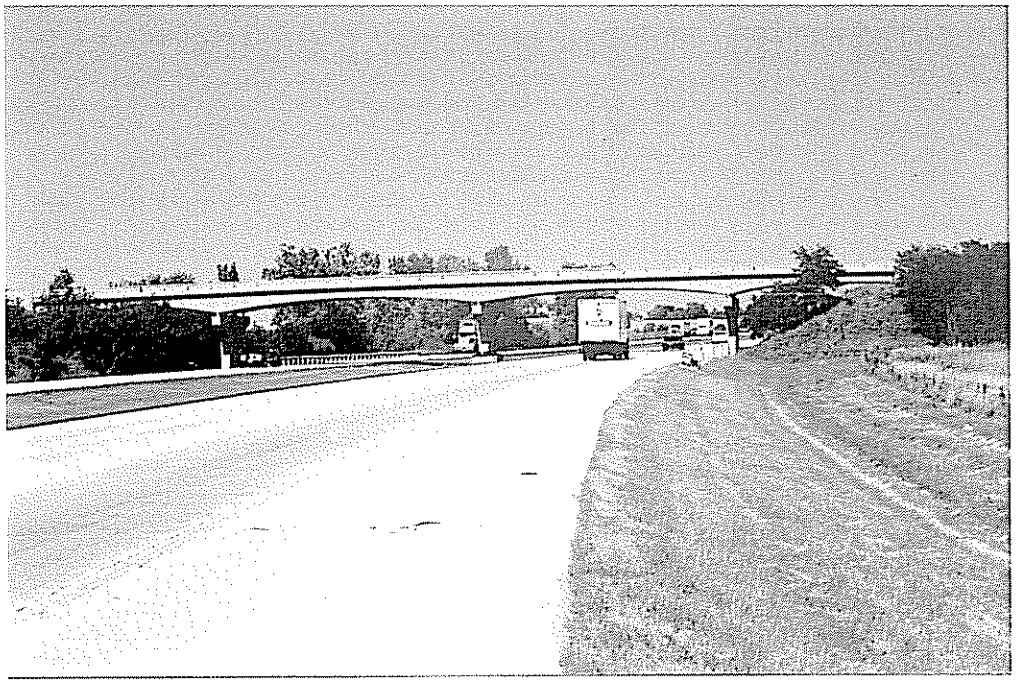
Access Justification Report
Addendum – HCS Analysis

Proposed Interstate 57 / 6000 North Road Interchange
Between IL 50 and 9000 North Road
Kankakee County, Illinois



Prepared for:
Illinois Department of Transportation, District 3

Prepared by:
Baker Engineering, Inc.
Chicago, Illinois

December 2005

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 Sb to IL-50
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3490	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	940	vph
Length of first accel/decel lane	590	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	950	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3490		940		950		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	969		261		264		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	4188		1128		1092		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4188 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4188	4800	No
v_{12}	4188	4400	No
$v_{FO} = v_F - v_R$	3060	4800	No
v_R	1128	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 35.0- pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.335	
Space mean speed in ramp influence area,	S_R = 60.6	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 60.6	mph

HCS Analyses
Table of Contents

1. 2005 EXISTING FREEWAY 5
2. 2005 EXISTING RAMPS 13
3. 2005 EXISTING INTERSECTIONS 55
4. 2030 NO-BUILD FREEWAY 89
5. 2030 NO-BUILD RAMPS 97
6. 2030 NO-BUILD INTERSECTIONS 131
7. 2030 BUILD FREEWAY 163
8. 2030 BUILD RAMPS 173
9. 2030 BUILD INTERSECTIONS 223
10. 2030 BUILD - 6000 N. ROAD RAMPS - LOS C 259
11. 2030 BUILD – MAINTAINING EXISTING LOS AT EXISTING RAMPS 277

2005 Existing Freeway

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	AM
Freeway/Direction:	I-57
From/To:	North of 9000N
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	39200	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	57	%
Volume, DDHV	2058	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	1235	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1235	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	17.6	pc/mi/ln
Level of Service, LOS	B	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	PM
Freeway/Direction:	I-57
From/To:	North of 9000N
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	39200	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	53	%
Volume, DDHV	2078	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	1247	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1247	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	17.8	pc/mi/ln
Level of Service, LOS	B	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	AM
Freeway/Direction:	I-57

From/To: IL 50 to 9000N
Jurisdiction:
Analysis Year: 2005
Description: I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	35400	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	50	%
Volume, DDHV	1625	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	975	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	975	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	13.9	pc/mi/ln
Level of Service, LOS	B	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	PM
Freeway/Direction:	I-57
From/To:	IL 50 to 9000N
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	35400	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	50	%
Volume, DDHV	1770	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	1062	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1062	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	15.2	pc/mi/ln
Level of Service, LOS	B	

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

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Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	AM
Freeway/Direction:	I-57
From/To:	South of IL 50
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	36500	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	50	%
Volume, DDHV	1732	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	1039	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1039	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	14.8	pc/mi/ln
Level of Service, LOS	B	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	PM
Freeway/Direction:	I-57
From/To:	South of IL 50
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	36500	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	52	%
Volume, DDHV	1898	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	1139	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1139	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	16.3	pc/mi/ln
Level of Service, LOS	B	

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

2005 Existing Ramps

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	9000N Rd to I-57 SB
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1333	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	292	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	210	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1333	292	210	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	370	81	58	v
Trucks and buses	16	16	16	%
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	0.926	0.926	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1600	350	252	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 1600$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1950	4800	No
v_{R12}	1950	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 16.1$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable, $M_S = 0.285$

Space mean speed in ramp influence area, $S_R = 62.0$ mph

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

Space mean speed for all vehicles, $S = 62.0$ mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	9000N Rd to I-57 SB
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1470	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	300	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	590	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1470	300	590	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	408	83	164	v
Trucks and buses	16	16	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	2.5	
Recreational vehicle PCE, ER	1.2	1.2	2.0	
Heavy vehicle adjustment, fHV	0.926	0.926	0.806	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1764	360	813	pcph

Estimation of V12 Merge Areas

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

P_{FM}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1764 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2124	4800	No
v_{R12}	2124	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 17.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.291	
Space mean speed in ramp influence area,	S_R = 61.9	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 61.9	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB TO 9000 N RD
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1543	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	210	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	292	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1543		210		292		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	429		58		81		v
Trucks and buses	16		16		16		%
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	0.926		0.926		0.926		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	1852		252		350		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1852 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1852	4800	No
v_{12}	1852	4400	No
$v_{FO} = v_F - v_R$	1600	4800	No
v_R	252	2100	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, D_S = 0.321

Space mean speed in ramp influence area, S_R = 61.0 mph

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

Space mean speed for all vehicles, S = 61.0 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB TO 9000 N RD
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2060	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	590	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	300	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2060		590		300		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	572		164		83		v
Trucks and buses	16		16		16		%
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	0.926		0.926		0.926		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	2472		708		360		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2472 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2472	4800	No
v_{12}	2472	4400	No
$v_{FO} = v_F - v_R$	1764	4800	No
v_R	708	2100	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 = 0.362

Space mean speed in ramp influence area, S_R = 59.9 mph

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

Space mean speed for all vehicles, S = 59.9 mph

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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB TO 9000 N RD
Jurisdiction:	
Analysis Year:	2005

Description: I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1625	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	268	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	710	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1625		268		710		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	451		74		197		v
Trucks and buses	16		16		16		%
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	0.926		0.926		0.926		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	1950		322		852		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

$P_{FD}^{EQ} = 1.000$ Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD} = 1950$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1950	4800	No
v_{12}	1950	4400	No
$v_{FO} = v_F - v_R$	1628	4800	No
v_R	322	2100	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, $D_S = 0.327$

Space mean speed in ramp influence area, $S_R = 60.8$ mph

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

Space mean speed for all vehicles, $S = 60.8$ mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB TO 9000 N RD
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1770	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	205	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	295	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1770		205		295		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	492		57		82		v
Trucks and buses	16		16		16		%
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	0.926		0.926		0.926		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	2124		246		354		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2124 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2124	4800	No
v_{12}	2124	4400	No
$v_{FO} = v_F - v_R$	1878	4800	No
v_R	246	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 19.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.320

Space mean speed in ramp influence area, S_R = 61.0 mph

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

Space mean speed for all vehicles, S = 61.0 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	9000N Rd to I-57 NB
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1357	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	710	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	268	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1357	710	268	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	377	197	74	v
Trucks and buses	16	16	16	%
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	0.926	0.926	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1628	852	322	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1628 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2480	4800	No
v_{R12}	2480	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 20.0+ pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.305	
Space mean speed in ramp influence area,	S_R = 61.5	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 61.5	mph

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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	9000N Rd to I-57 NB
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1565	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	295	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	205	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1565	295	205	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	435	82	57	v
Trucks and buses	16	16	16	%
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	0.926	0.926	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1878	354	246	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1878 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2232	4800	No
v_{R12}	2232	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 18.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.294	
Space mean speed in ramp influence area,	S_R = 61.8	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 61.8	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB to IL-50
Jurisdiction:	
Analysis Year:	2005

Description: I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1625	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	285	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	140	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1625		285		140		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	451		79		39		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	1950		342		161		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

$P_{FD}^{EQ} = 1.000$ Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD} = 1950$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1950	4800	No
v_{12}	1950	4400	No
$v_{FO} = v_F - v_R$	1608	4800	No
v_R	342	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 17.9$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	$D_S = 0.329$	
Space mean speed in ramp influence area,	$S_R = 60.8$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 60.8$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB to IL-50
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1770	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	465	vph
Length of first accel/decel lane	350	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	235	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1770		465		235		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	492		129		65		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	2124		558		270		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2124 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2124	4800	No
v_{12}	2124	4400	No
$v_{FO} = v_F - v_R$	1566	4800	No
v_R	558	2000	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 19.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.478

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

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

Space mean speed for all vehicles, S = 56.6 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	IL-50 SB to I-57 SB
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1340	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	140	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	285	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1340	140	285	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	372	39	79	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1608	161	342	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 1608$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1769	4800	No
v_{R12}	1769	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 14.8$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable, $M_S = 0.295$

Space mean speed in ramp influence area, $S_R = 61.7$ mph

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

Space mean speed for all vehicles, $S = 61.7$ mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	IL-50 SB to I-57 SB
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1305	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	235	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	465	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1305	235	465	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	363	65	129	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1566	270	558	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 1566$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1836	4800	No
v_{R12}	1836	4600	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable,	$M_S = 0.296$	
Space mean speed in ramp influence area,	$S_R = 61.7$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 61.7$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57
Junction:	IL-50 SB to I-57 NB
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1565	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	60	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

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

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1565	60	270	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	435	17	75	v
Trucks and buses	16	7	7	%
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	0.926	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1878	69	310	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 1878$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1947	4800	No
v_{R12}	1947	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 16.2$ 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,	$S_R = 61.6$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 61.6$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

Sandra Fikile Ncala
Michael Baker Jr. Inc

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57
Junction:	IL-50 SB to I-57 NB
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1685	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	85	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	260	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)	1685	85	260	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	468	24	72	v
Trucks and buses	16	7	7	%
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	0.926	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2022	98	299	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 2022$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2120	4800	No
v_{R12}	2120	4600	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable,	$M_S = 0.304$	
Space mean speed in ramp influence area,	$S_R = 61.5$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 61.5$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

Sandra Fikile Ncala
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Phone: Fax:
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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB to IL-50
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1740	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	445	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	260	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1740		445		260		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	483		124		72		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	2088		534		299		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2088 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2088	4800	No
v_{12}	2088	4400	No
$v_{FO} = v_F - v_R$	1554	4800	No
v_R	534	2000	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 19.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.476

Space mean speed in ramp influence area, S_R = 56.7 mph

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

Space mean speed for all vehicles, S = 56.7 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

Sandra Fikile Ncala
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Phone: Fax:
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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB to IL-50
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1900	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	475	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	270	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	1900		475		270		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	528		132		75		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	2280		570		310		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2280 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2280	4800	No
v_{12}	2280	4400	No
$v_{FO} = v_F - v_R$	1710	4800	No
v_R	570	2000	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, D_S = 0.479

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

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

Space mean speed for all vehicles, S = 56.6 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

Sandra Fikile Ncala
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Phone: Fax:
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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	IL-50 to I-57 NB
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1295	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	270	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	60	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1295	270	60	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	360	75	17	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1554	310	72	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1554 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1864	4800	No
v_{R12}	1864	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 15.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.297	
Space mean speed in ramp influence area,	S_R = 61.7	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 61.7	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	IL-50 to I-57 NB
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1425	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	260	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	85	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)	1425	260	85	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	396	72	24	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1710	299	102	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1710 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2009	4800	No
v_{R12}	2009	4600	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable,	M_S = 0.301	
Space mean speed in ramp influence area,	S_R = 61.6	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 61.6	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	IL-50 NB to I-57 SB
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1480	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	245	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	140	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)	1480	245	140	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	411	68	39	v
Trucks and buses	16	7	7	%
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	0.926	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1776	282	161	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 1776$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2058	4800	No
v_{R12}	2058	4600	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable,	$M_S = 0.303$	
Space mean speed in ramp influence area,	$S_R = 61.5$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 61.5$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

Sandra Fikile Ncala
Michael Baker Jr. Inc

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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	IL-50 NB to I-57 SB
Jurisdiction:	
Analysis Year:	2005
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1540	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	210	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	235	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)	1540	210	235	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	428	58	65	v
Trucks and buses	16	7	7	%
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	0.926	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1848	241	270	pcph

Estimation of V12 Merge Areas

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

P_{FM}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1848 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2089	4800	No
v_{R12}	2089	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 17.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.303	
Space mean speed in ramp influence area,	S_R = 61.5	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 61.5	mph

2005 Existing Intersection

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: AM Peak
Intersection: 1
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2005 Existing
Project ID:
East/West Street: 9000 N Rd
North/South Street: US 45/52

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	32	225	15	124	200	124	4	154	0	62	164	0
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	R	LT	R	L	T	L	T
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Flow Rate	285	16	359	137	4	171	68	182
% Heavy Veh	18	18	18	18	18	18	18	18
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	285	16	359	137	4	171	68	182
Left-Turn	35	0	137	0	4	0	68	0
Right-Turn	0	16	0	137	0	0	0	0
Prop. Left-Turns	0.1	0.0	0.4	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0
Prop. Heavy Vehicle	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.4	-0.4	0.5	-0.4	0.8	0.3	0.8	0.3

Worksheet 4 - Departure Headway and Service Time

	Eastbound	Westbound	Northbound	Southbound

	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	285	16	359	137	4	171	68	182
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.25	0.01	0.32	0.12	0.00	0.15	0.06	0.16
hd, final value	7.19	6.43	7.05	6.16	8.18	7.68	8.03	7.53
x, final value	0.57	0.03	0.70	0.23	0.01	0.36	0.15	0.38
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	4.9	4.1	4.7	3.9	5.9	5.4	5.7	5.2

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	285	16	359	137	4	171	68	182
Service Time	4.9	4.1	4.7	3.9	5.9	5.4	5.7	5.2
Utilization, x	0.57	0.03	0.70	0.23	0.01	0.36	0.15	0.38
Dep. headway, hd	7.19	6.43	7.05	6.16	8.18	7.68	8.03	7.53
Capacity	486	266	502	387	254	421	318	432
Delay	18.96	9.32	24.73	10.73	10.96	14.73	12.16	14.79
LOS	C	A	C	B	B	B	B	B
Approach:								
Delay	18.44		20.86		14.65		14.07	
LOS	C		C		B		B	

Intersection Delay 17.99 Intersection LOS C

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: PM Peak
Intersection: 1
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2005 Existing
Project ID:
East/West Street: 9000 N Rd
North/South Street: US 45/52

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	19	291	23	241	196	77	12	134	0	73	222	0

% Thrus Left Lane

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LT	R	LT	R	L	T	L	T
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Flow Rate	344	25	484	85	13	148	81	246
% Heavy Veh	18	18	18	18	18	18	18	18
No. Lanes	2		2		2		2	
Opposing-Lanes	2		2		2		2	
Conflicting-lanes	2		2		2		2	
Geometry group	5		5		5		5	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	344	25	484	85	13	148	81	246
Left-Turn	21	0	267	0	13	0	81	0
Right-Turn	0	25	0	85	0	0	0	0
Prop. Left-Turns	0.1	0.0	0.6	0.0	1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0
Prop. Heavy Vehicle	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Geometry Group	5		5		5		5	
Adjustments Exhibit 17-33:								
hLT-adj	0.5		0.5		0.5		0.5	
hRT-adj	-0.7		-0.7		-0.7		-0.7	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.3	-0.4	0.6	-0.4	0.8	0.3	0.8	0.3

Worksheet 4 - Departure Headway and Service Time

	Eastbound	Westbound	Northbound	Southbound

	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	344	25	484	85	13	148	81	246
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.31	0.02	0.43	0.08	0.01	0.13	0.07	0.22
hd, final value	7.76	7.02	7.68	6.70	9.08	8.58	8.64	8.14
x, final value	0.74	0.05	1.03	0.16	0.03	0.35	0.19	0.56
Move-up time, m	2.3		2.3		2.3		2.3	
Service Time	5.5	4.7	5.4	4.4	6.8	6.3	6.3	5.8

