225	83	11	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	900	333	44	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 900 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	900	4500	No
$v_{FO} = v_F - v_R$	567	4500	No
v_R	333	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} = 900 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	900	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 7.5 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 = N/A mph

Space mean speed for all vehicles, S_0 = 49.0 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: Wekiva Pkwy. EB CD
Junction: Off Ramp to Wekiva Pkwy. EB
Jurisdiction: Seminole County
Analysis Year: 2032
Description: Wekiva Pkwy. PD&E

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	810	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	300	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	650	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)	810	300	650	vph
Peak-hour factor, PHF	0.90	0.90	0.90	

Peak 15-min volume, v15	225	83	181	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	900	333	722	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v - v_F) P_{FD}$ = 900 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	900	4500	No
$v_{FO} = v - v_R$	567	4500	No
v_R	333	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} = 900 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	900	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 7.5 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 = N/A mph

Space mean speed for all vehicles, S_0 = 49.0 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: Wekiva Pkwy. EB CD
Junction: On Ramp from Wekiva Pkwy. EB
Jurisdiction: Seminole County
Analysis Year: 2032
Description: Wekiva Pkwy. PD&E

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	690	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	650	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

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

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	690	650		vph
Peak-hour factor, PHF	0.90	0.90		

Peak 15-min volume, v15	192	181	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	767	722	pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
v = v (P) = 767 pc/h
12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v FO	1489	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 = 767 (Equation 25-8)
12A

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v R12	767	4600	No

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 7.4 pc/mi/ln
R R 12 A

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

Speed Estimation

Intermediate speed variable, M = 0.235
S

Space mean speed in ramp influence area, S = 51.9 mph
R

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

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 to SR 46 (Existing)
Jurisdiction:	Lake County
Analysis Year:	2032 Build
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	4400	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	1270	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	310	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)	4400		1270		310		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	1222		353		86		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 4889 1411 344 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.573 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3403 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4889	6750	No
$v_{FO} = v_F - v_R$	3478	6750	No
v_R	1411	2000	No
v_3 or v_{av34}	1486 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} = 3403		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3403	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 22.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.555

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

Space mean speed in outer lanes, S_O = 58.4 mph

Space mean speed for all vehicles, S = 50.6 mph

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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:	2032 Build
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	4400	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	1270	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	310	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)	4400		1270		310		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1196		345		84		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 5046 1456 355 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.567 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3491 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5046	6750	No
$v_{FO} = v_F - v_R$	3590	6750	No
v_R	1456	2000	No
v_3 or v_{av34}	1555 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} = 3491		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3491	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 23.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.559

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

Space mean speed in outer lanes, S_O = 58.2 mph

Space mean speed for all vehicles, S = 50.5 mph

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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:	2032
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3440	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	310	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	1270	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)	3440		310		1270		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	935		84		345		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	3945	355	1456	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3945 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3945	4500	No
$v_{FO} = v_F - v_R$	3590	4500	No
v_R	355	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} = 3945		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3945	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 27.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.460

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

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

Space mean speed for all vehicles, S = 49.0 mph

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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 EB
Junction:	On Ramp from SR 46 (Existing)
Jurisdiction:	Lake County
Analysis Year:	2032
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	3130	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	1270	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	310	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)	3130	1270	310	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	851	345	84	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, 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, vp 3589 1456 355 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1992 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5045	6750	No
$v_{3 \text{ or } av34}$	1597 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} = 2050		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2050	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.346	
Space mean speed in ramp influence area,	S_R = 50.5	mph
Space mean speed in outer lanes,	S_O = 51.3	mph
Space mean speed for all vehicles,	S = 50.7	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	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:	2032
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	3130	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	310	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	1270	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)	3130	310	1270	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	851	84	345	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 3589 355 1456 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3589 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3944	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} = 3589		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3589	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 27.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.428

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

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

Space mean speed for all vehicles, S = 49.4 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

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:	2032
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3530	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	1680	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	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)	3530		1680		580	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	959		457		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	4048	1927	665	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4048 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4048	4500	No
$v_{FO} = v_F - v_R$	2121	4500	No
v_R	1927	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} = 4048		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4048	4400	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, D_S = 0.601

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

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

Space mean speed for all vehicles, S = 47.2 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	CTR
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:	2032
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3440	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	1590	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1680	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)	3440		1590		1680		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	935		432		457		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	3945	1823	1927	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3945 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3945	4500	No
$v_{FO} = v_F - v_R$	2122	4500	No
v_R	1823	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} = 3945 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3945	4400	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, D_S = 0.592

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

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

Space mean speed for all vehicles, S = 47.3 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:	Off Ramp from SR 46 Bypass
Jurisdiction:	Lake County
Analysis Year:	2032
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3270	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	1680	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	580	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)	3270		1680		580		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	889		457		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 3750 1927 665 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3750 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3750	4500	No
$v_{FO} = v_F - v_R$	1823	4500	No
v_R	1927	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} = 3750		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3750	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 23.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.601

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

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

Space mean speed for all vehicles, S = 47.2 mph

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Phone: Fax:
E-mail:

Merge 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:	On Ramp from SR 429
Jurisdiction:	Lake County
Analysis Year:	2032
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	1850	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	1590	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	310	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)	1850	1590	310	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	503	432	84	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	2121	1823	355	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2121 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3944	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} = 2121		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2121	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 26.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.417	
Space mean speed in ramp influence area,	S_R = 49.6	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 49.6	mph

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Phone: Fax:
E-mail:

Merge 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:	On Ramp from SR 429
Jurisdiction:	Lake County
Analysis Year:	2032
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	1850	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	1590	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	310	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)	1850	1590	310	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	514	442	86	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 2056 1767 344 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2056 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3823	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} = 2056		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2056	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 25.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.394	
Space mean speed in ramp influence area,	S_R = 49.9	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 49.9	mph

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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:	2032
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3440	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	520	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	2250	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)	3440		520		2250		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	935		141		611		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 3945 593 2568 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3945 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3945	4500	No
$v_{FO} = v_F - v_R$	3352	4500	No
v_R	593	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} = 3945		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3945	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 33.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.481

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

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

Space mean speed for all vehicles, S = 48.7 mph

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Phone: Fax:
E-mail:

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:	2032
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	2920	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	520	vph
Length of first accel/decel lane	530	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	2250	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)	2920	520	2250	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	793	141	611	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 3348 593 2568 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3348 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3941	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} = 3348		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3348	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 32.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.485	
Space mean speed in ramp influence area,	S_R = 48.7	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 48.7	mph

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:	2032
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	2920	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	2250	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	520	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)	2920	2250	520	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	793	611	141	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, 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	0.952	0.952	
Driver population factor, f_P	1.00	1.00	1.00	

Flow rate, vp 3348 2568 593 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 0.555 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1858 pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		5916	6750	No
v_3 or v_{av34}		1490 pc/h	(Equation 25-4 or 25-5)	
Is v_3 or v_{av34}	> 2700 pc/h?		No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2		Yes	
If yes, v_{12A} = 1913			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1913	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 29.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.554	
Space mean speed in ramp influence area,	S_R = 47.8	mph
Space mean speed in outer lanes,	S_O = 51.6	mph
Space mean speed for all vehicles,	S = 48.7	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:	NB Off Ramp to US 441
Jurisdiction:	Orange County
Analysis Year:	2032

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	5170	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	2250	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	520	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)	5170		2250		520		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1405		611		141		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 5929 2568 593 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.450 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4080 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5929	6750	No
$v_{FO} = v_F - v_R$	3361	6750	No
v_R	2568	3800	No
v_3 or v_{av34}	1849 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} = 4080 (Equation 25-18)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4080	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 25.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.659

Space mean speed in ramp influence area, S_R = 46.4 mph

Space mean speed in outer lanes, S_O = 57.0 mph

Space mean speed for all vehicles, S = 49.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	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:	2032

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	2950	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	490	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	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)	2950	490	580	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	802	133	158	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 3383 538 637 pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3383 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3921	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} = 3383		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3383	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 28.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.438

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

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

Space mean speed for all vehicles, S = 49.3 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	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:	2032
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	3530	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	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	490	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3530		580		490		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	959		158		133		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 4048 637 538 pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 0.629 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2784 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4048	6750	No
$v_{FO} = v_F - v_R$	3411	6750	No
v_R	637	2000	No
$v_{3 \text{ or } av34}$	1264 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} = 2784		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2784	4400	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, D_S = 0.485

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

Space mean speed in outer lanes, S_O = 59.3 mph

Space mean speed for all vehicles, S = 51.6 mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	KNM
Agency/Co.:	HNTB
Date performed:	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:	2032
Description:	Wekiva Parkway Project Development and Environment Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3440	vph

Off Ramp Data

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

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	580	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)	3440		490		580		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	935		133		158		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	3945	538	637	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3945 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3945	4500	No
$v_{FO} = v_F - v_R$	3407	4500	No
v_R	538	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} = 3945		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3945	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 33.7 pc/mi/ln

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

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:	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:	2032
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	2950	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	580	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	490	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)	2950	580	490	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	802	158	133	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 3383 637 538 pcph

Estimation of V12 Merge Areas

L_{EQ} = 794.64 (Equation 25-2 or 25-3)

P_{FM} = 0.609 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2062 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4020	6750	No
v_3 or v_{av34}	1321 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} = 2062		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2062	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.299

Space mean speed in ramp influence area, S_R = 51.1 mph

Space mean speed in outer lanes, S_O = 52.0 mph

Space mean speed for all vehicles, S = 51.4 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	2032

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 = 1220 veh/

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	6060	0.95	Level	9	0	0.957	1.00	6666
Ramp	650	0.95	Level	9	0	0.957	1.00	715
UpStream								
DownStream	1220	0.95	Level	9	0	0.957	1.00	1342

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} = 0.560 using Equation (Exhibit 25-12)

V_{12} = 4050 pc/h

V_3 or V_{av34} 2616 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	6666	Exhibit 25-14	7200	No
$V_{FO} = V_F - V_R$	5951	Exhibit 25-14	7200	No
V_R	715	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4050	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 = 33.7 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.492 (Exhibit 25-19)

S_R = 56.2 mph (Exhibit 25-19)

70.5 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	2032

Project Description: Wekiva Parkway Project Development & Environment Study

Inputs

Upstream Adj Ramp: ☒ Yes ☐ On ☐ No ☒ Off

L_{up} = 1948 ft

V_u = 650 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

	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5410	0.95	Level	9	0	0.957	1.00	5951
Ramp	1220	0.95	Level	9	0	0.957	1.00	1342
UpStream	650	0.95	Level	9	0	0.957	1.00	715
DownStream								

Merge Areas

Estimation of v_{12}

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

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

P_{FM} = 0.209 using Equation (Exhibit 25-5)

V_{12} = 1246 pc/h

V_3 or V_{av34} = 2352 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} = 2380 pc/h (Equation 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7293	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3722	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 = 30.8 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.447 (Exibit 25-19)

S_R = 57.5 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	2032

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 = 650 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	7130	0.95	Level	9	0	0.957	1.00	7843
Ramp	1220	0.95	Level	9	0	0.957	1.00	1342
UpStream								
DownStream	650	0.95	Level	9	0	0.957	1.00	715

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} = 4176 pc/h

V_3 or V_{av34} 1833 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	7843	Exhibit 25-14	9600	No
$V_{FO} = V_F - V_R$	6501	Exhibit 25-14	9600	No
V_R	1342	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4176	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 = 30.8 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.549 (Exhibit 25-19)

S_R = 54.6 mph (Exhibit 25-19)

