

Contract C-393A, Capital Project No. CP0301A, Account No. 7161-06-012 I-95/Scudder Falls Bridge Improvement Project

I-95 Mainline Analysis 2003 Existing AM Peak



HCS2000: Basic Freeway Segments Release 4.1d

Fax: Phone: E-mail: Operational Analysis_____ Analyst:
Agency or Company:
Date Performed:

Analysis miss 2/25/2004 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Northbound
From/To: btw exits 46 & 49
Jurisdiction: Bucks County
Analysis Year: 2003 Existing Description: Scudder Falls ____Flow Inputs and Adjustments_____ veh/h 2834 Volume, V 0.92 Peak-hour factor, PHF v 770 Peak 15-min volume, v15 6 0 Trucks and buses Recreational vehicles Grade Terrain type: 0.05 o,o Grade 0,33 mi Segment length 1.5 Trucks and buses PCE, ET Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 1.00 Driver population factor, fp pc/h/ln 1586 Flow rate, vp Speed Inputs and Adjustments_____ 12.0 ft 6.0 ft 0.50 interchange/mi Lane width Right-shoulder lateral clearance Interchange density 2 Number of lanes, N Measured Free-flow speed: mi/h 65.0 FFS or BFFS 0.0 mi/h Lane width adjustment, fLW mi/h Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID mi/h 0.0 4.5 mi/h Number of lanes adjustment, fN 4.5 mi/n 65.0 mi/h Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ pc/h/ln 1586 Flow rate, vp Free-flow speed, FFS 65.0 mi/h mi/h 64.9 Average passenger-car speed, S 2 Number of lanes, N 24.4 pc/mi/ln Density, D

Phone:

Fax:

E-mail: ____Operational Analysis______ Analyst: Jason Wiggins
Agency or Company: DMJM+HARRIS
Date Performed: 2/25/2004 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Northbound
From/To: btw exits 49 & 51
Jurisdiction: Bucks County
Analysis Year: 2003 Existing Description: Scudder Falls _Flow Inputs and Adjustments_____ 3191 veh/h Volume, V Peak-hour factor, PHF 0.92 867 Peak 15-min volume, v15 v 6 0 Trucks and buses Recreational vehicles Grade Terrain type: -3.00 Grade Segment length 0.47 mí Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 1786 pc/h/ln Flow rate, vp _____Speed Inputs and Adjustments_____ 12.0 6.0 ft Lane width Right-shoulder lateral clearance 0.50 interchange/mi Interchange density Number of lanes, N Free-flow speed: Measured 65.0 FFS or BFFS mi/h mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h 65.0 mi/h Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ 1786 pc/h/ln Flow rate, vp Free-flow speed, FFS 65.0 mi/h Average passenger-car speed, S 64.0 mi/h Number of lanes, N 27.9 Density, D pc/mi/ln

Phone:

Fax:

E-mail: Operational Analysis_____ Analyst: Jason Wiggins
Agency or Company: DMJM+HARRIS
Date Performed: 2/25/2004 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Northbound
From/To: btw exits 51 & 1
Jurisdiction: Bucks County
Analysis Year: 2003 Existing Description: Scudder Falls Flow Inputs and Adjustments_____ veh/h Volume, V 5111 0.92 Peak-hour factor, PHF 1389 Peak 15-min volume, v15 v 6 0 Trucks and buses Recreational vehicles Grade Terrain type: 0.73 Grade 0.49 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 pc/h/ln 2861 Flow rate, vp Speed Inputs and Adjustments 12.0 £t Lane width Right-shoulder lateral clearance 6.0 0.50 interchange/mi Interchange density Number of lanes, N 2 Measured Free-flow speed: 65.0 mi/h FFS or BFFS 0.0 mi/h Lane width adjustment, fLW mi/h Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID mi/h 0.0 Number of lanes adjustment, fN 4.5 mi/h 65.0 mi/h Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ 2861 pc/h/ln Flow rate, vp 65.0 mi/h Free-flow speed, FFS mi/h Average passenger-car speed, S Number of lanes, N pc/mi/ln Density, D

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Phone:

Fax:

E-mail: _____Operational Analysis_____ Analyst:
Agency or Company:
Date Performed:
Analysis Time Period:
Freeway/Direction:
From/To:
Jurisdiction:
Analysis Year:
Analysis Year: Description: Scudder Falls Flow Inputs and Adjustments_____ 4744 veh/h Volume, V Peak-hour factor, PHF 0.92 1289 Peak 15-min volume, v15 6 0 Trucks and buses Recreational vehicles Grade Terrain type: Grade 3.10 Segment length 0.75 тi Trucks and buses PCE, ET 2.0 Recreational vehicle PCE, ER
Heavy vehicle adjustment, fHV
Driver population factor, fp 3.0 0.943 1.00 pc/h/ln 1822 Flow rate, vp Speed Inputs and Adjustments_____ ft 12.0 ft 6.0 ft 0.50 interchange/mi Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: Measured mi/h 70.0 FFS or BFFS Lane width adjustment, fLW mi/h 0.0 mi/h mi/h mi/h Lateral clearance adjustment, fLC
Interchange density adjustment, fID 0.0 0.0 Number of lanes adjustment, fN 3.0 mi/h 70.0 mi/h Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ pc/h/ln Flow rate, vp 1822 Free-flow speed, FFS 70.0 mi/h mi/h Average passenger-car speed, S 67.6 Number of lanes, N 3 27.0 pc/mi/ln Density, D

Phone:

Fax:

E-mail: _____Operational Analysis_____ Analyst: Jason Wiggins
Agency or Company: DMJM+HARRIS
Date Performed: 2/25/2004 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Northbound
From/To: btw exits 2 & 3
Jurisdiction: Mercer County
Analysis Year: 2003 Existing Description: Scudder Falls _____Flow Inputs and Adjustments_____ veh/h Volume, V 4500 0.92 Peak-hour factor, PHF Peak 15-min volume, v15 1223 v Trucks and buses 6 Recreational vehicles 0 Level Terrain type: 0.00 Grade 0.00 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 pc/h/ln Flow rate, vp 1679 _____Speed Inputs and Adjustments____ 12.0 ft Lane width Right-shoulder lateral clearance 6.0 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured 70.0 mi/h FFS or BFFS mi/h 0.0 Lane width adjustment, fLW Lateral clearance adjustment, fLC mi/h 0.0 Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 3.0 mi/h 70.0 mi/h Free-flow speed, FFS Urban Freeway LOS and Performance Measures____ 1679 pc/h/ln Flow rate, vp 70.0 Free-flow speed, FFS mi/h 69.0 mi/h Average passenger-car speed, S Number of lanes, N 24.3 pc/mi/ln Density, D

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: Jason Wiggins
Agency or Company: DMJM+HARRIS
Date Performed: 2/25/2004 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Southbound
From/To: btw exits 3 & 2
Jurisdiction: Mercer County
Analysis Year: 2003 Existing Description: Scudder Falls Flow Inputs and Adjustments_____ Volume, V 1578 veh/h 0.92 Peak-hour factor, PHF Peak 15-min volume, v15 429 6 0 Trucks and buses Recreational vehicles Level Terrain type: 0.00 Grade Segment length 0.00 mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 589 pc/h/ln Flow rate, vp Speed Inputs and Adjustments_____ 12.0 Lane width ft Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N 3 Free-flow speed: Measured 70.0 FFS or BFFS mi/h mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 3.0 mi/h 70.0 mi/h Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ pc/h/ln Flow rate, vp 589 Free-flow speed, FFS 70.0 mi/h Average passenger-car speed, S 70.0 mi/h Number of lanes, N 3 8.4 Density, D pc/mi/ln

Phone:

Fax:

E-mail: Operational Analysis_____ Analyst: Jason Wiggins
Agency or Company: DMJM+HARRIS
Date Performed: 2/25/2004 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Southbound
From/To: btw exits 2 & 1
Jurisdiction: Mercer County
Analysis Year: 2003 Existing Description: Scudder Falls Flow Inputs and Adjustments_____ 1405 veh/h Volume, V 0.92 Peak-hour factor, PHF 382 Peak 15-min volume, v15 6 0 Trucks and buses S_G Recreational vehicles Grade Terrain type: -3.10 8 Grade 0.75 тi Segment length Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 1,00 Driver population factor, fp 524 pc/h/ln Flow rate, vp _____Speed Inputs and Adjustments_____ 12.0 6.0 ft Lane width ft Right-shoulder lateral clearance 0.50 interchange/mi Interchange density Number of lanes, N 3 Free-flow speed: Measured 70.0 FFS or BFFS mi/h 0.0 mi/h Lane width adjustment, fLW Lateral clearance adjustment, fLC 0.0 mi/h Interchange density adjustment, fID mi/h 0.0 Number of lanes adjustment, fN 3.0 mi/h 70.0 mi/h Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ pc/h/ln 524 Flow rate, vp 70.0 mi/h Free-flow speed, FFS Average passenger-car speed, S 70.0 mi/h Number of lanes, N 7.5 pc/mi/ln Density, D

Phone: Fax: E-mail: Operational Analysis_____ Analyst: Jason Wiggins
Agency or Company: DMJM+HARRIS
Date Performed: 2/25/2004 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Southbound
From/To: btw exits 1 & 51
Jurisdiction: Mercer County
Analysis Year: 2003 Existing Description: Scudder Falls Flow Inputs and Adjustments_____ Volume, V 1394 veh/h Peak-hour factor, PHF 0.92 Peak 15-min volume, v15 379 Trucks and buses 6 0 Recreational vehicles Terrain type: Grade Grade -0.73 90 Segment length 0.49 mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 780 pc/h/ln Speed Inputs and Adjustments 12.0 6.0 Lane width £t Right-shoulder lateral clearance 6.0 ft 0.50 interchange/mi Interchange density Number of lanes, N 2 Free-flow speed: Measured FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h mi/h Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h 65.0 mi/h Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ pc/h/ln Flow rate, vp 780 Free-flow speed, FFS 65.0 mi/h Average passenger-car speed, S mi/h 65.0 Number of lanes, N 2 12.0 Density, D pc/mi/ln

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E-mail: Operational Analysis_____ Analyst: Jason Wiggins
Agency or Company: DMJM+HARRIS
Date Performed: 2/25/2004 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Southbound
From/To: btw exits 51 & 49
Jurisdiction: Bucks County
Analysis Year: 2003 Existing Description: Scudder Falls Flow Inputs and Adjustments_____ Volume, V 1540 veh/h 0.92 Peak-hour factor, PHF Peak 15-min volume, v15 418 v Trucks and buses 6 0 Recreational vehicles Terrain type: Grade 3.00 Grade Segment length 0.47 Мi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 862 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ 12.0 ft. Lane width Right-shoulder lateral clearance 6.0 ft 0.50 interchange/mi Interchange density Number of lanes, N Free-flow speed: Measured FFS or BFFS 65.0 mi/h mi/h mi/h Lane width adjustment, fLW 0.0 Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h 65.0 mi/h Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ Flow rate, vp 862 pc/h/ln Free-flow speed, FFS 65.0 mi/h Average passenger-car speed, S 65.0 mi/h Number of lanes, N 2 Density, D 13.3 pc/mi/ln

Phone:

Fax:

E-mail: Operational Analysis_____ Analyst: Jason Wiggins
Agency or Company: DMJM+HARRIS
Date Performed: 2/25/2004 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Southbound
From/To: btw exits 49 & 46
Jurisdiction: Bucks County
Analysis Year: 2003 Existing Description: Scudder Falls _____Flow Inputs and Adjustments_____ Volume, V 2440 veh/h 0.92 Peak-hour factor, PHF Peak 15-min volume, v15 663 v Trucks and buses 6 0 o_f Recreational vehicles Terrain type: Grade -0.05 Grade 0.33 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1,00 pc/h/ln 1366 Flow rate, vp _____Speed Inputs and Adjustments____ 12.0 ft Lane width Right-shoulder lateral clearance 6.0 ft 0.50 interchange/mi Interchange density Number of lanes, N 2 Free-flow speed: Measured 65.0 mi/h FFS or BFFS mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 0.0 Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h 65.0 mi/h Free-flow speed, FFS Urban Freeway LOS and Performance Measures_____ 1366 pc/h/ln Flow rate, vp 65.0 Free-flow speed, FFS mi/h 65.0 mi/h Average passenger-car speed, S Number of lanes, N 21.0 pc/mi/ln Density, D

Phone: Fax: E-mail: _____Diverge Analysis_____ Analyst: Jason Wiggins
Agency/Co.: DMJM+HARRIS
Date performed: 2/15/2004
Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Northbound
Junction: NB off ramp to PA 332
Jurisdiction: Bucks County
Analysis Year: 2003 Existing Description: Scudder Falls Freeway Data_____ Type of analysis Diverge 2 65.0 mph 2834 vph Number of lanes in freeway Free-flow speed on freeway Volume on freeway Off Ramp Data Side of freeway Right Number of lanes in ramp 35.0 mph vph Free-Flow speed on ramp Volume on ramp 915 Length of first accel/decel lane 850
Length of second accel/decel lane ft ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1272 Volume on adjacent ramp vph Position of adjacent ramp Downstream Type of adjacent ramp On 2530 ft Distance to adjacent ramp Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Junction Components Ramp Ramp
2834 915 1272 vph
0.92 0.92 0.92
770 249 346 v
6 7 4 %
0 0 0 0 %
Level Level Level
0.00 % 0.00 % 0.00 %
0.00 mi 0.00 mi 0.00 mi
1.5 1.5 1.5 Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Length Trucks and buses PCE, ET 1.5 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2

```
Heavy vehicle adjustment, fHV
                               0.971
                                         0.966
                                                  0.980
Driver population factor, fP
                               1.00
                                         1.00
                                                  1.00
Flow rate, vp
                               3173
                                         1029
                                                  1410
                                                          pcph
              _Estimation of V12 Diverge Areas_____
                          (Equation 25-8 or 25-9)
               ΕQ
              P = 1.000 Using Equation 0
               FD
              v = v + (v - v) P = 3173 pc/h
               12 R F R FD
                   Capacity Checks____
                                             LOS F?
                     Actual
                                 Maximum
    v = v
                     3173
                                 4700
                                              Νo
    Fi F
                     3173
                                4400
                                              No
    12
                     2144
                                4700
    v = v - v
                                              No
    FO F R
                     1029 2000
    v
                                              No
    R
        Level of Service Determination (if not F)
                  D = 4.252 + 0.0086 v - 0.009 L = 23.9 pc/mi/ln
Density,
                                 12 D
Level of service for ramp-freeway junction areas of influence C
     Speed Estimation
Intermediate speed variable,
                                    D = 0.521
                                    S
Space mean speed in ramp influence area,
                                   S = 53.0  mph
                                    R
Space mean speed in outer lanes,
                                    S = N/A
                                               mph
Space mean speed for all vehicles,
                                   S = 53.0
                                              mph
```