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	344	25	484	85	13	148	81	246
Service Time	5.5	4.7	5.4	4.4	6.8	6.3	6.3	5.8
Utilization, x	0.74	0.05	1.03	0.16	0.03	0.35	0.19	0.56
Dep. headway, hd	7.76	7.02	7.68	6.70	9.08	8.58	8.64	8.14
Capacity	460	275	484	335	263	398	331	434
Delay	29.53	10.08	77.76	10.66	12.09	15.88	13.41	20.57
LOS	D	B	F	B	B	C	B	C
Approach:								
Delay	28.21		67.73		15.58		18.80	
LOS	D		F		C		C	

Intersection Delay 40.40 Intersection LOS E

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: CH 9 Division St

Inter.: 2
Area Type: All other areas
Jurisd:
Year : 2005 Existing

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	0	2	0	0	2	0
LGConfig	L	TR		L	TR			LTR			LTR	
Volume	147	5	230	3	3	3	96	268	2	2	321	104
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
RTOR Vol			23			0			0			10

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	18.0						30.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	387	1290	0.42	0.30	17.6	B		
TR	438	1461	0.54	0.30	18.9	B	18.3	B
Westbound								
L	308	1028	0.01	0.30	14.8	B		
TR	475	1583	0.01	0.30	14.8	B	14.8	B
Northbound								
LTR	1200	2399	0.34	0.50	9.2	A	9.2	A
Southbound								
LTR	1502	3003	0.31	0.50	9.0	A	9.0	A

Intersection Delay = 12.0 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: CH 9 Division St

Inter.: 2
Area Type: All other areas
Jurisd:
Year : 2005 Existing

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	0	2	0	0	2	0
LGConfig	L	TR		L	TR			LTR			LTR	
Volume	178	5	277	3	4	3	110	292	2	2	403	167
Lane Width	12.0	12.0		12.0	12.0			12.0			12.0	
RTOR Vol			28			0			0			17

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	20.0						28.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	430	1289	0.46	0.33	16.5	B		
TR	487	1460	0.58	0.33	18.3	B	17.6	B
Westbound								
L	310	930	0.01	0.33	13.4	B		
TR	534	1602	0.01	0.33	13.4	B	13.4	B
Northbound								
LTR	1022	2189	0.44	0.47	11.0	B	11.0	B
Southbound								
LTR	1392	2982	0.44	0.47	11.0	B	11.0	B

Intersection Delay = 13.0 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: 3rd St

Inter.: 3
Area Type: All other areas
Jurisd:
Year : 2005 Existing

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	2	0	0	2	0
LGConfig		LTR		L	TR			LTR			LTR	
Volume	28	127	74	153	123	54	49	193	126	26	155	26
Lane Width		12.0		12.0	12.0			12.0			12.0	
RTOR Vol			7			5			13			3

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	22.0						26.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	569	1552	0.43	0.37	14.8	B	14.8	B
Westbound								
L	389	1060	0.44	0.37	15.1	B		
TR	601	1639	0.32	0.37	13.9	B	14.5	B
Northbound								
LTR	1184	2732	0.33	0.43	11.4	B	11.4	B
Southbound								
LTR	1220	2815	0.19	0.43	10.6	B	10.6	B

Intersection Delay = 12.8 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: 3rd St

Inter.: 3
Area Type: All other areas
Jurisd:
Year : 2005 Existing

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	2	0	0	2	0
LGConfig		LTR		L	TR			LTR			LTR	
Volume	48	150	95	146	148	48	85	291	111	49	351	67
Lane Width		12.0		12.0	12.0			12.0			12.0	
RTOR Vol			10			5			11			7

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A				NB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A				Thru	A			
Right	A				Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	24.0					24.0			
Yellow	4.0					4.0			
All Red	2.0					2.0			

Cycle Length: 60.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	600	1500	0.52	0.40	14.5	B	14.5	B
Westbound								
L	385	963	0.42	0.40	13.7	B		
TR	662	1654	0.32	0.40	12.7	B	13.1	B
Northbound								
LTR	970	2426	0.54	0.40	14.4	B	14.4	B
Southbound								
LTR	1082	2705	0.47	0.40	13.6	B	13.6	B

Intersection Delay = 13.9 (sec/veh) Intersection LOS = B

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: AM Peak
Intersection: 4
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2005 Existing
Project ID:
East/West Street: 9000 N Rd
North/South Street: 4000E Rd
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	2	37	68	21	70	2
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	2	41	75	23	77	2
Percent Heavy Vehicles	6	--	--	6	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	46	2	13	2	2	2
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	51	2	14	2	2	2
Percent Heavy Vehicles	6	6	6	6	6	6
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	2	23		67			6	
C(m) (vph)	1494	1448		766			750	
v/c	0.00	0.02		0.09			0.01	
95% queue length	0.00	0.05		0.29			0.02	
Control Delay	7.4	7.5		10.1			9.8	
LOS	A	A		B			A	
Approach Delay				10.1			9.8	
Approach LOS				B			A	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: PM Peak
Intersection: 4
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2005 Existing
Project ID:
East/West Street: 9000 N Rd
North/South Street: 4000E Rd
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	2	71	34	18	63	2
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	2	78	37	20	70	2
Percent Heavy Vehicles	6	--	--	6	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	64	2	17	2	2	2
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	71	2	18	2	2	2
Percent Heavy Vehicles	6	6	6	6	6	6
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	2	20		91			6	
C(m) (vph)	1503	1449		757			754	
v/c	0.00	0.01		0.12			0.01	
95% queue length	0.00	0.04		0.41			0.02	
Control Delay	7.4	7.5		10.4			9.8	
LOS	A	A		B			A	
Approach Delay				10.4			9.8	
Approach LOS				B			A	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: AM Peak
Intersection: 5
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2005 Existing
Project ID:
East/West Street: 6000N Rd
North/South Street: US 45/52
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	5	324	40	40	338	5
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	5	360	44	44	375	5
Percent Heavy Vehicles	9	--	--	9	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	36	10	36	5	10	5
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	40	11	40	5	11	5
Percent Heavy Vehicles	9	9	9	9	9	9
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	5	44		91			21	
C(m) (vph)	1141	1118		343			292	
v/c	0.00	0.04		0.27			0.07	
95% queue length	0.01	0.12		1.05			0.23	
Control Delay	8.2	8.4		19.2			18.3	
LOS	A	A		C			C	
Approach Delay				19.2			18.3	
Approach LOS				C			C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: PM Peak
Intersection: 5
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2005 Existing
Project ID:
East/West Street: 6000N Rd
North/South Street: US 45/52
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	443	40	40	397	10
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	11	492	44	44	441	11
Percent Heavy Vehicles	9	--	--	9	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	34	46	34	1	10	5
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	37	51	37	1	11	5
Percent Heavy Vehicles	9	9	9	9	9	9
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	11	44		125			17	
C(m) (vph)	1073	997		230			232	
v/c	0.01	0.04		0.54			0.07	
95% queue length	0.03	0.14		2.92			0.24	
Control Delay	8.4	8.8		37.8			21.7	
LOS	A	A		E			C	
Approach Delay				37.8			21.7	
Approach LOS				E			C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: AM Peak
Intersection: 6
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2005 Existing
Project ID:
East/West Street: 6000N Rd
North/South Street: IL 50
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	14	432	10	5	402	5
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	15	480	11	5	446	5
Percent Heavy Vehicles	9	--	--	9	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	2	0	0	2	0
Configuration	LT		TR	LT		TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	19	31	20	21	45	16
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	21	34	22	23	50	17
Percent Heavy Vehicles	9	9	9	9	9	9
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT	LT		LTR			LTR	
v (vph)	15	5		77			90	
C(m) (vph)	1058	1021		285			271	
v/c	0.01	0.00		0.27			0.33	
95% queue length	0.04	0.01		1.07			1.40	
Control Delay	8.5	8.5		22.2			24.8	
LOS	A	A		C			C	
Approach Delay				22.2			24.8	
Approach LOS				C			C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: PM Peak
Intersection: 6
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2005 Existing
Project ID:
East/West Street: 6000N Rd
North/South Street: IL 50
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	5	517	5	20	467	12
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	5	574	5	22	518	13
Percent Heavy Vehicles	9	--	--	9	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	2	0	0	2	0
Configuration	LT		TR	LT		TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	17	30	12	12	26	35
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	18	33	13	13	28	38
Percent Heavy Vehicles	9	9	9	9	9	9
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT	LT		LTR			LTR	
v (vph)	5	22		64			79	
C(m) (vph)	985	944		211			285	
v/c	0.01	0.02		0.30			0.28	
95% queue length	0.02	0.07		1.22			1.10	
Control Delay	8.7	8.9		29.3			22.4	
LOS	A	A		D			C	
Approach Delay				29.3			22.4	
Approach LOS				D			C	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: AM Peak
Intersection: 7
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2005 Existing
Project ID:
East/West Street: 6000N Rd
North/South Street: 4000E Rd
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	2	119	2	2	54	2
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	2	132	2	2	60	2
Percent Heavy Vehicles	6	--	--	6	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	2	2	2	2	2	2
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	2	2	2	2	2	2
Percent Heavy Vehicles	6	6	6	6	6	6
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	2	2		6			6	
C(m) (vph)	1516	1426		766			785	
v/c	0.00	0.00		0.01			0.01	
95% queue length	0.00	0.00		0.02			0.02	
Control Delay	7.4	7.5		9.7			9.6	
LOS	A	A		A			A	
Approach Delay				9.7			9.6	
Approach LOS				A			A	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: PM Peak
Intersection: 7
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2005 Existing
Project ID:
East/West Street: 6000N Rd
North/South Street: 4000E Rd
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	2	56	2	2	100	2
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	2	62	2	2	111	2
Percent Heavy Vehicles	6	--	--	6	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	2	2	2	2	2	2
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	2	2	2	2	2	2
Percent Heavy Vehicles	6	6	6	6	6	6
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	2	2		6			6	
C(m) (vph)	1452	1513		800			787	
v/c	0.00	0.00		0.01			0.01	
95% queue length	0.00	0.00		0.02			0.02	
Control Delay	7.5	7.4		9.5			9.6	
LOS	A	A		A			A	
Approach Delay				9.5			9.6	
Approach LOS				A			A	

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: 3000N Rd

Inter.: 8
Area Type: All other areas
Jurisd:
Year : 2005 Existing

N/S St: US 45/52

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	0	1	2	1	1	2	1	1	2	1
LGConfig	L	TR		L	T	R	L	T	R	L	T	R
Volume	95	285	51	182	197	176	29	315	136	166	578	54
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			5			59			40			16

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A	A			SB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right	A				EB	Right				
SB	Right	A				WB	Right	A			
Green		8.0	20.0					8.0	30.0		
Yellow		4.0	4.0					4.0	4.0		
All Red		2.0	2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	396	1703	0.27	0.38	19.2	B		
TR	743	3342	0.50	0.22	31.1	C	28.4	C
Westbound								
L	338	1703	0.60	0.38	23.2	C		
T	758	3413	0.29	0.22	29.3	C	24.7	C
R	576	1524	0.23	0.38	19.2	B		
Northbound								
L	331	1703	0.10	0.49	13.2	B		
T	1138	3413	0.31	0.33	22.4	C	19.7	B
R	745	1524	0.14	0.49	12.7	B		
Southbound								
L	466	1703	0.39	0.49	14.1	B		
T	1138	3413	0.56	0.33	25.3	C	22.3	C
R	745	1524	0.06	0.49	12.1	B		

Intersection Delay = 23.5 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: 3000N Rd

Inter.: 8
Area Type: All other areas
Jurisd:
Year : 2005 Existing
N/S St: US 45/52

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	0	1	2	1	1	2	1	1	2	1
LGConfig	L	TR		L	T	R	L	T	R	L	T	R
Volume	246	540	101	267	471	125	49	633	219	227	477	45
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			10			38			66			15

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	A	A			NB Left	A	A		
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
WB Left	A	A			SB Left	A	A		
Thru		A			Thru		A		
Right		A			Right		A		
Peds					Peds				
NB Right	A				EB Right				
SB Right	A				WB Right	A			
Green	11.0	22.0				9.0	24.0		
Yellow	4.0	4.0				4.0	4.0		
All Red	2.0	2.0				2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	352	1703	0.78	0.43	28.9	C		
TR	816	3339	0.86	0.24	41.7	D	38.1	D
Westbound								
L	289	1703	1.03	0.43	82.5	F		
T	834	3413	0.63	0.24	31.8	C	46.6	D
R	627	1524	0.15	0.41	16.8	B		
Northbound								
L	333	1703	0.16	0.43	16.0	B		
T	910	3413	0.77	0.27	34.6	C	30.0	C
R	694	1524	0.24	0.46	15.2	B		
Southbound								
L	269	1703	0.94	0.43	57.7	E		
T	910	3413	0.58	0.27	29.6	C	37.6	D
R	694	1524	0.05	0.46	13.7	B		

Intersection Delay = 38.1 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: 3000N Rd

Inter.: 9
Area Type: All other areas
Jurisd:
Year : 2005 Existing

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	2	0	2	2	1	1	2	1
LGConfig	L	T	R	L	TR		L	T	R	L	T	R
Volume	227	100	182	53	251	93	126	1083	30	101	990	397
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			18			9			3			40

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A	A			NB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A	A			SB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right					EB	Right	A			
SB Right	A				WB	Right				
Green	10.0	13.0					9.0	34.0		
Yellow	4.0	4.0					4.0	4.0		
All Red	2.0	2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	280	1641	0.90	0.32	60.5	E		
T	249	1727	0.45	0.14	36.5	D	43.8	D
R	457	1468	0.40	0.31	24.9	C		
Westbound								
L	353	1641	0.17	0.32	21.9	C		
TR	457	3165	0.81	0.14	48.2	D	44.6	D
Northbound								
L	319	3187	0.44	0.10	39.1	D		
T	1243	3289	0.97	0.38	45.7	D	44.5	D
R	555	1468	0.05	0.38	17.8	B		
Southbound								
L	164	1641	0.68	0.10	50.2	D		
T	1243	3289	0.88	0.38	34.1	C	29.9	C
R	816	1468	0.49	0.56	12.6	B		

Intersection Delay = 38.5 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: 3000N Rd

Inter.: 9
Area Type: All other areas
Jurisd:
Year : 2005 Existing
N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	2	0	2	2	1	1	2	1
LGConfig	L	T	R	L	TR		L	T	R	L	T	R
Volume	365	304	276	116	293	231	221	1073	58	232	1018	453
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			28			23			6			45

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A			
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A	A			SB	Left	A			
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right					EB	Right	A			
SB	Right	A				WB	Right				
Green		17.0	25.0					15.0	39.0		
Yellow		4.0	4.0					4.0	4.0		
All Red		2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	312	1641	1.30	0.40	186.2	F		
T	360	1727	0.94	0.21	78.8	E	108.0	F
R	563	1468	0.49	0.38	28.8	C		
Westbound								
L	305	1641	0.42	0.40	26.7	C		
TR	642	3084	0.87	0.21	58.0	E	52.1	D
Northbound								
L	398	3187	0.62	0.13	52.7	D		
T	1069	3289	1.12	0.32	105.3	F	93.7	F
R	477	1468	0.12	0.32	28.6	C		
Southbound								
L	205	1641	1.26	0.13	202.1	F		
T	1069	3289	1.06	0.32	84.7	F	85.6	F
R	758	1468	0.60	0.52	21.6	C		

Intersection Delay = 88.0 (sec/veh) Intersection LOS = F

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: AM Peak
Intersection: 10
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2005 Existing
Project ID:
East/West Street: 3000 N Rd
North/South Street: 4000E Rd

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	30	60	7	5	114	2	18	83	2	1	68	17
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.90		0.90		0.90		0.90	
Flow Rate	106		133		114		94	
% Heavy Veh	6		6		6		6	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	106		133		114		94	
Left-Turn	33		5		20		1	
Right-Turn	7		2		2		18	
Prop. Left-Turns	0.3		0.0		0.2		0.0	
Prop. Right-Turns	0.1		0.0		0.0		0.2	
Prop. Heavy Vehicle	0.1		0.1		0.1		0.1	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1		0.1		0.1		-0.0	

Worksheet 4 - Departure Headway and Service Time

	Eastbound	Westbound	Northbound	Southbound

	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	106		133		114		94	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.09		0.12		0.10		0.08	
hd, final value	4.70		4.65		4.73		4.62	
x, final value	0.14		0.17		0.15		0.12	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	2.7		2.6		2.7		2.6	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	106		133		114		94	
Service Time	2.7		2.6		2.7		2.6	
Utilization, x	0.14		0.17		0.15		0.12	
Dep. headway, hd	4.70		4.65		4.73		4.62	
Capacity	356		383		364		344	
Delay	8.46		8.61		8.56		8.25	
LOS	A		A		A		A	
Approach:								
Delay	8.46		8.61		8.56		8.25	
LOS	A		A		A		A	

Intersection Delay 8.49 Intersection LOS A

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: PM Peak
Intersection: 10
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2005 Existing
Project ID:
East/West Street: 3000 N Rd
North/South Street: 4000E Rd

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	33	116	18	2	67	2	22	35	4	6	91	34
% Thrus Left Lane												

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.90		0.90		0.90		0.90	
Flow Rate	184		78		66		144	
% Heavy Veh	6		6		6		6	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	184		78		66		144	
Left-Turn	36		2		24		6	
Right-Turn	20		2		4		37	
Prop. Left-Turns	0.2		0.0		0.4		0.0	
Prop. Right-Turns	0.1		0.0		0.1		0.3	
Prop. Heavy Vehicle	0.1		0.1		0.1		0.1	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1		0.1		0.1		-0.0	