73.5 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	2032

Project Description: Wekiva Parkway Project Development & Environment Study

Inputs

Upstream Adj Ramp
- [x] Yes [ ] On
- [ ] No [x] Off

L_{up} = 1948 ft

V_u = 1220 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
- [x] No [ ] Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	5910	0.95	Level	9	0	0.957	1.00	6501
Ramp	650	0.95	Level	9	0	0.957	1.00	715
UpStream	1220	0.95	Level	9	0	0.957	1.00	1342
DownStream								

Merge Areas

Estimation of v_{12}

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

L_{EQ} = 1194.42 (Equation 25-2 or 25-3)

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

V_{12} = 3845 pc/h

V_3 or V_{av34} 2656 pc/h (Equation 25-4 or 25-5)

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

Is V_3 or V_{av34} > 1.5 * V_{12}/2 [ ] Yes [x] No

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

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	7216	Exhibit 25-7		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4560	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 = 37.6 (pc/mi/ln)

LOS = F (Exhibit 25-4)

Speed Determination

M_S = 0.659 (Exibit 25-19)

S_R = 51.6 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)

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	CTR
Agency or Company:	HNTB
Date Performed:	08/02/10
Analysis Time Period:	Build Service Road Concept
Freeway/Direction:	I-4 WB
From/To:	US 17/92 WB On to Off to SR 46
Jurisdiction:	Seminole County
Analysis Year:	2032
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	7130	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1937	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	2025	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.67	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.9	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	67.6	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2025	pc/h/ln
Free-flow speed, FFS	67.6	mi/h
Average passenger-car speed, S	62.8	mi/h
Number of lanes, N	4	
Density, D	32.3	pc/mi/ln

Level of service, LOS	D

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	CTR
Agency or Company:	HNTB
Date Performed:	8/02/2010
Analysis Time Period:	Build Service Road Concept
Freeway/Direction:	CD Road/EB
From/To:	SR 417 EB On to Off to I-4 EB
Jurisdiction:	Seminole County
Analysis Year:	2032
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	2280	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	620	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	863	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.54	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.2	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	66.8	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	863	pc/h/ln
Free-flow speed, FFS	66.8	mi/h
Average passenger-car speed, S	66.8	mi/h
Number of lanes, N	3	
Density, D	12.9	pc/mi/ln

Level of service, LOS	B

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	CTR
Agency or Company:	HNTB
Date Performed:	8/02/2010
Analysis Time Period:	Build Service Road Concept
Freeway/Direction:	CD Road/EB
From/To:	SR 417 EB On to Off to I-4 EB
Jurisdiction:	Seminole County
Analysis Year:	2032
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	2280	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	620	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	863	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.54	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.2	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	66.8	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	863	pc/h/ln
Free-flow speed, FFS	66.8	mi/h
Average passenger-car speed, S	66.8	mi/h
Number of lanes, N	3	
Density, D	12.9	pc/mi/ln

Level of service, LOS	B

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	CTR
Agency or Company:	HNTB
Date Performed:	8/02/2010
Analysis Time Period:	Build Service Road Concept
Freeway/Direction:	I-4 EB
From/To:	SR 46 On to US 17/92 Off
Jurisdiction:	Seminole County
Analysis Year:	2032
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	7130	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1937	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	2025	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.54	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.2	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	68.3	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2025	pc/h/ln
Free-flow speed, FFS	68.3	mi/h
Average passenger-car speed, S	63.2	mi/h
Number of lanes, N	4	
Density, D	32.0	pc/mi/ln

Level of service, LOS	D

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	CTR
Agency or Company:	HNTB
Date Performed:	8/03/2010
Analysis Time Period:	Build Service Road Concept
Freeway/Direction:	SR 417 WB
From/To:	On Ramp from I-4 EB & WB
Jurisdiction:	Seminole County
Analysis Year:	2032
Description:	Wekiva Parkway PD&E

Flow Inputs and Adjustments

Volume, V	3250	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	883	v
Trucks and buses	11	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.948	
Driver population factor, fp	1.00	
Flow rate, vp	932	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	2.00	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	7.5	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	61.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	932	pc/h/ln
Free-flow speed, FFS	61.0	mi/h
Average passenger-car speed, S	61.0	mi/h
Number of lanes, N	4	
Density, D	15.3	pc/mi/ln

Level of service, LOS	B

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

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:	2032
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	0.52	
Weaving ratio, R	0.38	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V o1	V o2	V w1	V w2	
Volume, V	2280	0	940	1510	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	620	0	255	410	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	2589	0	1067	1715	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	0.85	0.98
Weaving and non-weaving speeds, Si	44.76	42.78
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		1.81
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	43.79	mph
Weaving segment density, D	40.89	pc/mi/ln
Level of service, LOS	F	
Capacity of base condition, cb	5591	pc/h
Capacity as a 15-minute flow rate, c	5350	pc/h
Capacity as a full-hour volume, ch	4922	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	2782	4000	a
Average flow rate (pcphpl)	1790	2350	b
Volume ratio, VR	0.52	0.80	c
Weaving ratio, R	0.38	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:	2032
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	0.38	
Weaving ratio, R	0.17	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V o1	V o2	V w1	V w2	
Volume, V	3015	285	1675	335	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	819	77	455	91	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	3441	325	1911	382	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	0.58	0.44
Weaving and non-weaving speeds, Si	49.83	53.17
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	1.59
Maximum number of lanes, Nw (max) (Exhibit 24-7)	3.50
Type of operation is	Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S	51.85	mph
Weaving segment density, D	29.21	pc/mi/ln
Level of service, LOS	C	
Capacity of base condition, cb	8321	pc/h
Capacity as a 15-minute flow rate, c	7925	pc/h
Capacity as a full-hour volume, ch	7291	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	2293	4000	a
Average flow rate (pcphpl)	1514	2350	b
Volume ratio, VR	0.38	0.80	c
Weaving ratio, R	0.17	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:	Cristina Torres-Reyes
Agency/Co.:	HNTB
Date Performed:	3/11/2007
Analysis Time Period:	Build I-4 Connection @ SR417
Freeway/Dir of Travel:	I-4 SB
Weaving Location:	Off Ramp 16 w/Frontage Road
Jurisdiction:	Seminole County
Analysis Year:	2032
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	0.51	
Weaving ratio, R	0.42	

Conversion to pc/h Under Base Conditions

	Non-Weaving V A-C	Non-Weaving V B-D	Weaving V A-D	Weaving V B-C	
Volume, V	2270	0	990	1380	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	631	0	275	383	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	2522	0	1100	1533	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	0.61
Weaving and non-weaving speeds, Si	49.45	49.10
Number of lanes required for unconstrained operation, Nw (Exhibit 24-7)		2.18
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	49.28	mph
Weaving segment density, D	26.15	pc/mi/ln
Level of service, LOS	C	
Capacity of base condition, cb	7625	pc/h
Capacity as a 15-minute flow rate, c	7625	pc/h
Capacity as a full-hour volume, ch	6862	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	2633	4000	a
Average flow rate (pcphpl)	1288	2350	b
Volume ratio, VR	0.51	0.80	c
Weaving ratio, R	0.42	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.

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:	2032
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	0.52	
Weaving ratio, R	0.38	

Conversion to pc/h Under Base Conditions

	Non-Weaving		Weaving		
	V_{o1}	V_{o2}	V_{w1}	V_{w2}	
Volume, V	2270	0	1510	940	veh/h
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	631	0	419	261	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	2522	0	1677	1044	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	0.61	0.64
Weaving and non-weaving speeds, Si	49.15	48.45
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7)	2.22
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	48.81	mph
Weaving segment density, D	26.85	pc/mi/ln
Level of service, LOS	C	
Capacity of base condition, cb	7537	pc/h
Capacity as a 15-minute flow rate, c	7537	pc/h
Capacity as a full-hour volume, ch	6783	pc/h

Limitations on Weaving Segments

	Analyzed	If Max Exceeded Maximum	See Note Note
Weaving flow rate, Vw	2721	4000	a
Average flow rate (pcphpl)	1310	2350	b
Volume ratio, VR	0.52	0.80	c
Weaving ratio, R	0.38	N/A	d
Weaving length (ft)	2500	2500	e

Notes:

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

FREEWAY WEAVING WORKSHEET

General Information

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

Site Information

Freeway/Dir of Travel	Wekiva Parkway EB
Weaving Seg Location	SB Wekiva Parkway
Jurisdiction	Orange County
Analysis Year	2032 Build

Inputs

Freeway free-flow speed, S_{FF} (mi/h)	65	Weaving type	A
Weaving number of lanes, N	3	Volume ratio, VR	0.92
Weaving seg length, L (ft)	1500	Weaving ratio, R	0.21
Terrain	Level		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	f_{HV}	f_p	v
V_{o1}	0	0.90	11	0	1.5	1.2	0.948	1.00	0
V_{o2}	170	0.90	11	0	1.5	1.2	0.948	1.00	199
V_{w1}	410	0.90	11	0	1.5	1.2	0.948	1.00	480
V_{w2}	1510	0.90	11	0	1.5	1.2	0.948	1.00	1770
V_w				2250	V_{nw}				199
V									2449

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)			0.35	0.0020
b (Exhibit 24-6)			2.20	4.00
c (Exhibit 24-6)			0.97	1.30
d (Exhibit 24-6)			0.80	0.75
Weaving intensity factor, Wi			2.82	0.69
Weaving and non-weaving speeds, Si (mi/h)			29.40	47.62

Number of lanes required for unconstrained operation, Nw: 2.33
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)	30.34
Weaving segment density, D (pc/mi/ln)	26.91
Level of service, LOS	C
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	2032 Build

Inputs

Freeway free-flow speed, S_{FF} (mi/h)	65	Weaving type	A
Weaving number of lanes, N	3	Volume ratio, VR	0.05
Weaving seg length, L (ft)	1500	Weaving ratio, R	0.00
Terrain	Level		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	f_{HV}	f_p	v
V_{o1}	1850	0.90	11	0	1.5	1.2	0.948	1.00	2168
V_{o2}	1510	0.90	11	0	1.5	1.2	0.948	1.00	1770
V_{w1}	170	0.90	11	0	1.5	1.2	0.948	1.00	199
V_{w2}	0	0.90	11	0	1.5	1.2	0.948	1.00	0
V_w				199	V_{nw}				3938
V									4137

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	0.53	0.21		
Weaving and non-weaving speeds, Si (mi/h)	50.91	60.40		

Number of lanes required for unconstrained operation, Nw 0.39
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)	59.87
Weaving segment density, D (pc/mi/ln)	23.03
Level of service, LOS	C
Capacity of base condition, c_b (pc/h)	6620
Capacity as a 15-minute flow rate, c (veh/h)	6275
Capacity as a full-hour volume, c_h (veh/h)	5647

Notes

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

SHORT REPORT

General Information		Site Information	
Analyst	KNM	Intersection	Wekiva Parkway@Connector SPUI
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	2032 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)	260	131	1645	605	109	260	1462		788	130		390
% 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	274	138	1732	637	115	274	1539		829	137		411
Lane Group Capacity	369	591	1985	716	591	1121	1579		1091	813		1091
v/c Ratio	0.74	0.23	0.87	0.89	0.19	0.24	0.97		0.76	0.17		0.38
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	44.5	43.4	13.4	46.2	43.1	6.2	29.3		8.7	16.4		5.2
Delay Factor k	0.30	0.11	0.40	0.41	0.11	0.11	0.48		0.31	0.11		0.11
Incremental Delay d_2	7.9	0.2	4.6	13.2	0.2	0.1	16.9		3.2	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
Control Delay	52.4	43.6	18.0	59.4	43.2	6.3	46.2		11.9	16.5		5.4
Lane Group LOS	D	D	B	E	D	A	D		B	B		A
Approach Delay	24.0			43.4			34.2			8.2		
Approach LOS	C			D			C			A		
Intersection Delay	29.8			Intersection LOS						C		