Fax: Phone: E-mail: _____Merge Analysis_____ Analyst:
Agency/Co.:
Date performed:
Analysis time period:
Freeway/Dir of Travel:
Dason Wiggins
DMJM+HARRIS
2/15/2004
AM Peak
Freeway/Dir of Travel:
I-95 Northbound Junction: NB On ramp from PA332
Jurisdiction: Bucks County
Analysis Year: 2003 Existing Description: Scudder Falls _____Freeway Data_____ Merge Type of analysis Number of lanes in freeway 65.0 mph 1919 vph Free-flow speed on freeway Volume on freeway On Ramp Data_____ Right Side of freeway 1 Number of lanes in ramp mph vph ft Free-flow speed on ramp 35.0 Volume on ramp 1272 Length of first accel/decel lane 1375
Length of second accel/decel lane f.t. Adjacent Ramp Data (if one exists) Yes 915 Upstream Does adjacent ramp exist? Volume on adjacent Ramp vph Position of adjacent Ramp Type of adjacent Ramp Off 2530 ft Distance to adjacent Ramp Conversion to pc/h Under Base Conditions_____ Freeway Ramp Junction Components Adjacent

 Volume, V (vph)
 1919
 1272
 915
 vph

 Peak-hour factor, PHF
 0.92
 0.92
 0.92
 0.92

 Peak 15-min volume, v15
 521
 346
 249
 v

 Trucks and buses
 6
 4
 7
 %

 Recreational vehicles
 0
 0
 0
 %

 Terrain type:
 Level
 Level
 Level
 Level

 Grade
 %
 %
 %
 %

 Length
 mi
 mi
 mi
 mi

 Trucks and buses PCE, ET
 1.5
 1.5
 1.5

 Recreational vehicle PCE, ER
 1.2
 1.2
 1.2

 Ramp

Heavy vehicle adjustment Driver population factor Flow rate, vp		0.971 1.00 2148	0.980 1.00 1410	1.00	pcph	
	_Estimation of	f V12 Merge	Areas		***************************************	
V = V	(Equ 1.000 Usin (P) = 214 F FM	-				
	Capaci	ty Checks				
v FO V R12	Actual 3558 3558			LOS F? No		
	f Service Det	ermination (if not I	·)		
Density, D = $5.475 + 0.00734 \text{ v} + 0.0078 \text{ v} - 0.00627 \text{ L} = 24.0 \text{ pc/mi/ln}}{R}$ R 12 A Level of service for ramp-freeway junction areas of influence C Speed Estimation						
Intermediate speed varia	_	management of the state of the	0.362			
Space mean speed in ramp influence area, $S = 56.7$ mph						
Space mean speed in outer lanes, $S = N/A$ mph 0 Space mean speed for all vehicles, $S = 56.7$ mph						

Fax: Phone: E-mail:_____Diverge Analysis_____ Analyst:
Agency/Co.:
Date performed:
Analysis time period:
Freeway/Dir of Travel:

Jason Wiggins
DMJM+HARRIS
2/15/2004
AM Peak
Freeway/Dir of Travel:
I-95 Northbound Junction: NB off ramp to Taylorsville
Jurisdiction: Bucks County
Analysis Year: 2003 Existing Description: Scudder Falls Freeway Data_____ Diverge Type of analysis 2 65.0 mph 3191 vph Number of lanes in freeway Free-flow speed on freeway Volume on freeway Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 35.0 mph vph Free-Flow speed on ramp Length of first accel/decel lane 850
Length of second accel/decel lane ft £t. Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1096 Volume on adjacent ramp vph Downstream Position of adjacent ramp Type of adjacent ramp On 1250 ft Distance to adjacent ramp _____Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Ramp Junction Components Ramp
3191 144 1096 vph
0.92 0.92 0.92
867 39 298 v
6 5 6 %
0 0 0 0 %
Level Level Level
0.00 % 0.00 % 0.00 %
0.00 mi 0.00 mi 0.00 mi Volume, V (vph) Peak-hour factor, PHF
Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Length

Trucks and buses PCE, ET 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2

Heavy vehicle adjus Driver population f Flow rate, vp		0.971 1.00 3573	0.976 1.00 160	0.971 1.00 1227	pcph	
<u> </u>	Estimation or	f V12 Diverge	Areas_			
_	L = (Equation 25-8 or 25-9) EQ					
	P = 1.000 Using Equation 0 FD					
v	= v + (v - v) 12 R F R		pc/h			
	Capaci	ty Checks	·			
v = v Fi F	Actual 3573	Maximum 4700		LOS F? No		
v	3573	4400		No		
12 v = v - v FO F R	3413	4700		No		
V R	160	2000		No		
Le	vel of Service Det	ermination (i	f not F)		
Density, $D = 4.252 + 0.0086 \text{ v} - 0.009 \text{ L} = 27.3 \text{ pc/mi/ln}$						
R 12 D Level of service for ramp-freeway junction areas of influence C						
Speed Estimation						
Intermediate speed	variable,	D = S	0.442			
Space mean speed in	ramp influence ar	ea, S =	54.8	mph		
Space mean speed in	outer lanes,	R S = 0	N/A	mph		
Space mean speed fo	or all vehicles,	S =	54.8	mph		

Fax:

Phone: E-mail: Merge Analysis_____ Analyst:
Agency/Co.:
Date performed:
Analysis time period:
Freeway/Dir of Travel:

Jason Wiggins
DMJM+HARRIS
2/15/2004
AM Peak
Freeway/Dir of Travel:
I-95 Northbound Junction:

NB On ramp from Taylorsville E

Jurisdiction:

Bucks County

Analysis Year:

2003 Existing Description: Scudder Falls _____Freeway Data_____ Merqe Type of analysis Number of lanes in freeway mph vph 65.0 Free-flow speed on freeway 3047 Volume on freeway On Ramp Data_____ Right Side of freeway Number of lanes in ramp 1 35.0 mph vph Free-flow speed on ramp 1096 Volume on ramp Length of first accel/decel lane Length of second accel/decel lane ft 455 ft Adjacent Ramp Data (if one exists)_____ Yes 144 Does adjacent ramp exist? vph Volume on adjacent Ramp Upstream Position of adjacent Ramp Type of adjacent Ramp Off 1250 ft Distance to adjacent Ramp Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Ramp Junction Components