Worksheet 4 - Departure Headway and Service Time

	Eastbound	Westbound	Northbound	Southbound

	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	184		78		66		144	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.16		0.07		0.06		0.13	
hd, final value	4.59		4.73		4.86		4.58	
x, final value	0.23		0.10		0.09		0.18	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	2.6		2.7		2.9		2.6	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	184		78		66		144	
Service Time	2.6		2.7		2.9		2.6	
Utilization, x	0.23		0.10		0.09		0.18	
Dep. headway, hd	4.59		4.73		4.86		4.58	
Capacity	434		328		316		394	
Delay	8.99		8.27		8.33		8.61	
LOS	A		A		A		A	
Approach:								
Delay	8.99		8.27		8.33		8.61	
LOS	A		A		A		A	

Intersection Delay 8.66 Intersection LOS A

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: SB I-57 Off Ramp

Inter.: 11
Area Type: All other areas
Jurisd:
Year : 2005 Existing

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	0	0	0	2	0	0	2	0
LGConfig	L		R					T			T	
Volume	35		250					1467			1218	
Lane Width	12.0		12.0					12.0			12.0	
RTOR Vol			75									

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left				
Thru						Thru	P			
Right	P					Right				
Peds						Peds				
WB Left					SB	Left				
Thru						Thru	P			
Right						Right				
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	14.0						64.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	242	1556	0.16	0.16	34.3	C	69.0	E
R	217	1392	0.89	0.16	75.9	E		
Westbound								
Northbound								
T	2404	3381	0.68	0.71	8.8	A	8.8	A
Southbound								
T	2404	3381	0.56	0.71	7.2	A	7.2	A

Intersection Delay = 12.5 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: SB I-57 Off Ramp

Inter.: 11
Area Type: All other areas
Jurisd:
Year : 2005 Existing

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	1	0	0	0	0	2	0	0	2	0
LGConfig	L		R					T			T	
Volume	90		375					1705			1330	
Lane Width	12.0		12.0					12.0			12.0	
RTOR Vol			113									

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left	P				NB Left				
Thru					Thru	P			
Right	P				Right				
Peds					Peds				
WB Left					SB Left				
Thru					Thru	P			
Right					Right				
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	23.0					55.0			
Yellow	4.0					4.0			
All Red	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	398	1556	0.25	0.26	28.2	C		
							44.4	D
R	356	1392	0.82	0.26	50.0	D		
Westbound								
Northbound								
T	2066	3381	0.92	0.61	23.4	C	23.4	C
Southbound								
T	2066	3381	0.72	0.61	14.2	B	14.2	B

Intersection Delay = 22.0 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: NB I-57 Off Ramp

Inter.: 12
Area Type: All other areas
Jurisd:
Year : 2005 Existing

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	1	0	1	0	2	0	0	2	0
LGConfig				L		R		T			T	
Volume				200		245		987			1218	
Lane Width				12.0		12.0		12.0			12.0	
RTOR Vol						74						

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left					NB	Left				
Thru						Thru	P			
Right						Right				
Peds						Peds				
WB Left		P			SB	Left				
Thru						Thru	P			
Right		P				Right				
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green		18.0					60.0			
Yellow		4.0					4.0			
All Red		2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
L	311	1556	0.71	0.20	46.7	D	46.5	D
R	278	1392	0.68	0.20	46.2	D		
Northbound								
T	2254	3381	0.49	0.67	8.2	A	8.2	A
Southbound								
T	2254	3381	0.60	0.67	9.5	A	9.5	A

Intersection Delay = 14.3 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: NB I-57 Off Ramp

Inter.: 12
Area Type: All other areas
Jurisd:
Year : 2005 Existing
N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	1	0	1	0	2	0	0	2	0
LGConfig				L		R		T			T	
Volume				235		240		1325			1415	
Lane Width				12.0		12.0		12.0			12.0	
RTOR Vol						72						

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left					NB Left				
Thru					Thru	P			
Right					Right				
Peds					Peds				
WB Left		P			SB Left				
Thru					Thru	P			
Right		P			Right				
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green		23.0				55.0			
Yellow		4.0				4.0			
All Red		2.0				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
L	398	1556	0.66	0.26	38.1	D	36.5	D
R	356	1392	0.53	0.26	34.3	C		
Northbound								
T	2066	3381	0.71	0.61	14.2	B	14.2	B
Southbound								
T	2066	3381	0.76	0.61	15.4	B	15.4	B

Intersection Delay = 17.6 (sec/veh) Intersection LOS = B

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: SB I-57 Off Ramp

Inter.: 13
Area Type: All other areas
Jurisd:
Year : 2005 Existing

N/S St: 9000N Rd

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	0	1	1
LGConfig		TR			LT						LT	R
Volume		481	124	168	497					102	0	108
Lane Width		12.0			12.0						12.0	12.0
RTOR Vol			12									32

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left					NB Left				
Thru	A				Thru				
Right	A				Right				
Peds					Peds				
WB Left		A			SB Left	A			
Thru		A			Thru	A			
Right					Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	31.0	35.0				6.0			
Yellow	4.0	4.0				4.0			
All Red	2.0	2.0				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
TR	550	1596	1.20	0.34	134.6	F	134.6	F
Westbound								
LT	629	1617	1.17	0.39	122.2	F	122.2	F
Northbound								
Southbound								
LT	104	1560	1.09	0.07	155.5	F	133.8	F
R	93	1392	0.90	0.07	104.5	F		

Intersection Delay = 128.7 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: SB I-57 Off Ramp

Inter.: 13
Area Type: All other areas
Jurisd:
Year : 2005 Existing

N/S St: 9000N Rd

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	0	1	1
LGConfig		TR			LT						LT	R
Volume		500	200	100	382					272	0	318
Lane Width		12.0			12.0						12.0	12.0
RTOR Vol			20									95

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left					NB Left				
Thru	A				Thru				
Right	A				Right				
Peds					Peds				
WB Left		A			SB Left	A			
Thru		A			Thru	A			
Right					Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	32.0	26.0				14.0			
Yellow	4.0	4.0				4.0			
All Red	2.0	2.0				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
TR	561	1579	1.35	0.36	197.0	F	197.0	F
Westbound								
LT	468	1621	1.14	0.29	119.1	F	119.1	F
Northbound								
Southbound								
LT	243	1560	1.24	0.16	177.1	F	161.7	F
R	217	1392	1.14	0.16	142.9	F		

Intersection Delay = 163.8 (sec/veh) Intersection LOS = F

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: AM Peak
Intersection: 14
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2005 Existing
Project ID:
East/West Street: 9000
North/South Street: I-57 NB Off Ramp
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	350	233			497	360
Peak-Hour Factor, PHF	0.90	0.90			0.90	0.90
Hourly Flow Rate, HFR	388	258			552	400
Percent Heavy Vehicles	16	--	--		--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		Yes			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	168	0	100			
Peak Hour Factor, PHF	0.90	0.90	0.90			
Hourly Flow Rate, HFR	186	0	111			
Percent Heavy Vehicles	16	16	16			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	0	1	1			
Configuration	LT		R			

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT		LT		R			
v (vph)	388		186		111			
C(m) (vph)	668		33		769			
v/c	0.58		5.64		0.14			
95% queue length	3.75		22.26		0.50			
Control Delay	17.6		2326		10.5			
LOS	C		F		B			
Approach Delay				1460				
Approach LOS				F				

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: PM Peak
Intersection: 14
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2005 Existing
Project ID:
East/West Street: 9000
North/South Street: I-57 NB Off Ramp
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	140	632			395	155
Peak-Hour Factor, PHF	0.90	0.90			0.90	0.90
Hourly Flow Rate, HFR	155	702			438	172
Percent Heavy Vehicles	16	--	--		--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		Yes			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	87	0	118			
Peak Hour Factor, PHF	0.90	0.90	0.90			
Hourly Flow Rate, HFR	96	0	131			
Percent Heavy Vehicles	16	16	16			
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			/			/
Lanes	0	1	1			
Configuration	LT		R			

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT		LT		R			
v (vph)	155		96		131			
C(m) (vph)	904		91		418			
v/c	0.17		1.05		0.31			
95% queue length	0.62		6.32		1.32			
Control Delay	9.8		194.5		17.5			
LOS	A		F		C			
Approach Delay				92.4				
Approach LOS				F				

2030 No-Build Freeway

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	AM
Freeway/Direction:	I-57
From/To:	North of 9000N
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	77000	veh/day
Peak-hour proportion of AADT, K	0.09	
Peak-hour direction percent, D	58	%
Volume, DDHV	3996	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	2398	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2398	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	53.4	mi/h
Number of lanes, N	2	
Density, D	44.9	pc/mi/ln
Level of Service, LOS	E	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	PM
Freeway/Direction:	I-57

From/To: North of 9000N
Jurisdiction:
Analysis Year: 2030 No-Build
Description: I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	77000	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	55	%
Volume, DDHV	4141	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	2485	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2485	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of Service, LOS	F	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	AM
Freeway/Direction:	I-57
From/To:	IL 50 to 9000N
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	62500	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	50	%
Volume, DDHV	3010	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	1806	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1806	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	67.8	mi/h
Number of lanes, N	2	
Density, D	26.6	pc/mi/ln
Level of Service, LOS	D	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	PM
Freeway/Direction:	I-57
From/To:	IL 50 to 9000N
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	62500	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	51	%
Volume, DDHV	3157	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	1894	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1894	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	66.6	mi/h
Number of lanes, N	2	
Density, D	28.4	pc/mi/ln
Level of Service, LOS	D	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	AM
Freeway/Direction:	I-57
From/To:	South of IL 50
Jurisdiction:	
Analysis Year:	2030 No-Build

Description: I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	70000	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	50	%
Volume, DDHV	3500	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	2184	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2184	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	60.6	mi/h
Number of lanes, N	2	
Density, D	36.1	pc/mi/ln
Level of Service, LOS	E	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	PM
Freeway/Direction:	I-57
From/To:	South of IL 50
Jurisdiction:	
Analysis Year:	2030 No-Build

Description: I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	70000	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	50	%
Volume, DDHV	3500	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	2184	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2184	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	60.6	mi/h
Number of lanes, N	2	
Density, D	36.1	pc/mi/ln
Level of Service, LOS	E	

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

2030 No-Build Ramps

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	9000N Rd to I-57 SB
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2010	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	50.0	mph
Volume on ramp	1010	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane	2000	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	910	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2010	1010	910	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	558	281	253	v
Trucks and buses	16	16	16	%
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	0.926	0.926	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2412	1212	1092	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2412 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3624	4800	No
v_{R12}	3624	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 5.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.027	
Space mean speed in ramp influence area,	S_R = 69.2	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 69.2	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	9000N Rd to I-57 SB
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2130	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	50.0	mph
Volume on ramp	1020	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane	2000	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1990	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2130	1020	1990	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	592	283	553	v
Trucks and buses	16	16	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	2.5	
Recreational vehicle PCE, ER	1.2	1.2	2.0	
Heavy vehicle adjustment, fHV	0.926	0.926	0.806	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2556	1224	2742	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2556 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3780	4800	No
v_{R12}	3780	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 6.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.052	
Space mean speed in ramp influence area,	S_R = 68.5	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 68.5	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
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Phone: Fax:
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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB TO 9000 N RD
Jurisdiction:	
Analysis Year:	2030 No-Build

Description: I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2920	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	910	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1010	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2920		910		1010		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	811		253		281		v
Trucks and buses	16		16		16		%
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	0.926		0.926		0.926		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	3504		1092		1212		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3504 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3504	4800	No
v_{12}	3504	4400	No
$v_{FO} = v_F - v_R$	2412	4800	No
v_R	1092	2100	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, D_S = 0.331

Space mean speed in ramp influence area, S_R = 60.7 mph

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

Space mean speed for all vehicles, S = 60.7 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
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Phone: Fax:
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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB TO 9000 N RD
Jurisdiction:	
Analysis Year:	2030 No-Build

Description: I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4120	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	1990	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1020	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4120		1990		1020		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	1144		553		283		v
Trucks and buses	16		16		16		%
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	0.926		0.926		0.926		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	4944		2388		1224		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4944 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4944	4800	Yes
v_{12}	4944	4400	Yes
$v_{FO} = v_F - v_R$	2556	4800	No
v_R	2388	2100	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 33.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.448	
Space mean speed in ramp influence area,	S_R = 57.5	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 57.5	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
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Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB TO 9000 N RD
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3000	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	950	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1920	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3000		950		1920		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	833		264		533		v
Trucks and buses	16		16		16		%
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	0.926		0.926		0.926		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	3600		1140		2304		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3600 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3600	4800	No
v_{12}	3600	4400	No
$v_{FO} = v_F - v_R$	2460	4800	No
v_R	1140	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 32.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.336

Space mean speed in ramp influence area, S_R = 60.6 mph

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

Space mean speed for all vehicles, S = 60.6 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB TO 9000 N RD
Jurisdiction:	
Analysis Year:	2030 No-Build

Description: I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3040	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	800	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1170	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3040		800		1170		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	844		222		325		v
Trucks and buses	16		16		16		%
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	0.926		0.926		0.926		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	3648		960		1404		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

$P_{FD}^{EQ} = 1.000$ Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD} = 3648$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3648	4800	No
v_{12}	3648	4400	No
$v_{FO} = v_F - v_R$	2688	4800	No
v_R	960	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 32.9$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	$D_S = 0.319$	
Space mean speed in ramp influence area,	$S_R = 61.1$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 61.1$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	9000N Rd to I-57 NB
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2050	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	50.0	mph
Volume on ramp	1920	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane	2000	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	950	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2050	1920	950	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	569	533	264	v
Trucks and buses	16	16	16	%
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	0.926	0.926	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2460	2304	1140	pcph

Estimation of V12 Merge Areas

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

P_{FM}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2460 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4764	4800	No
v_{R12}	4764	4600	Yes

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, M_S = 0.338

Space mean speed in ramp influence area, S_R = 60.5 mph

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

Space mean speed for all vehicles, S = 60.5 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	9000N Rd to I-57 NB
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2240	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	50.0	mph
Volume on ramp	1170	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane	2000	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	800	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2240	1170	800	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	622	325	222	v
Trucks and buses	16	16	16	%
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	0.926	0.926	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2688	1404	960	pcph

Estimation of V12 Merge Areas

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

$P_{FM}^{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 2688$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4092	4800	No
v_{R12}	4092	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 9.2$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	$M_S = 0.114$	
Space mean speed in ramp influence area,	$S_R = 66.8$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 66.8$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

Sandra Fikile Ncala
Michael Baker Jr. Inc

Phone: Fax:
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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB to IL-50
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3020	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	670	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1150	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3020		670		1150		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	839		186		319		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	3624		804		1322		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

$P_{FD}^{EQ} = 1.000$ Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD} = 3624$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3624	4800	No
v_{12}	3624	4400	No
$v_{FO} = v_F - v_R$	2820	4800	No
v_R	804	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 32.7$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	$D_S = 0.305$	
Space mean speed in ramp influence area,	$S_R = 61.4$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 61.4$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB to IL-50
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3150	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	1440	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1790	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3150		1440		1790		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	875		400		497		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	3780		1728		2058		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

$P_{FD}^{EQ} = 1.000$ Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD} = 3780$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3780	4800	No
v_{12}	3780	4400	No
$v_{FO} = v_F - v_R$	2052	4800	No
v_R	1728	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 34.1$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	$D_S = 0.389$	
Space mean speed in ramp influence area,	$S_R = 59.1$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 59.1$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

Sandra Fikile Ncala
Michael Baker Jr. Inc

Phone: Fax:
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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57
Junction:	IL-50 to I-57 NB
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1770	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	1230	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1730	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1770	1230	1730	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	492	342	481	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2124	1414	2076	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2124 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3538	4800	No
v_{R12}	3538	4600	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable,	M_S = 0.355	
Space mean speed in ramp influence area,	S_R = 60.1	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 60.1	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Phone: Fax:
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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57
Junction:	IL-50 to I-57 NB
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2360	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	680	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1140	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2360	680	1140	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	656	189	317	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2832	782	1368	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 2832$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3614	4800	No
v_{R12}	3614	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 27.0$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	$M_S = 0.366$	
Space mean speed in ramp influence area,	$S_R = 59.8$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 59.8$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB to IL-50
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3500	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	1730	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1230	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3500		1730		1230		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	972		481		342		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	4200		2076		1414		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4200 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4200	4800	No
v_{12}	4200	4400	No
$v_{FO} = v_F - v_R$	2124	4800	No
v_R	2076	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 37.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.420

Space mean speed in ramp influence area, S_R = 58.2 mph

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

Space mean speed for all vehicles, S = 58.2 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB to IL-50
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3500	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	1140	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		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	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3500		1140		680		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	972		317		189		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	4200		1368		782		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4200 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4200	4800	No
v_{12}	4200	4400	No
$v_{FO} = v_F - v_R$	2832	4800	No
v_R	1368	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 37.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.356

Space mean speed in ramp influence area, S_R = 60.0 mph

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

Space mean speed for all vehicles, S = 60.0 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Michael Baker Jr. Inc

Phone: Fax:
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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	IL-50 to I-57 SB
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2350	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	1150	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	670	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2350	1150	670	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	653	319	186	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2820	1322	804	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 2820$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4142	4800	No
v_{R12}	4142	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 30.9$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	$M_S = 0.466$	
Space mean speed in ramp influence area,	$S_R = 56.9$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 56.9$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

Sandra Fikile Ncala
Michael Baker Jr. Inc

Phone: Fax:
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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	IL-50 to I-57 SB
Jurisdiction:	
Analysis Year:	2030 No-Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1710	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	1790	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1440	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1710	1790	1440	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	475	497	400	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2052	2058	1728	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2052 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4110	4800	No
v_{R12}	4110	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 30.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.459	
Space mean speed in ramp influence area,	S_R = 57.2	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 57.2	mph