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	2032 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)	260	1280			1798	440				288		85
% 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	274	1347			1893	463				303		89
Lane Group Capacity	279	2631			2083	1174				236		1583
v/c Ratio	0.98	0.51			0.91	0.39				1.28		0.06
Green Ratio	0.80	0.80			0.63	0.80				0.13		1.00
Uniform Delay d_1	42.6	4.1			19.0	3.5				52.0		0.0
Delay Factor k	0.49	0.12			0.43	0.11				0.50		0.11
Incremental Delay d_2	48.8	0.2			6.4	0.2				156.0		0.0
PF Factor	1.000	1.000			1.000	1.000				1.000		0.950
Control Delay	91.3	4.2			25.4	3.7				208.0		0.0
Lane Group LOS	F	A			C	A				F		A
Approach Delay	19.0			21.1						160.8		
Approach LOS	B			C						F		
Intersection Delay	32.9			Intersection LOS						C		

SHORT REPORT

General Information		Site Information	
Analyst	*Cristina Torres-Reyes*	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	*2032*

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)	*59*	*187*	*94*	*38*	*215*	*97*	*86*	*1041*	*33*	*61*	*354*	*35*
% 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	*62*	*197*	*99*	*40*	*226*	*102*	*91*	*1096*	*35*	*64*	*373*	*37*
Lane Group Capacity	*243*	*395*	*336*	*250*	*395*	*336*	*567*	*2022*	*902*	*230*	*1062*	*902*
v/c Ratio	*0.26*	*0.50*	*0.29*	*0.16*	*0.57*	*0.30*	*0.16*	*0.54*	*0.04*	*0.28*	*0.35*	*0.04*
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	*16.4*	*17.4*	*16.6*	*16.1*	*17.7*	*16.6*	*5.1*	*6.7*	*4.7*	*5.5*	*5.8*	*4.7*
Delay Factor k	*0.11*	*0.11*	*0.11*	*0.11*	*0.17*	*0.11*	*0.11*	*0.14*	*0.11*	*0.11*	*0.11*	*0.11*
Incremental Delay d_2	*0.6*	*1.0*	*0.5*	*0.3*	*2.0*	*0.5*	*0.1*	*0.3*	*0.0*	*0.7*	*0.2*	*0.0*
PF Factor	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.00*
Control Delay	*17.0*	*18.4*	*17.0*	*16.4*	*19.7*	*17.1*	*5.2*	*7.0*	*4.7*	*6.2*	*6.0*	*4.8*
Lane Group LOS	*B*	*B*	*B*	*B*	*B*	*B*	*A*	*A*	*A*	*A*	*A*	*A*
Approach Delay	*17.8*			*18.6*			*6.8*			*5.9*		
Approach LOS	*B*			*B*			*A*			*A*		
Intersection Delay	*10.0*			Intersection LOS			*B*					

SHORT REPORT

General Information		Site Information	
Analyst	*Cristina Torres-Reyes*	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	*2032*

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)	*304*	*197*	*188*	*60*	*317*	*83*	*168*	*468*	*74*	*57*	*186*	*377*
% 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 = *23.2*	G =	G =	G =	G = *24.5*	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	*320*	*207*	*198*	*63*	*334*	*87*	*177*	*493*	*78*	*60*	*196*	*397*
Lane Group Capacity	*397*	*1372*	*612*	*448*	*1372*	*612*	*483*	*761*	*646*	*246*	*761*	*646*
v/c Ratio	*0.81*	*0.15*	*0.32*	*0.14*	*0.24*	*0.14*	*0.37*	*0.65*	*0.12*	*0.24*	*0.26*	*0.61*
Green Ratio	*0.39*	*0.39*	*0.39*	*0.39*	*0.39*	*0.39*	*0.41*	*0.41*	*0.41*	*0.41*	*0.41*	*0.41*
Uniform Delay d_1	*16.4*	*12.0*	*12.9*	*11.9*	*12.5*	*11.9*	*12.4*	*14.3*	*11.0*	*11.7*	*11.7*	*14.0*
Delay Factor k	*0.35*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.23*	*0.11*	*0.11*	*0.11*	*0.20*
Incremental Delay d_2	*11.6*	*0.1*	*0.3*	*0.1*	*0.1*	*0.1*	*0.5*	*1.9*	*0.1*	*0.5*	*0.2*	*1.8*
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	*28.0*	*12.0*	*13.2*	*12.1*	*12.6*	*12.0*	*12.8*	*16.2*	*11.1*	*12.2*	*11.9*	*15.8*
Lane Group LOS	*C*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*
Approach Delay	*19.4*			*12.4*			*14.9*			*14.3*		
Approach LOS	*B*			*B*			*B*			*B*		
Intersection Delay	*15.5*			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	2032 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)	260	131	1645	605	109	260	1462		788	130		390
% 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	274	138	1732	637	115	274	1539		829	137		411
Lane Group Capacity	376	591	1985	716	591	1144	1753		1211	885		1187
v/c Ratio	0.73	0.23	0.87	0.89	0.19	0.24	0.88		0.68	0.15		0.35
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	44.3	43.4	13.4	46.2	43.1	6.1	26.7		7.7	16.3		5.1
Delay Factor k	0.29	0.11	0.40	0.41	0.11	0.11	0.40		0.25	0.11		0.11
Incremental Delay d_2	7.0	0.2	4.6	13.2	0.2	0.1	5.4		1.6	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
Control Delay	51.3	43.6	18.0	59.4	43.2	6.3	32.2		9.3	16.3		5.2
Lane Group LOS	D	D	B	E	D	A	C		A	B		A
Approach Delay	23.9			43.4			24.2			8.0		
Approach LOS	C			D			C			A		
Intersection Delay	25.9			Intersection LOS						C		

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	2032 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)		1397			1605	293				466		1505
% 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		1471			1689	308				491		1584
Lane Group Capacity		1645			1645	1468				632		2803
v/c Ratio		0.89			1.03	0.21				0.78		0.57
Green Ratio		0.50			0.50	1.00				0.36		1.00
Uniform Delay d_1		15.8			17.5	0.0				20.0		0.0
Delay Factor k		0.42			0.50	0.11				0.33		0.16
Incremental Delay d_2		6.8			29.3	0.1				6.1		0.3
PF Factor		1.000			1.000	0.950				1.000		0.950
Control Delay		22.6			46.8	0.1				26.1		0.3
Lane Group LOS		C			D	A				C		A
Approach Delay		22.6			39.6					6.4		
Approach LOS		C			D					A		
Intersection Delay		22.6			Intersection LOS					C		

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	2032 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)	957		92				298	494			294	686
% 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	1007		97				314	520			309	722
Lane Group Capacity	1146		1583				512	932			932	1583
v/c Ratio	0.88		0.06				0.61	0.56			0.33	0.46
Green Ratio	0.33		1.00				0.50	0.50			0.50	1.00
Uniform Delay d_1	18.9		0.0				10.8	10.4			9.0	0.0
Delay Factor k	0.41		0.11				0.20	0.16			0.11	0.11
Incremental Delay d_2	8.0		0.0				2.2	0.8			0.2	0.2
PF Factor	1.000		0.950				1.000	1.000			1.000	0.950
Control Delay	26.9		0.0				13.0	11.2			9.2	0.2
Lane Group LOS	C		A				B	B			A	A
Approach Delay	24.5						11.9			2.9		
Approach LOS	C						B			A		
Intersection Delay	13.5			Intersection LOS						B		

SHORT REPORT

General Information		Site Information	
Analyst	*CTR/KNM*	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	*2032*

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)		319	145	345	180					423		157
% 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		336	153	363	189					445		165
Lane Group Capacity		665	1049	523	1640					686		1583
v/c Ratio		0.51	0.15	0.69	0.12					0.65		0.10
Green Ratio		0.19	0.66	0.46	0.46					0.39		1.00
Uniform Delay d_1		29.2	5.0	15.0	12.2					20.0		0.0
Delay Factor k		0.11	0.11	0.26	0.11					0.23		0.11
Incremental Delay d_2		0.6	0.1	4.0	0.0					2.2		0.0
PF Factor		1.000	1.000	1.000	1.000					1.000		0.950
Control Delay		29.8	5.1	19.0	12.2					22.2		0.0
Lane Group LOS		C	A	B	B					C		A
Approach Delay		22.1			16.7						16.2	
Approach LOS		C			B						B	
Intersection Delay		18.1			Intersection LOS						B	

SHORT REPORT

General Information		Site Information	
Analyst	*CTR/KNM*	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	*2032*

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)	*140*	*602*			*422*	*440*	*103*		*387*			
% 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	*147*	*634*			*444*	*463*	*108*		*407*			
Lane Group Capacity	*673*	*2306*			*1330*	*1049*	*354*		*1583*			
v/c Ratio	*0.22*	*0.27*			*0.33*	*0.44*	*0.31*		*0.26*			
Green Ratio	*0.65*	*0.65*			*0.38*	*0.66*	*0.20*		*1.00*			
Uniform Delay d_1	*5.8*	*6.0*			*17.9*	*6.4*	*27.3*		*0.0*			
Delay Factor k	*0.11*	*0.11*			*0.11*	*0.11*	*0.11*		*0.11*			
Incremental Delay d_2	*0.2*	*0.1*			*0.1*	*0.3*	*0.5*		*0.1*			
PF Factor	*1.000*	*1.000*			*1.000*	*1.000*	*1.000*		*0.950*			
Control Delay	*5.9*	*6.0*			*18.0*	*6.7*	*27.8*		*0.1*			
Lane Group LOS	*A*	*A*			*B*	*A*	*C*		*A*			
Approach Delay	*6.0*			*12.3*			*5.9*					
Approach LOS	*A*			*B*			*A*					
Intersection Delay	*8.6*			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	*2032*

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)	*80*	*529*	*61*	*267*	*546*	*7*	*242*	*1340*	*498*	*7*	*782*	*71*
% Heavy Vehicles	*11*	*11*	*11*	*11*	*11*	*11*	*10*	*10*	*10*	*10*	*10*	*10*
PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Pretimed/Actuated (P/A)	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
Startup Lost Time	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
Extension of Effective Green	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*
Arrival Type	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Unit Extension	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Lane Width	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*	*12.0*
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