 Volume, V (vph)
 3047
 1096
 144
 vph

 Peak-hour factor, PHF
 0.92
 0.92
 0.92
 0.92

 Peak 15-min volume, v15
 828
 298
 39
 v

 Trucks and buses
 6
 6
 5
 %

 Recreational vehicles
 0
 0
 0
 %
 %

 Terrain type:
 Level
 Level
 Level
 Level
 Level
 Level
 Level
 Trucks and buses
 %
 %
 %
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0.971
Heavy vehicle adjustment, fHV Driver population factor, fP
                                0.971
                                                    0.976
                                 1.00
                                           1,00
                                                     1.00
                                 3411
                                           1227
                                                    160
                                                              pcph
Flow rate, vp
                Estimation of V12 Merge Areas_____
                            (Equation 25-2 or 25-3)
               L =
                ΕQ
               P = 1.000 Using Equation 0
               ΕM
               v = v (P) = 3411 pc/h
                12 F FM
                    Capacity Checks____
                                               LOS F?
                       Actual
                                 Maximum
                       4638
                                  4700
                                                No
    v
     FO
                                 4600
                                                Yes
                       4638
     R12
          Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 38.2 pc/mi/ln
                                   12
Level of service for ramp-freeway junction areas of influence F
                 Speed Estimation
                                      M = 0.692
Intermediate speed variable,
                                      S
                                      S = 49.1
Space mean speed in ramp influence area,
                                                mph
                                       R
Space mean speed in outer lanes,
                                      S = N/A
                                                 mph
                                      0
                                     S = 49.1
                                                 mph
Space mean speed for all vehicles,
```

Phone: Fax: E-mail: Merge Analysis_____ Analyst:
Agency/Co.:
DMJM+HARRIS
Date performed:
Analysis time period:
Freeway/Dir of Travel:
Dason Wiggins
DMJM+HARRIS
2/15/2004
AM Peak
Freeway/Dir of Travel:
I-95 Northbound Junction: NB On ramp from Taylorsville W Jurisdiction: Bucks County Analysis Year: 2003 Existing Description: Scudder Falls _____Freeway Data_____ Merge Type of analysis Number of lanes in freeway 2 65.0 mph 4143 vph Free-flow speed on freeway Volume on freeway On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 35.0 mph vph ft Free-flow speed on ramp Length of first accel/decel lane 275
Length of second accel/decel lane £t Adjacent Ramp Data (if one exists)_____ Yes Does adjacent ramp exist? 1096 Upstream vph Volume on adjacent Ramp Position of adjacent Ramp Type of adjacent Ramp On 910 ft Distance to adjacent Ramp _____Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Ramp Junction Components

 Volume, V (vph)
 4143
 968
 1096
 vph

 Peak-hour factor, PHF
 0.92
 0.92
 0.92
 0.92

 Peak 15-min volume, v15
 1126
 263
 298
 v

 Trucks and buses
 6
 4
 6
 %

 Recreational vehicles
 0
 0
 0
 %
 %

 Terrain type:
 Level
 Level
 Level
 Level
 Level
 Level
 Ferrain
 %
 %
 %
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 %
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Heavy vehicle adjustm Driver population fac Flow rate, vp		0.971 1.00 4638	0.980 1.00 1073	0.971 1.00 1227	pcph
	Estimation	of V12 Merge A	areas	·····	
EQ P FM V) = 1.000 U	Equation 25-2 csing Equation 4638 pc/h			
	Capa	city Checks	·············		
v FO v R12	5711	Maximum 4700 4600		3	
	el of Service D	etermination (i	if not F)		
Level of service for	R ramp-freeway j	12	A of influence	ce F	pc/mi/ln
Intermediate speed va	ariable,	M =	1.480		
Space mean speed in ramp influence area, $S = 31.0$ mph					
Space mean speed in outer lanes, $S = N/A$ mph 0 Space mean speed for all vehicles, $S = 31.0$ mph					

Fax: Phone: E-mail: _____Diverge Analysis______ Analyst:
Agency/Co.:
DMJM+HARRIS
Date performed:
Analysis time period:
AM Peak
Freeway/Dir of Travel:

Jason Wiggins
DMJM+HARRIS
2/15/2004
AM Peak
Freeway/Dir of Travel:
I-95 Northbound Junction: NB Off Ramp to NJ29
Jurisdiction: Mercer County
Analysis Year: 2003 Existing Description: Scudder Falls Freeway Data_____ Diverge Type of analysis 2 70.0 mph 5112 vph Number of lanes in freeway Free-flow speed on freeway Volume on freeway Off Ramp Data_____ Right Side of freeway Number of lanes in ramp 1 35.0 mph vph Free-Flow speed on ramp 709 Volume on ramp Length of first accel/decel lane 550 ft ft Length of second accel/decel lane Adjacent Ramp Data (if one exists)_____ Yes 128 Does adjacent ramp exist? vph Volume on adjacent ramp Downstream Position of adjacent ramp Type of adjacent ramp On 545 ft Distance to adjacent ramp ____Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Ramp Junction Components Ramp
5112 709 128 vph
0.92 0.92 0.92
1389 193 35 v
6 5 4 %
0 0 0 %
Level Level Level
0.00 % 0.00 % 0.00 %
0.00 mi 0.00 mi 0.00 mi Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Length Trucks and buses PCE, ET 1.5 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2 1.2 1.5

Heavy vehicle adjustmer Driver population factor Flow rate, vp		0.971 1.00 5723	0.976 1.00 790	1.00	pcph
	Estimation	of V12 Diverge	Areas		
L =	(E	quation 25-8 c	or 25-9)		
~	EQ P = 1.000 Using Equation 0				
	v + (v - v) R F R	P = 5723 FD	pc/h		
	Capac	ity Checks			
V == V		Maximum 4800		OS F? es	
Fi F V	5723	4400	Ye	e s	
12 v = v - v	4933	4800	Y	es	
FO F R V R	790	2000	N	0	
Level	of Service De	etermination (:	if not F)		
Density, Level of service for r	R		D		pc/mi/ln
	Speed E	Estimation			
Intermediate speed var	iable,	D =	0.499		
Space mean speed in ra	mp influence a		56.0	mph	
Space mean speed in ou	ter lanes,		N/A	mph	
Space mean speed for a	ll vehicles,	•	56.0	mph	

Fax: Phone: E-mail: Merge Analysis_____ Analyst:
Agency/Co.:
Date performed:
Analysis time period:
Freeway/Dir of Travel:

Analysis time DMJM+HARRIS
2/15/2004
AM Peak
Freeway/Dir of Travel:

AM Peak
Freeway/Dir of Travel:

AND Common Travel:

AND Common Travel Junction: NB On ramp from NJ 29
Jurisdiction: Mercer County
Analysis Year: 2003 Existing Description: Scudder Falls Freeway Data_____ Merge Type of analysis Number of lanes in freeway 70.0 4402 mph vph Free-flow speed on freeway Volume on freeway On Ramp Data_____ Right Side of freeway 1 Number of lanes in ramp mph vph 35.0 Free-flow speed on ramp Volume on ramp 128 Length of first accel/decel lane 1700 ft ft. Length of second accel/decel lane Adjacent Ramp Data (if one exists)_____ Yes 709 Does adjacent ramp exist? Volume on adjacent Ramp vph Upstream Position of adjacent Ramp Off 545 ft Type of adjacent Ramp Distance to adjacent Ramp Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Junction Components

 Volume, V (vph)
 4402
 128
 709
 vph

 Peak-hour factor, PHF
 0.92
 0.92
 0.92
 0.92

 Peak 15-min volume, v15
 1196
 35
 193
 v

 Trucks and buses
 6
 4
 5
 %

 Recreational vehicles
 0
 0
 0
 %
 %

 Terrain type:
 Level
 Level
 Level
 Level
 Level
 Level
 Level
 Trucks and buses
 PCE, ET
 1.5
 1.5
 1.5
 1.5
 1.5
 1.5
 1.2
 1.2
 1.2
 1.2
 1.2
 1.2
 1.2
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 1.2
 1.2
 1.2
 1.2 Ramp

Heavy vehicle adjustment, fH Driver population factor, fP Flow rate, vp		0.971 1.00 4928	1.00		pcph
Est	imation of	V12 Merge A	reas		
L = EQ	~	tion 25-2 o			
P = 1. FM	000 Using	Equation	0		
) = 4928 FM	pc/h			
	Capacity	Checks			
A	ctual	Maximum	I	LOS F?	
v 5 FO	070	4800)	(es	
	070	4600	3	(es	
Level of Se	rvice Deter	mination (i	f not F)		
Density, D = 5.475 + 0.00734 R Level of service for ramp-fr	R	12	А		pc/mi/ln
	_Speed Esti	mation			
Intermediate speed variable,		M = S	0.823		
Space mean speed in ramp influence area, $S = 47.0$ mph					
Space mean speed in outer la	nes,		N/A	mph	
Space mean speed for all veh	icles,	S ==	47.0	mph	

Fax:

Phone: E-mail: Merge Analysis_____ Analyst:
Agency/Co.:
Date performed:
Analysis time period:
Freeway/Dir of Travel:
Dason Wiggins
DMJM+HARRIS
2/15/2004
AM Peak
Freeway/Dir of Travel:
I-95 Northbound Junction: NB On ramp from Upper River Rd
Jurisdiction: Mercer County
Analysis Year: 2003 Existing Description: Scudder Falls Freeway Data_____ Merge Type of analysis Number of lanes in freeway 3 mph vph 70.0 Free-flow speed on freeway 4530 Volume on freeway On Ramp Data_____ Right Side of freeway Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph vph 214 500 Volume on ramp Length of first accel/decel lane ft Length of second accel/decel lane ft Adjacent Ramp Data (if one exists)_____ Yes 128 Does adjacent ramp exist? vph Volume on adjacent Ramp Upstream Position of adjacent Ramp Type of adjacent Ramp On 1640 ft Distance to adjacent Ramp Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Ramp Junction Components

 Volume, V (vph)
 4530
 214
 128
 vph

 Peak-hour factor, PHF
 0.92
 0.92
 0.92
 0.92

 Peak 15-min volume, v15
 1231
 58
 35
 v

 Trucks and buses
 6
 12
 4
 %

 Recreational vehicles
 0
 0
 0
 %
 %

 Terrain type:
 Level
 Level
 Level
 Level
 Level

 Grade
 %
 %
 %
 %
 %

 Length
 mi
 mi
 mi
 mi
 mi

 Trucks and buses PCE, ET
 1.5
 1.5
 1.5
 1.5

 Recreational vehicle PCE, ER
 1.2
 1.2
 1.2
 1.2
 1.2

Heavy vehicle adjust Driver population fa Flow rate, vp		0.971 1.00 5072	0.943 1.00 247	0.980 1.00 142	pcph
	Estimation	of V12 Merge A	ceas		
E P	Q = 0.591 Us	Equation 25-2 or sing Equation			
	M = v (P) = 1 2 F FM	3000 pc/h			
	Capa	city Checks			
V FO	Actual 5319	Maximum 7200	LOS No	F?	
v R12	3247	4600	No		
Lev	el of Service D	etermination (i	f not F)		
Density, D = 5.475 + R Level of service for	R ramp-freeway j	12 unction areas o	A f influence	e C	pc/mi/ln
	Speed	Estimation			
Intermediate speed v	variable,	M = S	0.386		
Space mean speed in	ramp influence		59.2 mp	h	
Space mean speed in		0	64.3 mp		
Space mean speed for	all vehicles,	S =	61.1 mp	h	

Fax: Phone: E-mail: _____Diverge Analysis_____ Analyst:
Agency/Co.:
Date performed:
Analysis time period:
Freeway/Dir of Travel:
Dason Wiggins
DMJM+HARRIS
2/15/2004
AM Peak
I-95 Northbound Junction: NB Off Ramp to Bear Tavern Rd Jurisdiction: Mercer County Analysis Year: 2003 Existing Description: Scudder Falls Freeway Data_____ Type of analysis Diverge 3 70.0 mph 4744 vph Number of lanes in freeway Free-flow speed on freeway Volume on freeway Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 35.0 mph vph ft Free-Flow speed on ramp 822 Volume on ramp Length of first accel/decel lane 1210 ft. Length of second accel/decel lane Adjacent Ramp Data (if one exists)_____ Yes 578 Downstream Does adjacent ramp exist? Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp On 2545 ft Distance to adjacent ramp ____Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Ramp Junction Components Ramp
4744 822 578 vph
0.92 0.92 0.92
1289 223 157 v
6 3 4 %
0 0 0 0 %
Level Level Level
0.00 % 0.00 % 0.00 %
0.00 mi 0.00 mi 0.00 mi
1.5 1.5 1.5 Volume, V (vph) Peak-hour factor, PHF
Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Length Trucks and buses PCE, ET 1.5 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2

Heavy vehicle adjustme Driver population fact Flow rate, vp		0.971 1.00 5311	0,985 1.00 907	1.00	pcph
	Estimation	of V12 Diverg	e Areas		
L =	(E	Equation 25-8	or 25-9)		
	0.586 Us	sing Equation	5		
FD v = 12	v + (v - v) R F R		pc/h		
	Capac	city Checks			
v = v		Maximum 7200		OS F?	
Fi F V	3486	4400	N	0	
12 v = v - v FO F R	4404	7200	N	10	
v R	907	2000	N	10	
Level	of Service De	etermination ((if not F)		
Density, Level of service for 1	R		D		pc/mi/ln
		Estimation			
Intermediate speed var		D =	= 0.510		
Space mean speed in ra	amp influence	S area, S = R		mph	
Space mean speed in or	iter lanes,		= 73.6	mph	
Space mean speed for a	all vehicles,	~	= 60.8	mph	

Fax: Phone: E-mail: Merge Analysis_____ Analyst:
Agency/Co.:
DMJM+HARRIS
Date performed:
Analysis time period:
Freeway/Dir of Travel:

Analysis time Period:
AM Peak
Freeway/Dir of Travel:

AND On rame from Junction: NB On ramp from Bear Tavern Rd
Jurisdiction: Mercer County
Analysis Year: 2003 Existing Description: Scudder Falls Freeway Data_____ Merge Type of analysis Number of lanes in freeway Free-flow speed on freeway 3 70.0 mph 3922 vph Volume on freeway On Ramp Data_____ Right Side of freeway 1 Number of lanes in ramp 35.0 mph 578 vph 1150 ft Free-flow speed on ramp Volume on ramp Length of first accel/decel lane 1150 ft Length of second accel/decel lane Adjacent Ramp Data (if one exists)_____ Yes 822 Upstream Does adjacent ramp exist? vph Volume on adjacent Ramp Position of adjacent Ramp Off Type of adjacent Ramp 2545 ft Distance to adjacent Ramp Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Junction Components Ramp
3922 578 822 vp
0.92 0.92 0.92
1066 157 223 v
6 4 3 %
0 0 0 0 %
Level Level Level
% % %
mi mi mi mi vph Volume, V (vph) Peak-hour factor, PHF Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Length mi
Trucks and buses PCE, ET 1.5 1.5
Recreational vehicle PCE, ER 1.2 1.2 1.5 1.2

Heavy vehicle adjustment, Driver population factor, Flow rate, vp	fP	0.971 1.00 4391	1.00 641	1.00 907	
	Estimation of	7 V12 Merge	Areas		
EQ P = FM	1015.65 (Equ 0.610 Usin (P) = 267	ng Equation			
	Capacit	ty Checks			
V FO V R12	Actual 5032	Maximum 7200 4600		LOS F? No	
Level of	Service Det	ermination (if not	E)	
Density, D = 5.475 + 0.00 R Level of service for ramp	R -freeway jun	12	of infl	A	pc/mi/ln
Intermediate speed variab	ole,	М =	= 0.348		
Space mean speed in ramp	influence ar	R	= 60.3 = 65.6	•	
Space mean speed in outer Space mean speed for all		0	= 62.0	mph	

Fax: Phone: E-mail: _____Merge Analysis_____ Analyst: Jason Wiggins
Agency/Co.: DMJM+HARRIS
Date performed: 2/15/2004 Analysis time period: AM Peak
Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from Bear Tavern E
Jurisdiction: Mercer County
Analysis Year: 2003 Existing Description: Scudder Falls Freeway Data_____ Merge Type of analysis Number of lanes in freeway 70.0 1211 mph vph Free-flow speed on freeway Volume on freeway On Ramp Data_____ Right Side of freeway 1 Number of lanes in ramp 35.0 mph vph Free-flow speed on ramp 194 Volume on ramp Length of first accel/decel lane 1203 ft ft Length of second accel/decel lane Adjacent Ramp Data (if one exists)_____ Yes 430 Does adjacent ramp exist? vph Volume on adjacent Ramp Upstream Position of adjacent Ramp Type of adjacent Ramp Off ft 440 Distance to adjacent Ramp Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Ramp Junction Components Ramp
1211 194 430
0.92 0.92 0.92
329 53 117
6 2 6
0 0 0 0
Level Level Level
% % %
mi mi mi mi
1.5 1.5 1.5
1.2 1.2 1.2 vph Volume, V (vph) Peak-hour factor, PHF v Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade mi Length Trucks and buses PCE, ET 1.5
Recreational vehicle PCE, ER 1.2

Heavy vehicle adjustment, Driver population factor, Flow rate, vp		0.971 1.00 1356	1.00	0.971 1.00 481	pcph
	Estimation of	V12 Merge	Areas		
L = EQ	298.10 (Equ	ation 25-2 (or 25-3)		
	0.611 Usin	ng Equation	1		
v = v 12 F	(P) = 829 FM	e pc/h			
	Capacit	ty Checks			
V	Actual 1569	Maximum 7200		LOS F? No	
FO v R12	1042	4600	1	No	
Level of	Service Dete	ermination (if not F)	······································
Density, D = $5.475 + 0.00$ R Level of service for ramp	R	12	A		pc/mi/ln
	Speed Est	timation			
Intermediate speed variab	ole,	M =	0.248		
Space mean speed in ramp	influence are		63.1	mph	
Space mean speed in outer	lanes,		: 69.9	mph	
Space mean speed for all	vehicles,	-	65.2	mph	

Fax:

Phone: E-mail:

_____Operational Analysis_____

Analyst: Jason Wiggins
Agency/Co.: DMJM+HARRIS
Date Performed: 2/16/2004
Analysis Time Period: AM Peak
Freeway/Dir of Travel: I-95 Southbound

Freeway/Dir of Travel: I-95 Southbound
Weaving Location: Bear Tavern Road
Jurisdiction: Mercer County
Analysis Year: 2003 Existing

Description: Scudder Falls

_____Inputs______

Freeway free-flow speed, SFF 70 mph Weaving number of lanes, N 4 304 ft Weaving segment length, L Terrain type Level 9 Grade mi Length Weaving type 0.30 Volume ratio, VR Weaving ratio, R 0.13

Conversion to pc/h Under Base Conditions_____

	Non-Weaving		Weaving		
	V	V	V	V	
	A-C	B-D	A-D	B-C	
Volume, V	1148	0	430	63	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	312	0	117	17	v
Trucks and buses	6	10	6	4	Ö
Recreational vehicles	0	0	0	0	O _O O
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.971	0.952	0.971	0.980	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	1285	0	481	69	pc/h

_______Weaving and Non-Weaving Speeds_____

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.0035
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	1.05	0.40
Weaving and non-weaving speeds, Si	44.24	57.99
Number of lanes required for		

unconstrained operation, Nw (Exhibit 24-7) 1.08
Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity_____

Weaving segment speed, S Weaving segment density, D	53.05 8 65	mph pc/mi/ln
Level of service, LOS	A. 03	PC/1117 111
Capacity of base condition, cb	6098	pc/h
Capacity as a 15-minute flow rate, c	5920	pc/h
Capacity as a full-hour volume, ch	5446	pc/h

Limitations on Weaving Segments

		eded See Note	
	Analyzed	Maximum	Note
Weaving flow rate, Vw	550	2800	a
Average flow rate (pcphpl)	458	2400	р
Volume ratio, VR	0.30	0.35	С
Weaving ratio, R	0.13	N/A	d
Weaving length (ft)	304	2500	е
AT in the case of			

Notes:

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

Fax: Phone: E-mail: _____Diverge Analysis_____ Analyst:
Agency/Co.:
Date performed:
Analysis time period:
Freeway/Dir of Travel:

Dason Wiggins
DMJM+HARRIS
2/15/2004
AM Peak
Freeway/Dir of Travel:

AM Peak
Freeway/Dir of Travel:

DATE OF BOTH TO NOT Junction: SB Off Ramp to NJ 29
Jurisdiction: Mercer County
Analysis Year: 2003 Existing Description: Scudder Falls Freeway Data_____ Diverge Type of analysis 3 Number of lanes in freeway 70.0 1405 mph vph Free-flow speed on freeway Volume on freeway Off Ramp Data_____ Right Side of freeway Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph vph 309 Volume on ramp Length of first accel/decel lane 2000 Length of second accel/decel lane ft ft Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 298 vph Volume on adjacent ramp Downstream Position of adjacent ramp Type of adjacent ramp On ft Distance to adjacent ramp 880 Conversion to pc/h Under Base Conditions Freeway Ramp Adjacent Ramp Junction Components Ramp

1405 309 298 V

0.92 0.92 0.92

382 84 81 V

6 11 4 %

0 0 0 0 %

Level Level Level

0.00 % 0.00 % 0.00 %

0.00 mi 0.00 mi 0.00 mi

1.5 1.5 1.5 Volume, V (vph) vph Peak-hour factor, PHF Peak 15-min volume, v15
Trucks and bucc V Recreational vehicles Terrain type: Grade Length Trucks and buses PCE, ET 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2 1.5

1.2