2030 No-Build Intersections

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: AM Peak
Project ID: I-57 Interchange Study
E/W St: 9000N Rd

Inter.: 1
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: US 45/52

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	1	1	2	1	1	2	1	1	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	70	510	30	440	630	170	10	270	520	110	290	10
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
RTOR Vol			9			51			246			3

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A	A			SB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right	A				EB	Right	A			
SB	Right	A				WB	Right	A			
Green		24.0	22.0					7.0	13.0		
Yellow		4.0	4.0					4.0	4.0		
All Red		2.0	2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	488	1530	0.16	0.58	10.5	B		
T	749	3066	0.76	0.24	36.0	D	32.4	C
R	532	1369	0.04	0.39	17.1	B		
Westbound								
L	522	1530	0.94	0.58	43.6	D		
T	749	3066	0.93	0.24	52.1	D	45.6	D
R	532	1369	0.25	0.39	18.8	B		
Northbound								
L	229	1530	0.05	0.29	23.4	C		
T	443	3066	0.68	0.14	40.6	D	28.3	C
R	654	1369	0.46	0.48	16.3	B		
Southbound								
L	237	1530	0.51	0.29	27.0	C		
T	443	3066	0.73	0.14	42.7	D	37.9	D
R	654	1369	0.01	0.48	12.4	B		

Intersection Delay = 38.1 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: PM Peak
Project ID: I-57 Interchange Study
E/W St: 9000N Rd

Inter.: 1
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: US 45/52

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	1	1	2	1	1	2	1	1	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	40	800	50	790	440	170	20	230	510	130	390	60
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
RTOR Vol			15			51			153			18

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A	A			NB	Left	A	A		
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A	A			SB	Left	A	A		
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right	A				EB	Right	A			
SB Right	A				WB	Right	A			
Green	26.0	22.0					7.0	11.0		
Yellow	4.0	4.0					4.0	4.0		
All Red	2.0	2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	584	1530	0.08	0.60	8.2	A		
T	749	3066	1.19	0.24	131.3	F	121.2	F
R	532	1369	0.07	0.39	17.4	B		
Westbound								
L	522	1530	1.68	0.60	340.4	F		
T	749	3066	0.65	0.24	32.6	C	211.7	F
R	532	1369	0.25	0.39	18.8	B		
Northbound								
L	199	1530	0.11	0.27	25.5	C		
T	375	3066	0.68	0.12	42.9	D	28.2	C
R	654	1369	0.61	0.48	18.9	B		
Southbound								
L	232	1530	0.62	0.27	32.0	C		
T	375	3066	1.15	0.12	135.2	F	102.1	F
R	654	1369	0.07	0.48	12.8	B		

Intersection Delay = 137.4 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: CH 9 Division St

Inter.: 2
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	0	2	0	0	2	0
LGConfig	L	TR		L	TR		DefL	TR			LTR	
Volume	330	10	1070	10	10	10	670	600	10	10	720	170
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0			12.0	
RTOR Vol			107			1			1			17

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	30.0						48.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	424	1273	0.87	0.33	45.0	D		
TR	486	1458	2.22	0.33	587.6	F	450.1	F
Westbound								
L	80	228	0.14	0.33	21.7	C		
TR	530	1589	0.04	0.33	20.3	C	20.8	C
Northbound								
DefL	207	388	3.59	0.53	1200	F		
TR	911	1708	0.74	0.53	19.6	B	637.8	F
Southbound								
LTR	1602	3004	0.61	0.53	15.3	B	15.3	B

Intersection Delay = 405.4 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: CH 9 Division St

Inter.: 2
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	0	2	0	0	2	0
LGConfig	L	TR		L	TR		DefL	TR			LTR	
Volume	400	10	1140	10	10	10	800	660	10	10	910	330
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0			12.0	
RTOR Vol			114			1			1			33

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	30.0						48.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	424	1273	1.05	0.33	86.6	F		
TR	486	1457	2.37	0.33	652.1	F	494.7	F
Westbound								
L	80	228	0.14	0.33	21.7	C		
TR	530	1589	0.04	0.33	20.3	C	20.8	C
Northbound								
DefL	102	192	8.72	0.53	3513	F		
TR	911	1708	0.82	0.53	23.2	C	1924	F
Southbound								
LTR	1587	2976	0.85	0.53	22.6	C	22.6	C

Intersection Delay = 858.9 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: 3rd St

Inter.: 3
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	2	0	0	2	0
LGConfig		LTR		L	TR			LTR			LTR	
Volume	60	290	170	340	280	120	110	430	350	60	350	60
Lane Width		12.0		12.0	12.0			12.0			12.0	
RTOR Vol			17			12			35			6

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A			
	Thru	A					Thru	A			
	Right	A					Right	A			
	Peds						Peds				
WB	Left	A				SB	Left	A			
	Thru	A					Thru	A			
	Right	A					Right	A			
	Peds						Peds				
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		42.0						36.0			
Yellow		4.0						4.0			
All Red		2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	625	1339	0.89	0.47	37.4	D	37.4	D
Westbound								
L	304	651	1.24	0.47	158.2	F		
TR	765	1640	0.56	0.47	18.3	B	83.7	F
Northbound								
LTR	920	2300	1.03	0.40	65.4	E	65.4	E
Southbound								
LTR	822	2055	0.63	0.40	23.2	C	23.2	C

Intersection Delay = 57.4 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: 3rd St

Inter.: 3
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	2	0	0	2	0
LGConfig		LTR		L	TR		DefL	TR			LTR	
Volume	110	340	210	330	330	110	190	650	250	110	790	150
Lane Width		12.0		12.0	12.0		12.0	12.0			12.0	
RTOR Vol			10			5			11			7

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	40.0						38.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	425	956	1.70	0.44	349.4	F	349.4	F
Westbound								
L	235	528	1.56	0.44	297.5	F		
TR	733	1650	0.66	0.44	21.9	C	140.7	F
Northbound								
DefL	81	192	2.60	0.42	782.6	F		
TR	694	1643	1.42	0.42	225.0	F	323.1	F
Southbound								
LTR	803	1901	1.44	0.42	232.6	F	232.6	F

Intersection Delay = 261.8 (sec/veh) Intersection LOS = F

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: AM Peak
Intersection: 4
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2030 No-Build
Project ID:
East/West Street: 9000 N Rd
North/South Street: 4000E Rd
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	80	150	50	160	10
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	11	88	166	55	177	11
Percent Heavy Vehicles	6	--	--	6	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	60	10	20	10	10	10
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	66	11	22	11	11	11
Percent Heavy Vehicles	6	6	6	6	6	6
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	11	55		99			33	
C(m) (vph)	1362	1288		495			503	
v/c	0.01	0.04		0.20			0.07	
95% queue length	0.02	0.13		0.74			0.21	
Control Delay	7.7	7.9		14.1			12.7	
LOS	A	A		B			B	
Approach Delay				14.1			12.7	
Approach LOS				B			B	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: PM Peak
Intersection: 4
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2030 No-Build
Project ID:
East/West Street: 9000 N Rd
North/South Street: 4000E Rd
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	160	80	40	140	10
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	11	177	88	44	155	11
Percent Heavy Vehicles	6	--	--	6	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	80	10	20	10	10	10
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	88	11	22	11	11	11
Percent Heavy Vehicles	6	6	6	6	6	6
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	11	44		121			33	
C(m) (vph)	1388	1276		481			516	
v/c	0.01	0.03		0.25			0.06	
95% queue length	0.02	0.11		0.99			0.20	
Control Delay	7.6	7.9		15.0-			12.5	
LOS	A	A		B			B	
Approach Delay				15.0-			12.5	
Approach LOS				B			B	

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: AM Peak
Project ID: I-57 Interchange Study
E/W St: 6000N Rd

Inter.: 5
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: US 45/52

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	1	2	2	1	2	2	1	2	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	160	930	300	200	740	530	200	660	250	150	700	260
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
RTOR Vol			90			99			105			30

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right	P				EB	Right	P			
SB Right	P				WB	Right	P			
Green	16.0	39.0					12.0	29.0		
Yellow	4.0	4.0					4.0	4.0		
All Red	2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	221	1656	0.81	0.13	69.7	E		
T	1079	3319	0.96	0.32	57.7	E	53.1	D
R	704	1482	0.33	0.47	19.9	B		
Westbound								
L	429	3216	0.52	0.13	49.5	D		
T	1079	3319	0.76	0.32	39.6	D	37.1	D
R	704	1482	0.68	0.47	27.1	C		
Northbound								
L	322	3216	0.69	0.10	58.3	E		
T	802	3319	0.91	0.24	59.2	E	53.7	D
R	630	1482	0.26	0.43	22.5	C		
Southbound								
L	322	3216	0.52	0.10	52.7	D		
T	802	3319	0.97	0.24	69.6	E	57.6	E
R	630	1482	0.41	0.43	24.4	C		

Intersection Delay = 49.7 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: PM Peak
Project ID: I-57 Interchange Study
E/W St: 6000N Rd

Inter.: 5
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: US 45/52

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	2	1	2	2	1	2	2	1	2	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	250	680	350	150	580	500	300	750	400	200	750	400
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
RTOR Vol			105			90			120			45

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A			
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A				SB	Left	A			
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right	P				EB	Right	P			
SB	Right	P				WB	Right	P			
Green		12.0	35.0					14.0	35.0		
Yellow		4.0	4.0					4.0	4.0		
All Red		2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	322	3216	0.86	0.10	74.0	E		
T	968	3319	0.78	0.29	43.2	D	45.3	D
R	679	1482	0.40	0.46	22.0	C		
Westbound								
L	322	3216	0.52	0.10	52.7	D		
T	968	3319	0.67	0.29	39.1	D	36.9	D
R	679	1482	0.67	0.46	28.0	C		
Northbound								
L	375	3216	0.89	0.12	74.1	E		
T	968	3319	0.86	0.29	48.2	D	49.0	D
R	655	1482	0.47	0.44	24.2	C		
Southbound								
L	375	3216	0.59	0.12	52.8	D		
T	968	3319	0.86	0.29	48.2	D	43.1	D
R	655	1482	0.60	0.44	27.0	C		

Intersection Delay = 43.8 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: AM Peak
Project ID: I-57 Interchange Study
E/W St: 6000N Rd

Inter.: 6
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	2	1	1	2	0	2	2	0	1	2	1
LGConfig	L	T	R	L	TR		L	TR		L	T	R
Volume	600	270	530	670	230	680	740	1100	800	340	1170	660
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0	12.0	12.0
RTOR Vol			159									198

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A			
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A				SB	Left	A			
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		11.0	22.0					7.0	26.0		
Yellow		4.0	4.0					4.0	4.0		
All Red		2.0	2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	393	3216	1.70	0.12	364.0	F		
T	811	3319	0.37	0.24	28.5	C	219.4	F
R	362	1482	1.14	0.24	124.3	F		
Westbound								
L	202	1656	3.68	0.12	1259	F		
TR				0.24				
Northbound								
L	250	3216	3.29	0.08	1081	F		
TR				0.29				
Southbound								
L	129	1656	2.93	0.08	930.8	F		
T	959	3319	1.36	0.29	198.9	F	311.8	F
R	428	1482	1.20	0.29	142.0	F		

Intersection Delay = (sec/veh) Intersection LOS =

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: PM Peak
Project ID: I-57 Interchange Study
E/W St: 6000N Rd

Inter.: 6
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	2	1	1	2	0	2	2	0	1	2	1
LGConfig	L	T	R	L	TR		L	TR		L	T	R
Volume	400	250	700	370	150	270	620	1860	480	570	1610	650
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0	12.0	12.0
RTOR Vol			210									225

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	7.0	15.0					14.0	30.0		
Yellow	4.0	4.0					4.0	4.0		
All Red	2.0	2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	250	3216	1.78	0.08	406.5	F		
T	553	3319	0.50	0.17	34.8	C	404.4	F
R	247	1482	2.20	0.17	591.6	F		
Westbound								
L	129	1656	3.19	0.08	1045	F		
TR				0.17				
Northbound								
L	500	3216	1.38	0.16	220.3	F		
TR				0.33				
Southbound								
L	258	1656	2.45	0.16	703.6	F		
T	1106	3319	1.62	0.33	312.1	F	356.4	F
R	494	1482	0.96	0.33	58.8	E		

Intersection Delay = (sec/veh) Intersection LOS =

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: AM Peak
Intersection: 7
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2030 No-Build
Project ID:
East/West Street: 6000N Rd
North/South Street: 4000E Rd
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	150	10	10	70	10
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	11	166	11	11	77	11
Percent Heavy Vehicles	6	--	--	6	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	10	10	10	10	10	10
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	11	11	11	11	11	11
Percent Heavy Vehicles	6	6	6	6	6	6
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	11	11		33			33	
C(m) (vph)	1483	1375		669			689	
v/c	0.01	0.01		0.05			0.05	
95% queue length	0.02	0.02		0.16			0.15	
Control Delay	7.4	7.6		10.7			10.5	
LOS	A	A		B			B	
Approach Delay				10.7			10.5	
Approach LOS				B			B	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: PM Peak
Intersection: 7
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2030 No-Build
Project ID:
East/West Street: 6000N Rd
North/South Street: 4000E Rd
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	70	10	10	130	10
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	11	77	11	11	144	11
Percent Heavy Vehicles	6	--	--	6	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	10	10	10	10	10	10
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	11	11	11	11	11	11
Percent Heavy Vehicles	6	6	6	6	6	6
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	11	11		33			33	
C(m) (vph)	1401	1483		706			690	
v/c	0.01	0.01		0.05			0.05	
95% queue length	0.02	0.02		0.15			0.15	
Control Delay	7.6	7.4		10.3			10.5	
LOS	A	A		B			B	
Approach Delay				10.3			10.5	
Approach LOS				B			B	

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: 3000N Rd

Inter.: 8
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: US 45/52

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	0	1	2	1	1	2	1	1	2	1
LGConfig	L	TR		L	T	R	L	T	R	L	T	R
Volume	170	500	90	320	340	310	50	550	240	290	1010	90
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			9			93			72			27

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A	A			SB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right	A				EB	Right				
SB	Right	A				WB	Right	A			
Green		22.0	22.0					10.0	42.0		
Yellow		4.0	4.0					4.0	4.0		
All Red		2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	437	1703	0.43	0.42	24.4	C		
TR	613	3342	1.05	0.18	100.3	F	83.2	F
Westbound								
L	372	1703	0.96	0.42	70.0	E		
T	626	3413	0.60	0.18	46.7	D	52.1	D
R	483	1524	0.50	0.32	34.1	C		
Northbound								
L	202	1703	0.28	0.48	23.8	C		
T	1195	3413	0.51	0.35	31.2	C	26.5	C
R	889	1524	0.21	0.58	12.0	B		
Southbound								
L	338	1703	0.95	0.48	75.2	E		
T	1195	3413	0.94	0.35	51.7	D	54.8	D
R	889	1524	0.08	0.58	11.0	B		

Intersection Delay = 54.0 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: 3000N Rd

Inter.: 8
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: US 45/52

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	0	1	2	1	1	2	1	1	2	1
LGConfig	L	TR		L	T	R	L	T	R	L	T	R
Volume	430	950	180	470	820	220	90	1110	380	400	830	80
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			10			38			66			15

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A	A			SB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right	A				EB	Right				
SB	Right	A				WB	Right	A			
Green		13.0	33.0					19.0	31.0		
Yellow		4.0	4.0					4.0	4.0		
All Red		2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	244	1703	1.96	0.43	480.4	F		
TR	917	3335	1.36	0.28	211.6	F	286.2	F
Westbound								
L	244	1703	2.14	0.43	560.9	F		
T	939	3413	0.97	0.28	65.3	E	217.8	F
R	737	1524	0.27	0.48	18.7	B		
Northbound								
L	330	1703	0.30	0.47	23.4	C		
T	882	3413	1.40	0.26	230.5	F	176.1	F
R	635	1524	0.55	0.42	27.5	C		
Southbound								
L	330	1703	1.35	0.47	211.2	F		
T	882	3413	1.05	0.26	87.3	F	122.3	F
R	635	1524	0.11	0.42	21.5	C		

Intersection Delay = 203.9 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: 3000N Rd

Inter.: 9
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	1	1	2	1	2	2	1	1	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	370	160	300	90	410	150	200	2050	50	160	1750	650
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
RTOR Vol			30			15			5			65

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A			
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A	A			SB	Left	A			
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right	A				EB	Right	A			
SB	Right	A				WB	Right	A			
Green		11.0	12.0					8.0	65.0		
Yellow		4.0	4.0					4.0	4.0		
All Red		2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	210	1641	1.96	0.24	489.8	F		
T	329	3289	0.54	0.10	53.2	D	264.8	F
R	318	1468	0.94	0.22	82.0	F		
Westbound								
L	261	1641	0.38	0.24	37.8	D		
T	329	3289	1.39	0.10	245.5	F	172.9	F
R	318	1468	0.47	0.22	42.1	D		
Northbound								
L	212	3187	1.05	0.07	130.8	F		
T	1782	3289	1.28	0.54	157.2	F	152.0	F
R	1003	1468	0.05	0.68	6.2	A		
Southbound								
L	109	1641	1.63	0.07	378.5	F		
T	1782	3289	1.09	0.54	78.2	E	82.0	F
R	1003	1468	0.65	0.68	12.3	B		

Intersection Delay = 140.6 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: 3000N Rd

Inter.: 9
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	1	1	2	1	2	2	1	1	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	590	490	450	190	480	380	360	2000	90	380	2000	740
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
RTOR Vol			45			38			9			74