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

Duration of Analysis (hrs) = *0.25*

Cycle Length C = *86.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*84*	*557*	*64*	*281*	*575*	*7*	*255*	*1411*	*524*	*7*	*823*	*75*
Lane Group Capacity	*189*	*758*	*660*	*378*	*796*	*660*	*286*	*1506*	*1075*	*286*	*1506*	*1075*
v/c Ratio	*0.44*	*0.73*	*0.10*	*0.74*	*0.72*	*0.01*	*0.89*	*0.94*	*0.49*	*0.02*	*0.55*	*0.07*
Green Ratio	*0.12*	*0.23*	*0.45*	*0.12*	*0.23*	*0.45*	*0.17*	*0.29*	*0.73*	*0.17*	*0.29*	*0.73*
Uniform Delay d_1	*35.4*	*30.5*	*13.4*	*36.8*	*30.4*	*12.9*	*34.7*	*29.7*	*4.8*	*29.4*	*25.7*	*3.2*
Delay Factor k	*0.11*	*0.29*	*0.11*	*0.30*	*0.28*	*0.11*	*0.42*	*0.45*	*0.11*	*0.11*	*0.15*	*0.11*
Incremental Delay d_2	*1.7*	*3.7*	*0.1*	*7.8*	*3.3*	*0.0*	*27.5*	*11.4*	*0.3*	*0.0*	*0.4*	*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	*37.1*	*34.3*	*13.5*	*44.5*	*33.7*	*12.9*	*62.2*	*41.1*	*5.1*	*29.5*	*26.1*	*3.3*
Lane Group LOS	*D*	*C*	*B*	*D*	*C*	*B*	*E*	*D*	*A*	*C*	*C*	*A*
Approach Delay	*32.7*			*37.0*			*35.0*			*24.3*		
Approach LOS	*C*			*D*			*C*			*C*		
Intersection Delay	*32.9*			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	*2032 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)	*93*	*1976*	*191*	*87*	*2575*	*803*	*65*	*81*	*114*	*191*	*466*	*203*
% 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	*98*	*2080*	*201*	*92*	*2711*	*845*	*68*	*85*	*120*	*201*	*491*	*214*
Lane Group Capacity	*123*	*2685*	*1257*	*123*	*2685*	*1257*	*190*	*537*	*1367*	*343*	*537*	*1367*
v/c Ratio	*0.80*	*0.77*	*0.16*	*0.75*	*1.01*	*0.67*	*0.36*	*0.16*	*0.09*	*0.59*	*0.91*	*0.16*
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	*60.0*	*21.4*	*1.4*	*59.8*	*28.0*	*2.9*	*39.2*	*48.7*	*1.3*	*43.0*	*55.2*	*1.4*
Delay Factor k	*0.34*	*0.32*	*0.11*	*0.30*	*0.50*	*0.24*	*0.11*	*0.11*	*0.11*	*0.18*	*0.43*	*0.11*
Incremental Delay d_2	*29.6*	*1.5*	*0.1*	*22.1*	*19.8*	*1.4*	*1.2*	*0.1*	*0.0*	*2.6*	*20.3*	*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	*89.6*	*22.9*	*1.5*	*81.8*	*47.8*	*4.3*	*40.4*	*48.8*	*1.4*	*45.6*	*75.5*	*1.5*
Lane Group LOS	*F*	*C*	*A*	*F*	*D*	*A*	*D*	*D*	*A*	*D*	*E*	*A*
Approach Delay	*23.9*			*38.6*			*25.9*			*51.4*		
Approach LOS	*C*			*D*			*C*			*D*		
Intersection Delay	*34.8*			Intersection LOS						*C*		

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	*2032 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*		*0*	*2*			*3*	*1*			
Lane Group		*T*			*LT*			*T*	*R*			
Volume (vph)		*531*		*70*	*700*			*2760*	*510*			
% 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*			
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*	
Lane Width		*12.0*			*12.0*			*12.0*	*12.0*			
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour		*0*			*0*			*0*	*0*			
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	EW Perm	02	03	04	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		*559*			*811*			*2905*	*537*			
Lane Group Capacity		*1105*			*832*			*2817*	*1482*			
v/c Ratio		*0.51*			*0.97*			*1.03*	*0.36*			
Green Ratio		*0.34*			*0.34*			*0.59*	*1.00*			
Uniform Delay d_1		*31.1*			*38.5*			*24.0*	*0.0*			
Delay Factor k		*0.11*			*0.48*			*0.50*	*0.11*			
Incremental Delay d_2		*0.4*			*25.0*			*25.6*	*0.2*			
PF Factor		*1.000*			*1.000*			*1.000*	*0.950*			
Control Delay		*31.5*			*63.5*			*49.6*	*0.2*			
Lane Group LOS		*C*			*E*			*D*	*A*			
Approach Delay	*31.5*			*63.5*			*41.9*					
Approach LOS	*C*			*E*			*D*					
Intersection Delay	*44.3*			Intersection LOS			*D*					

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	2032

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)	154	356	96	123	400	267	174	141	255	273	49	108
% Heavy Vehicles	11	11	11	11	11	11	2	2	2	2	2	2
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3	3	3	3	3	3	3	3	3	3	3
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	NS Perm	06	07	08
Timing	G = 15.0	G = 20.0	G =	G =	G = 20.0	G =	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	162	375	101	129	421	281	183	148	268	287	52	114
Lane Group Capacity	348	489	416	348	489	416	385	532	905	353	532	905
v/c Ratio	0.47	0.77	0.24	0.37	0.86	0.68	0.48	0.28	0.30	0.81	0.10	0.13
Green Ratio	0.21	0.29	0.29	0.21	0.29	0.29	0.29	0.29	0.57	0.29	0.29	0.57
Uniform Delay d_1	24.0	22.9	19.2	23.5	23.7	22.1	20.7	19.4	7.7	23.3	18.4	6.9
Delay Factor k	0.11	0.32	0.11	0.11	0.39	0.25	0.11	0.11	0.11	0.35	0.11	0.11
Incremental Delay d_2	1.0	7.2	0.3	0.7	14.5	4.3	0.9	0.3	0.2	13.5	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	25.0	30.1	19.5	24.1	38.2	26.4	21.6	19.7	7.9	36.8	18.5	7.0
Lane Group LOS	C	C	B	C	D	C	C	B	A	D	B	A
Approach Delay	27.1			32.0			15.0			27.2		
Approach LOS	C			C			B			C		
Intersection Delay	25.9			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	2032

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)	2	477	147	476	1029	25	345	18	257	10	18	6
% Heavy Vehicles	11	11	11	11	11	11	2	2	2	2	2	2
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Arrival Type	3	3	3	3	3	3	3	3	3	3	3	
Unit Extension	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0	0	0	0	0	0	0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

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

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

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	2	502	155	501	1083	26	363	19	271	11	25	
Lane Group Capacity	97	804	683	488	1133	963	324	437	676	326	422	
v/c Ratio	0.02	0.62	0.23	1.03	0.96	0.03	1.12	0.04	0.40	0.03	0.06	
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	21.2	16.8	29.4	16.6	6.2	40.8	31.5	21.1	31.4	31.6	
Delay Factor k	0.11	0.21	0.11	0.50	0.47	0.11	0.50	0.11	0.11	0.11	0.11	
Incremental Delay d_2	0.1	1.5	0.2	47.7	17.2	0.0	86.5	0.0	0.4	0.0	0.1	
PF Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Control Delay	15.2	22.7	16.9	77.1	33.7	6.2	127.3	31.5	21.5	31.5	31.7	
Lane Group LOS	B	C	B	E	C	A	F	C	C	C	C	
Approach Delay	21.3			46.8			80.6			31.6		
Approach LOS	C			D			F			C		
Intersection Delay	48.4			Intersection LOS						D		

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	2032

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)	7	1229			1093	677				749		31
% 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	7	1294			1151	713				788		33
Lane Group Capacity	236	1143			2175	1455				799		368
v/c Ratio	0.03	1.13			0.53	0.49				0.99		0.09
Green Ratio	0.67	0.67			0.67	1.00				0.23		0.23
Uniform Delay d_1	6.8	20.0			10.3	0.0				45.9		36.1
Delay Factor k	0.11	0.50			0.13	0.11				0.49		0.11
Incremental Delay d_2	0.1	70.8			0.2	0.3				28.3		0.1
PF Factor	1.000	1.000			1.000	0.950				1.000		1.000
Control Delay	6.8	90.7			10.5	0.3				74.2		36.2
Lane Group LOS	A	F			B	A				E		D
Approach Delay	90.3			6.6						72.7		
Approach LOS	F			A						E		
Intersection Delay	47.5			Intersection LOS						D		

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	*2032*

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)	*440*	*1380*			*1380*	*200*				*200*		*580*
% 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	*463*	*1453*			*1453*	*211*				*211*		*611*
Lane Group Capacity	*441*	*1557*			*1557*	*970*				*217*		*598*
v/c Ratio	*1.05*	*0.93*			*0.93*	*0.22*				*0.97*		*1.02*
Green Ratio	*0.76*	*0.48*			*0.48*	*0.67*				*0.13*		*0.41*
Uniform Delay d_1	*28.4*	*22.1*			*22.1*	*5.8*				*38.8*		*26.5*
Delay Factor k	*0.50*	*0.45*			*0.45*	*0.11*				*0.48*		*0.50*
Incremental Delay d_2	*56.5*	*10.7*			*10.7*	*0.1*				*53.0*		*42.4*
PF Factor	*1.000*	*1.000*			*1.000*	*1.000*				*1.000*		*1.000*
Control Delay	*84.9*	*32.8*			*32.8*	*6.0*				*91.9*		*68.9*
Lane Group LOS	*F*	*C*			*C*	*A*				*F*		*E*
Approach Delay	*45.4*			*29.4*						*74.8*		
Approach LOS	*D*			*C*						*E*		
Intersection Delay	*44.9*			Intersection LOS						*D*		

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	2032

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)						1270		310			1270	310
% 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						1337		326			1337	326
Lane Group Capacity						2575		2444			2444	1455
v/c Ratio						0.52		0.13			0.55	0.22
Green Ratio						1.00		0.75			0.75	1.00
Uniform Delay d_1						0.0		2.8			4.2	0.0
Delay Factor k						0.12		0.11			0.15	0.11
Incremental Delay d_2						0.2		0.0			0.3	0.1
PF Factor						0.950		1.000			1.000	0.950
Control Delay						0.2		2.8			4.5	0.1
Lane Group LOS						A		A			A	A
Approach Delay				0.2			2.8			3.6		
Approach LOS				A			A			A		
Intersection Delay	2.2			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	*2032*

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)	*310*									*1270*		
% 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	*326*									*1337*		
Lane Group Capacity	*386*									*2013*		
v/c Ratio	*0.84*									*0.66*		
Green Ratio	*0.24*									*0.64*		
Uniform Delay d_1	*29.1*									*9.1*		
Delay Factor k	*0.38*									*0.24*		
Incremental Delay d_2	*15.7*									*0.8*		
PF Factor	*1.000*									*1.000*		
Control Delay	*44.8*									*10.0*		
Lane Group LOS	*D*									*A*		
Approach Delay	*44.8*									*10.0*		
Approach LOS	*D*									*A*		
Intersection Delay	*16.8*			Intersection LOS						*B*		

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	*2032*

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)	*33*	*607*			*675*	*10*				*10*		*105*
% 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	*35*	*639*			*711*	*11*				*11*		*111*
Lane Group Capacity	*300*	*1081*			*1081*	*919*				*428*		*383*
v/c Ratio	*0.12*	*0.59*			*0.66*	*0.01*				*0.03*		*0.29*
Green Ratio	*0.63*	*0.63*			*0.63*	*0.63*				*0.26*		*0.26*
Uniform Delay d_1	*7.0*	*10.3*			*11.0*	*6.5*				*26.0*		*27.9*
Delay Factor k	*0.11*	*0.18*			*0.23*	*0.11*				*0.11*		*0.11*
Incremental Delay d_2	*0.2*	*0.9*			*1.5*	*0.0*				*0.0*		*0.4*
PF Factor	*1.000*	*1.000*			*1.000*	*1.000*				*1.000*		*1.000*
Control Delay	*7.1*	*11.2*			*12.5*	*6.5*				*26.0*		*28.3*
Lane Group LOS	*A*	*B*			*B*	*A*				*C*		*C*
Approach Delay	*10.9*			*12.4*						*28.1*		
Approach LOS	*B*			*B*						*C*		
Intersection Delay	*13.0*			Intersection LOS						*B*		

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	03/03/2010	Jurisdiction	Seminole County
Time Period	Build	Analysis Year	2032

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)	10	588	19	15	640	125	35	48	87	15	30	10
% 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	11	619	20	16	674	132	37	51	92	16	32	11
Lane Group Capacity	390	919	1164	426	919	1164	265	360	536	261	360	536
v/c Ratio	0.03	0.67	0.02	0.04	0.73	0.11	0.14	0.14	0.17	0.06	0.09	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	8.2	16.0	1.9	7.3	16.8	2.1	30.5	30.5	20.2	30.0	30.2	19.1
Delay Factor k	0.11	0.25	0.11	0.11	0.29	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Incremental Delay d_2	0.0	2.0	0.0	0.0	3.1	0.0	0.2	0.2	0.2	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	8.2	17.9	1.9	7.4	19.9	2.1	30.7	30.7	20.4	30.1	30.3	19.1
Lane Group LOS	A	B	A	A	B	A	C	C	C	C	C	B
Approach Delay	17.3			16.8			25.4			28.1		
Approach LOS	B			B			C			C		
Intersection Delay	18.3			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	*2032*