```
Driver population factor, fP
                                        354
                                                  330
                               1573
                                                          pcph
Flow rate, vp
                Estimation of V12 Diverge Areas
                          (Equation 25-8 or 25-9)
              L ==
               ΕQ
              P = 0.704 Using Equation 5
               FD
              v = v + (v - v) P = 1213 pc/h
               12 R F R FD
                   Capacity Checks____
                                             LOS F?
                                Maximum
                     Actual
                                             No
                     1573
                                7200
    v = v
    Fi F
                                4400
                                             No
                     1213
    V
    12
                     1219 7200
                                             No
    v = v - v
    FO F R
                                2000
                     354
                                             No
    v
     R
      Level of Service Determination (if not F)_____
                  D = 4.252 + 0.0086 v - 0.009 L = -3.3 pc/mi/ln
Density,
                                  12 D
Level of service for ramp-freeway junction areas of influence A
             Speed Estimation_____
                                    D = 0.460
Intermediate speed variable,
                                    S
                                   S = 57.1 mph
Space mean speed in ramp influence area,
Space mean speed in outer lanes,
                                    S = 76.8
                                              mph
                                    0
                                   s = 60.7
Space mean speed for all vehicles,
                                              mph
```

0.971

1.00

0.948

1.00

0.980

1.00

Heavy vehicle adjustment, fHV

Fax: Phone: E-mail: Merge Analysis_____ Analyst:
Agency/Co.:
DMJM+HARRIS
Date performed:
Analysis time period:
Freeway/Dir of Travel:
Dason Wiggins
DMJM+HARRIS
2/15/2004
AM Peak
Freeway/Dir of Travel:
I-95 Southbound Junction: SB On ramp from NJ 29
Jurisdiction: Mercer County
Analysis Year: 2003 Existing Description: Scudder Falls _____Freeway Data_____ Merqe Type of analysis Number of lanes in freeway 2 70.0 mph 1096 vph Free-flow speed on freeway Volume on freeway On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 35.0 Free-flow speed on ramp mph vph 298 338 Volume on ramp ft Length of first accel/decel lane ft. Length of second accel/decel lane _____Adjacent Ramp Data (if one exists)_____ Yes 309 Upstream Does adjacent ramp exist? vph Volume on adjacent Ramp Position of adjacent Ramp Off ogn ft Type of adjacent Ramp Distance to adjacent Ramp _____Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Ramp Junction Components

 Volume, V (vph)
 1096
 298
 309
 vph

 Peak-hour factor, PHF
 0.92
 0.92
 0.92
 0.92

 Peak 15-min volume, v15
 298
 81
 84
 v

 Trucks and buses
 6
 4
 11
 %

 Recreational vehicles
 0
 0
 0
 %

 Terrain type:
 Level
 Level
 Level
 Level

 Grade
 %
 %
 %
 %

 Length
 mi
 mi
 mi
 mi

 Trucks and buses PCE, ET
 1.5
 1.5
 1.5
 1.5

 Recreational vehicle PCE, ER
 1.2
 1.2
 1.2
 1.2

Heavy vehicle adjustment, fHV Driver population factor, fP Flow rate, vp	1.00	0.980 1.00 330	1.00	pcph
Estimati	on of V12 Merge A	Areas		
EQ	(Equation 25-2 of Using Equation 1227 pc/h			
Ca	pacity Checks			
v 1557 FO	Maximum 4800 4600	LOS : No	F?	
Density, D = 5.475 + 0.00734 v + R R Level of service for ramp-freeway	12	00627 L =	15.3	
Spee	ed Estimation			***************************************
Intermediate speed variable,		0.316		
Space mean speed in ramp influence	ce area, S = R	61.2 mph		
Space mean speed in outer lanes,		N/A mph		
Space mean speed for all vehicles		61.2 mph	:	

Fax: Phone: E-mail: _____Diverge Analysis_____ Analyst:
Agency/Co.:
Date performed:
Analysis time period:
AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB Off Ramp to Taylorsville W Jurisdiction: Bucks County Analysis Year: 2003 Existing Description: Scudder Falls Freeway Data_____ Diverge Type of analysis Number of lanes in freeway Free-flow speed on freeway 2 65.0 mph 1394 vph Volume on freeway Off Ramp Data_____ Right Side of freeway Number of lanes in ramp 1. Free-Flow speed on ramp 35.0 mph Volume on ramp 118 vph Length of first accel/decel lane 550 ft Length of second accel/decel lane ft Adjacent Ramp Data (if one exists)_____ Yes 72 Downstream Does adjacent ramp exist? Volume on adjacent ramp vph Position of adjacent ramp Off 790 ft Type of adjacent ramp Distance to adjacent ramp Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Ramp Junction Components Ramp
1394 118 72 v
0.92 0.92 0.92
379 32 20 v
6 4 7 %
0 0 0 0 %
Level Level Level
0.00 % 0.00 % 0.00 %
0.00 mi 0.00 mi 0.00 mi
1.5 1.5 1.5 vph Volume, V (vph) Peak-hour factor, PHF
Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Length Trucks and buses PCE, ET 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2 1.5 1.2

Heavy vehicle adjustment Driver population factor Flow rate, vp		0.971 1.00 1561	0.980 1.00 131		pcph
	Estimation o	of V12 Diverge	e Areas_		
L =	(Ec	quation 25-8 (or 25-9)		
EQ P == FD	1.000 Usi	ing Equation	0		
	v + (v - v) R F R		pc/h		
	Capac	ity Checks			
v = v	Actual 1561	Maximum 4700		LOS F?	
Fi F V	1561	4400		No	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1430	4700		No	
v R	131	2000		No	
Level	of Service De	termination (if not	F)	
* ·	D = 4.252 + 0	12	D		pc/mi/ln
Level of service for ra	mp-freeway ju	nction areas	of infl	uence B	
	Speed E	stimation			
Intermediate speed vari	able,	D =	0.440		
Space mean speed in ram	np influence a	-	= 54.9	mph	
Space mean speed in out	er lanes,		= N/A	mph	
Space mean speed for al	ll vehicles,		= 54.9	mph	

Fax: Phone: E-mail: Diverge Analysis_____ Analyst:

Agency/Co.:
DMJM+HARRIS
Date performed:
Analysis time period:
Freeway/Dir of Travel:

Analysis time period:

AM Peak
Freeway/Dir of Travel:

AM Peak
Freeway/Dir of Travel:

AM Peak
Freeway/Dir of Travel:

AM Peak Junction: SB Off Ramp to Taylorsville E
Jurisdiction: Bucks County
Analysis Year: 2003 Existing Description: Scudder Falls Freeway Data_____ Diverge Type of analysis Number of lanes in freeway 2 65.0 mph 1276 vph Free-flow speed on freeway Volume on freeway Off Ramp Data_____ Right Side of freeway 1 Number of lanes in ramp 35.0 mph Free-Flow speed on ramp vph 72 Volume on ramp 100 ft Length of first accel/decel lane ft Length of second accel/decel lane Adjacent Ramp Data (if one exists)_____ Yes 336 Does adjacent ramp exist? vph Volume on adjacent ramp Position of adjacent ramp Downstream Type of adjacent ramp On 1400 ft Distance to adjacent ramp Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Junction Components Ramp Ramp
1276 72 336
0.92 0.92 0.92
347 20 91
6 7 3
0 0 0
Level Level Level
0.00 % 0.00 % 0.00
0.00 mi 0.00 mi 0.00 vph Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses ò Recreational vehicles Terrain type:

1.5 1.5 1.2 1.2

mi

1.5 1.2

Grade

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

Heavy vehicle adjustm Driver population fac Flow rate, vp	ent, fHV tor, fP	0.971 1.00 1429	0.966 1.00 81	1.00	pcph
	Estimation (of V12 Diverge	e Areas_		
L		quation 25-8 d	or 25-9)		
	= 1.000 Us:	ing Equation	0		
FD V 12	w + (v - v)	P = 1429 FD	pc/h		
	Capac	ity Checks			
v = v	Actual 1429	Maximum 4700		LOS F?	
Fi F V	1429	4400		No	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1348	4700		No	
FO F R V R	81	2000		No	
Leve	el of Service De	termination (if not l	F)	
Density,	Ŕ		D		pc/mi/ln
Level of service for	ramp-freeway ju	nction areas	of infl	uence B	
	Speed B	Estimation			
Intermediate speed v	ariable,	D ≖ S	= 0.435		
Space mean speed in	ramp influence a		= 55.0	mph	
Space mean speed in	outer lanes,		= N/A	mph	
Space mean speed for	all vehicles,	S =	= 55.0	mph	

Fax: Phone: E-mail: Merge Analysis_____ Jason Wiggins DMJM+HARRIS Analyst: Agency/Co.: Agency/Co.:

Date performed: 2/15/2004

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from Taylorsville
Jurisdiction: Bucks County
Analysis Year: 2003 Existing Description: Scudder Falls Freeway Data_____ Merge Type of analysis 2 Number of lanes in freeway 65.0 mph 1204 vph Free-flow speed on freeway vph Volume on freeway On Ramp Data____ Right Side of freeway 1 Number of lanes in ramp 35.0 mph Free-flow speed on ramp vph 336 Volume on ramp ft 1265 Length of first accel/decel lane Length of second accel/decel lane ft Adjacent Ramp Data (if one exists)_____ Yes 72 Does adjacent ramp exist? vph Volume on adjacent Ramp Upstream Position of adjacent Ramp Off Type of adjacent Ramp 1400 £t Distance to adjacent Ramp Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Junction Components 1204 336 0.92 0.92 327 91 6 3 Ramp 72 vph Volume, V (vph) 0.92 20 Peak-hour factor, PHF Peak 15-min volume, v15 6 3 7
0 0 0
Level Level Level 7 O Trucks and buses Recreational vehicles Terrain type: mi Grade mi Length Trucks and buses PCE, ET 1.5 1.5 1.2 1.2 1.5 1.2 1.2

Recreational vehicle PCE, ER

Heavy vehicle adjustme Driver population fact Flow rate, vp	nt, fHV or, fP	0.971 1.00 1348	0.985 1.00 371	0.966 1.00 81	pcph
	Estimation	of V12 Merge A	Areas		
FM		Equation 25-2 of sing Equation 1348 pc/h			
	Capa	city Checks			
v FO	1719	Maximum 4700 4600	LO No No		
v R12	1,13	4000	140		
Leve	l of Service D	etermination (if not F)_		
Density, D = 5.475 + R Level of service for	R ramp-freeway j	12	of influer	ice B	pc/mi/ln
Intermediate speed va	riable,	M =	0.254		
Space mean speed in r	amp influence		= 59.2 r	nph	
Space mean speed in o	uter lanes,		= N/A 1	nph	
Space mean speed for	all vehicles,	S =	= 59.2 r	mph	

Fax: Phone: E-mail: _____Diverge Analysis______ Jason Wiggins DMJM+HARRIS Analyst: Agency/Co.: Agency/Co.: DMJM+HARR.
Date performed: 2/15/2004
Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB Off Ramp to PA332
Jurisdiction: Bucks County
Analysis Year: 2003 Existing Description: Scudder Falls Freeway Data_____ 65.0 mph 1540 Diverge Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway Off Ramp Data_____ Right Side of freeway 1 Number of lanes in ramp 35.0 mph Free-Flow speed on ramp vph 445 Volume on ramp ft Length of first accel/decel lane 850 ft Length of second accel/decel lane ____Adjacent Ramp Data (if one exists)_____ Yes 1345 Does adjacent ramp exist? vph Volume on adjacent ramp Downstream Position of adjacent ramp On Type of adjacent ramp 2525 ft Distance to adjacent ramp Conversion to pc/h Under Base Conditions_____ Adjacent
Ramp
1540 445 1345
0.92 0.92 0.92
418 121 365
6 7 6
0 0 0
Level Level Level
0.00 % 0.00 % 0.00 %
0.00 mi 0.00 mi 0.00 mi
1.5 1.5 1.5
1.2 1.2 1.2 Freeway Ramp Adjacent Junction Components dqv Volume, V (vph) Peak-hour factor, PHF v Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type:

mi

Grade

Length

Trucks and buses PCE, ET Recreational vehicle PCE, ER

```
Heavy vehicle adjustment, fHV 0.971
                                              0.971
                                    0.966
                                       1.00
                             1.00
                                                1.00
Driver population factor, fP
                                               1506 pcph
                             1724
                                       501
Flow rate, vp
             Estimation of V12 Diverge Areas
                         (Equation 25-8 or 25-9)
              L =
              EQ
              P = 1.000 Using Equation 0
              FD
              v = v + (v - v) P = 1724 pc/h
                      F R FD
              12 R
                ____Capacity Checks_____
                     Actual
                                Maximum
                                            LOS F?
                                            Νо
                               4700
                     1724
    v = v
    Fi F
                                            No
                               4400
                     1724
    V
    12
                                            No
                               4700
                     1223
    v = v - v
    FO F R
                                            No
                     501
                               2000
    v
     R
      Level of Service Determination (if not F)_____
                 D = 4.252 + 0.0086 v - 0.009 L = 11.4 pc/mi/ln
Density,
Level of service for ramp-freeway junction areas of influence B
       Speed Estimation_____
                                   D = 0.473
Intermediate speed variable,
                                    S
Space mean speed in ramp influence area,
                                  s = 54.1
                                            mph
                                   R
                                   S = N/A mph
Space mean speed in outer lanes,
                                  S = 54.1 mph
Space mean speed for all vehicles,
```

Fax: Phone: E-mail: Merge Analysis_____ Jason Wiggins DMJM+HARRIS Analyst: Agency/Co.: Agency/Co.: DMJM+HARRI
Date performed: 2/15/2004
Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from PA 332

Jurisdiction: Bucks County

Analysis Year: 2003 Existing Description: Scudder Falls Freeway Data_____ Merge Type of analysis 2 Number of lanes in freeway 65.0 mph 1095 vph Free-flow speed on freeway Volume on freeway On Ramp Data____ Right Side of freeway 1 Number of lanes in ramp 35.0 mph Free-flow speed on ramp vph 1345 Volume on ramp ft Length of first accel/decel lane 1375 ft. Length of second accel/decel lane Adjacent Ramp Data (if one exists)_____ Yes 445 Does adjacent ramp exist? vph Volume on adjacent Ramp Upstream Position of adjacent Ramp Off Type of adjacent Ramp 2525 ft Distance to adjacent Ramp Conversion to pc/h Under Base Conditions_____ Freeway Ramp Adjacent Junction Components vph Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Length Trucks and buses PCE, ET Recreational vehicle PCE, ER

Heavy vehicle adjustment, fHV Driver population factor, fP Flow rate, vp	1.00	0.971 1.00 1506		pcph
Estima	tion of V12 Merge	Areas		
EQ P = 1.000 FM	(Equation 25-2 Using Equation = 1226 pc/h			
	Capacity Checks			
v 2732 FO	Maximum 4700 4600	LC No		
Level of Servi	ce Determination	(if not F)		
Density, D = 5.475 + 0.00734 v R Level of service for ramp-freevSp	12	A of influe	nce B	
Intermediate speed variable,	М	= 0.285		
Space mean speed in ramp influ	R	= 58.5	•	
Space mean speed in oast land	0	= 58.5		

HCS+: Unsignalized Intersections Release 5.21

TWO-WAY STOP CONTROL SUMMARY_____

Analyst: Jason Wiggins
Agency/Co.: DMJM+HARRIS
Date Performed: 2/17/2004
Analysis Time Period: AM Peak

Intersection: I-95 NB Off Ramp Jurisdiction: Mercer County

Units: U. S. Customary

Analysis Year: 2003 Existing

Project ID: Scudder Falls
East/West Street: NJ 29
North/South Street: off ramp
Intersection Orientation: EW

Study period (hrs): 0.25

				and Adjı	ıstme	nts_		1	
Major Street:	Approach		Eastbo				Westboun		
-	Movement	1	2	3	1	4	5	6	
		L	Т	R		L	Т	R.	
Volume							206		
Peak-Hour Fact	or, PHF						0.92		
Hourly Flow Ra							223		
Percent Heavy							some Man	****	
Percent heavy Median Type/St		linc	livideo	₹		/			
		Cit	ITATOC	4		,			
RT Channelized	1 ?						1		
Lanes							т		
Configuration							-		
Upstream Signa	1?		No)			No		
Minor Street:	Approach		North	oound			Southbou		
	Movement	7	8	9	1	10	11	12	
		L	T	R	1	L	T	R	
Volume							562		
Peak Hour Fact	tor PHF						0.92		
	·						610		
Hourly Flow Ra							0		
Percent Heavy			0				Ö		
Percent Grade		- /	0			,	O		,
Flared Approa	ch: Exists	?/Stor	age		,	ſ	1		/
Lanes							1_		
Configuration							T		
						a			
Approach	Delay, EB	Queue WB	Lengt	h, and Le Northbou		OI S	Sol	thboun	d
Movement	1	4	ı 7	8	9		1 10	11	12
			1 '	•	_		, — : I	Т	
Lane Config			*				1		
v (vph)			***************************************					610	
C(m) (vph)								679	
								0.90	
v/c	art h							11.41	
95% queue len								39.1	
_ , " , , , , ,								E	
Control Delay								فشة	
LOS								י מכ	
	У							39.1 E	

Fax: Phone: E-Mail: TWO-WAY STOP CONTROL(TWSC) ANALYSIS_____ Jason Wiggins Analyst: DMJM+HARRIS Agency/Co.: 2/17/2004 Date Performed: Analysis Time Period: AM Peak I-95 NB Off Ramp Intersection: Mercer County Jurisdiction: Units: U. S. Customary 2003 Existing Analysis Year: Project ID: Scudder Falls NJ 29 East/West Street: North/South Street: off ramp Study period (hrs): 0.25 Intersection Orientation: EW Vehicle Volumes and Adjustments 6 3 2 1 Major Street Movements Т R T R L L 206 Volume 0.92 Peak-Hour Factor, PHF 56 Peak-15 Minute Volume 223 Hourly Flow Rate, HFR Percent Heavy Vehicles Median Type/Storage Undivided RT Channelized? 1 Lanes \mathbf{T} Configuration No No Upstream Signal? 12 11 9 10 8 Minor Street Movements R L Τ R T L 562 Volume 0.92 Peak Hour Factor, PHF 153 Peak-15 Minute Volume 610 Hourly Flow Rate, HFR 0 Percent Heavy Vehicles 0 Percent Grade (%) Flared Approach: Exists?/Storage RT Channelized? 1 Lanes Т Configuration Pedestrian Volumes and Adjustments 15 16 13 14 Movements Flow (ped/hr)

alking	lth (ft) Speed (ft Blockage	/sec)			.0 4	. 0	12.0 4.0 0		
			Uı	ostream	. Signal	Data			
		Prog. Flow vph	Sat Flow vph	Arriv Type	ral Gi	ceen C	ycle ength sec	Prog. Speed mph	Distance to Signal feet
Thro	-Turn								
Vorkshee	et 3-Data	for Co	mputing	Effect		lay to		Street V Moveme	
Sat flow Number o	w rate, ma w rate, ma of major s	ajor rt	vehicl	es: lanes:					
	1		n and E	011011-1	in Time	Calcui	lation		
	et 4-Criti			ollow-u	ıp Time	Calcu:	lation ————		
Critica	l Gap Calo			7 L	up Time 8 T	Calcui 9 R	lation 10 L	11 T	12 R
Critica Movemen t(c,bas t(c,hv)	l Gap Cald	culatio	on 4	7	8	9	10	T 6.5	
Critica Movemen t(c,bas t(c,hv) P(hv) t(c,g) Grade/1	l Gap Calc t e)	culation 1 L	on 4 L	7 L 1.00 0.20 0.00	8 T 1.00 0.20 0.00	9 R 1.00 0.10 0.00	1.00 L 1.00 0.20 0.00	6.5 1.00 0 0.20 0.00	1.00 0.10 0.00
Critica Movemen t(c,bas t(c,hv) P(hv) t(c,g) Grade/1 t(3,lt) t(c,T):	l Gap Calc t e)	1 L 1.00	on 4 L	7 L 1.00	8 T 1.00	9 R 1.00	1.00 L 1.00 0.20 0.00	T 6.5 1.00 0 0.20 0.00 0.00	1.00 0.10
Critica Movemen t(c,bas t(c,hv) P(hv) t(c,g) Grade/1 t(3,lt) t(c,T): t(c)	l Gap Calcot e) 00 1-stage 2-stage 1-stage 2-stage	1.00 0.00 0.00	0.00 0.00 0.00	7 L 1.00 0.20 0.00 0.00	8 T 1.00 0.20 0.00 0.00	9 R 1.00 0.10 0.00 0.00	1.00 L 1.00 0.20 0.00 0.00	T 6.5 1.00 0 0.20 0.00 0.00 0.00 1.00 6.5	R 1.00 0.10 0.00 0.00
Critica Movemen t(c,bas t(c,hv) P(hv) t(c,g) Grade/1 t(3,lt) t(c,T):	l Gap Calcot e) 00 1-stage 2-stage 1-stage 2-stage	1.00 1.00 0.00 0.00	1.00 0.00 0.00	7 L 1.00 0.20 0.00	8 T 1.00 0.20 0.00	9 R 1.00 0.10 0.00	1.00 L 1.00 0.20 0.00	6.5 1.00 0 0.20 0.00 0.00 0.00	R 1.00 0.10 0.00
Critica Movemen t(c,bas t(c,hv) P(hv) t(c,g) Grade/1 t(3,lt) t(c,T): t(c)	l Gap Calcot e) 00 1-stage 2-stage 1-stage 2-stage	1.00 0.00 0.00 0.00	0.00 0.00 0.00	7 L 1.00 0.20 0.00 0.00 1.00	8 T 1.00 0.20 0.00 0.00 1.00	9 R 1.00 0.10 0.00 0.00	10 L 1.00 0.20 0.00 1.00	T 6.5 1.00 0 0.20 0.00 0.00 1.00 6.5	R 1.00 0.10 0.00 0.00 0.00
Critica Movemen t(c,bas t(c,hv) P(hv) t(c,g) Grade/1 t(3,lt) t(c,T): t(c) Follow Movemen t(f,bas t(f,HV) P(HV) t(f)	l Gap Calcot e) 00 1-stage 2-stage 1-stage 2-stage	1.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00	7 L 1.00 0.20 0.00 1.00	8 T 1.00 0.20 0.00 0.00 1.00	9 R 1.00 0.10 0.00 0.00	10 L 1.00 0.20 0.00 1.00	T 6.5 1.00 0 0.20 0.00 0.00 1.00 6.5	R 1.00 0.10 0.00 0.00 0.00