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A	A			NB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A	A			SB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right	A				EB	Right	A			
SB Right	A				WB	Right	A			
Green	11.0	18.0					10.0	57.0		
Yellow	4.0	4.0					4.0	4.0		
All Red	2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	210	1641	3.12	0.29	1009	F		
T	493	3289	1.10	0.15	122.8	F	471.7	F
R	416	1468	1.08	0.28	110.8	F		
Westbound								
L	210	1641	1.00	0.29	102.8	F		
T	493	3289	1.08	0.15	115.2	F	96.2	F
R	416	1468	0.91	0.28	65.9	E		
Northbound								
L	266	3187	1.50	0.08	300.4	F		
T	1562	3289	1.42	0.47	225.4	F	229.3	F
R	905	1468	0.10	0.62	9.4	A		
Southbound								
L	137	1641	3.08	0.08	1010	F		
T	1562	3289	1.42	0.47	225.4	F	279.2	F
R	905	1468	0.82	0.62	23.7	C		

Intersection Delay = 276.6 (sec/veh) Intersection LOS = F

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: AM Peak
Intersection: 10
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2030 No-Build
Project ID:
East/West Street: 3000 N Rd
North/South Street: 4000E Rd

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	40	80	10	10	140	10	20	100	10	10	90	20

% Thrus Left Lane

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.90		0.90		0.90		0.90	
Flow Rate	143		177		144		133	
% Heavy Veh	6		6		6		6	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	143		177		144		133	
Left-Turn	44		11		22		11	
Right-Turn	11		11		11		22	
Prop. Left-Turns	0.3		0.1		0.2		0.1	
Prop. Right-Turns	0.1		0.1		0.1		0.2	
Prop. Heavy Vehicle	0.1		0.1		0.1		0.1	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1		0.1		0.1		0.0	

Worksheet 4 - Departure Headway and Service Time

	Eastbound	Westbound	Northbound	Southbound

	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	143		177		144		133	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.13		0.16		0.13		0.12	
hd, final value	4.98		4.90		5.00		4.95	
x, final value	0.20		0.24		0.20		0.18	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	3.0		2.9		3.0		3.0	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	143		177		144		133	
Service Time	3.0		2.9		3.0		3.0	
Utilization, x	0.20		0.24		0.20		0.18	
Dep. headway, hd	4.98		4.90		5.00		4.95	
Capacity	393		427		394		383	
Delay	9.21		9.45		9.25		9.06	
LOS	A		A		A		A	
Approach:								
Delay	9.21		9.45		9.25		9.06	
LOS	A		A		A		A	

Intersection Delay 9.26 Intersection LOS A

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: PM Peak
Intersection: 10
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2030 No-Build
Project ID:
East/West Street: 3000 N Rd
North/South Street: 4000E Rd

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	40	150	20	10	80	10	30	40	10	10	110	40

% Thrus Left Lane

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.90		0.90		0.90		0.90	
Flow Rate	232		110		88		177	
% Heavy Veh	6		6		6		6	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	232		110		88		177	
Left-Turn	44		11		33		11	
Right-Turn	22		11		11		44	
Prop. Left-Turns	0.2		0.1		0.4		0.1	
Prop. Right-Turns	0.1		0.1		0.1		0.2	
Prop. Heavy Vehicle	0.1		0.1		0.1		0.1	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1		0.1		0.1		-0.0	

Worksheet 4 - Departure Headway and Service Time

	Eastbound	Westbound	Northbound	Southbound

	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	232		110		88		177	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.21		0.10		0.08		0.16	
hd, final value	4.82		4.97		5.13		4.86	
x, final value	0.31		0.15		0.13		0.24	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	2.8		3.0		3.1		2.9	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	232		110		88		177	
Service Time	2.8		3.0		3.1		2.9	
Utilization, x	0.31		0.15		0.13		0.24	
Dep. headway, hd	4.82		4.97		5.13		4.86	
Capacity	482		360		338		427	
Delay	9.99		8.85		8.86		9.39	
LOS	A		A		A		A	
Approach:								
Delay	9.99		8.85		8.86		9.39	
LOS	A		A		A		A	

Intersection Delay 9.44 Intersection LOS A

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: SB I-57 On/Off Ramp

Inter.: 11
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	2	0	0	0	0	3	1	2	3	0
LGConfig	L		R					T	R	L	T	
Volume	170		500					2160	400	750	2060	
Lane Width	12.0		12.0					12.0	12.0	12.0	12.0	
RTOR Vol			50						120			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	P				NB	Left				
	Thru						Thru		P		
	Right	P					Right		P		
	Peds						Peds				
WB	Left					SB	Left	P			
	Thru						Thru	P	P		
	Right						Right				
	Peds						Peds				
NB	Right	P				EB	Right				
SB	Right					WB	Right				
Green		11.0						19.0	42.0		
Yellow		4.0						4.0	4.0		
All Red		2.0						2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	190	1556	0.99	0.12	103.4	F		
							283.3	F
R	301	2464	1.66	0.12	351.3	F		
Westbound								
Northbound								
T	2257	4837	1.06	0.47	62.4	E	56.1	E
R	1059	1615	0.29	0.66	7.3	A		
Southbound								
L	740	3505	1.13	0.21	108.9	F		
T	3601	4837	0.64	0.74	6.4	A	33.8	C

Intersection Delay = 69.4 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: SB I-57 On/Off Ramp

Inter.: 11
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	2	0	0	0	0	3	1	2	3	0
LGConfig	L		R					T	R	L	T	
Volume	690		750					2510	480	1310	2240	
Lane Width	12.0		12.0					12.0	12.0	12.0	12.0	
RTOR Vol			75						144			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left				
Thru						Thru		P		
Right	P					Right		P		
Peds						Peds				
WB Left					SB	Left	P			
Thru						Thru	P	P		
Right						Right				
Peds						Peds				
NB Right	P				EB	Right				
SB Right					WB	Right				
Green	19.0						18.0	35.0		
Yellow	4.0						4.0	4.0		
All Red	2.0						2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	328	1556	2.34	0.21	647.2	F		
							448.5	F
R	520	2464	1.44	0.21	245.2	F		
Westbound								
Northbound								
T	1881	4837	1.48	0.39	247.6	F	219.3	F
R	1077	1615	0.35	0.67	7.4	A		
Southbound								
L	701	3505	2.08	0.20	525.6	F		
T	3171	4837	0.78	0.66	13.0	B	202.2	F

Intersection Delay = 251.8 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: NB I-57 On/Off Ramp

Inter.: 12
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	2	0	2	2	3	0	0	3	0
LGConfig				L		R	L	T			TR	
Volume				400		1330	520	1800			2410	710
Lane Width				12.0		12.0	12.0	12.0			12.0	
RTOR Vol						133						0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left					NB	Left	P			
Thru						Thru	P	P		
Right						Right				
Peds						Peds				
WB Left		P			SB	Left				
Thru						Thru		P		
Right		P				Right		P		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green		23.0					9.0	40.0		
Yellow		4.0					4.0	4.0		
All Red		2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
L	772	3022	0.58	0.26	32.3	C		
							412.1	F
R	630	2464	2.11	0.26	538.9	F		
Northbound								
L	351	3505	1.65	0.10	344.0	F		
T	2956	4837	0.68	0.61	12.9	B	87.1	F
Southbound								
TR	2108	4742	1.64	0.44	317.3	F	317.3	F

Intersection Delay = 262.9 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: NB I-57 On/Off Ramp

Inter.: 12
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	2	0	2	2	3	0	0	3	0
LGConfig				L		R	L	T			TR	
Volume				470		670	530	2670			3080	150
Lane Width				12.0		12.0	12.0	12.0			12.0	
RTOR Vol						67						0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left					NB	Left	P			
Thru						Thru	P	P		
Right						Right				
Peds						Peds				
WB Left		P			SB	Left				
Thru						Thru		P		
Right		P				Right		P		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green		17.0					15.0	40.0		
Yellow		4.0					4.0	4.0		
All Red		2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
L	571	3022	0.91	0.19	57.3	E		
							163.8	F
R	465	2464	1.44	0.19	246.8	F		
Northbound								
L	584	3505	1.01	0.17	76.9	E		
T	3278	4837	0.91	0.68	16.8	B	26.8	C
Southbound								
TR	2141	4818	1.68	0.44	331.4	F	331.4	F

Intersection Delay = 177.5 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: SB I-57 On/Off Ramp

Inter.: 13
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: 9000N Rd

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	2	1	2	2	0	0	0	0	2	0	1
LGConfig		T	R	L	T					L		R
Volume		1270	300	710	1190					490		420
Lane Width		12.0	12.0	12.0	12.0					12.0		12.0
RTOR Vol			90									156

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left					NB Left				
Thru		A			Thru				
Right		A			Right				
Peds					Peds				
WB Left	A				SB Left	A			
Thru	A	A			Thru				
Right					Right	A			
Peds					Peds				
NB Right					EB Right	A			
SB Right					WB Right				
Green	18.0	36.0				18.0			
Yellow	4.0	4.0				4.0			
All Red	2.0	2.0				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
T	1248	3119	1.13	0.40	96.4	F	83.6	F
R	928	1392	0.25	0.67	6.1	A		
Westbound								
L	604	3022	1.31	0.20	185.5	F		
T	2079	3119	0.64	0.67	9.3	A	75.2	E
Northbound								
Southbound								
L	604	3022	0.90	0.20	51.8	D		
							70.4	E
R	278	1392	1.05	0.20	104.9	F		

Intersection Delay = 77.3 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: SB I-57 On/Off Ramp

Inter.: 13
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: 9000N Rd

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	2	1	2	2	0	0	0	0	2	0	1
LGConfig		T	R	L	T					L		R
Volume		1410	480	540	930					940		1050
Lane Width		12.0	12.0	12.0	12.0					12.0		12.0
RTOR Vol			144									315

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left					NB	Left				
Thru		A				Thru				
Right		A				Right				
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A	A				Thru				
Right						Right	A			
Peds						Peds				
NB Right					EB	Right	A			
SB Right					WB	Right				
Green	12.0	30.0					30.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
T	1040	3119	1.51	0.33	263.1	F	213.4	F
R	1021	1392	0.37	0.73	4.6	A		
Westbound								
L	403	3022	1.49	0.13	271.8	F		
T	1663	3119	0.62	0.53	15.4	B	109.6	F
Northbound								
Southbound								
L	1007	3022	1.04	0.33	68.3	E		
							205.6	F
R	464	1392	1.76	0.33	381.1	F		

Intersection Delay = 179.5 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/11/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: NB I-57 On/Off Ramp

Inter.: 14
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: 9000N Rd

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	2	0	0	2	1	2	0	1	0	0	0
LGConfig	L	T			T	R	L		R			
Volume	940	820			1490	980	410		540			
Lane Width	12.0	12.0			12.0	12.0	12.0		12.0			
RTOR Vol						424			72			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A	A				Thru				
Right						Right	A			
Peds						Peds				
WB Left					SB	Left				
Thru		A				Thru				
Right		A				Right				
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right	A			
Green	22.0	35.0					15.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	857	3505	1.22	0.24	142.8	F		
T	2183	3119	0.42	0.70	5.9	A	79.0	E
Westbound								
T	1213	3119	1.37	0.39	197.2	F	146.8	F
R	1005	1615	0.61	0.62	11.5	B		
Northbound								
L	584	3505	0.78	0.17	42.7	D		
							270.8	F
R	269	1615	1.93	0.17	470.8	F		
Southbound								

Intersection Delay = 144.6 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/11/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: NB I-57 On/Off Ramp

Inter.: 14
Area Type: All other areas
Jurisd:
Year : 2030 No-Build

N/S St: 9000N Rd

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	2	0	0	2	1	2	0	1	0	0	0
LGConfig	L	T			T	R	L		R			
Volume	560	1800			1260	610	210		590			
Lane Width	12.0	12.0			12.0	12.0	12.0		12.0			
RTOR Vol						183			87			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A	A				Thru				
Right						Right	A			
Peds						Peds				
WB Left					SB	Left				
Thru		A				Thru				
Right		A				Right				
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right	A			
Green	19.0	34.0					19.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	740	3505	0.84	0.21	42.6	D		
T	2045	3119	0.98	0.66	29.9	C	32.9	C
Westbound								
T	1178	3119	1.19	0.38	121.5	F	92.8	F
R	1059	1615	0.45	0.66	7.9	A		
Northbound								
L	740	3505	0.31	0.21	30.2	C		
							246.1	F
R	341	1615	1.64	0.21	336.1	F		
Southbound								

Intersection Delay = 86.1 (sec/veh) Intersection LOS = F

2030 Build Freeway

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	AM
Freeway/Direction:	I-57
From/To:	North of 9000N
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	77000	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	58	%
Volume, DDHV	3996	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	2398	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2398	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	53.4	mi/h
Number of lanes, N	2	
Density, D	44.9	pc/mi/ln
Level of Service, LOS	E	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	PM
Freeway/Direction:	I-57
From/To:	North of 9000N
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	77000	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	55	%
Volume, DDHV	4130	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	2478	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2478	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of Service, LOS	F	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	AM
Freeway/Direction:	I-57
From/To:	6000N to 9000N
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	63500	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	51	%
Volume, DDHV	3126	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	1876	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1876	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	66.9	mi/h
Number of lanes, N	2	
Density, D	28.0	pc/mi/ln
Level of Service, LOS	D	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	PM
Freeway/Direction:	I-57
From/To:	6000N to 9000N
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	63500	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	52	%
Volume, DDHV	3484	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	2090	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2090	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	63.0	mi/h
Number of lanes, N	2	
Density, D	33.2	pc/mi/ln
Level of Service, LOS	D	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	AM
Freeway/Direction:	I-57
From/To:	IL 50 to 6000N
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	63500	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	51	%
Volume, DDHV	3376	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	2026	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2026	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	64.3	mi/h
Number of lanes, N	2	
Density, D	31.5	pc/mi/ln
Level of Service, LOS	D	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	PM
Freeway/Direction:	I-57
From/To:	IL 50 to 6000N
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	63500	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	52	%
Volume, DDHV	3489	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	2093	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2093	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	62.9	mi/h
Number of lanes, N	2	
Density, D	33.3	pc/mi/ln
Level of Service, LOS	D	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	AM
Freeway/Direction:	I-57
From/To:	South of IL 50
Jurisdiction:	
Analysis Year:	2030 Build

Description: I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	70000	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	50	%
Volume, DDHV	3500	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	2184	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2184	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	60.6	mi/h
Number of lanes, N	2	
Density, D	36.1	pc/mi/ln
Level of Service, LOS	E	

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

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	JM
Agency or Company:	
Date Performed:	5/16/05
Analysis Time Period:	PM
Freeway/Direction:	I-57
From/To:	South of IL 50
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Flow Inputs and Adjustments

Annual average daily traffic, AADT	70000	veh/day
Peak-hour proportion of AADT, K	0.10	
Peak-hour direction percent, D	50	%
Volume, DDHV	3500	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	0.926	
Driver population factor, fp	1.00	
Flow rate, vp	2184	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
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	0.0	mi/h
Number of lanes adjustment, fN	0.0	mi/h
Free-flow speed	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2184	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	60.6	mi/h
Number of lanes, N	2	
Density, D	36.1	pc/mi/ln
Level of Service, LOS	E	

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

2030 Build Ramps

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	9000N Rd to I-57 SB
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2430	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	50.0	mph
Volume on ramp	710	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane	2000	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	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2430	710	490	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	675	197	136	v
Trucks and buses	16	16	16	%
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	0.926	0.926	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2916	852	588	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2916 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3768	4800	No
v_{R12}	3768	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 6.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.050	
Space mean speed in ramp influence area,	S_R = 68.6	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 68.6	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	9000N Rd to I-57 SB
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2860	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	50.0	mph
Volume on ramp	720	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane	2000	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1350	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2860	720	1350	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	794	200	375	v
Trucks and buses	16	16	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	2.5	
Recreational vehicle PCE, ER	1.2	1.2	2.0	
Heavy vehicle adjustment, fHV	0.926	0.926	0.806	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3432	864	1860	pcph

Estimation of V12 Merge Areas

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

P_{FM}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3432 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4296	4800	No
v_{R12}	4296	4600	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, M_S = 0.167

Space mean speed in ramp influence area, S_R = 65.3 mph

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

Space mean speed for all vehicles, S = 65.3 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB TO 9000 N RD
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2920	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	490	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	710	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2920		490		710		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	811		136		197		v
Trucks and buses	16		16		16		%
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	0.926		0.926		0.926		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	3504		588		852		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3504 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3504	4800	No
v_{12}	3504	4400	No
$v_{FO} = v_F - v_R$	2916	4800	No
v_R	588	2100	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, D_S = 0.286

Space mean speed in ramp influence area, S_R = 62.0 mph

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

Space mean speed for all vehicles, S = 62.0 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB TO 9000 N RD
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4110	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	1350	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	720	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4110		1350		720		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	1142		375		200		v
Trucks and buses	16		16		16		%
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	0.926		0.926		0.926		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	4932		1620		864		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4932 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4932	4800	Yes
v_{12}	4932	4400	Yes
$v_{FO} = v_F - v_R$	3312	4800	No
v_R	1620	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 33.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.379