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)	*66*	*624*			*680*	*127*				*102*		*100*
% 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	*69*	*657*			*716*	*134*				*107*		*105*
Lane Group Capacity	*297*	*1081*			*1081*	*919*				*466*		*417*
v/c Ratio	*0.23*	*0.61*			*0.66*	*0.15*				*0.23*		*0.25*
Green Ratio	*0.63*	*0.63*			*0.63*	*0.63*				*0.26*		*0.26*
Uniform Delay d_1	*7.6*	*10.5*			*11.1*	*7.1*				*27.4*		*27.6*
Delay Factor k	*0.11*	*0.19*			*0.24*	*0.11*				*0.11*		*0.11*
Incremental Delay d_2	*0.4*	*1.0*			*1.5*	*0.1*				*0.3*		*0.3*
PF Factor	*1.000*	*1.000*			*1.000*	*1.000*				*1.000*		*1.000*
Control Delay	*8.0*	*11.5*			*12.6*	*7.2*				*27.7*		*27.9*
Lane Group LOS	*A*	*B*			*B*	*A*				*C*		*C*
Approach Delay	*11.1*			*11.8*						*27.8*		
Approach LOS	*B*			*B*						*C*		
Intersection Delay	*13.4*			Intersection LOS						*B*		

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	*2032*

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)	25	516	185	117	646	57	136	5	149	35	5	25
% 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	26	543	195	123	680	60	143	5	157	37	5	26
Lane Group Capacity	386	919	1164	479	919	1164	296	392	583	296	392	583
v/c Ratio	0.07	0.59	0.17	0.26	0.74	0.05	0.48	0.01	0.27	0.13	0.01	0.04
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	8.4	14.9	2.2	7.0	16.9	2.0	33.0	29.7	21.0	30.4	29.7	19.3
Delay Factor k	0.11	0.18	0.11	0.11	0.30	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Incremental Delay d_2	0.1	1.0	0.1	0.3	3.2	0.0	1.2	0.0	0.3	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	1.000
Control Delay	8.5	15.9	2.3	7.3	20.1	2.0	34.2	29.7	21.3	30.6	29.7	19.3
Lane Group LOS	A	B	A	A	C	A	C	C	C	C	C	B
Approach Delay	12.2			17.0			27.5			26.2		
Approach LOS	B			B			C			C		
Intersection Delay	17.1			Intersection LOS						B		

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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	2032 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)	33		617				471	2254			741	749
% 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 = 15.0	G =	G =	G =	G = 95.0	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	35		607				496	2373			780	788
Lane Group Capacity	207		2623				472	2580			2580	1455
v/c Ratio	0.17		0.23				1.05	0.92			0.30	0.54
Green Ratio	0.13		1.00				0.79	0.79			0.79	1.00
Uniform Delay d_1	46.9		0.0				12.5	9.6			3.4	0.0
Delay Factor k	0.11		0.11				0.50	0.44			0.11	0.14
Incremental Delay d_2	0.4		0.0				55.4	6.0			0.1	0.4
PF Factor	1.000		0.950				1.000	1.000			1.000	0.950
Control Delay	47.3		0.0				67.9	15.6			3.5	0.4
Lane Group LOS	D		A				E	B			A	A
Approach Delay	2.6						24.6			1.9		
Approach LOS	A						C			A		
Intersection Delay	14.8			Intersection LOS						B		

SHORT REPORT

General Information		Site Information	
Analyst	KNM	Intersection	US 17/92 and I-4 EB Ramps
Agency or Co.	HNTB		
Date Performed	3/24/08	Area Type	All other areas
Time Period	Build I-4 Connection @ SR 417	Jurisdiction	Seminole County
		Analysis Year	2032 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)	976			85	61	107	285	675			701	657
% 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 = 15.0	G = 35.0	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	1027			89	64	113	300	711			738	692
Lane Group Capacity	1146			828	218	864	291	1358			951	1212
v/c Ratio	0.90			0.11	0.29	0.13	1.03	0.52			0.78	0.57
Green Ratio	0.33			0.50	0.13	0.58	0.46	0.42			0.29	0.83
Uniform Delay d_1	38.0			15.9	47.7	11.3	27.9	26.1			38.9	3.2
Delay Factor k	0.42			0.11	0.11	0.11	0.50	0.13			0.33	0.17
Incremental Delay d_2	9.4			0.1	0.8	0.1	61.0	0.4			4.1	0.7
PF Factor	1.000			1.000	1.000	1.000	1.000	1.000			1.000	1.000
Control Delay	47.5			15.9	48.4	11.3	88.9	26.5			43.0	3.8
Lane Group LOS	D			B	D	B	F	C			D	A
Approach Delay	47.5			21.8			45.0			24.1		
Approach LOS	D			C			D			C		
Intersection Delay	36.0			Intersection LOS						D		

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	2032 Build

Volume and Timing Input

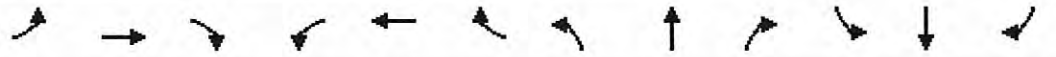
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1		1				1	1			1	1
Lane Group	L		R				L	T			T	R
Volume (vph)	474		86				88	1022			539	214
% Heavy Vehicles	2		2				2	2			2	2
PHF	0.95		0.95				0.95	0.95			0.95	0.95
Pretimed/Actuated (P/A)	A		A				A	A			A	A
Startup Lost Time	2.0		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	499		48				93	1076			567	225
Lane Group Capacity	531		1583				392	1118			1118	950
v/c Ratio	0.94		0.03				0.24	0.96			0.51	0.24
Green Ratio	0.30		1.00				0.60	0.60			0.60	0.60
Uniform Delay d_1	34.1		0.0				9.3	18.9			11.5	9.3
Delay Factor k	0.45		0.11				0.11	0.47			0.12	0.11
Incremental Delay d_2	24.9		0.0				0.3	18.5			0.4	0.1
PF Factor	1.000		0.950				1.000	1.000			1.000	1.000
Control Delay	59.1		0.0				9.6	37.5			11.9	9.5
Lane Group LOS	E		A				A	D			B	A
Approach Delay	53.9						35.2			11.2		
Approach LOS	D						D			B		
Intersection Delay	31.7			Intersection LOS						C		

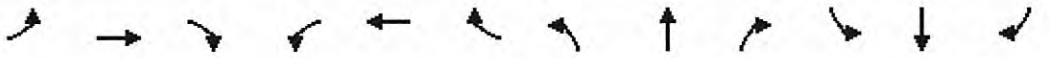


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	213	609	90	315	672	393	245	1164	1170	457	850	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane 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)	232	662	98	342	730	427	266	1265	1272	497	924	210
RTOR Reduction (vph)	0	0	81	0	0	21	0	0	2	0	0	123
Lane Group Flow (vph)	232	662	17	342	730	406	266	1265	1270	497	924	87
Turn Type	Prot		Perm	Prot		pt+ov	Prot		pt+ov	Prot		Perm
Protected Phases	5	2		1	6	6 7	3	8	8 1	7	4	
Permitted Phases			2									4
Actuated Green, G (s)	13.5	25.5	25.5	17.5	29.5	54.5	27.2	72.5	96.5	18.5	63.8	63.8
Effective Green, g (s)	16.0	28.0	28.0	20.0	32.0	57.0	29.7	75.0	99.0	21.0	66.3	66.3
Actuated g/C Ratio	0.10	0.18	0.18	0.12	0.20	0.36	0.19	0.47	0.62	0.13	0.41	0.41
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)	177	619	277	429	708	564	329	1659	979	451	1466	656
v/s Ratio Prot	0.13	0.19		0.10	c0.21	0.26	0.15	0.36	c0.80	c0.14	0.26	
v/s Ratio Perm			0.01									0.05
v/c Ratio	1.31	1.07	0.06	0.80	1.03	0.72	0.81	0.76	1.30	1.10	0.63	0.13
Uniform Delay, d1	72.0	66.0	55.0	68.0	64.0	44.6	62.4	35.1	30.5	69.5	37.1	29.0
Progression Factor	1.00	1.00	1.00	0.82	0.71	0.87	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	174.3	56.2	0.4	6.4	35.0	2.9	13.6	3.4	141.2	73.0	2.1	0.4
Delay (s)	246.3	122.2	55.5	62.4	80.4	41.5	76.0	38.5	171.7	142.5	39.2	29.5
Level of Service	F	F	E	E	F	D	E	D	F	F	D	C
Approach Delay (s)		144.6			65.2			102.5			69.4	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM Average Control Delay	92.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	112.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

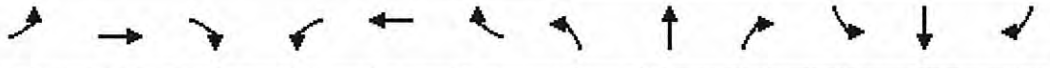
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	1613	697	771	1448	67	227	64	609	295	372	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. 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	1721	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	1721	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)	33	1753	758	838	1574	73	247	70	662	321	404	37
RTOR Reduction (vph)	0	0	121	0	0	28	0	0	32	0	0	31
Lane Group Flow (vph)	33	1753	637	838	1574	45	156	161	630	321	404	6
Turn Type	Prot		Perm	Prot		Perm	Split		pt+ov	Split		Perm
Protected Phases	5	2		1	6		8	8	8 1	4	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	4.6	68.5	68.5	31.5	95.4	95.4	11.5	11.5	48.5	25.5	25.5	25.5
Effective Green, g (s)	6.1	71.0	71.0	33.0	97.9	97.9	13.0	13.0	50.0	27.0	27.0	27.0
Actuated g/C Ratio	0.04	0.44	0.44	0.21	0.61	0.61	0.08	0.08	0.31	0.17	0.17	0.17
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)	67	1570	702	708	2165	969	137	140	871	299	314	267
v/s Ratio Prot	0.02	c0.50		c0.24	0.44		0.09	c0.09	0.23	0.18	c0.22	
v/s Ratio Perm			0.40			0.03						0.00
v/c Ratio	0.49	1.12	0.91	1.18	0.73	0.05	1.14	1.15	0.72	1.07	1.29	0.02
Uniform Delay, d1	75.4	44.5	41.4	63.5	21.7	12.4	73.5	73.5	48.8	66.5	66.5	55.5
Progression Factor	0.90	1.15	1.22	1.10	0.31	0.15	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	53.4	2.1	87.2	0.7	0.0	119.0	122.0	3.0	73.0	151.0	0.0
Delay (s)	68.0	104.5	52.6	157.3	7.4	1.8	192.5	195.5	51.8	139.5	217.5	55.5
Level of Service	E	F	D	F	A	A	F	F	D	F	F	E
Approach Delay (s)		88.5			57.8			97.9			176.7	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	88.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	107.5%	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)	365	2152	0	0	1652	445	634	0	1206	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)	397	2339	0	0	1796	484	689	0	1311	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	127	0	0	4	0	0	0
Lane Group Flow (vph)	397	2339	0	0	1796	358	689	0	1307	0	0	0
Turn Type	Prot					Perm	Prot		custom			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	14.5	89.0			69.0	69.0	58.5		58.5			
Effective Green, g (s)	16.0	92.0			72.0	72.0	60.0		60.0			
Actuated g/C Ratio	0.10	0.58			0.45	0.45	0.38		0.38			
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)	343	2035			1593	712	1287		1045			
v/s Ratio Prot	0.12	c0.66			0.51		0.20					
v/s Ratio Perm						0.23			c0.47			
v/c Ratio	1.16	1.15			1.13	0.50	0.54		1.25			
Uniform Delay, d1	72.0	34.0			44.0	31.3	39.1		50.0			
Progression Factor	0.91	0.99			0.25	0.02	1.00		1.00			
Incremental Delay, d2	74.2	67.8			58.2	0.2	0.4		120.7			
Delay (s)	139.9	101.5			69.2	1.0	39.5		170.7			
Level of Service	F	F			E	A	D		F			
Approach Delay (s)		107.1			54.7			125.5			0.0	
Approach LOS		F			D			F			A	