```
Total Saturation Flow Rate, s (vph)
Arrival Type
Effective Green, g (sec)
Cycle Length, C (sec)
Rp (from Exhibit 16-11)
Proportion vehicles arriving on green P
g(q1)
g(g2)
g(q)
Computation 2-Proportion of TWSC Intersection Time blocked
                                                                   Movement 5
                                               Movement 2
                                                                       V(1,prot)
                                                   V(l,prot) V(t)
                                            V(t)
alpha
beta
Travel time, t(a) (sec)
Smoothing Factor, F
Proportion of conflicting flow, f
Max platooned flow, V(c, max)
Min platooned flow, V(c, min)
Duration of blocked period, t(p)
                                                                     0.000
                                                  0.000
Proportion time blocked, p
                                            Result
Computation 3-Platoon Event Periods
                                            0.000
p(2)
                                            0.000
p(5)
p(dom)
p(subo)
Constrained or unconstrained?
Proportion
                                               (2)
                                                                (3)
                              (1)
unblocked
                                                Two-Stage Process
                         Single-stage
 for minor
                                                             Stage II
                            Process
                                            Stage I
movements, p(x)
 p(1)
 p(4)
 p(7)
 p(8)
 p(9)
 p(10)
 p(11)
 p(12)
 Computation 4 and 5
 Single-Stage Process
                                                                               12
                                                               10
                                                                       11
                                                         9
                           1
                                                 8
                                  4
 Movement
                                                                                R
                                                                        \mathbf{T}
                                          L
                                                 Т
                                                         R.
                                                                L
                                  L
                           L
                                                                       223
 V c,x
 s
 Рx
 V c,u,x
 Cr,x
 C plat, x
 Two-Stage Process
                                                                           11
                                         8
                                                         10
                        7
```

Stagel Stage2 Stagel Stag	e2 Stage1 Stag	e2 Stagel Stage2
V(c,x)		0
s P(x) V(c,u,x)		U
C(r,x) C(plat,x)		
Worksheet 6-Impedance and Capacity Equatio	ns	
Step 1: RT from Minor St.	9	12
Conflicting Flows		
Potential Capacity	1.00	1.00
Pedestrian Impedance Factor Movement Capacity	1,00	I
Probability of Queue free St.	1.00	1.00
Step 2: LT from Major St.	4	1
Conflicting Flows		
Potential Capacity	* 00	1 00
Pedestrian Impedance Factor	1.00	1.00
Movement Capacity Probability of Queue free St.	1.00	1.00
Maj L-Shared Prob Q free St.		
Step 3: TH from Minor St.	8	11
Conflicting Flows		223
Potential Capacity		679
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mymnt	1.00	1.00
Movement Capacity	1.00	679
Probability of Queue free St.	1,00	0.10
Step 4: LT from Minor St.	7	10
Conflicting Flows		
Potential Capacity		7 OO
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor	0.10 0.22	
Maj. L, Min T Adj. Imp Factor.	0.22	1.00
Cap. Adj. factor due to Impeding mvmnt Movement Capacity	0.22	2,00
Worksheet 7-Computation of the Effect of	Two-stage Gap Ac	ceptance
Step 3: TH from Minor St.	8	11

Part 1 - First Stage
Conflicting Flows
Potential Capacity
Pedestrian Impedance Factor
Cap. Adj. factor due to Impeding mvmnt
Movement Capacity
Probability of Queue free St.

Part 2 - Second Stage					
Conflicting Flows					
Potential Capacity					
Pedestrian Impedance Factor Cap. Adj. factor due to Impeding mvmnt					
Movement Capacity					
Movement oupacity					
Part 3 - Single Stage				223	
Conflicting Flows				679	
Potential Capacity Pedestrian Impedance Factor	1.	0.0		1.00	
Cap. Adj. factor due to Impeding mvmnt	1.			1.00	
Movement Capacity				679	
Hovement output of					
Result for 2 stage process:					
a					
y				679	
C t	1.	00		0.10	
Probability of Queue free St.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
Step 4: LT from Minor St.		7		10	
Part 1 - First Stage					
Conflicting Flows					
Potential Capacity					
Pedestrian Impedance Factor					
Cap. Adj. factor due to Impeding mvmnt					
Movement Capacity					
Part 2 - Second Stage					
Conflicting Flows					
Potential Capacity					
Pedestrian Impedance Factor					
Cap. Adj. factor due to Impeding mvmnt					
Movement Capacity					
Part 3 - Single Stage	············				
Conflicting Flows					
Potential Capacity					
Pedestrian Impedance Factor		.00		1.00	
Maj. L, Min T Impedance factor		10			
Maj. L, Min T Adj. Imp Factor.		. 22		1.00	
Cap. Adj. factor due to Impeding mvmnt	0.	- 4 4		1.00	
Movement Capacity					
Results for Two-stage process:	······································				
a					
У					
C t					
Worksheet 8-Shared Lane Calculations				———	
Movement 7	8	9	10	11	12
L	T	R	L	T	R
Volume (vph)				610	
Movement Capacity (vph)				679	
Shared Lane Capacity (vph)					

Worksheet 9-Computation of Effect of Flared Minor Street Approaches

Marramon T		7	8	9	10	11	12
lovement		Ĺ	T	R	L	Т	R
C sep						679	
Volume						610	
Delay							
Q sep							
Q sep +l							
round (Qsep +1)							
n max							
C sh							
SUM C sep							
n							
C act							
Worksheet 10-Delay,		and Leve	el of S	Service 9	10	11	12
Movement Lane Config	1 4	,	0	9	10	T	<i>2.</i> 12
v (vph)						610	······································
C(m) (vph)						679	
v/c						0.90	
95% queue length						11.41	
Control Delay						39.1	
LOS						E	
Approach Delay						39.1	
Approach LOS						E	
Worksheet 11-Share	d Major LT Impe	edance an	д рета				
				Mover	ment 2	Move	ment 5
p(oj)				1	.00	1	.00
v(il), Volume for	stream 2 or 5						
v(i2). Volume for	stream 3 or 6						
s(il), Saturation	flow rate for	stream 2	or 5				
- (10) Coturation	flow rate for	etream 3	or 6				

s(i2), Saturation flow rate for stream 3 or 6

d(M, LT), Delay for stream 1 or 4

d(rank,1) Delay for stream 2 or 5

N, Number of major street through lanes

P*(oj)

TWO-WAY STOP CONTROL SUMMARY

Jason Wiggins Analyst: Agency/Co.: DMJM+HARRIS Date Performed: 2/17/2004 Analysis Time Period: AM Peak

Intersection: I-95 NB Off Ramp
Jurisdiction: Mercer County Jurisdiction:

Units: U. S. Customary

Approach LOS

Analysis Year: 2003 Existing

Project ID: Scudder Falls East/West Street: NJ 29 North/South Street: off ramp

(ntersection O	rientation:	EW		5	cady bei	ciod (hrs)	: 0.25	
	Veh	icle V	olumes a	and Adju	stments			···
Major Street:	Approach		Eastbour			Westbound		
	Movement	1	2	3	4	5	6	
		L	T	R	l L	T	R	
Volume						206	~ 	
Volume Peak-Hour Fact	or. PHF					0.92		
Hourly Flow Ra						223		
Percent Heavy	Vehicles						****	
		IIn	divided		/			
Median Type/St		011	arvidea		•			
RT Channelized	1 3					1		
Lanes						T		
Configuration			N1 0			Nо		
Upstream Signa	IT ?		No			110		·
Minor Street:	Approach		Northbo	und		Southbou		
	Movement	7	8	9	10	1.1	12	
		L	${f T}$	R	L	${f T}$	R	
						562		
Volume						0.92		
Peak Hour Fact						610		
Hourly Flow Ra								
Percent Heavy	Vehicles					0		
Percent Grade	(%)		0		,	0		,
Flared Approac	ch: Exists	?/Stor	age		/	_		/
Lanes						1		
Configuration						T		
	Delav.	Oueue	Length,	and Le	vel of S	Service		
Approach	EB	WB	1	Northbou	nd	Sou	thbound	
Movement	1	4	1 7	8	9	1 10	11	12
	-	-	i ·			1	${f T}$	
Lane Config			1			,		
v (vph)							610	
C(m) (vph)							679	
v/c							0.90	
95% queue len	ath						11.41	
Control Delay							39.1	
_							E	
LOS	: **						39.1	
Approach Dela	У						E	

Fax: Phone: E-Mail: TWO-WAY STOP CONTROL(TWSC) ANALYSIS_____ Jason Wiggins Analyst: DMJM+HARRIS Agency/Co.: 2/17/2004 Date Performed: Analysis Time Period: AM Peak I-95 NB Off Ramp Intersection: Jurisdiction: Mercer County Units: U. S. Customary 2003 Existing Analysis Year: Project ID: Scudder Falls NJ 29 East/West Street: North/South Street: off ramp Study period (hrs): 0.25 Intersection Orientation: EW Vehicle Volumes and Adjustments_ 6 2 3 Major Street Movements 1 T R R L L 206 Volume 0.92 Peak-Hour Factor, PHF 56 Peak-15 Minute Volume 223 Hourly Flow Rate, HFR Percent Heavy Vehicles Undivided Median Type/Storage RT Channelized? 1 Lanes T Configuration No No Upstream Signal? 11 12 10 8 9 Minor Street Movements Т R L Т R L 562 Volume 0.92 Peak Hour Factor, PHF 153 Peak-15 Minute Volume 610 Hourly Flow Rate, HFR Percent Heavy Vehicles 0 Percent Grade (%) Flared Approach: Exists?/Storage RT Channelized? 1 Lanes T Configuration Pedestrian Volumes and Adjustments_____ 16 13 14 15 Movements 0 0 Flow (ped/hr)

12.0 12.0 12.0 12.0 Lane Width (ft) 4.0 4.0 4.0 Walking Speed (ft/sec) 4.0 0 0 0 0 Percent Blockage Upstream Signal Data Distance Cycle Prog. Arrival Green Proq. Sat to Signal Speed Time Length Flow Flow Type feet mph vph sec sec vph S2 Left-Turn Through S5 Left-Turn Through Worksheet 3-Data for Computing Effect of Delay to Major Street Vehicles Movement 2 Movement 5 Shared In volume, major th vehicles: Shared ln volume, major rt vehicles: Sat flow rate, major th vehicles: Sat flow rate, major rt vehicles: Number of major street through lanes: Worksheet 4-Critical Gap and Follow-up Time Calculation Critical Gap Calculation 9 10 11 12 8 7 4 Movement 1 R Т L L т R L L 6.5 t(c,base) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 t(c,hv) 0 P(hv) 0.20 0,10 0.10 0.20 0.20 0.20 t(c,g)0.00 0.00 0.00 0.00 0.00 0.00 Grade/100 0.00 t(3,1t) 0.00 0.00 0.00 0.00 0.00 0.00 0.00 1-stage 0.00 t(c,T): 1.00 1.00 0.00 0.00 1.00 0.00 1.00 2-stage 0.00 6.5 1-stage t(c) 2-stage Follow-Up Time Calculations 12 7 8 9 10 11 4 Movement 1 L Т R R L L T L 4.00 t(f,base) 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 t(f,HV) 0 P(HV) 4.0 t(f) Worksheet 5-Effect of Upstream Signals Computation 1-Queue Clearance Time at Upstream Signal Movement 2 Movement 5

V(1,prot)

V(l,prot)

V(t)

V(t)