Space mean speed in ramp influence area, S_R = 59.4 mph

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

Space mean speed for all vehicles, S = 59.4 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB TO 9000 N RD
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2990	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	650	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1630	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2990		650		1630		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	831		181		453		v
Trucks and buses	16		16		16		%
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	0.926		0.926		0.926		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	3588		780		1956		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3588 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3588	4800	No
v_{12}	3588	4400	No
$v_{FO} = v_F - v_R$	2808	4800	No
v_R	780	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 32.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.303	
Space mean speed in ramp influence area,	S_R = 61.5	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 61.5	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	3220
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB TO 9000 N RD
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3220	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	500	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		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	On	
Distance to adjacent ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3220		500		680		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	894		139		189		v
Trucks and buses	16		16		16		%
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	0.926		0.926		0.926		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	3864		600		816		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3864 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3864	4800	No
v_{12}	3864	4400	No
$v_{FO} = v_F - v_R$	3264	4800	No
v_R	600	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 34.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.287

Space mean speed in ramp influence area, S_R = 62.0 mph

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

Space mean speed for all vehicles, S = 62.0 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
MICHAEL BAKER JR. INC

Phone: Fax:
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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	9000N Rd to I-57 NB
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2340	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	50.0	mph
Volume on ramp	1630	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane	2000	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	650	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2340	1630	650	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	650	453	181	v
Trucks and buses	16	16	16	%
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	0.926	0.926	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2808	1956	780	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 2808$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4764	4800	No
v_{R12}	4764	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 14.1$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable, $M_S = 0.338$

Space mean speed in ramp influence area, $S_R = 60.5$ mph

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

Space mean speed for all vehicles, $S = 60.5$ mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

STEPHEN ARHIN
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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	9000N Rd to I-57 NB
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2720	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	50.0	mph
Volume on ramp	680	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane	2000	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	500	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2720	680	500	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	756	189	139	v
Trucks and buses	16	16	16	%
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	0.926	0.926	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3264	816	600	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 3264$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4080	4800	No
v_{R12}	4080	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 9.3$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	$M_S = 0.112$	
Space mean speed in ramp influence area,	$S_R = 66.9$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 66.9$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB to IL-50
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3390	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	570	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		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	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3390		570		680		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	942		158		189		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	4068		684		782		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4068 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4068	4800	No
v_{12}	4068	4400	No
$v_{FO} = v_F - v_R$	3384	4800	No
v_R	684	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 36.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.295

Space mean speed in ramp influence area, S_R = 61.8 mph

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

Space mean speed for all vehicles, S = 61.8 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB to IL-50
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3490	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	940	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	950	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3490		940		950		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	969		261		264		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	4188		1128		1092		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4188 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4188	4800	No
v_{12}	4188	4400	No
$v_{FO} = v_F - v_R$	3060	4800	No
v_R	1128	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 37.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.335

Space mean speed in ramp influence area, S_R = 60.6 mph

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

Space mean speed for all vehicles, S = 60.6 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57
Junction:	IL-50 to I-57 NB
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2600	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	630	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	900	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2600	630	900	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	722	175	250	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3120	724	1080	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 3120$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3844	4800	No
v_{R12}	3844	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 28.9$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	$M_S = 0.403$	
Space mean speed in ramp influence area,	$S_R = 58.7$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 58.7$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

Sandra Fikile Ncala
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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57
Junction:	IL-50 to I-57 NB
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2540	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	680	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	960	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2540	680	960	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	706	189	267	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3048	782	1152	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 3048$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3830	4800	No
v_{R12}	3830	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,	$M_S = 0.401$	
Space mean speed in ramp influence area,	$S_R = 58.8$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 58.8$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB to IL-50
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3500	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	900	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	630	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3500		900		630		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	972		250		175		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	4200		1080		724		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4200 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4200	4800	No
v_{12}	4200	4400	No
$v_{FO} = v_F - v_R$	3120	4800	No
v_R	1080	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 37.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.330

Space mean speed in ramp influence area, S_R = 60.8 mph

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

Space mean speed for all vehicles, S = 60.8 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Phone: Fax:
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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB to IL-50
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3500	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	960	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		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	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3500		960		680		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	972		267		189		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	4200		1152		782		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

$P_{FD}^{EQ} = 1.000$ Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD} = 4200$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4200	4800	No
v_{12}	4200	4400	No
$v_{FO} = v_F - v_R$	3048	4800	No
v_R	1152	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 37.7$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	$D_S = 0.337$	
Space mean speed in ramp influence area,	$S_R = 60.6$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 60.6$	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

Sandra Fikile Ncala
Michael Baker Jr. Inc

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	IL-50 to I-57 SB
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2820	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	680	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	570	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2820	680	570	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	783	189	158	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3384	782	684	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3384 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4166	4800	No
v_{R12}	4166	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 31.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.472	
Space mean speed in ramp influence area,	S_R = 56.8	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 56.8	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	IL-50 to I-57 SB
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2350	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	950	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	940	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2350	950	940	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	653	264	261	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2820	1092	1128	pcph

Estimation of V12 Merge Areas

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

P_{FM}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2820 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3912	4800	No
v_{R12}	3912	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 29.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.416	
Space mean speed in ramp influence area,	S_R = 58.4	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 58.4	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	6000N to I-57 SB
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2620	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	770	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	530	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2620	770	530	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	728	214	147	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3144	885	636	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3144 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4029	4800	No
v_{R12}	4029	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 30.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.440	
Space mean speed in ramp influence area,	S_R = 57.7	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 57.7	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

Sandra Fikile Ncala
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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	6000N to I-57 SB
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2350	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	1140	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1140	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2350	1140	1140	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	653	317	317	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2820	1311	1368	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2820 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4131	4800	No
v_{R12}	4131	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 30.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.464	
Space mean speed in ramp influence area,	S_R = 57.0	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 57.0	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB to 6000N
Jurisdiction:	
Analysis Year:	2030 No-Build

Description: I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3140	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	530	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	770	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3140		530		770		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	872		147		214		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	3768		636		885		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3768 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3768	4800	No
v_{12}	3768	4400	No
$v_{FO} = v_F - v_R$	3132	4800	No
v_R	636	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 34.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.290

Space mean speed in ramp influence area, S_R = 61.9 mph

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

Space mean speed for all vehicles, S = 61.9 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB to 6000 N Road
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3480	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	1140	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1140	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3480		1140		1140		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	967		317		317		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	4176		1368		1311		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4176 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4176	4800	No
v_{12}	4176	4400	No
$v_{FO} = v_F - v_R$	2808	4800	No
v_R	1368	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 37.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.356

Space mean speed in ramp influence area, S_R = 60.0 mph

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

Space mean speed for all vehicles, S = 60.0 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Phone: Fax:
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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB to 6000N
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3230	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	1130	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	890	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3230		1130		890		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	897		314		247		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	3876		1356		1023		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3876 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3876	4800	No
v_{12}	3876	4400	No
$v_{FO} = v_F - v_R$	2520	4800	No
v_R	1356	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 34.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.355

Space mean speed in ramp influence area, S_R = 60.1 mph

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

Space mean speed for all vehicles, S = 60.1 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

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Diverge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB to 6000N
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3220	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	490	vph
Length of first accel/decel lane	300	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	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3220		490		490		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	894		136		136		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	3864		588		563		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3864 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3864	4800	No
v_{12}	3864	4400	No
$v_{FO} = v_F - v_R$	3276	4800	No
v_R	588	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 34.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.286	
Space mean speed in ramp influence area,	S_R = 62.0	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 62.0	mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

Sandra Fikile Ncala
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Phone: Fax:
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Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	AM PEAK
Freeway/Dir of Travel:	I-57
Junction:	6000N to I-57 NB
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2100	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	890	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1130	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2100	890	1130	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	583	247	314	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2520	1023	1356	pcph

Estimation of V12 Merge Areas

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

P_{FM}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2520 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3543	4800	No
v_{R12}	3543	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 26.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.356

Space mean speed in ramp influence area, S_R = 60.0 mph

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

Space mean speed for all vehicles, S = 60.0 mph

HCS2000: Ramps and Ramp Junctions Release 4.1d

Sandra Fikile Ncala
Michael Baker Jr. Inc

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JM
Agency/Co.:	
Date performed:	5/10/05
Analysis time period:	PM PEAK
Freeway/Dir of Travel:	I-57
Junction:	6000N to I-57 NB
Jurisdiction:	
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2730	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	490	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	490	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2730	490	490	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	758	136	136	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3276	563	588	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 3276$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3839	4800	No
v_{R12}	3839	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 28.9$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable, $M_S = 0.402$

Space mean speed in ramp influence area, $S_R = 58.7$ mph

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

Space mean speed for all vehicles, $S = 58.7$ mph

2030 Build Intersections

HCS2000: Signalized Intersections Release 4.1e

Analyst:
Agency: Michael Baker Jr.
Date: 5/13/05
Period: AM Peak
Project ID: I-57 Interchange Study
E/W St: 9000N Rd

Inter.: 1
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: US 45/52

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	1	1	2	1	1	2	1	1	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	70	510	30	280	630	170	10	270	820	110	290	10
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
RTOR Vol			9			51			246			3

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A	A			SB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right	A				EB	Right	A			
SB	Right	A				WB	Right	A			
Green		24.0	22.0					7.0	13.0		
Yellow		4.0	4.0					4.0	4.0		
All Red		2.0	2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	488	1530	0.16	0.58	10.5	B		
T	749	3066	0.76	0.24	36.0	D	32.4	C
R	532	1369	0.04	0.39	17.1	B		
Westbound								
L	522	1530	0.60	0.58	13.7	B		
T	749	3066	0.93	0.24	52.1	D	37.8	D
R	532	1369	0.25	0.39	18.8	B		
Northbound								
L	229	1530	0.05	0.29	23.4	C		
T	443	3066	0.68	0.14	40.6	D	48.1	D
R	654	1369	0.98	0.48	52.0	D		
Southbound								
L	237	1530	0.51	0.29	27.0	C		
T	443	3066	0.73	0.14	42.7	D	37.9	D
R	654	1369	0.01	0.48	12.4	B		

Intersection Delay = 39.7 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: PM Peak
Project ID: I-57 Interchange Study
E/W St: 9000N Rd

Inter.: 1
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: US 45/52

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	1	1	2	1	1	2	1	1	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	40	800	50	540	440	170	20	230	510	130	390	60
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
RTOR Vol			15			51			153			18

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A	A			SB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right	A				EB	Right	A			
SB	Right	A				WB	Right	A			
Green		26.0	22.0					6.0	12.0		
Yellow		4.0	4.0					4.0	4.0		
All Red		2.0	2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	584	1530	0.08	0.60	8.2	A		
T	749	3066	1.19	0.24	131.3	F	121.2	F
R	517	1369	0.08	0.38	18.0	B		
Westbound								
L	522	1530	1.15	0.60	112.8	F		
T	749	3066	0.65	0.24	32.6	C	70.6	E
R	517	1369	0.26	0.38	19.5	B		
Northbound								
L	182	1530	0.12	0.27	25.6	C		
T	409	3066	0.63	0.13	39.9	D	26.5	C
R	669	1369	0.59	0.49	18.0	B		
Southbound								
L	226	1530	0.64	0.27	35.6	D		
T	409	3066	1.06	0.13	99.9	F	78.4	E
R	669	1369	0.07	0.49	12.2	B		

Intersection Delay = 77.6 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: CH 9 Division St

Inter.: 2
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	0	2	0	0	2	0
LGConfig	L	TR		L	TR		DefL	TR			LTR	
Volume	330	10	520	10	10	10	220	600	10	10	720	120
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0			12.0	
RTOR Vol			77			1			1			17

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	30.0						48.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	424	1273	0.87	0.33	45.0	D		
TR	487	1461	1.03	0.33	79.5	E	64.9	E
Westbound								
L	116	348	0.09	0.33	21.0	C		
TR	530	1589	0.04	0.33	20.3	C	20.5	C
Northbound								
DefL	226	424	1.08	0.53	103.7	F		
TR	911	1708	0.74	0.53	19.6	B	41.8	D
Southbound								
LTR	1614	3026	0.57	0.53	14.6	B	14.6	B

Intersection Delay = 39.7 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: CH 9 Division St

Inter.: 2
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	0	1	1	0	0	2	0	0	2	0
LGConfig	L	TR		L	TR		DefL	TR			LTR	
Volume	400	10	620	10	10	10	250	660	10	10	910	330
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0			12.0	
RTOR Vol			62			1			1			33

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	30.0						48.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	424	1273	1.05	0.33	86.6	F		
TR	486	1459	1.30	0.33	178.8	F	140.7	F
Westbound								
L	80	228	0.14	0.33	21.7	C		
TR	530	1589	0.04	0.33	20.3	C	20.8	C
Northbound								
DefL	102	192	2.73	0.53	824.4	F		
TR	911	1708	0.82	0.53	23.2	C	241.3	F
Southbound								
LTR	1587	2976	0.85	0.53	22.6	C	22.6	C

Intersection Delay = 123.3 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: 3rd St

Inter.: 3
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	2	0	0	2	0
LGConfig		LTR		L	TR			LTR			LTR	
Volume	60	290	170	340	280	120	110	430	350	60	350	60
Lane Width		12.0		12.0	12.0			12.0			12.0	
RTOR Vol			17			12			35			6

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A			
	Thru	A					Thru	A			
	Right	A					Right	A			
	Peds						Peds				
WB	Left	A				SB	Left	A			
	Thru	A					Thru	A			
	Right	A					Right	A			
	Peds						Peds				
NB	Right					EB	Right				
SB	Right					WB	Right				
Green		42.0						36.0			
Yellow		4.0						4.0			
All Red		2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	625	1339	0.89	0.47	37.4	D	37.4	D
Westbound								
L	304	651	1.24	0.47	158.2	F		
TR	765	1640	0.56	0.47	18.3	B	83.7	F
Northbound								
LTR	920	2300	1.03	0.40	65.4	E	65.4	E
Southbound								
LTR	822	2055	0.63	0.40	23.2	C	23.2	C

Intersection Delay = 57.4 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: 3rd St

Inter.: 3
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	1	1	0	0	2	0	0	2	0
LGConfig		LTR		L	TR		DefL	TR			LTR	
Volume	110	340	210	330	330	110	190	650	250	110	790	150
Lane Width		12.0		12.0	12.0		12.0	12.0			12.0	
RTOR Vol			10			5			11			7

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A					Thru	A			
Right	A					Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	40.0						38.0			
Yellow	4.0						4.0			
All Red	2.0						2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	425	956	1.70	0.44	349.4	F	349.4	F
Westbound								
L	235	528	1.56	0.44	297.5	F		
TR	733	1650	0.66	0.44	21.9	C	140.7	F
Northbound								
DefL	81	192	2.60	0.42	782.6	F		
TR	694	1643	1.42	0.42	225.0	F	323.1	F
Southbound								
LTR	803	1901	1.44	0.42	232.6	F	232.6	F

Intersection Delay = 261.8 (sec/veh) Intersection LOS = F

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: AM Peak
Intersection: 4
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2030 Build
Project ID:
East/West Street: 9000 N Rd
North/South Street: 4000E Rd
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	80	150	50	160	10
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	11	88	166	55	177	11
Percent Heavy Vehicles	6	--	--	6	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	60	10	20	10	10	10
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	66	11	22	11	11	11
Percent Heavy Vehicles	6	6	6	6	6	6
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	11	55		99			33	
C(m) (vph)	1362	1288		495			503	
v/c	0.01	0.04		0.20			0.07	
95% queue length	0.02	0.13		0.74			0.21	
Control Delay	7.7	7.9		14.1			12.7	
LOS	A	A		B			B	
Approach Delay				14.1			12.7	
Approach LOS				B			B	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: PM Peak
Intersection: 4
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2030 Build
Project ID:
East/West Street: 9000 N Rd
North/South Street: 4000E Rd
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	160	80	40	140	10
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	11	177	88	44	155	11
Percent Heavy Vehicles	6	--	--	6	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	80	10	20	10	10	10
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	88	11	22	11	11	11
Percent Heavy Vehicles	6	6	6	6	6	6
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	11	44		121			33	
C(m) (vph)	1388	1276		481			516	
v/c	0.01	0.03		0.25			0.06	
95% queue length	0.02	0.11		0.99			0.20	
Control Delay	7.6	7.9		15.0-			12.5	
LOS	A	A		B			B	
Approach Delay				15.0-			12.5	
Approach LOS				B			B	

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: AM Peak
Project ID: I-57 Interchange Study
E/W St: 6000N Rd

Inter.: 5
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: US 45/52

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	1	2	2	1	2	2	1	2	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	100	990	300	300	800	330	200	460	350	200	600	100
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
RTOR Vol			90			99			105			30

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right	A				EB	Right	A			
SB Right	A				WB	Right	A			
Green	15.0	44.0					12.0	25.0		
Yellow	4.0	4.0					4.0	4.0		
All Red	2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	207	1656	0.54	0.13	52.0	D		
T	1217	3319	0.90	0.37	45.7	D	41.5	D
R	766	1482	0.30	0.52	16.9	B		
Westbound								
L	402	3216	0.83	0.13	64.7	E		
T	1217	3319	0.73	0.37	35.2	D	38.7	D
R	766	1482	0.34	0.52	17.2	B		
Northbound								
L	322	3216	0.69	0.10	58.3	E		
T	691	3319	0.74	0.21	48.7	D	45.4	D
R	568	1482	0.48	0.38	28.6	C		
Southbound								
L	322	3216	0.69	0.10	58.3	E		
T	691	3319	0.97	0.21	72.9	E	65.6	E
R	568	1482	0.14	0.38	24.2	C		

Intersection Delay = 46.2 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: PM Peak
Project ID: I-57 Interchange Study
E/W St: 6000N Rd

Inter.: 5
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: US 45/52

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	2	1	2	2	1	2	2	1	2	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	100	830	350	250	830	300	300	650	400	250	650	150
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
RTOR Vol			105			90			120			45