Intersection Summary			
HCM Average Control Delay	95.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	108.3%	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)	1086	1521	750	317	661	122	1018	993	499	113	659	418
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)	1180	1653	815	345	718	133	1107	1079	542	123	716	454
RTOR Reduction (vph)	0	0	321	0	0	104	0	0	128	0	0	337
Lane Group Flow (vph)	1180	1653	494	345	718	29	1107	1079	414	123	716	117
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)	42.5	59.5	59.5	12.5	29.5	29.5	39.5	53.4	53.4	10.6	24.5	24.5
Effective Green, g (s)	44.0	62.0	62.0	14.0	32.0	32.0	41.0	55.9	55.9	12.1	27.0	27.0
Actuated g/C Ratio	0.28	0.39	0.39	0.09	0.20	0.20	0.26	0.35	0.35	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)	944	1371	613	300	708	317	880	1236	553	134	597	267
v/s Ratio Prot	c0.34	c0.47		0.10	0.20		c0.32	0.30		0.07	c0.20	
v/s Ratio Perm			0.31			0.02			0.26			0.07
v/c Ratio	1.25	1.21	0.81	1.15	1.01	0.09	1.26	0.87	0.75	0.92	1.20	0.44
Uniform Delay, d1	58.0	49.0	43.6	73.0	64.0	52.2	59.5	48.7	45.9	73.5	66.5	59.7
Progression Factor	1.00	1.10	1.29	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	113.4	93.2	1.1	98.9	37.4	0.6	125.3	7.1	5.5	52.9	105.2	1.2
Delay (s)	171.5	147.1	57.5	171.9	101.4	52.7	184.8	55.8	51.4	126.3	171.7	60.9
Level of Service	F	F	E	F	F	D	F	E	D	F	F	E
Approach Delay (s)		135.0			116.3			107.3			128.5	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	123.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	111.7%	ICU Level of Service	H
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)	250	0	430	0	0	0	0	880	878	332	996	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)	272	0	467	0	0	0	0	957	954	361	1083	0
RTOR Reduction (vph)	0	0	195	0	0	0	0	0	359	0	0	0
Lane Group Flow (vph)	272	0	272	0	0	0	0	957	595	361	1083	0
Turn Type	Prot		custom						Perm	Prot		
Protected Phases	8							2		1	6	
Permitted Phases			8						2			
Actuated Green, G (s)	21.9		21.9					53.5	53.5	17.6	77.6	
Effective Green, g (s)	21.9		21.9					56.0	56.0	20.1	80.1	
Actuated g/C Ratio	0.20		0.20					0.51	0.51	0.18	0.73	
Clearance Time (s)	4.0		4.0					6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0		3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	352		555					1802	806	627	2577	
v/s Ratio Prot	c0.15							0.27		c0.11	0.31	
v/s Ratio Perm			0.10						c0.38			
v/c Ratio	0.77		0.49					0.53	0.74	0.58	0.42	
Uniform Delay, d1	41.7		39.1					18.2	21.2	41.1	5.9	
Progression Factor	1.00		1.00					1.00	1.00	0.99	0.36	
Incremental Delay, d2	10.1		0.7					1.1	6.0	2.8	0.4	
Delay (s)	51.8		39.8					19.3	27.2	43.2	2.5	
Level of Service	D		D					B	C	D	A	
Approach Delay (s)		44.2			0.0			23.3			12.7	
Approach LOS		D			A			C			B	

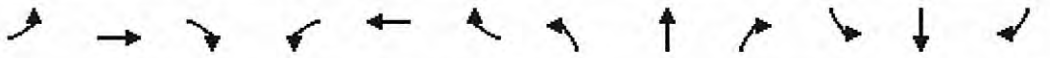
Intersection Summary			
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Volume (vph)	616	514	0	0	681	64	647	0	613	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)	670	559	0	0	740	70	703	0	666	0	0
RTOR Reduction (vph)	0	0	0	0	0	50	0	0	212	0	0
Lane Group Flow (vph)	670	559	0	0	740	20	703	0	454	0	0
Turn Type	Prot					Perm	Prot		custom		
Protected Phases	5	2			6		4				
Permitted Phases						6			4		
Actuated Green, G (s)	27.4	62.5			28.6	28.6	34.5		34.5		
Effective Green, g (s)	29.9	65.0			31.1	31.1	37.0		37.0		
Actuated g/C Ratio	0.27	0.59			0.28	0.28	0.34		0.34		
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)	933	2091			1001	448	1155		532		
v/s Ratio Prot	c0.20	0.16			c0.21		0.20				
v/s Ratio Perm						0.01			c0.29		
v/c Ratio	0.72	0.27			0.74	0.04	0.61		0.85		
Uniform Delay, d1	36.2	10.9			35.8	28.7	30.5		34.0		
Progression Factor	0.79	0.50			0.78	0.61	1.09		1.16		
Incremental Delay, d2	2.2	0.3			4.8	0.2	2.4		15.8		
Delay (s)	30.8	5.7			32.9	17.7	35.5		55.1		
Level of Service	C	A			C	B	D		E		
Approach Delay (s)		19.4			31.6			45.0		0.0	
Approach LOS		B			C			D		A	

Intersection Summary			
HCM Average Control Delay	32.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	195	425	788	777	573	627
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)	212	462	857	845	623	682
RTOR Reduction (vph)	0	395	0	232	0	0
Lane Group Flow (vph)	212	67	857	613	623	682
Turn Type		Perm		Perm	Prot	
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	13.4	13.4	38.9	38.9	38.2	83.6
Effective Green, g (s)	15.9	15.9	41.4	41.4	40.7	86.1
Actuated g/C Ratio	0.14	0.14	0.38	0.38	0.37	0.78
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)	256	229	1332	596	655	2770
v/s Ratio Prot	c0.12		0.24		c0.35	0.19
v/s Ratio Perm		0.04		c0.39		
v/c Ratio	0.83	0.29	0.64	1.03	0.95	0.25
Uniform Delay, d1	45.7	42.0	28.2	34.3	33.7	3.2
Progression Factor	1.06	1.52	0.51	0.29	0.89	0.33
Incremental Delay, d2	19.0	0.7	1.9	40.1	21.1	0.2
Delay (s)	67.3	64.7	16.3	50.2	51.0	1.2
Level of Service	E	E	B	D	D	A
Approach Delay (s)	65.5		33.1			25.0
Approach LOS	E		C			C

Intersection Summary			
HCM Average Control Delay	36.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



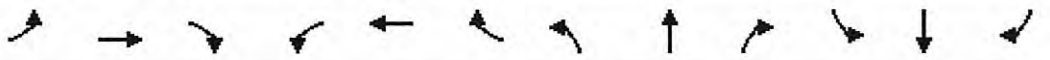
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	53	21	137	338	42	1080	126	799	288	311	725	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.86	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1524	1504	3433	3539	1583	3433	3539	1583
Flt Permitted	0.15	1.00	1.00	0.65	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	277	1863	1583	1204	1524	1504	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	23	149	367	46	1174	137	868	313	338	788	46
RTOR Reduction (vph)	0	0	113	0	130	130	0	0	216	0	0	29
Lane Group Flow (vph)	58	23	36	367	480	480	137	868	97	338	788	17
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)	26.2	23.4	23.4	45.4	35.1	35.1	5.0	30.5	30.5	11.6	37.1	37.1
Effective Green, g (s)	33.2	26.9	26.9	48.9	38.6	38.6	8.5	34.0	34.0	15.1	40.6	40.6
Actuated g/C Ratio	0.30	0.24	0.24	0.44	0.35	0.35	0.08	0.31	0.31	0.14	0.37	0.37
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	169	456	387	628	535	528	265	1094	489	471	1306	584
v/s Ratio Prot	0.02	0.01		c0.10	0.31		0.04	c0.25		c0.10	0.22	
v/s Ratio Perm	0.08		0.02	0.16		c0.32			0.06			0.01
v/c Ratio	0.34	0.05	0.09	0.58	0.90	0.91	0.52	0.79	0.20	0.72	0.60	0.03
Uniform Delay, d1	30.4	31.8	32.1	21.5	33.8	34.0	48.8	34.8	28.0	45.4	28.2	22.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.07	0.69	1.81	1.00	0.76	0.73
Incremental Delay, d2	1.2	0.0	0.1	1.4	17.4	19.3	1.2	4.4	0.7	4.8	1.9	0.1
Delay (s)	31.6	31.8	32.2	22.9	51.3	53.3	53.2	28.5	51.2	50.0	23.3	16.2
Level of Service	C	C	C	C	D	D	D	C	D	D	C	B
Approach Delay (s)		32.0			45.5			36.4			30.7	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM Average Control Delay	38.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	86	188	173	247	168	201	311	1208	121	143	558	99
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	0.64	1.00	1.00	0.40	1.00	1.00	0.34	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	1196	3539	1583	754	1863	1583	1240	3539	1583	376	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)	93	204	188	268	183	218	338	1313	132	155	607	108
RTOR Reduction (vph)	0	0	164	0	0	99	0	0	64	0	0	55
Lane Group Flow (vph)	93	204	24	268	183	119	338	1313	68	155	607	53
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)	15.4	11.8	11.8	33.0	23.9	23.9	60.9	54.2	54.2	56.1	51.8	51.8
Effective Green, g (s)	18.4	14.3	14.3	34.5	26.4	26.4	63.9	56.7	56.7	59.1	54.3	54.3
Actuated g/C Ratio	0.17	0.13	0.13	0.31	0.24	0.24	0.58	0.52	0.52	0.54	0.49	0.49
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)	227	460	206	395	447	380	884	1824	816	363	1747	781
v/s Ratio Prot	0.02	0.06		c0.11	0.10		c0.03	c0.37		0.02	0.17	
v/s Ratio Perm	0.05		0.02	c0.11		0.08	0.19		0.04	0.21		0.03
v/c Ratio	0.41	0.44	0.12	0.68	0.41	0.31	0.38	0.72	0.08	0.43	0.35	0.07
Uniform Delay, d1	40.3	44.2	42.3	30.8	35.2	34.4	11.3	20.5	13.5	16.4	17.0	14.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.82	0.88	0.84	1.57	0.67	0.28
Incremental Delay, d2	1.2	0.7	0.3	4.6	0.6	0.5	0.1	1.3	0.1	0.5	0.3	0.1
Delay (s)	41.5	44.9	42.5	35.3	35.8	34.8	9.4	19.5	11.4	26.3	11.7	4.1
Level of Service	D	D	D	D	D	C	A	B	B	C	B	A
Approach Delay (s)		43.3			35.3			17.0			13.4	
Approach LOS		D			D			B			B	

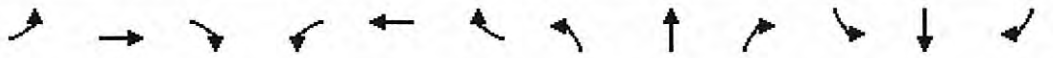
Intersection Summary			
HCM Average Control Delay	22.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