```
Total Saturation Flow Rate, s (vph)
Arrival Type
Effective Green, g (sec)
Cycle Length, C (sec)
Rp (from Exhibit 16-11)
Proportion vehicles arriving on green P
q(q1)
g (q2)
g(q)
Computation 2-Proportion of TWSC Intersection Time blocked
                                              Movement 2
                                                                  Movement 5
                                                                      V(1,prot)
                                           V(t)
                                                   V(l,prot) V(t)
alpha
beta
Travel time, t(a) (sec)
Smoothing Factor, F
Proportion of conflicting flow, f
Max platooned flow, V(c, max)
Min platooned flow, V(c,min)
Duration of blocked period, t(p)
                                                                    0.000
                                                 0.000
Proportion time blocked, p
                                           Result
Computation 3-Platoon Event Periods
                                           0.000
p(2)
                                           0.000
p(5)
p(dom)
p(subo)
Constrained or unconstrained?
Proportion
                                                               (3)
unblocked
                             (1)
                                              (2)
                         Single-stage
                                               Two-Stage Process
for minor
                                           Stage I
                                                            Stage II
                           Process
movements, p(x)
p(1)
p(4)
p(7)
(8)q
p(9)
p(10)
p(11)
p(12)
 Computation 4 and 5
 Single-Stage Process
                                                              10
                                                                      11
                                                                             12
                                         7
                                                8
                          1
                                 4
 Movement
                                                               L
                                                                       T
                                                                              R
                                                \mathbf{T}
                                                        R
                                 L
                                         L
                          L
                                                                      223
 V c,x
 s
 Рx
 V c,u,x
 Cr,x
 C plat, x
 Two-Stage Process
```

8

7

11

10

_ ·				~	~	~ . "	G :
Stagel	Stage2	Stagel	Stage2	Stagel	Stage2	Stagel	Stage2

(c,x)		0
P(x)		
(c,u,x)		
C(r,x)		
(plat,x)		
Worksheet 6-Impedance and Capacity Equation	ions	
Step 1: RT from Minor St.	9	12
Conflicting Flows		
Potential Capacity Pedestrian Impedance Factor	1,00	1.00
Movement Capacity	±.00	# v O O
Probability of Queue free St.	1.00	1.00
Step 2: LT from Major St.	4	1
Conflicting Flows		
Potential Capacity Pedestrian Impedance Factor	1.00	1.00
Movement Capacity	w. r O O	1.00
Probability of Queue free St.	1.00	1.00
Maj L-Shared Prob Q free St.		
Step 3: TH from Minor St.	8	1.1
Conflicting Flows		223
Potential Capacity		679
Pedestrian Impedance Factor	1.00	1.00
Cap. Adj. factor due to Impeding mvmnt	1.00	1.00 679
Movement Capacity Probability of Queue free St.	1.00	0.10
Step 4: LT from Minor St.	7	10
Conflicting Flows		
Potential Capacity	1 00	7 00
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor	0.10 0.22	
Maj. L, Min T Adj. Imp Factor. Cap. Adj. factor due to Impeding mvmnt	0.22	1.00
Cap. Adj. factor due to impeding momnt Movement Capacity	U , Z Z	1.00
Worksheet 7-Computation of the Effect of	Two-stage Gap Acc	eptance
Step 3: TH from Minor St.	8	11

Part 1 - First Stage
Conflicting Flows
Potential Capacity
Pedestrian Impedance Factor
Cap. Adj. factor due to Impeding mvmnt
Movement Capacity
Probability of Queue free St.

art 2 - Second Stage						
onflicting Flows						
otential Capacity						
edestrian Impedance Factor						
ap. Adj. factor due to Impeding mvmnt						
ovement Capacity						
0.3m30						
art 3 - Single Stage						
onflicting Flows					223	
otential Capacity					679	
edestrian Impedance Factor		1.0	0		1.00	
ap. Adj. factor due to Impeding mvmnt		1.0	0		1.00	
ovement Capacity					679	
esult for 2 stage process:						
t					679	
robability of Queue free St.		1.0	0		0.10	
						·····
tep 4: LT from Minor St.			7		10	
art 1 - First Stage		***************************************	··			
onflicting Flows						
Potential Capacity						
edestrian Impedance Factor						
cap. Adj. factor due to Impeding mvmnt	<u>.</u>					
Novement Capacity						
*					.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Part 2 - Second Stage						
Conflicting Flows						
Potential Capacity						
Pedestrian Impedance Factor						
Cap. Adj. factor due to Impeding mvmnt	ī.					
Movement Capacity						
Part 3 - Single Stage						
Conflicting Flows						
Potential Capacity						
Pedestrian Impedance Factor		1.0			1.00	
Maj. L, Min T Impedance factor		0.1				
Maj. L, Min T Adj. Imp Factor.		0.2	22			
Cap. Adj. factor due to Impeding mvmn	t	0.2	22		1.00	
Movement Capacity						
Results for Two-stage process:						
a .,						
y C t						
Worksheet 8-Shared Lane Calculations						
Movement		8	9	10	11	12
Movement	L	T	R	L	T	R
			······································			
					610	
Volume (vph)						
Volume (vph) Movement Capacity (vph) Shared Lane Capacity (vph)					679	

Worksheet 9-Computation of Effect of Flared Minor Street Approaches

Movement	~		7	8		10	11	12
			L	I	R	L	Т	R
C sep			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		· · · · · · · · · · · · · · · · · · ·		679	
Volume							610	
Delay								
Q sep								
Q sep +1								
round (Qsep +1)								
n max						·		
C sh								
SUM C sep								
n								
C act								
Worksheet 10-Delay	Onene	Lenath	. and I	evel of	Servic	<u> </u>		***************************************
WOLKSHEEC TO DETAY	, 20000							
Movement	1	4	7	8	9	10	11	12
Lane Config							T	
							610	
v (vph)							PTO	
v (vph) C(m) (vph)							679	
v (vph) C(m) (vph) v/c								
C(m) (vph)							679 0.90 11.41	
C(m) (vph) v/c							679 0.90	
C(m) (vph) v/c 95% queue length							679 0.90 11.41 39.1 E	
C(m) (vph) v/c 95% queue length Control Delay							679 0.90 11.41 39.1	

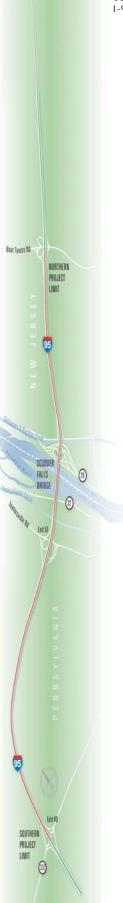
Worksheet 11-Shared Major LT Impedance and Delay

	Movement 2	Movement 5
p(oj)	1.00	1.00
v(i1), Volume for stream 2 or 5 v(i2), Volume for stream 3 or 6		
s(il), Saturation flow rate for stream 2 or 5 s(i2), Saturation flow rate for stream 3 or 6 P*(oj)		
d(M,LT), Delay for stream 1 or 4 N, Number of major street through lanes d(rank,1) Delay for stream 2 or 5		



Contract C-393A, Capital Project No. CP0301A, Account No. 7161-06-012 I-95/Scudder Falls Bridge Improvement Project

I-95 Mainline Analysis 2003 Existing PM Peak



Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analyst:	Jason Wiggins		
Agency or Company:	DMJM+HARRIS		
	2/12/2004		
Analysis Time Period:			
	I-95 Northbound		
rom/To:	btw exits 46 & 4	9	
Jurisdiction:		_	
Analysis Year:	•		
Description: Scudder			
	Flow Inputs and	Adjustments	
Volume, V		2265	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, vl	5	615	v
Trucks and buses		6	ġ.
Recreational vehicles		0	0
Terrain type:		Grade	
Grade		0.05	<u>9.</u>
Segment length		0.33	mi
Frucks and buses PCE,	ET	1.5	
Recreational vehicle P	CE, ER	1.2	
Heavy vehicle adjustme		0.971	
Driver population fact		1.00	
Flow rate, vp	· •	1268	pc/h/ln
	Speed Inputs an	d Adjustments	
Lane width		12.0	£t
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed:		Measured	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adju	stment, fLC	0.0	mi/h
Interchange density ad		0.0	mi/h
Number of lanes adjust		4.5	mi/h
Free-flow speed, FFS		65.0	mi/h
-		Urban Freewa	У
	LOS and Perform	ance Measures	
Flow rate, vp		1268	pc/h/ln
Free-flow speed, FFS		65.0	mi/h
7		65 0	må /b

Phone: E-mail:	Fax:	
	onal Analysis	
Operativ	onds andry oro	
Analyst: Jason Wie	ggins	
Agency or Company: DMJM+HAR		
Date Performed: 2/12/200	4	
Analysis Time Period: PM Peak		
Freeway/Direction: I-95 Nor		
	s 49 & 51	
Jurisdiction: Bucks Co		
Analysis Year: 2003 Exi	sting	
Description: Scudder Falls		
Flow In	puts and Adjustments	
Volume, V	1594	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	433	V
Trucks and buses	6	ojo
Recreational vehicles	0	8
Terrain type:	Grade	
Grade	-3,00	0,00
Segment length	0.47	mi
Trucks and buses PCE, ET	1 . 5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.971	
Driver population factor, fp	1.00	//1
Flow rate, vp	892	pc/h/ln
Speed I	nputs and Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance		ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	-
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fL		mi/h
Interchange density adjustment,		mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	1
LOS and	Performance Measures	
Flow rate, vp	892	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Acceptable to the second of C	65.0	mi/b

Phone: E-mail:		Fax:	
	Operational Anal	lysis	
nnaluet.			
Analyst: Agency or Company:	Jason Wiggins DMJM+HARRIS		
Date Performed:	2/12/2004		
Analysis Time Period:			
Freeway/Direction:	I-95 Northbound		
From/To:	btw exits 51 & 1		
·	Bucks County		
Analysis Year:			
Description: Scudder	_		
	Flow Inputs and	Adjustments	
Volume, V		1570	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, vl	5	427	V
Trucks and buses		6	9
Recreational vehicles		0	o _j o
Terrain type:		Grade	
Grade		0.73	o;o
Segment length		0.49	mi
Frucks and buses PCE,		1,5	
Recreational vehicle P		1.2	
Heavy vehicle adjustme		0.971	
Driver population fact	or, fp	1.00	
Flow rate, vp		879	pc/h/ln
	Speed Inputs and	d 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:		Measured	
FFS or BFFS		65.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adju		0.0	mi/h
Interchange density ad	-	0.0	mi/h
Number of lanes adjust	ment, iN	4.5	mi/h
Free-flow speed, FFS		65.0	mi/h
		Urban Freeway	/
	LOS and Perform	ance Measures	
Flow rate, vp		879	pc/h/ln
Free-flow speed, FFS		65.0	mi/h
Attorney packages car	amaad C	65 0	mi/h

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
	man and many district the second		
Analyst:	Jason Wiggins DMJM+HARRIS		
Agency or Company: Date Performed:	2/12/2004		
Analysis Time Period:			
reeway/Direction:	I-95 Northbound		
	btw exits 1 & 2		
	Mercer County		
Analysis Year:			
Description: Scudder	_		
	Flow Inputs and	Adjustments	
Jolume, V		1419	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v1	5	386	V
Trucks and buses		6	<u>0</u>
Recreational vehicles		0	8
Cerrain type:		Grade	
Grade		3.10	<u>0.</u> 'ô
Segment length		0.75	mi
Trucks and buses PCE, ET		2.0	
Recreational vehicle PCE, ER		3 , 0	
Heavy vehicle adjustment, fHV		0.943	
Driver population fact	or, fp	1.00	
Flow rate, vp		545	pc/h/ln
	Speed Inputs an	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		3	
Free-flow speed:		Measured	
FFS or BFFS	~~~	70.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adju		0.0	mi/h
Interchange density ad		0.0	mi/h
Number of lanes adjust	ment, IN	3.0	mi/h
Free-flow speed, FFS		70.0 Urban Freeway	mi/h
	LOS and Perform	nance Measures	
Flow rate, vp		545	pc/h/ln
Free-flow speed, FFS		70.0	mi/h
	speed s	70.0	mi/h

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analyst:	Jason Wiggins		
Agency or Company:	DMJM+HARRIS		
	2/12/2004		
Analysis Time Period:			
	I-95 Northbound		
From/To:	btw exits 2 & 3		
Jurisdiction:	Mercer County		
Analysis Year:	2003 Existing		
Description: Scudder F	alls		
	Flow Inputs and	Adjustments	
Volume, V		1745	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v15		474	v
Trucks and buses		6	o _o
Recreational vehicles		0	O.O
Terrain type:		Level	
Grade		0.00	%
Segment length		0.00	mi
Trucks and buses PCE, E		1.5	
Recreational vehicle PC		1.2	
Heavy vehicle adjustmer		0.971	
Driver population facto	or, fp	1.00	4. 4.
Flow rate, vp		651	pc/h/ln
	Speed Inputs an	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		3	
Free-flow speed:		Measured	
FFS or BFFS	~~~~	70.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density add		0.0	mi/h
Number of lanes adjustm	ient, IN	3.0	mi/h
Free-flow speed, FFS		70.0 Urban Freeway	mi/h
	LOS and Perform		
Elou nato m	·········	 651	ng/h/ln
Flow rate, vp		651 70.0	pc/h/ln
Free-flow speed, FFS		70.0	mi/h

Phone: E-mail:	Fax:
	3
Operationa	l Analysis
Analyst: Jason Wiggi	ns
Agency or Company: DMJM+HARRIS	
Date Performed: 2/12/2004	
Analysis Time Period: PM Peak	
Freeway/Direction: I-95 Southb	
From/To: btw exits 3	₹ 2
Jurisdiction: Mercer Coun	ty
Analysis Year: 2003 Existi	ng
Description: Scudder Falls	
Flow Input	s and Adjustments
Volume, V	3605 veh/h
Peak-hour factor, PHF	0.92
Peak 15-min volume, v15	980 v
Trucks and buses	6
Recreational vehicles	0 %
Terrain type:	Level
Grade	0.00 %
Segment length	0.00 mi
Trucks and buses PCE, ET	1.5
Recreational vehicle PCE, ER	1.2
Heavy vehicle adjustment, fHV	0.971
Driver population factor, fp	1.00
Flow rate, vp	1345 pc/h/ln
Speed Inpu	its and Adjustments
Lane width	12.0 ft
Right-shoulder lateral clearance	6.0 ft
Interchange density	0.50 interchange/mi
Number of lanes, N	3
Free-flow speed:	Measured
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, fII	
Number of lanes adjustment, fN	3.0 mi/h
Free-flow speed, FFS	70.0 mi/h
illo lion opoda, ilo	Urban Freeway
LOS and Pe	erformance Measures
Flow rate, vp	1345 pc/h/ln
Free-flow speed, FFS	70.0 mi/h
race trow speed, tro	70.0 mi/h

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analyst: Agency or Company: Date Performed: Analysis Time Period: Freeway/Direction: From/To: Jurisdiction: Analysis Year: Description: Scudder	I-95 Southbound btw exits 2 & 1 Mercer County 2003 Existing		
bescription. bedader	Flow Inputs and	Adiustments	
	rrow riipaco ana	114 J 43 cmc1163	
Volume, V Peak-hour factor, PHF	_	4074 0.92	veh/h
Peak 15-min volume, v1	5	1107	v
Trucks and buses Recreational vehicles		6 0	රූර වැට
Terrain type:		Grade	6
Grade		-3.10	o o
Segment length		0.75	mi
Trucks and buses PCE,	ET	1,5	
Recreational vehicle P		1.2	
Heavy vehicle adjustme		0.971	
Driver population fact		1.00	
Flow rate, vp		1520	pc/h/ln
	Speed Inputs an	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		3	3 · · · · ··
Free-flow speed:		Measured	
FFS or BFFS		70.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adju		0.0	mi/h
Interchange density ad	_	0.0	mi/h
Number of lanes adjust	ment, fN	3,0	mi/h
Free-flow speed, FFS		70.0 Urban Freeway	mi/h
	LOS and Perform	_	
Flow rate, vp		1520	pc/h/ln
Free-flow speed, FFS		70.0	mi/h
NVOKAGO PACCORGOY-CAY	chood 9	60 7	mi/b

Phone: E-mail:		Fax:	
	Operational Anal	lysis	
Analyst:	Jason Wiggins		
Agency or Company:	DMJM+HARRIS		
Date Performed:	2/12/2004		
Analysis Time Period:			
Freeway/Direction:	I-95 Southbound		
From/To:	btw exits 1 & 51		
	Mercer County		
Analysis Year:	-		
Description: Scudder E	dils		
	Flow Inputs and	Adjustments	
Volume, V		4183	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v15	5	1137	v
Trucks and buses		6	06
Recreational vehicles		0	o,
Terrain type:		Grade	
Grade		-0.73	0,
Segment length		0.49	mi
Trucks and buses PCE, ET		1.5	
Recreational vehicle PCE, ER		1.2	
Heavy vehicle adjustmen		0.971	
Driver population factor	or, fp	1.00	45. 45
Flow rate, vp		2342	pc/h/ln
	Speed Inputs and	d 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:		Measured	
FFS or BFFS		65.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density ad		0.0	mi/h
Number of lanes adjustr	ment, fN	4.5	mi/h
Free-flow speed, FFS		65.0	mi/h
		Urban Freeway	
	LOS and Perform	ance Measures	
Flow rate, vp		2342	pc/h/ln
Free-flow speed, FFS		65.0	mi/h
There was a second and a second and a		E 2 E	mi/h

Phone: E-mail:		Fax:	
	Operational Analy	ysis	***************************************
Analyst:	Jason Wiggins		
Agency or Company:	DMJM+HARRIS		
-	2/12/2004		
Analysis Time Period:			
	I-95 Southbound		
From/To:	btw exits 51 & 49		
•	Bucks County		
Analysis Year:	2003 Existing		
Description: Scudder Fa			
	Flow Inputs and A	Adjustments	
Volume, V		3402	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v15		924	V
Trucks and buses		6	ο, _ο
Recreational vehicles		0	o o
Terrain type:		Grade	
Grade		3.00	ું ક
Segment length		0.47	mi.
Trucks and buses PCE, E'	r	1.5	
Recreational vehicle PC	E, ER	1.2	
Heavy vehicle adjustmen	t, fHV	0.971	
Driver population facto	r, fp	1.00	
Flow rate, vp		1904	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:		Measured	
FFS or BFFS		65.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density adj	ustment, fID	0.0	mi/h
Number of lanes adjustm	ent, fN	4.5	mi/h
Free-flow speed, FFS		65.0	mi/h
		Urban Freeway	
<u></u>	LOS and Performa	nce Measures	
Flow rate, vp		1904	pc/h/ln
Free-flow speed, FFS		65.0	mi/h
The made opena, its		62.6	mi/h

Phone: E-mail:		Fax:	
	Operational Anal	ysis	
Analyst:	Jason Wiggins		
Agency or Company:			
	2/12/2004		
Analysis Time Period:			
Freeway/Direction:	I-95 Southbound		
From/To:	btw exits 49 & 46	;	
	Bucks County		
Analysis Year:			
Description: Scudder E	Talls		
	Flow Inputs and	Adjustments	
Volume, V		3523	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v15		957	V
Trucks and buses		6	o ₀
Recreational vehicles		0	o o
Terrain type: Grade		Grade	0
		-0.05	9
Segment length	r m	0.33 1.5	mi
Frucks and buses PCE, E Recreational vehicle PC		1.2	
deavy vehicle adjustmer	•	0.971	
Driver population factor		1.00	
Flow rate, vp)	1972	pc/h/ln
, .	Speed Inputs and		E
	speed inputs and	-	
Lane width	-l	12.0	ft
Right-shoulder lateral	crearance	6.0	ft
Interchange density Number of lanes, N		0.50 2	interchange/mi
Free-flow speed:		Z Measured	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fl.W	0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustr		4.5	mi/h
Free-flow speed, FFS	•	65.0	mi/h
- ·		Urban Freeway	
	LOS and Performa	nce Measures	
Flow rate, vp		1972	pc/h/ln
Free-flow speed, FFS		65.0	mi/h
	road s	61 0	i / l-

Phone: E-mail:		F	ax:				
	Diver	ge Ana	lysis				
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description:	PM Peak I-95 Northbour NB off ramp to Bucks County 2003 Existing		2				
	Free	eway Da	ta				
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway	_		Diver 2 65.0 2265	-	mph vph		
	Off F	Ramp Da	ta	**************************************	***************************************		
Side of freeway Number of lanes in ramp Free-Flow speed on ramp Volume on ramp Length of first accel/o Length of second accel/o	ecel lane		Right 1 35.0 1178 850		mph vph ft ft		
	Adjacent Ramp	Data	(if o	ne exists	s)		
Does adjacent ramp exist Volume on adjacent ramp Position of adjacent ra Type of adjacent ramp Distance to adjacent ra	nmp		Yes 507 Downs On 2530	tream	vph ft		
Сог	version to pc/h	n Under	Base	Conditio	ons		
Junction Components		Freew	ay	Ramp		Adjace Ramp	nt
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles	;	2265 0.92 615 6		1178 0.92 320 7 0		507 0.92 138 4 0	vph v %
Terrain type: Grade		Level	Po m i	Level 0.00	oo oo	Level	% mi