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right	A				EB	Right	A			
SB Right	A				WB	Right	A			
Green	11.0	36.0					15.0	34.0		
Yellow	4.0	4.0					4.0	4.0		
All Red	2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	295	3216	0.38	0.09	52.1	D		
T	996	3319	0.93	0.30	54.7	D	47.4	D
R	704	1482	0.39	0.47	20.6	C		
Westbound								
L	295	3216	0.94	0.09	91.4	F		
T	996	3319	0.93	0.30	54.7	D	56.2	E
R	704	1482	0.33	0.47	19.9	B		
Northbound								
L	402	3216	0.83	0.13	64.7	E		
T	940	3319	0.77	0.28	43.3	D	44.5	D
R	630	1482	0.49	0.43	25.7	C		
Southbound								
L	402	3216	0.69	0.13	55.3	E		
T	940	3319	0.77	0.28	43.3	D	44.0	D
R	630	1482	0.19	0.43	21.7	C		

Intersection Delay = 48.3 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: AM Peak
Project ID: I-57 Interchange Study
E/W St: 6000N Rd

Inter.: 6
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	2	1	2	2	1	2	2	1	2	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	410	770	310	420	770	430	270	1100	400	240	1120	260
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
RTOR Vol			93			129			120			78

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right	A				EB	Right	A			
SB Right	A				WB	Right	A			
Green	18.0	28.0					11.0	39.0		
Yellow	4.0	4.0					4.0	4.0		
All Red	2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	482	3216	0.95	0.15	78.4	E		
T	774	3319	1.11	0.23	111.4	F	88.8	F
R	556	1482	0.43	0.38	28.5	C		
Westbound								
L	482	3216	0.97	0.15	83.7	F		
T	774	3319	1.11	0.23	111.4	F	87.6	F
R	556	1482	0.60	0.38	32.1	C		
Northbound								
L	295	3216	1.02	0.09	111.3	F		
T	1079	3319	1.13	0.32	112.0	F	95.9	F
R	778	1482	0.40	0.52	17.5	B		
Southbound								
L	295	3216	0.91	0.09	83.4	F		
T	1079	3319	1.15	0.32	120.2	F	102.1	F
R	778	1482	0.26	0.52	15.9	B		

Intersection Delay = 93.8 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: PM Peak
Project ID: I-57 Interchange Study
E/W St: 6000N Rd

Inter.: 6
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	2	1	2	2	1	2	2	1	2	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	250	440	680	370	350	270	260	1860	290	470	1310	550
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
RTOR Vol			204			81			87			165

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
WB Left	A				SB	Left	A			
Thru		A				Thru		A		
Right		A				Right		A		
Peds						Peds				
NB Right	A				EB	Right	A			
SB Right	A				WB	Right	A			
Green	10.0	17.0					14.0	55.0		
Yellow	4.0	4.0					4.0	4.0		
All Red	2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	268	3216	1.04	0.08	120.0	F		
T	470	3319	1.04	0.14	103.9	F	119.8	F
R	457	1482	1.16	0.31	134.5	F		
Westbound								
L	268	3216	1.53	0.08	313.1	F		
T	470	3319	0.83	0.14	61.8	E	158.3	F
R	457	1482	0.46	0.31	34.2	C		
Northbound								
L	375	3216	0.77	0.12	60.9	E		
T	1521	3319	1.36	0.46	198.4	F	166.7	F
R	877	1482	0.26	0.59	12.0	B		
Southbound								
L	375	3216	1.39	0.12	245.1	F		
T	1521	3319	0.96	0.46	45.6	D	83.3	F
R	877	1482	0.49	0.59	14.5	B		

Intersection Delay = 129.7 (sec/veh) Intersection LOS = F

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: AM Peak
Intersection: 7
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2030 Build
Project ID:
East/West Street: 6000N Rd
North/South Street: 4000E Rd
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	150	10	10	70	10
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	11	166	11	11	77	11
Percent Heavy Vehicles	6	--	--	6	--	--
Median Type/Storage	Undivided		/			
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	10	10	10	10	10	10
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	11	11	11	11	11	11
Percent Heavy Vehicles	6	6	6	6	6	6
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	11	11		33			33	
C(m) (vph)	1483	1375		669			689	
v/c	0.01	0.01		0.05			0.05	
95% queue length	0.02	0.02		0.16			0.15	
Control Delay	7.4	7.6		10.7			10.5	
LOS	A	A		B			B	
Approach Delay				10.7			10.5	
Approach LOS				B			B	

HCS2000: Unsignalized Intersections Release 4.1d

TWO-WAY STOP CONTROL SUMMARY

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: PM Peak
Intersection: 7
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2030 Build
Project ID:
East/West Street: 6000N Rd
North/South Street: 4000E Rd
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	70	10	10	130	10
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	11	77	11	11	144	11
Percent Heavy Vehicles	6	--	--	6	--	--
Median Type/Storage	Undivided			/		
RT Channelized?						
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	10	10	10	10	10	10
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	11	11	11	11	11	11
Percent Heavy Vehicles	6	6	6	6	6	6
Percent Grade (%)		0			0	
Flared Approach: Exists?/Storage			No /			No /
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LTR	LTR		LTR			LTR	
v (vph)	11	11		33			33	
C(m) (vph)	1401	1483		706			690	
v/c	0.01	0.01		0.05			0.05	
95% queue length	0.02	0.02		0.15			0.15	
Control Delay	7.6	7.4		10.3			10.5	
LOS	A	A		B			B	
Approach Delay				10.3			10.5	
Approach LOS				B			B	

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: 3000N Rd

Inter.: 8
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: US 45/52

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	0	1	2	1	1	2	1	1	2	1
LGConfig	L	TR		L	T	R	L	T	R	L	T	R
Volume	170	500	90	320	340	310	50	550	240	290	1010	90
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			9			93			72			27

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A	A			SB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right	A				EB	Right				
SB	Right	A				WB	Right	A			
Green		22.0	22.0					10.0	42.0		
Yellow		4.0	4.0					4.0	4.0		
All Red		2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	437	1703	0.43	0.42	24.4	C		
TR	613	3342	1.05	0.18	100.3	F	83.2	F
Westbound								
L	372	1703	0.96	0.42	70.0	E		
T	626	3413	0.60	0.18	46.7	D	52.1	D
R	483	1524	0.50	0.32	34.1	C		
Northbound								
L	202	1703	0.28	0.48	23.8	C		
T	1195	3413	0.51	0.35	31.2	C	26.5	C
R	889	1524	0.21	0.58	12.0	B		
Southbound								
L	338	1703	0.95	0.48	75.2	E		
T	1195	3413	0.94	0.35	51.7	D	54.8	D
R	889	1524	0.08	0.58	11.0	B		

Intersection Delay = 54.0 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: 3000N Rd

Inter.: 8
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: US 45/52

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	0	1	2	1	1	2	1	1	2	1
LGConfig	L	TR		L	T	R	L	T	R	L	T	R
Volume	430	950	180	470	820	220	90	1110	380	400	830	80
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
RTOR Vol			10			38			66			15

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A	A			SB	Left	A	A		
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right	A				EB	Right				
SB	Right	A				WB	Right	A			
Green		13.0	33.0					19.0	31.0		
Yellow		4.0	4.0					4.0	4.0		
All Red		2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	244	1703	1.96	0.43	480.4	F		
TR	917	3335	1.36	0.28	211.6	F	286.2	F
Westbound								
L	244	1703	2.14	0.43	560.9	F		
T	939	3413	0.97	0.28	65.3	E	217.8	F
R	737	1524	0.27	0.48	18.7	B		
Northbound								
L	330	1703	0.30	0.47	23.4	C		
T	882	3413	1.40	0.26	230.5	F	176.1	F
R	635	1524	0.55	0.42	27.5	C		
Southbound								
L	330	1703	1.35	0.47	211.2	F		
T	882	3413	1.05	0.26	87.3	F	122.3	F
R	635	1524	0.11	0.42	21.5	C		

Intersection Delay = 203.9 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: 3000N Rd

Inter.: 9
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	1	1	2	1	2	2	1	1	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	370	160	300	90	410	150	200	2050	50	160	1750	650
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
RTOR Vol			30			15			5			65

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A			
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A	A			SB	Left	A			
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right	A				EB	Right	A			
SB	Right	A				WB	Right	A			
Green		11.0	12.0					8.0	65.0		
Yellow		4.0	4.0					4.0	4.0		
All Red		2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	210	1641	1.96	0.24	489.8	F		
T	329	3289	0.54	0.10	53.2	D	264.8	F
R	318	1468	0.94	0.22	82.0	F		
Westbound								
L	261	1641	0.38	0.24	37.8	D		
T	329	3289	1.39	0.10	245.5	F	172.9	F
R	318	1468	0.47	0.22	42.1	D		
Northbound								
L	212	3187	1.05	0.07	130.8	F		
T	1782	3289	1.28	0.54	157.2	F	152.0	F
R	1003	1468	0.05	0.68	6.2	A		
Southbound								
L	109	1641	1.63	0.07	378.5	F		
T	1782	3289	1.09	0.54	78.2	E	82.0	F
R	1003	1468	0.65	0.68	12.3	B		

Intersection Delay = 140.6 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: 3000N Rd

Inter.: 9
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	2	1	1	2	1	2	2	1	1	2	1
LGConfig	L	T	R	L	T	R	L	T	R	L	T	R
Volume	590	490	450	190	480	380	360	2000	90	220	2000	740
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
RTOR Vol			45			38			9			74

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A	A			NB	Left	A			
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
WB	Left	A	A			SB	Left	A			
	Thru		A				Thru		A		
	Right		A				Right		A		
	Peds						Peds				
NB	Right	A				EB	Right	A			
SB	Right	A				WB	Right	A			
Green		13.0	15.0					10.0	58.0		
Yellow		4.0	4.0					4.0	4.0		
All Red		2.0	2.0					2.0	2.0		

Cycle Length: 120.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	238	1641	2.76	0.28	840.5	F		
T	411	3289	1.32	0.13	214.2	F	446.4	F
R	379	1468	1.19	0.26	152.3	F		
Westbound								
L	238	1641	0.89	0.28	67.2	E		
T	411	3289	1.30	0.13	203.1	F	139.8	F
R	379	1468	1.00	0.26	91.4	F		
Northbound								
L	266	3187	1.50	0.08	300.4	F		
T	1590	3289	1.40	0.48	213.8	F	219.7	F
R	942	1468	0.10	0.64	8.3	A		
Southbound								
L	137	1641	1.78	0.08	434.2	F		
T	1590	3289	1.40	0.48	213.8	F	185.8	F
R	942	1468	0.79	0.64	20.0-	B		

Intersection Delay = 239.9 (sec/veh) Intersection LOS = F

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: AM Peak
Intersection: 10
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2030 Build
Project ID:
East/West Street: 3000 N Rd
North/South Street: 4000E Rd

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	40	80	10	10	140	10	20	100	10	10	90	20

% Thrus Left Lane

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.90		0.90		0.90		0.90	
Flow Rate	143		177		144		133	
% Heavy Veh	6		6		6		6	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	143		177		144		133	
Left-Turn	44		11		22		11	
Right-Turn	11		11		11		22	
Prop. Left-Turns	0.3		0.1		0.2		0.1	
Prop. Right-Turns	0.1		0.1		0.1		0.2	
Prop. Heavy Vehicle	0.1		0.1		0.1		0.1	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1		0.1		0.1		0.0	

Worksheet 4 - Departure Headway and Service Time

	Eastbound	Westbound	Northbound	Southbound

	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	143		177		144		133	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.13		0.16		0.13		0.12	
hd, final value	4.98		4.90		5.00		4.95	
x, final value	0.20		0.24		0.20		0.18	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	3.0		2.9		3.0		3.0	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	143		177		144		133	
Service Time	3.0		2.9		3.0		3.0	
Utilization, x	0.20		0.24		0.20		0.18	
Dep. headway, hd	4.98		4.90		5.00		4.95	
Capacity	393		427		394		383	
Delay	9.21		9.45		9.25		9.06	
LOS	A		A		A		A	
Approach:								
Delay	9.21		9.45		9.25		9.06	
LOS	A		A		A		A	

Intersection Delay 9.26 Intersection LOS A

Phone: Fax:
E-Mail:

ALL-WAY STOP CONTROL(AWSC) ANALYSIS

Analyst: JM
Agency/Co.: Michael Baker Jr.
Date Performed: 5/5/05
Analysis Time Period: PM Peak
Intersection: 10
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2030 Build
Project ID:
East/West Street: 3000 N Rd
North/South Street: 4000E Rd

Worksheet 2 - Volume Adjustments and Site Characteristics

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	40	150	20	10	80	10	30	40	10	10	110	40

% Thrus Left Lane

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		LTR		LTR	
PHF	0.90		0.90		0.90		0.90	
Flow Rate	232		110		88		177	
% Heavy Veh	6		6		6		6	
No. Lanes	1		1		1		1	
Opposing-Lanes	1		1		1		1	
Conflicting-lanes	1		1		1		1	
Geometry group	1		1		1		1	

Duration, T 0.25 hrs.

Worksheet 3 - Saturation Headway Adjustment Worksheet

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rates:								
Total in Lane	232		110		88		177	
Left-Turn	44		11		33		11	
Right-Turn	22		11		11		44	
Prop. Left-Turns	0.2		0.1		0.4		0.1	
Prop. Right-Turns	0.1		0.1		0.1		0.2	
Prop. Heavy Vehicle	0.1		0.1		0.1		0.1	
Geometry Group	1		1		1		1	
Adjustments Exhibit 17-33:								
hLT-adj	0.2		0.2		0.2		0.2	
hRT-adj	-0.6		-0.6		-0.6		-0.6	
hHV-adj	1.7		1.7		1.7		1.7	
hadj, computed	0.1		0.1		0.1		-0.0	

Worksheet 4 - Departure Headway and Service Time

	Eastbound	Westbound	Northbound	Southbound

	L1	L2	L1	L2	L1	L2	L1	L2
Flow rate	232		110		88		177	
hd, initial value	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
x, initial	0.21		0.10		0.08		0.16	
hd, final value	4.82		4.97		5.13		4.86	
x, final value	0.31		0.15		0.13		0.24	
Move-up time, m	2.0		2.0		2.0		2.0	
Service Time	2.8		3.0		3.1		2.9	

Worksheet 5 - Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Flow Rate	232		110		88		177	
Service Time	2.8		3.0		3.1		2.9	
Utilization, x	0.31		0.15		0.13		0.24	
Dep. headway, hd	4.82		4.97		5.13		4.86	
Capacity	482		360		338		427	
Delay	9.99		8.85		8.86		9.39	
LOS	A		A		A		A	
Approach:								
Delay	9.99		8.85		8.86		9.39	
LOS	A		A		A		A	

Intersection Delay 9.44 Intersection LOS A

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: SB I-57 On/Off Ramp

Inter.: 11
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	2	0	0	0	0	3	1	2	3	0
LGConfig	L		R					T	R	L	T	
Volume	70		500					2160	400	280	2060	
Lane Width	12.0		12.0					12.0	12.0	12.0	12.0	
RTOR Vol			50						120			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left				
Thru						Thru		P		
Right	P					Right		P		
Peds						Peds				
WB Left					SB	Left	P			
Thru						Thru	P	P		
Right						Right				
Peds						Peds				
NB Right	P				EB	Right				
SB Right					WB	Right				
Green	19.0						9.0	44.0		
Yellow	4.0						4.0	4.0		
All Red	2.0						2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	328	1556	0.24	0.21	31.2	C		
							61.4	E
R	520	2464	0.96	0.21	66.1	E		
Westbound								
Northbound								
T	2365	4837	1.01	0.49	45.3	D	40.5	D
R	1238	1615	0.25	0.77	3.5	A		
Southbound								
L	351	3505	0.89	0.10	66.3	E		
T	3171	4837	0.72	0.66	11.6	B	18.1	B

Intersection Delay = 32.7 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: SB I-57 On/Off Ramp

Inter.: 11
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	0	2	0	0	0	0	3	1	2	3	0
LGConfig	L		R					T	R	L	T	
Volume	190		750					2510	480	470	2240	
Lane Width	12.0		12.0					12.0	12.0	12.0	12.0	
RTOR Vol			75						144			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	P				NB	Left				
Thru						Thru		P		
Right	P					Right		P		
Peds						Peds				
WB Left					SB	Left	P			
Thru						Thru	P	P		
Right						Right				
Peds						Peds				
NB Right	P				EB	Right				
SB Right					WB	Right				
Green	19.0						18.0	35.0		
Yellow	4.0						4.0	4.0		
All Red	2.0						2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	328	1556	0.64	0.21	41.8	D		
							200.6	F
R	520	2464	1.44	0.21	245.2	F		
Westbound								
Northbound								
T	1881	4837	1.48	0.39	247.6	F	219.3	F
R	1077	1615	0.35	0.67	7.4	A		
Southbound								
L	701	3505	0.74	0.20	40.9	D		
T	3171	4837	0.78	0.66	13.0	B	17.9	B

Intersection Delay = 131.7 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: NB I-57 On/Off Ramp