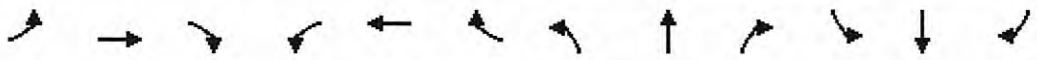
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	1790	398	555	1982	13	842	71	527	41	37	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. 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	1946	433	603	2154	14	915	77	573	45	40	158
RTOR Reduction (vph)	0	0	187	0	0	7	0	0	183	0	0	80
Lane Group Flow (vph)	67	1946	246	603	2154	7	915	77	390	45	40	78
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	39.5	39.5	16.5	51.6	51.6	23.5	23.5	23.5	4.5	4.5	4.5
Effective Green, g (s)	6.9	42.0	42.0	19.0	54.1	54.1	26.0	26.0	26.0	7.0	7.0	7.0
Actuated g/C Ratio	0.06	0.38	0.38	0.17	0.49	0.49	0.24	0.24	0.24	0.06	0.06	0.06
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)	111	1942	604	593	2501	779	811	440	374	113	119	101
v/s Ratio Prot	0.04	c0.38		c0.18	0.42		c0.27	0.04		0.03	0.02	
v/s Ratio Perm			0.16			0.00			0.25			c0.05
v/c Ratio	0.60	1.00	0.41	1.02	0.86	0.01	1.13	0.17	1.04	0.40	0.34	0.78
Uniform Delay, d1	50.2	34.0	24.9	45.5	24.6	14.3	42.0	33.5	42.0	49.5	49.3	50.7
Progression Factor	1.07	0.58	0.42	1.00	1.00	1.00	0.76	0.74	0.58	1.00	1.00	1.00
Incremental Delay, d2	6.7	18.1	1.5	41.3	4.2	0.0	69.8	0.7	52.3	2.3	1.7	30.3
Delay (s)	60.7	37.7	11.9	86.8	28.8	14.3	101.9	25.4	76.6	51.8	51.0	81.1
Level of Service	E	D	B	F	C	B	F	C	E	D	D	F
Approach Delay (s)		33.8			41.4			88.9			70.7	
Approach LOS		C			D			F			E	

Intersection Summary			
HCM Average Control Delay	50.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	297	1570	843	335	2319	146	718	66	289	144	62	199
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)	323	1707	916	364	2521	159	780	72	314	157	67	216
RTOR Reduction (vph)	0	0	340	0	0	94	0	0	241	0	0	181
Lane Group Flow (vph)	323	1707	576	364	2521	65	780	72	73	157	67	35
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)	15.5	45.5	45.5	12.5	42.5	42.5	22.5	11.6	11.6	14.4	3.5	3.5
Effective Green, g (s)	18.0	48.0	48.0	15.0	45.0	45.0	25.0	14.1	14.1	16.9	6.0	6.0
Actuated g/C Ratio	0.16	0.44	0.44	0.14	0.41	0.41	0.23	0.13	0.13	0.15	0.05	0.05
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)	290	2219	691	468	2621	648	780	239	203	272	102	86
v/s Ratio Prot	c0.18	0.34		0.11	c0.39		c0.23	0.04		0.09	c0.04	
v/s Ratio Perm			c0.36			0.04			0.05			0.02
v/c Ratio	1.11	0.77	0.83	0.78	0.96	0.10	1.00	0.30	0.36	0.58	0.66	0.41
Uniform Delay, d1	46.0	26.3	27.4	45.9	31.7	20.0	42.5	43.5	43.8	43.2	51.0	50.3
Progression Factor	1.07	0.73	0.74	1.04	0.98	1.84	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	81.9	2.1	9.3	3.1	5.0	0.1	32.2	0.7	1.1	3.0	14.2	3.2
Delay (s)	131.1	21.3	29.6	50.7	36.1	36.9	74.7	44.2	44.9	46.2	65.2	53.5
Level of Service	F	C	C	D	D	D	E	D	D	D	E	D
Approach Delay (s)		35.9			37.8			64.8			52.7	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM Average Control Delay	42.1	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

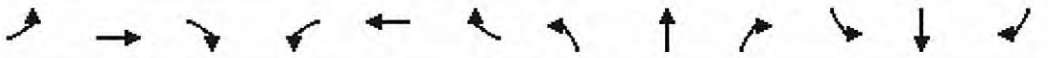


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	445	1637	0	0	2425	925	629	0	711	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0		4.0			
Lane Util. Factor	0.97	0.91			0.91	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)	484	1779	0	0	2636	1005	684	0	773	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	347	0	0	45	0	0	0
Lane Group Flow (vph)	484	1779	0	0	2636	658	684	0	728	0	0	0
Turn Type	Prot					Perm	Prot		custom			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	11.5	73.5			55.5	55.5	23.5		23.5			
Effective Green, g (s)	14.0	76.0			58.0	58.0	26.0		26.0			
Actuated g/C Ratio	0.13	0.69			0.53	0.53	0.24		0.24			
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)	437	3513			2681	835	811		659			
v/s Ratio Prot	c0.14	0.35			c0.52		0.20					
v/s Ratio Perm						0.42			c0.26			
v/c Ratio	1.11	0.51			0.98	0.79	0.84		1.10			
Uniform Delay, d1	48.0	8.1			25.5	21.0	40.1		42.0			
Progression Factor	1.05	0.90			0.49	1.51	1.00		1.00			
Incremental Delay, d2	72.0	0.4			7.3	2.8	10.4		67.3			
Delay (s)	122.5	7.7			19.8	34.5	50.5		109.3			
Level of Service	F	A			B	C	D		F			
Approach Delay (s)		32.2			23.8			81.7			0.0	
Approach LOS		C			C			F			A	

Intersection Summary			
HCM Average Control Delay	37.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
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	1240	650	0	2194	0	842	0	528	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	1348	707	0	2385	0	915	0	574	0	0
RTOR Reduction (vph)	0	0	347	0	0	0	0	0	1	0	0
Lane Group Flow (vph)	0	1348	360	0	2385	0	915	0	573	0	0
Turn Type			Perm				Prot		custom		
Protected Phases		2			6		4				
Permitted Phases			2						4		
Actuated Green, G (s)		53.5	53.5		53.5		43.5		43.5		
Effective Green, g (s)		56.0	56.0		56.0		46.0		46.0		
Actuated g/C Ratio		0.51	0.51		0.51		0.42		0.42		
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)		2589	806		2589		1436		662		
v/s Ratio Prot		0.27			c0.47		0.27				
v/s Ratio Perm			0.23						c0.36		
v/c Ratio		0.52	0.45		0.92		0.64		0.87		
Uniform Delay, d1		18.0	17.2		25.0		25.4		29.2		
Progression Factor		0.56	1.46		0.54		1.00		1.00		
Incremental Delay, d2		0.6	1.4		2.4		2.2		14.2		
Delay (s)		10.7	26.5		16.0		27.6		43.4		
Level of Service		B	C		B		C		D		
Approach Delay (s)		16.1			16.0			33.7		0.0	
Approach LOS		B			B			C		A	

Intersection Summary			
HCM Average Control Delay	20.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

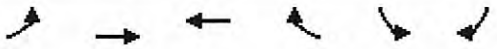


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	1532	4	54	1946	260	22	93	201	357	18	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	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	5083		1770	5085	1583	1770	1863	1583	1681	1693	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.62	1.00	1.00	0.51	0.49	1.00
Satd. Flow (perm)	1770	5083		1770	5085	1583	1160	1863	1583	896	875	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)	102	1665	4	59	2115	283	24	101	218	388	20	60
RTOR Reduction (vph)	0	0	0	0	0	136	0	0	118	0	0	46
Lane Group Flow (vph)	102	1669	0	59	2115	147	24	101	100	202	206	14
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)	9.7	51.7		6.1	48.1	48.1	16.3	14.2	14.2	31.2	31.2	22.6
Effective Green, g (s)	12.2	55.7		8.6	52.1	52.1	21.3	16.7	16.7	33.7	33.7	25.1
Actuated g/C Ratio	0.11	0.51		0.08	0.47	0.47	0.19	0.15	0.15	0.31	0.31	0.23
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)	196	2574		138	2408	750	250	283	240	367	365	361
v/s Ratio Prot	c0.06	c0.33		0.03	c0.42		0.00	0.05		0.06	c0.07	
v/s Ratio Perm						0.09	0.01		0.06	0.10	c0.11	0.01
v/c Ratio	0.52	0.65		0.43	0.88	0.20	0.10	0.36	0.42	0.55	0.56	0.04
Uniform Delay, d1	46.1	20.0		48.4	26.1	16.8	36.3	41.8	42.2	30.2	32.0	33.0
Progression Factor	1.03	0.64		1.20	0.49	0.07	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	1.0		0.8	2.1	0.2	0.2	0.8	1.2	1.8	2.0	0.0
Delay (s)	49.5	13.8		59.1	14.8	1.4	36.4	42.6	43.4	32.0	34.0	33.1
Level of Service	D	B		E	B	A	D	D	D	C	C	C
Approach Delay (s)		15.9			14.3			42.7			33.0	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

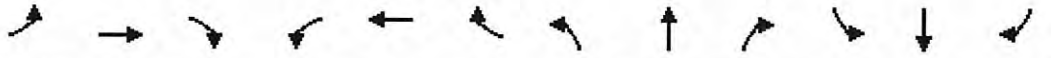
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↱	↰↰	↑↑↑	↰↰	↱↱
Volume (vph)	1613	297	156	1794	657	383
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	0.88
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	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)	1753	323	170	1950	714	416
RTOR Reduction (vph)	0	160	0	0	0	306
Lane Group Flow (vph)	1753	163	170	1950	714	110
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	52.6	52.6	10.8	69.9	26.1	26.1
Effective Green, g (s)	55.6	55.6	13.3	72.9	29.1	29.1
Actuated g/C Ratio	0.51	0.51	0.12	0.66	0.26	0.26
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)	2570	800	415	3370	908	737
v/s Ratio Prot	c0.34		0.05	c0.38	c0.21	
v/s Ratio Perm		0.10				0.04
v/c Ratio	0.68	0.20	0.41	0.58	0.79	0.15
Uniform Delay, d1	20.5	15.0	44.7	10.1	37.6	31.0
Progression Factor	0.69	1.30	1.46	0.20	0.78	0.50
Incremental Delay, d2	1.2	0.5	0.4	0.4	3.6	0.1
Delay (s)	15.4	19.9	65.5	2.5	33.0	15.7
Level of Service	B	B	E	A	C	B
Approach Delay (s)	16.1			7.5	26.6	
Approach LOS	B			A	C	

Intersection Summary			
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	35	1605	2011	319	288	62
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	0.06	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	115	5085	5085	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	1745	2186	347	313	67
RTOR Reduction (vph)	0	0	0	142	0	5
Lane Group Flow (vph)	38	1745	2186	205	313	62
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	61.5	61.5	61.5	61.5	34.5	34.5
Effective Green, g (s)	65.0	65.0	65.0	65.0	37.0	37.0
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.34	0.34
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)	68	3005	3005	935	595	532
v/s Ratio Prot		0.34	c0.43		c0.18	
v/s Ratio Perm	0.33			0.13		0.04
v/c Ratio	0.56	0.58	0.73	0.22	0.53	0.12
Uniform Delay, d1	13.7	14.0	16.1	10.6	29.4	25.2
Progression Factor	1.57	1.20	0.95	2.46	1.00	1.00
Incremental Delay, d2	25.2	0.7	1.2	0.4	3.3	0.4
Delay (s)	46.8	17.5	16.5	26.4	32.7	25.7
Level of Service	D	B	B	C	C	C
Approach Delay (s)		18.1	17.9		31.5	
Approach LOS		B	B		C	

Intersection Summary			
HCM Average Control Delay	19.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