```
0.971
                                       0.966
                                                0.980
Heavy vehicle adjustment, fHV
Driver population factor, fP
                             1.00
                                       1.00
                                                1.00
Flow rate, vp
                             2536
                                       1325
                                                562
                                                        pcph
                Estimation of V12 Diverge Areas_____
             L ==
                         (Equation 25-8 or 25-9)
              ΕQ
             P ==
                  1.000 Using Equation 0
              FD
             v = v + (v - v) P = 2536 pc/h
              12 R F R FD
              Capacity Checks_____
                                           LOS F?
                    Actual
                               Maximum
                    2536
   v = v
                               4700
                                            No
    Fi F
                    2536
                               4400
                                            No
    12
                    1211
                               4700
                                            No
   v = v - v
    FO F R
                    1325
                               2000
                                            ИО
   v
    R
   Level of Service Determination (if not F)_____
                  D = 4.252 + 0.0086 v - 0.009 L = 18.4 pc/mi/ln
Density,
                        12
Level of service for ramp-freeway junction areas of influence B
           Speed Estimation
Intermediate speed variable,
                                 D = 0.547
Space mean speed in ramp influence area,
                                 s = 52.4
Space mean speed in outer lanes,
                                 S = N/A
                                            mph
Space mean speed for all vehicles,
                              S = 52.4
                                            mph
```

Phone: E-mail:		F	ax:				
	Merge	Analy	sis				
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Scudder F	PM Peak I-95 Northboun NB On ramp fro Bucks County 2003 Existing		2				
	Free	way Da	ta			······································	reliable delete in the later and resident an
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway	-		Merge 2 65.0 1087		mph vph		
	On R	amp Da	ta				
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/d Length of second accel/	ecel lane		Right 1 35.0 507 1375		mph vph ft ft		
	Adjacent Ramp	Data	(if on	e exists	s)		*****************************
Does adjacent ramp exis Volume on adjacent Ramp Position of adjacent Ra Type of adjacent Ramp Distance to adjacent Ra	mp		Yes 1178 Upstre Off 2530	am	vph ft		
Con	version to pc/h	Under	Base	Conditio	ns		
Junction Components		Freew	ay	Ramp		Adjacent Ramp	
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade		1087 0.92 295 6 0 Level	-	507 0,92 138 4 0 Level	o;o	1178 0.92 320 7 0 Level	vph v %

```
0.980
Heavy vehicle adjustment, fHV
                           0.971
                                             0.966
Driver population factor, fP
                           1.00
                                    1.00
                                             1.00
Flow rate, vp
                           1217
                                    562
                                            1325
                                                    pcph
              Estimation of V12 Merge Areas_____
            L =
                       (Equation 25-2 or 25-3)
             ΕQ
             P = 1.000 Using Equation 0
            v = v (P) = 1217 pc/h
             12 F FM
            ____Capacity Checks_____
                                    LOS F?
                   Actual
                             Maximum
   V
                   1779
                             4700
                                        No
    FO
                   1779
                          4600 No
    R12
       Level of Service Determination (if not F)
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 10.5
                                                  pc/mi/ln
         R 12 A
Level of service for ramp-freeway junction areas of influence B
       Speed Estimation
Intermediate speed variable,
                              M = 0.248
Space mean speed in ramp influence area,
                              s = 59.3
Space mean speed in outer lanes,
                               S = N/A
                                         mph
Space mean speed for all vehicles, S = 59.3
                                         mph
```

Phone: E-mail:		1	ax:				
	Diver	ge Ana	alysis_	,			
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Scudder F	PM Peak I-95 Southbound SB Off Ramp to Bucks County 2003 Existing	i PA332	2				
	Free	way Da	ata				
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway			Diverg 2 65.0 3402		mph vph		
	Off R	amp Da	ata				
Side of freeway Number of lanes in ramp Free-Flow speed on ramp Volume on ramp Length of first accel/d Length of second accel/	ecel lane		Right 1 35.0 1135 850		mph vph ft ft		
	Adjacent Ramp	Data	(if or	ne exists	3)		
Does adjacent ramp exis Volume on adjacent ramp Position of adjacent ra Type of adjacent ramp Distance to adjacent ra	mp		Yes 1256 Downst On 2525	cream	vph ft		
Con	version to pc/h	Unde	r Base	Conditio	ons		
Junction Components	•	Free	way	Ramp	***************************************	Adjacent Ramp	,
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade		3402 0.92 924 6 0 Leve 0.00	1	1135 0.92 308 7 0 Level 0.00	o,o	1256 0.92 341 6 0 Level 0.00	vph v % %

```
0.971
                                      0.966
                                               0.971
Heavy vehicle adjustment, fHV
Driver population factor, fP
                             1.00
                                               1.00
                                      1.00
Flow rate, vp
                             3809
                                      1277
                                               1406
                                                      pcph
                  Estimation of V12 Diverge Areas_____
             L =
                        (Equation 25-8 or 25-9)
              ΕQ
             P = 1.000 Using Equation 0
              FD
             v = v + (v - v) P = 3809 pc/h
              12 R F R FD
             Capacity Checks
                              Maximum
                                          LOS F?
                    Actual
   v = v
                    3809
                              4700
                                          No
    Fi F
                    3809
                              4400
                                          No
    12
                    2532
                              4700
                                          No
   v = v - v
    FO F R
                    1277
                              2000
                                          No
   V
    R
   Level of Service Determination (if not F)_____
                 D = 4.252 + 0.0086 v - 0.009 L = 29.4 pc/mi/ln
Density,
                       12
Level of service for ramp-freeway junction areas of influence D
         Speed Estimation
Intermediate speed variable,
                                D = 0.543
Space mean speed in ramp influence area, S = 52.5
                                           mph
Space mean speed in outer lanes,
                                S = N/A
                                           mph
                             S = 52.5
Space mean speed for all vehicles,
```

Phone: E-mail:		Fax:				
	Mer	ge Analysis				white to the first the fir
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Scudder F	PM Peak I-95 Southbo SB On ramp f Bucks County 2003 Existin	und				
	Fr	eeway Data	····			
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway		Merge 2 65.0 2267		mph vph		
	On	Ramp Data			Ann in red Annual Annua	
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/c Length of second accel/	lecel lane decel lane	Right 1 35.0 1256 1375		mph vph ft ft		
	Adjacent Ra	mp Data (if o	one exist	s)	······································	***************************************
Does adjacent ramp exist Volume on adjacent Ramp Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp	o ump	Yes 1135 Upst: Off 2525		vph ft		
Cor	nversion to po	:/h Under Base	e Conditi	ons		
Junction Components		Freeway	Ramp		Adjacent Ramp	
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type:	5	2267 0.92 616 6 0 Level	1256 0.92 341 6 0 Level		1135 0.92 308 7 0 Level	vph v %
Grade		o,o		o,o		Š