Inter.: 12
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	2	0	2	2	3	0	0	3	0
LGConfig				L		R	L	T			TR	
Volume				400		500	520	1700			1940	110
Lane Width				12.0		12.0	12.0	12.0			12.0	
RTOR Vol						150						0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left					NB	Left	P			
Thru						Thru	P	P		
Right						Right				
Peds						Peds				
WB Left	P				SB	Left				
Thru						Thru		P		
Right	P					Right		P		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	23.0						9.0	40.0		
Yellow	4.0						4.0	4.0		
All Red	2.0						2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
L	772	3022	0.58	0.26	32.3	C		
							33.2	C
R	630	2464	0.62	0.26	34.1	C		
Northbound								
L	351	3505	1.65	0.10	344.0	F		
T	2956	4837	0.64	0.61	12.2	B	90.0	F
Southbound								
TR	2140	4815	1.06	0.44	64.3	E	64.3	E

Intersection Delay = 71.0 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: NB I-57 On/Off Ramp

Inter.: 12
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: IL 50

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	0	0	2	0	2	2	3	0	0	3	0
LGConfig				L		R	L	T			TR	
Volume				470		490	530	2170			2240	150
Lane Width				12.0		12.0	12.0	12.0			12.0	
RTOR Vol						97						0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left					NB	Left	P			
Thru						Thru	P	P		
Right						Right				
Peds						Peds				
WB Left		P			SB	Left				
Thru						Thru		P		
Right		P				Right		P		
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green		17.0					15.0	40.0		
Yellow		4.0					4.0	4.0		
All Red		2.0					2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
Westbound								
L	571	3022	0.91	0.19	57.3	E	60.9	E
R	465	2464	0.94	0.19	65.1	E		
Northbound								
L	584	3505	1.01	0.17	76.9	E		
T	3278	4837	0.74	0.68	10.8	B	23.8	C
Southbound								
TR	2138	4811	1.24	0.44	138.2	F	138.2	F

Intersection Delay = 75.1 (sec/veh) Intersection LOS = E

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: SB I-57 On/Off Ramp

Inter.: 13
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: 9000N Rd

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	2	1	2	2	0	0	0	0	2	0	1
LGConfig		T	R	L	T					L		R
Volume		1140	300	410	1190					240		250
Lane Width		12.0	12.0	12.0	12.0					12.0		12.0
RTOR Vol			90									75

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left					NB	Left				
Thru		A				Thru				
Right		A				Right				
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A	A				Thru				
Right						Right	A			
Peds						Peds				
NB Right					EB	Right	A			
SB Right					WB	Right				
Green	18.0	36.0					18.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
T	1248	3119	1.02	0.40	56.3	E	48.5	D
R	928	1392	0.25	0.67	6.1	A		
Westbound								
L	604	3022	0.75	0.20	39.3	D		
T	2079	3119	0.64	0.67	9.3	A	17.0	B
Northbound								
Southbound								
L	604	3022	0.44	0.20	32.1	C		
							35.8	D
R	278	1392	0.70	0.20	41.0	D		

Intersection Delay = 32.0 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/5/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: SB I-57 On/Off Ramp

Inter.: 13
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: 9000N Rd

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	2	1	2	2	0	0	0	0	2	0	1
LGConfig		T	R	L	T					L		R
Volume		1180	480	240	930					620		730
Lane Width		12.0	12.0	12.0	12.0					12.0		12.0
RTOR Vol			144									219

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left					NB	Left				
Thru		A				Thru				
Right		A				Right				
Peds						Peds				
WB Left	A				SB	Left	A			
Thru	A	A				Thru				
Right						Right	A			
Peds						Peds				
NB Right					EB	Right	A			
SB Right					WB	Right				
Green	30.0	30.0					12.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
T	1040	3119	1.26	0.33	155.1	F	123.8	F
R	742	1392	0.50	0.53	13.9	B		
Westbound								
L	1007	3022	0.27	0.33	22.1	C		
T	2287	3119	0.45	0.73	4.9	A	8.5	A
Northbound								
Southbound								
L	403	3022	1.71	0.13	368.8	F		
							643.8	F
R	186	1392	3.05	0.13	977.4	F		

Intersection Delay = 242.6 (sec/veh) Intersection LOS = F

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/11/05
Period: AM
Project ID: I-57 Interchange Study
E/W St: NB I-57 On/Off Ramp

Inter.: 14
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: 9000N Rd

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	2	0	0	2	1	2	0	1	0	0	0
LGConfig	L	T			T	R	L		R			
Volume	800	570			1190	830	410		240			
Lane Width	12.0	12.0			12.0	12.0	12.0		12.0			
RTOR Vol						249			72			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A				NB	Left	A			
Thru	A	A				Thru				
Right						Right	A			
Peds						Peds				
WB Left					SB	Left				
Thru		A				Thru				
Right		A				Right				
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right	A			
Green	22.0	35.0					15.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	857	3505	1.04	0.24	74.8	E		
T	2183	3119	0.29	0.70	5.2	A	45.8	D
Westbound								
T	1213	3119	1.09	0.39	81.4	F	58.7	E
R	1005	1615	0.64	0.62	12.1	B		
Northbound								
L	584	3505	0.78	0.17	42.7	D		
							42.8	D
R	269	1615	0.70	0.17	42.9	D		
Southbound								

Intersection Delay = 51.5 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/11/05
Period: PM
Project ID: I-57 Interchange Study
E/W St: NB I-57 On/Off Ramp

Inter.: 14
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: 9000N Rd

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	2	0	0	2	1	2	0	1	0	0	0
LGConfig	L	T			T	R	L		R			
Volume	320	1470			960	360	210		290			
Lane Width	12.0	12.0			12.0	12.0	12.0		12.0			
RTOR Vol						108			87			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4			5	6	7	8
EB	Left	A				NB	Left	A			
	Thru	A	A				Thru				
	Right						Right	A			
	Peds						Peds				
WB	Left					SB	Left				
	Thru		A				Thru				
	Right		A				Right				
	Peds						Peds				
NB	Right					EB	Right				
SB	Right					WB	Right	A			
Green		19.0	34.0					19.0			
Yellow		4.0	4.0					4.0			
All Red		2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	740	3505	0.48	0.21	31.7	C		
T	2045	3119	0.80	0.66	13.5	B	16.8	B
Westbound								
T	1178	3119	0.91	0.38	36.6	D	30.4	C
R	1059	1615	0.26	0.66	6.6	A		
Northbound								
L	740	3505	0.31	0.21	30.2	C		
							33.7	C
R	341	1615	0.66	0.21	37.3	D		
Southbound								

Intersection Delay = 23.7 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: AM Peak
Project ID: I-57 Interchange Study
E/W St: 6000N Rd

Inter.: 15
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: I-57 SB On/Off Ramps

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	2	1	2	2	0	0	0	0	2	0	2
LGConfig		T	R	L	T					L		R
Volume		1260	330	440	1210					260		270
Lane Width		12.0	12.0	12.0	12.0					12.0		12.0
RTOR Vol			99									81

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left					NB	Left				
Thru		A				Thru				
Right		A				Right				
Peds						Peds				
WB Left	A	A			SB	Left	A			
Thru	A	A				Thru				
Right						Right	A			
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	15.0	41.0					16.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
T	1397	3066	1.00	0.46	49.1	D	44.1	D
R	624	1369	0.41	0.46	16.9	B		
Westbound								
L	1116	2971	0.44	0.69	12.7	B		
T	2112	3066	0.64	0.69	8.4	A	9.5	A
Northbound								
Southbound								
L	528	2971	0.55	0.18	34.9	C		
							34.6	C
R	431	2423	0.49	0.18	34.2	C		

Intersection Delay = 27.0 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: PM Peak
Project ID: I-57 Interchange Study
E/W St: 6000N Rd

Inter.: 15
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: I-57 SB On/Off Ramps

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	2	1	2	2	0	0	0	0	2	0	2
LGConfig		T	R	L	T					L		R
Volume		740	760	380	780					520		620
Lane Width		12.0	12.0	12.0	12.0					12.0		12.0
RTOR Vol			228									234

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4		5	6	7	8
EB Left					NB Left				
Thru		A			Thru				
Right		A			Right				
Peds					Peds				
WB Left	A	A			SB Left	A			
Thru	A	A			Thru				
Right					Right	A			
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	9.0	42.0				21.0			
Yellow	4.0	4.0				4.0			
All Red	2.0	2.0				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
T	1431	3066	0.57	0.47	18.1	B	28.1	C
R	639	1369	0.92	0.47	42.0	D		
Westbound								
L	651	2971	0.65	0.63	11.6	B		
T	1942	3066	0.45	0.63	8.6	A	9.6	A
Northbound								
Southbound								
L	693	2971	0.83	0.23	41.5	D		
							40.1	D
R	565	2423	0.76	0.23	38.1	D		

Intersection Delay = 24.9 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: AM Peak
Project ID: I-57 Interchange Study
E/W St: 6000N Rd

Inter.: 16
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: I-57 NB On/Off Ramps

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	2	0	0	2	1	2	0	2	0	0	0
LGConfig	L	T			T	R	L		R			
Volume	440	1080			950	450	710		420			
Lane Width	12.0	12.0			12.0	12.0	12.0		12.0			
RTOR Vol						135			126			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A	A			NB	Left	A			
Thru	A	A				Thru				
Right						Right	A			
Peds						Peds				
WB Left					SB	Left				
Thru		A				Thru				
Right		A				Right				
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	10.0	37.0					25.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	783	2971	0.62	0.59	14.7	B		
T	1806	3066	0.66	0.59	13.4	B	13.8	B
Westbound								
T	1260	3066	0.84	0.41	29.0	C	27.5	C
R	563	1369	0.62	0.41	23.1	C		
Northbound								
L	825	2971	0.96	0.28	53.3	D		
							45.8	D
R	673	2423	0.49	0.28	27.7	C		
Southbound								

Intersection Delay = 26.9 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1e

Analyst: JM
Agency: Michael Baker Jr.
Date: 5/13/05
Period: PM Peak
Project ID: I-57 Interchange Study
E/W St: 6000N Rd

Inter.: 16
Area Type: All other areas
Jurisd:
Year : 2030 Build

N/S St: I-57 NB On/Off Ramps

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	2	2	0	0	2	1	2	0	2	0	0	0
LGConfig	L	T			T	R	L		R			
Volume	230	1030			960	260	210		280			
Lane Width	12.0	12.0			12.0	12.0	12.0		12.0			
RTOR Vol						78			84			

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4			5	6	7	8
EB Left	A	A			NB	Left	A			
Thru	A	A				Thru				
Right						Right	A			
Peds						Peds				
WB Left					SB	Left				
Thru		A				Thru				
Right		A				Right				
Peds						Peds				
NB Right					EB	Right				
SB Right					WB	Right				
Green	12.0	40.0					20.0			
Yellow	4.0	4.0					4.0			
All Red	2.0	2.0					2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
L	839	2971	0.31	0.64	9.8	A		
T	1976	3066	0.58	0.64	9.5	A	9.6	A
Westbound								
T	1363	3066	0.78	0.44	24.4	C	23.1	C
R	608	1369	0.33	0.44	16.6	B		
Northbound								
L	660	2971	0.35	0.22	29.9	C		
							30.1	C
R	538	2423	0.41	0.22	30.4	C		
Southbound								

Intersection Delay = 18.0 (sec/veh) Intersection LOS = B

2030 Build – 6000 N. Road Ramps – LOS C

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-57 NB
Junction:	6000 N Road to I-57 NB
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2100	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	890	vph
Length of first accel/decel lane	745	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1130	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2100	890	1130	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	583	247	314	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2520	1023	1356	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 2520$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3543	4800	No
v_{R12}	3543	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 28.0-$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	$M_S = 0.381$	
Space mean speed in ramp influence area,	$S_R = 59.3$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 59.3$	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-57 NB
Junction:	6000 N Road to I-57 NB
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2730	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	490	vph
Length of first accel/decel lane	1145	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	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2730	490	490	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	758	136	136	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3276	563	588	pcph

Estimation of V12 Merge Areas

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

P_{FM}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3276 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3839	4800	No
v_{R12}	3839	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 28.0- pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.388	
Space mean speed in ramp influence area,	S_R = 59.1	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 59.1	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB to 6000 N Road
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3230	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	1130	vph
Length of first accel/decel lane	1070	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	890	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3230		1130		890		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	897		314		247		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	3876		1356		1023		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3876 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3876	4800	No
v_{12}	3876	4400	No
$v_{FO} = v_F - v_R$	2520	4800	No
v_R	1356	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 28.0- pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.355	
Space mean speed in ramp influence area,	S_R = 60.1	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 60.1	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-57 NB
Junction:	I-57 NB to 6000 N Road
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3220	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	490	vph
Length of first accel/decel lane	1055	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	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3220		490		490		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	894		136		136		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	3864		588		563		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3864 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3864	4800	No
v_{12}	3864	4400	No
$v_{FO} = v_F - v_R$	3276	4800	No
v_R	588	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 28.0- pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.286	
Space mean speed in ramp influence area,	S_R = 62.0	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 62.0	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-57 SB
Junction:	6000 N Road to I-57 SB
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2620	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	770	vph
Length of first accel/decel lane	1355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	530	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2620	770	530	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	728	214	147	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3144	885	636	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3144 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4029	4800	No
v_{R12}	4029	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 28.0- pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.405	
Space mean speed in ramp influence area,	S_R = 58.7	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 58.7	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-57 SB
Junction:	6000 N Road to I-57 SB
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2350	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	1140	vph
Length of first accel/decel lane	1455	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1140	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2350	1140	1140	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	653	317	317	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2820	1311	1368	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2820 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4131	4800	No
v_{R12}	4131	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 28.0- pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.418	
Space mean speed in ramp influence area,	S_R = 58.3	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 58.3	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB to 6000 N Road
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3140	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	530	vph
Length of first accel/decel lane	965	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	770	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3140		530		770		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	872		147		214		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	3768		636		885		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3768 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3768	4800	No
v_{12}	3768	4400	No
$v_{FO} = v_F - v_R$	3132	4800	No
v_R	636	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 28.0- pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.290

Space mean speed in ramp influence area, S_R = 61.9 mph

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

Space mean speed for all vehicles, S = 61.9 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 SB to 6000 N Road
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3480	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	1140	vph
Length of first accel/decel lane	1355	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1140	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3480		1140		1140		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	967		317		317		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	4176		1368		1311		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4176 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4176	4800	No
v_{12}	4176	4400	No
$v_{FO} = v_F - v_R$	2808	4800	No
v_R	1368	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 28.0- pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.356	
Space mean speed in ramp influence area,	S_R = 60.0	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 60.0	mph

2030 Build – Maintaining Existing LOS At Existing Ramps

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-57 SB
Junction:	9000 N. Road to I-57 SB
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2860	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	720	vph
Length of first accel/decel lane	1255	ft
Length of second accel/decel lane	2055	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1350	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2860	720	1350	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	794	200	375	v
Trucks and buses	16	16	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	2.5	
Recreational vehicle PCE, ER	1.2	1.2	2.0	
Heavy vehicle adjustment, fHV	0.926	0.926	0.806	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3432	864	1860	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3432 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4296	4800	No
v_{R12}	4296	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 10.0- pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.288	
Space mean speed in ramp influence area,	S_R = 61.9	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 61.9	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-57 NB
Junction:	IL 50 to I-57 NB
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2600	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	630	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	900	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2600	630	900	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	722	175	250	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3120	724	1080	pcph

Estimation of V12 Merge Areas

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

$P_{EQ} = 1.000$ Using Equation 0

$v_{12} = v_F (P_{FM}) = 3120$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3844	4800	No
v_{R12}	3844	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 28.0-$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	$M_S = 0.389$	
Space mean speed in ramp influence area,	$S_R = 59.1$	mph
Space mean speed in outer lanes,	$S_O =$ N/A	mph
Space mean speed for all vehicles,	$S = 59.1$	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-57 NB
Junction:	IL 50 to I-57 NB
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build

Description: I-57 Interchange Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2540	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	680	vph
Length of first accel/decel lane	1115	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	960	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2540	680	960	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	706	189	267	v
Trucks and buses	16	7	16	%
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	0.926	0.966	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3048	782	1152	pcph

Estimation of V12 Merge Areas

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

P_{EQ} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3048 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3830	4800	No
v_{R12}	3830	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 28.0- pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.389	
Space mean speed in ramp influence area,	S_R = 59.1	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 59.1	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 Sb to IL-50
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3390	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	570	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		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	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3390		570		680		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	942		158		189		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	4068		684		782		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

P_{FD}^{EQ} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4068 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4068	4800	No
v_{12}	4068	4400	No
$v_{FO} = v_F - v_R$	3384	4800	No
v_R	684	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 35.0- pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.295

Space mean speed in ramp influence area, S_R = 61.8 mph

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

Space mean speed for all vehicles, S = 61.8 mph

Phone:
E-mail:
Fax:

Diverge Analysis

Analyst:	Nick VanderZwan
Agency/Co.:	Baker Engineering
Date performed:	11/7/2005
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-57 SB
Junction:	I-57 Sb to IL-50
Jurisdiction:	IDOT District 3
Analysis Year:	2030 Build
Description:	I-57 Interchange Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3490	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	50.0	mph
Volume on ramp	940	vph
Length of first accel/decel lane	590	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	950	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3490		940		950		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	969		261		264		v
Trucks and buses	16		16		7		%
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	0.926		0.926		0.966		
Driver population factor, fP	1.00		1.00		1.00		
Flow rate, vp	4188		1128		1092		pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)

$P_{FD}^{EQ} = 1.000$ Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD} = 4188$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4188	4800	No
v_{12}	4188	4400	No
$v_{FO} = v_F - v_R$	3060	4800	No
v_R	1128	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 35.0-$ pc/mi/ln

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

Speed Estimation

Intermediate speed variable, $D_S = 0.335$

Space mean speed in ramp influence area, $S_R = 60.6$ mph

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

Space mean speed for all vehicles, $S = 60.6$ mph