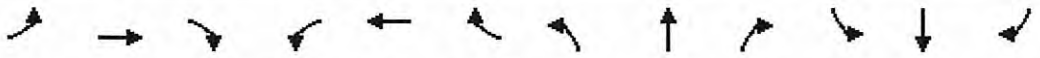


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	122	1176	42	134	1661	215	300	161	99	133	77	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane 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	0.57	1.00	1.00	0.65	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1054	1863	1583	1205	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)	133	1278	46	146	1805	234	326	175	108	145	84	109
RTOR Reduction (vph)	0	0	29	0	0	133	0	0	80	0	0	90
Lane Group Flow (vph)	133	1278	17	146	1805	101	326	175	28	145	84	19
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)	10.6	35.6	35.6	12.1	37.1	37.1	41.3	26.5	26.5	24.7	16.4	16.4
Effective Green, g (s)	13.1	39.6	39.6	14.6	41.1	41.1	43.8	29.0	29.0	29.7	18.9	18.9
Actuated g/C Ratio	0.12	0.36	0.36	0.13	0.37	0.37	0.40	0.26	0.26	0.27	0.17	0.17
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)	211	1831	570	235	1900	591	556	491	417	381	320	272
v/s Ratio Prot	0.08	0.25		c0.08	c0.35		c0.11	0.09		0.04	0.05	
v/s Ratio Perm			0.01			0.06	c0.12		0.02	0.07		0.01
v/c Ratio	0.63	0.70	0.03	0.62	0.95	0.17	0.59	0.36	0.07	0.38	0.26	0.07
Uniform Delay, d1	46.1	30.1	22.8	45.1	33.5	23.1	24.5	32.9	30.4	31.9	39.5	38.2
Progression Factor	1.00	1.00	1.00	1.53	0.44	0.38	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.0	2.2	0.1	3.5	8.9	0.4	1.6	2.0	0.3	0.6	2.0	0.5
Delay (s)	52.2	32.3	22.9	72.7	23.5	9.2	26.1	34.9	30.7	32.6	41.5	38.7
Level of Service	D	C	C	E	C	A	C	C	C	C	D	D
Approach Delay (s)		33.8			25.2			29.5			36.8	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM Average Control Delay	29.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	0	0	290	690	136	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0	6.0	6.0	
Lane Util. Factor			1.00	0.95	1.00	
Frt			1.00	1.00	1.00	
Flt Protected			0.95	1.00	0.95	
Satd. Flow (prot)			1770	3539	1770	
Flt Permitted			0.95	1.00	0.95	
Satd. Flow (perm)			1770	3539	1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	315	750	148	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	315	750	148	0
Turn Type			Perm			
Protected Phases				6	8	
Permitted Phases			6			
Actuated Green, G (s)			48.2	48.2	9.8	
Effective Green, g (s)			48.2	48.2	9.8	
Actuated g/C Ratio			0.69	0.69	0.14	
Clearance Time (s)			6.0	6.0	6.0	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)			1219	2437	248	
v/s Ratio Prot				c0.21	c0.08	
v/s Ratio Perm			0.18			
v/c Ratio			0.26	0.31	0.60	
Uniform Delay, d1			4.1	4.3	28.2	
Progression Factor			1.00	1.00	0.47	
Incremental Delay, d2			0.5	0.3	3.8	
Delay (s)			4.6	4.6	17.1	
Level of Service			A	A	B	
Approach Delay (s)	0.0			4.6	17.1	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	6.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

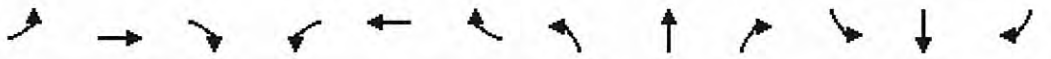


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	695	21	815	14	3	1	0	0	8	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0		6.0			6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00		1.00			1.00	
Frt	1.00		0.85	1.00	1.00	0.85		1.00			0.98	
Flt Protected	0.95		1.00	0.95	1.00	1.00		0.96			1.00	
Satd. Flow (prot)	1770		1583	1770	1863	1583		1795			1817	
Flt Permitted	0.30		1.00	0.95	1.00	1.00		1.00			1.00	
Satd. Flow (perm)	555		1583	1770	1863	1583		1863			1817	
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)	5	0	755	23	886	15	3	1	0	0	9	2
RTOR Reduction (vph)	0	0	138	0	0	3	0	0	0	0	2	0
Lane Group Flow (vph)	5	0	617	23	886	12	0	4	0	0	9	0
Turn Type	custom		custom	Perm		Perm	Perm					
Protected Phases					6			8			4	
Permitted Phases	2		2	6		6	8					
Actuated Green, G (s)	57.2		57.2	57.2	57.2	57.2		0.8			0.8	
Effective Green, g (s)	57.2		57.2	57.2	57.2	57.2		0.8			0.8	
Actuated g/C Ratio	0.82		0.82	0.82	0.82	0.82		0.01			0.01	
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0		6.0			6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	454		1294	1446	1522	1294		21			21	
v/s Ratio Prot					c0.48						c0.00	
v/s Ratio Perm	0.01		0.39	0.01		0.01		0.00				
v/c Ratio	0.01		0.48	0.02	0.58	0.01		0.19			0.43	
Uniform Delay, d1	1.2		1.9	1.2	2.2	1.2		34.3			34.4	
Progression Factor	1.00		1.00	0.50	1.41	0.39		0.36			1.00	
Incremental Delay, d2	0.0		1.3	0.0	1.6	0.0		4.4			13.5	
Delay (s)	1.2		3.2	0.6	4.7	0.5		16.7			47.9	
Level of Service	A		A	A	A	A		B			D	
Approach Delay (s)		3.2			4.6			16.7			47.9	
Approach LOS		A			A			B			D	

Intersection Summary			
HCM Average Control Delay	4.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	493	252	0	0	0	0	129	71	174	116	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	0.95	1.00					1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583					1863	1583	1770	1863	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.67	1.00	
Satd. Flow (perm)	1770	3539	1583					1863	1583	1244	1863	
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)	8	536	274	0	0	0	0	140	77	189	126	0
RTOR Reduction (vph)	0	0	108	0	0	0	0	0	60	0	0	0
Lane Group Flow (vph)	8	536	166	0	0	0	0	140	17	189	126	0
Turn Type	Perm		Perm						Perm	Perm		
Protected Phases		2						8			4	
Permitted Phases	2		2						8	4		
Actuated Green, G (s)	42.3	42.3	42.3					15.7	15.7	15.7	15.7	
Effective Green, g (s)	42.3	42.3	42.3					15.7	15.7	15.7	15.7	
Actuated g/C Ratio	0.60	0.60	0.60					0.22	0.22	0.22	0.22	
Clearance Time (s)	6.0	6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1070	2139	957					418	355	279	418	
v/s Ratio Prot		c0.15						0.08			0.07	
v/s Ratio Perm	0.00		0.10						0.01	c0.15		
v/c Ratio	0.01	0.25	0.17					0.33	0.05	0.68	0.30	
Uniform Delay, d1	5.5	6.5	6.1					22.8	21.3	24.8	22.6	
Progression Factor	0.75	0.81	0.36					1.00	1.00	0.82	0.78	
Incremental Delay, d2	0.0	0.3	0.4					0.5	0.1	6.3	0.4	
Delay (s)	4.1	5.5	2.6					23.2	21.4	26.7	18.1	
Level of Service	A	A	A					C	C	C	B	
Approach Delay (s)		4.5			0.0			22.6			23.2	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

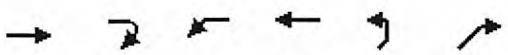


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	426	1205	89	41	846	23	51	14	24	64	21	453
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	3433	3503		1770	3525			1792	1583		1795	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.76	1.00		0.77	1.00
Satd. Flow (perm)	3433	3503		1770	3525			1421	1583		1431	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)	463	1310	97	45	920	25	55	15	26	70	23	492
RTOR Reduction (vph)	0	5	0	0	2	0	0	0	17	0	0	220
Lane Group Flow (vph)	463	1402	0	45	943	0	0	70	9	0	93	272
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)	18.8	51.0		4.4	36.6			36.1	36.1		36.1	36.1
Effective Green, g (s)	20.3	53.5		5.9	39.1			38.6	38.6		38.6	38.6
Actuated g/C Ratio	0.18	0.49		0.05	0.36			0.35	0.35		0.35	0.35
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)	634	1704		95	1253			499	555		502	555
v/s Ratio Prot	c0.13	c0.40		0.03	0.27							
v/s Ratio Perm								0.05	0.01		0.06	c0.17
v/c Ratio	0.73	0.82		0.47	0.75			0.14	0.02		0.19	0.49
Uniform Delay, d1	42.3	24.2		50.5	31.2			24.4	23.3		24.8	28.0
Progression Factor	1.00	1.00		0.90	1.01			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.3	3.3		3.5	2.5			0.6	0.1		0.8	3.1
Delay (s)	46.6	27.5		49.2	34.0			25.0	23.4		25.6	31.1
Level of Service	D	C		D	C			C	C		C	C
Approach Delay (s)		32.3			34.7			24.5			30.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	32.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	4	7	0	0	705	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	
Lane Util. Factor		1.00			1.00	
Frt		1.00			1.00	
Flt Protected		0.98			0.95	
Satd. Flow (prot)		1832			1770	
Flt Permitted		0.98			0.95	
Satd. Flow (perm)		1832			1770	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	8	0	0	766	21
RTOR Reduction (vph)	0	0	0	0	1	0
Lane Group Flow (vph)	0	12	0	0	786	0
Turn Type	Perm					
Protected Phases		2			4	
Permitted Phases	2					
Actuated Green, G (s)		1.6			56.4	
Effective Green, g (s)		1.6			56.4	
Actuated g/C Ratio		0.02			0.81	
Clearance Time (s)		6.0			6.0	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		42			1426	
v/s Ratio Prot					c0.44	
v/s Ratio Perm		0.01				
v/c Ratio		0.29			0.55	
Uniform Delay, d1		33.6			2.4	
Progression Factor		1.00			0.91	
Incremental Delay, d2		3.7			1.4	
Delay (s)		37.4			3.5	
Level of Service		D			A	
Approach Delay (s)		37.4	0.0		3.5	
Approach LOS		D	A		A	

Intersection Summary			
HCM Average Control Delay	4.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations			↰	↑↑	↰	
Volume (veh/h)	0	0	210	630	140	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	228	685	152	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		799	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		799	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 %			86		45	100
cM capacity (veh/h)			1622		278	1084

Direction, Lane #	WB 1	WB 2	WB 3	NE 1
Volume Total	228	342	342	152
Volume Left	228	0	0	152
Volume Right	0	0	0	0
cSH	1622	1700	1700	278
Volume to Capacity	0.14	0.20	0.20	0.55
Queue Length 95th (ft)	12	0	0	76
Control Delay (s)	7.6	0.0	0.0	32.7
Lane LOS	A			D
Approach Delay (s)	1.9			32.7
Approach LOS				D

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	44.6%	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)	35	287	188	0	0	0	0	105	85	29	181	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)	38	312	204	0	0	0	0	114	92	32	197	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			516			486	388	156	289	592	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			516			486	388	156	289	592	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 %	98			100			100	79	89	93	52	100
cM capacity (veh/h)	1622			1046			283	532	862	469	408	1084

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	NE 1	SW 1	SW 2
Volume Total	38	156	156	204	207	32	197
Volume Left	38	0	0	0	0	32	0
Volume Right	0	0	0	204	92	0	0
cSH	1622	1700	1700	1700	964	469	408
Volume to Capacity	0.02	0.09	0.09	0.12	0.21	0.07	0.48
Queue Length 95th (ft)	2	0	0	0	20	5	64
Control Delay (s)	7.3	0.0	0.0	0.0	11.8	13.2	21.8
Lane LOS	A				B	B	C
Approach Delay (s)	0.5				11.8	20.6	
Approach LOS					B	C	

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		