```
0.971
                                            0.966
Heavy vehicle adjustment, fHV
                           0.971
                                   1.00
                                            1.00
Driver population factor, fP
                           1.00
Flow rate, vp
                           2538
                                   1406
                                            1277
                                                   pcph
              Estimation of V12 Merge Areas
                      (Equation 25-2 or 25-3)
            L =
             ΕQ
            P = 1.000 Using Equation 0
             FM
            v = v (P) = 2538 pc/h
             12 F FM
           Capacity Checks
                                   LOS F?
                  Actual
                            Maximum
                   3944
                            4700
                                       No
   v
    ΕO
                   3944
                           4600 No
   v
    R12
      Level of Service Determination (if not F)
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 27.0
                                                  pc/mi/ln
                    R 12 A
Level of service for ramp-freeway junction areas of influence C
   Speed Estimation
                              M = 0.426
Intermediate speed variable,
Space mean speed in ramp influence area,
                              S = 55.2
Space mean speed in outer lanes,
                              S = N/A
                                        mph
Space mean speed for all vehicles, S = 55.2
                                        mph
```

Phone:

Fax:

E-mail:		ı ar	•				
	Diverg	ge Analy	sis_				
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Scudder F	I-95 Northbound NB off ramp to Bucks County 2003 Existing	Taylors					
	Freev	vay Data	Ĭ			······································	
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway		2 65	verg 5.0 594		mph vph		
	Off Ra	amp Data	à				
Side of freeway Number of lanes in ramp Free-Flow speed on ramp Volume on ramp Length of first accel/c Length of second accel/	lecel lane	1 35 30	ight 5.0 08 50		mph vph ft ft		
	Adjacent Ramp	Data (:	if on	e exists	s)		
Does adjacent ramp exist Volume on adjacent ramp Position of adjacent ramp Distance to adjacent ramp	nmp	1 i Do Oi	es 66 ownst 1 250		vph ft		
Сот	version to pc/h	Under 1	Base	Conditio	ons		
Junction Components	-	Freewa		Ramp	***************************************	Adjacent Ramp	
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade	;	1594 0.92 433 6 0 Level 0.00	o)o	308 0.92 84 5 0 Level 0.00	وزه	166 0.92 45 6 0 Level	vph v %
Table		0.00	1	0.00		0.00	, - 1

```
0.971
                                   0.976
                                           0.971
Heavy vehicle adjustment, fHV
                                   1.00
                                           1.00
Driver population factor, fP
                          1.00
Flow rate, vp
                          1785
                                   343
                                           186
                                                  pcph
                 Estimation of V12 Diverge Areas_____
                      (Equation 25-8 or 25-9)
            L ==
             ΕQ
            P = 1.000 Using Equation 0
             FD
            v = v + (v - v) P = 1785 pc/h
            12 R F R FD
           Capacity Checks_____
                                   LOS F?
                  Actual
                            Maximum
                  1785
                            4700
                                       Νo
   v = v
    Fi F
                  1785 4400
                                      No
    12
                  1442 4700
                                      Νo
   v = v - v
    FO F R
                          2000
                  343
                                No
   v
    R
  Level of Service Determination (if not F)
                D = 4.252 + 0.0086 v - 0.009 L = 12.0 pc/mi/ln
Density,
                     12
Level of service for ramp-freeway junction areas of influence B
       Speed Estimation
                              D = 0.459
Intermediate speed variable,
Space mean speed in ramp influence area, S = 54.4
                                        mph
Space mean speed in outer lanes,
                              S = N/A
                                        mph
                         S = 54.4
Space mean speed for all vehicles,
```

mph

Phone: E-mail:	Fax:						
	Mer	ge Analysis_					
			***************************************	***************************************	Article and the same of the sa		
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Scudder	PM Peak I-95 Northbo NB On ramp f Bucks County 2003 Existin	und rom Taylorsv	ille E				
-	Fr	eeway Data					

Type of analysis Number of lanes in fre	eway	Merg 2					
Free-flow speed on fre		65.0		mph	mnh		
Volume on freeway	cway	1286		vph			
. orame on rrooma,		1100					
	On	Ramp Data		····	***************************************		
Side of freeway		Righ	t				
Number of lanes in ram	р	1					
Free-flow speed on ram	p	35.0		mph			
Volume on ramp		166		vph			
Length of first accel/		455		ft			
Length of second accel	/decel lane			ft			
	Adjacent Ra	mp Data (if	one exist	s)			
Does adjacent ramp exi	st?	Yes					
Volume on adjacent Ram		308		vph			
Position of adjacent R		Upst	ream	•			
Type of adjacent Ramp		Off	Off				
Distance to adjacent R	amp	1250		ft			
Co	nversion to pc	/h Under Bas	e Conditi	ons			
Junction Components		Freeway	Ramp		Adjacent Ramp		
Volume, V (vph)		1286	166		308	vph	
Peak-hour factor, PHF		0.92	0.92		0.92	- t	
Peak 15-min volume, v1	5	349	45		84	v	
Trucks and buses		6	6		5	Q ₀	
Recreational vehicles		0	0		0	O _i O	
Terrain type:		Level	Level		Level		
Grade		Q.C		9	ę	à	
T 3. 3.							

```
0.971
                                    0.971
                                             0.976
Heavy vehicle adjustment, fHV
Driver population factor, fP
                                    1.00
                           1.00
                                             1.00
Flow rate, vp
                           1440
                                    186
                                             343
                                                    pcph
             Estimation of V12 Merge Areas_____
            L =
                       (Equation 25-2 or 25-3)
             ΕQ
            P = 1.000 Using Equation 0
             FM
            v = v (P) = 1440 \text{ pc/h}
             12 F FM
            Capacity Checks_____
                                    LOS F?
                   Actual
                             Maximum
   V
                   1626
                             4700
                                        No
    FΟ
                   1626
                          4600 No
    R12
       Level of Service Determination (if not F)
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 15.2
                                                   pc/mi/ln
         R 12 A
Level of service for ramp-freeway junction areas of influence B
       Speed Estimation_____
Intermediate speed variable,
                              M = 0.309
Space mean speed in ramp influence area, S = 57.9
Space mean speed in outer lanes,
                               S = N/A
                                         mph
Space mean speed for all vehicles, S = 57.9
                                         mph
```

Phone: Fax:							
	Merge	· Analy	sis				***
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Scudder Fa	PM Peak I-95 Northboun NB On ramp fro Bucks County 2003 Existing		orsvil	le W			
	Free	eway Da	ıta				······································
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway	-		Merge 2 65.0 1452		mph vph		
	On F	Ramp Da	ıta				
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/d Length of second accel/d			Right 1 35.0 118 275		mph vph ft ft		
	Adjacent Ramp	Data	(if or	ne exists	;)		
Does adjacent ramp exis Volume on adjacent Ramp Position of adjacent Ram Type of adjacent Ramp Distance to adjacent Ram	qp		Yes 166 Upstre On 910		vph ft		
Con	version to pc/h	n Unde	Base	Conditio	ons		
Junction Components		Freev	vay	Ramp		Adjacent Ramp	
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type:		1452 0.92 395 6 0	1	118 0.92 32 4 0 Level		166 0.92 45 6 0 Level	vph v %
Grade		neve.	Ç Ç	never	O.		oj o

```
Heavy vehicle adjustment, fHV
                           0.971
                                   0.980
                                            0.971
Driver population factor, fP
                           1.00
                                   1.00
                                            1.00
Flow rate, vp
                           1626
                                   131
                                            186
                                                 pcph
            Estimation of V12 Merge Areas_____
            L =
                      (Equation 25-2 or 25-3)
             ΕQ
            P = 1.000 Using Equation 0
             ΕM
            v = v (P) = 1626 pc/h
             12 F FM
           Capacity Checks
                                   LOS F?
                            Maximum
                  Actual
                  1757
                            4700
   V
                                       No
    FO
                           4600
                  1757
                                       No
    R12
       Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 17.4
                                                 pc/mi/ln
         R 12 A
Level of service for ramp-freeway junction areas of influence B
      Speed Estimation
                              M = 0.324
Intermediate speed variable,
Space mean speed in ramp influence area, S = 57.5
Space mean speed in outer lanes,
                              S = N/A mph
                         s = 57.5
Space mean speed for all vehicles,
                                        mph
```

Phone: E-mail:	ax:	•							
	Diver	ge Ana	lys	sis_					
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Scudder F	Jason Wiggins DMJM+HARRIS 2/15/2004 PM Peak I-95 Southboun SB Off Ramp to Bucks County 2003 Existing	.d							
	Free	way Da	ta_						
Type of analysis				verg	е				
Number of lanes in free Free-flow speed on free Volume on freeway		2 65.0 mph 4183 vph							
	Off R	amp Da	ıta_	~~~	·····	~~~~	*****************		
Side of freeway Number of lanes in ramp Free-Flow speed on ramp Volume on ramp Length of first accel/d Length of second accel/	ecel lane		1	, O 4		mph vph ft ft			
	Adjacent Ramp	Data	(i:	f on	e exists	s)	***************************************		
Does adjacent ramp exis Volume on adjacent ramp Position of adjacent ra Type of adjacent ramp Distance to adjacent ra	mp		Yes 44: Dot Of: 79	2 wnst f	ream	vph ft			
Con	version to pc/h	Unde	Ва	ase	Conditio	ons			
Junction Components		Freev	vay		Ramp		Adjace Ramp	nt	
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles		4183 0.92 1137 6 0			584 0.92 159 4 0		442 0.92 120 7		vph v %
Terrain type: Grade		Leve.	L	ojo ,	Level 0.00	0,0	Level	o'o .	

```
0.980
                                               0.966
Heavy vehicle adjustment, fHV
                             0.971
Driver population factor, fP
                                      1.00
                                               1.00
                             1.00
Flow rate, vp
                             4683
                                      647
                                               497
                                                       pcph
                  Estimation of V12 Diverge Areas_____
                        (Equation 25-8 or 25-9)
             L =
              ΕQ
             P = 1.000 Using Equation 0
              FD
             v = v + (v - v) P = 4683 pc/h
              12 R F R FD
              Capacity Checks_____
                               Maximum
                                       LOS F?
                    Actual
                    4683
                               4700
                                           No
   v = v
    Fi F
                    4683
                               4400
                                           Yes
    12
                    4036
                             4700
                                           No
   v = v - v
    FO F R
                    647
                               2000
                                           No
   V
    R
   Level of Service Determination (if not F)______
                 D = 4.252 + 0.0086 v - 0.009 L = 39.6 pc/mi/ln
Density,
                       12
Level of service for ramp-freeway junction areas of influence F
          Speed Estimation
Intermediate speed variable,
                                D = 0.486
Space mean speed in ramp influence area,
                                S = 53.8
Space mean speed in outer lanes,
                                 S = N/A
                                            mph
                             S = 53.8
Space mean speed for all vehicles,
```

Phone: Fax: E-mail:								
	Diver	ge Ana	lysis_					
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Scudder F	PM Peak I-95 Southboun SB Off Ramp to Bucks County 2003 Existing		rsvill	e E				
	Free	eway Da	ta					
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway			Diverg 2 65.0 3599		mph vph			
	Off F	Ramp Da	ta					
Side of freeway Number of lanes in ramp Free-Flow speed on ramp Volume on ramp Length of first accel/o Length of second accel/	ecel lane		Right 1 35.0 442 100		mph vph ft ft			
	Adjacent Ramp	Data	(if on	e exist	s)			
Does adjacent ramp exist Volume on adjacent ramp Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp	nmp		Yes 245 Downst On 1400	ream	vph ft			
Cor	nversion to pc/h	n Under	Base	Conditi	ons			
Junction Components		Freew	ау	Ramp		Adjace Ramp	nt	
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type:	j.	3599 0.92 978 6 0 Level		442 0.92 120 7 0 Level		245 0.92 67 3 0 Level	vph v %	
Grade		0.00	ojo	0.00	° 6	0.00	og m i	

```
0.966
                                               0.985
Heavy vehicle adjustment, fHV
                             0.971
                             1.00
                                      1.00
                                               1.00
Driver population factor, fP
                                               270
Flow rate, vp
                             4029
                                      497
                                                       pcph
                  Estimation of V12 Diverge Areas
                        (Equation 25-8 or 25-9)
             L =
              ΕQ
             P = 1.000 Using Equation 0
              FD
             v = v + (v - v) P = 4029 pc/h
              12 R F R FD
             Capacity Checks
                               Maximum
                                          LOS F?
                    Actual
                    4029
                               4700
                                           No
   v = v
    Fi F
                    4029
                               4400
                                           No
    12
                    3532
                              4700
                                           No
   v = v - v
    FO
       F R
                               2000
                    497
                                           No
   v
    R
  Level of Service Determination (if not F)______
                 D = 4.252 + 0.0086 v - 0.009 L = 38.0 pc/mi/ln
Density,
                       12
Level of service for ramp-freeway junction areas of influence E
           Speed Estimation_____
                                D = 0.473
Intermediate speed variable,
                                S = 54.1
Space mean speed in ramp influence area,
Space mean speed in outer lanes,
                                 S = N/A
                                            mph
                             s = 54.1
Space mean speed for all vehicles,
                                           mph
```

none: Fax:									
	Merge	Analy	sis						
<u> </u>	PM Peak I-95 Southboun SB On ramp fro Bucks County 2003 Existing	nd om Tayl	orsvil	le					
	Free	eway Da	ta			·····			
Type of analysis Number of lanes in freew Free-flow speed on freew Volume on freeway			Merge 2 65.0 3157		mph vph				
	On F	Ramp Da	ita						
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/de Length of second accel/de			Right 1 35.0 245 1265		mph vph ft ft				
	Adjacent Ramp	p Data	(if on	e exists	;)				
Does adjacent ramp exist Volume on adjacent Ramp Position of adjacent Ram Type of adjacent Ramp Distance to adjacent Ram	: ? np		Yes 442 Upstre Off 1400		vph ft				
Con	version to pc/l	h Unde:	Base	Conditio	ons				
Junction Components		Free	way	Ramp		Adjacent Ramp			
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles		3157 0.92 858 6		245 0.92 67 3		442 0.92 120 7	vph v %		
Terrain type: Grade		Leve	L %	Level	9,	Level	8		

```
0.966
                           0.971
                                    0.985
Heavy vehicle adjustment, fHV
                                            1.00
Driver population factor, fP
                           1.00
                                    1.00
                                    270
                                            497
Flow rate, vp
                           3534
                                                   pcph
                 Estimation of V12 Merge Areas_____
            L = (Equation 25-2 or 25-3)
             ΕQ
            P = 1.000 Using Equation 0
            v = v (P) = 3534 pc/h
             12 F FM
            Capacity Checks_____
                                    LOS F?
                             Maximum
                   Actual
                             4700
                   3804
                                        No
   v
    FΟ
                           4600 No
                   3804
    R12
       Level of Service Determination (if not F)
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 27.1 pc/mi/ln
         R 12 A
Level of service for ramp-freeway junction areas of influence C
      Speed Estimation
                              M = 0.407
Intermediate speed variable,
Space mean speed in ramp influence area, S = 55.6
Space mean speed in outer lanes,
                               S = N/A
                                         mph
Space mean speed for all vehicles, S = 55.6
                                         mph
```

Phone: E-mail:		F	ax:				
	Merge	Analy	sis				
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description:	I-95 Northboun NB On ramp fro Mercer County 2003 Existing		:9				
	Free	way Da	ta			·	
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway	-		Merge 2 70.0 1216		mph vph		
	On R	.amp Da	ıta				
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/d Length of second accel/	ecel lane		Right 1 35.0 62 1700		mph vph ft ft		
	Adjacent Ramp	Data	(if on	e exists	s)		
Does adjacent ramp exis Volume on adjacent Ramp Position of adjacent Ra Type of adjacent Ramp Distance to adjacent Ra	mp		Yes 354 Upstre Off 545	am	vph ft		
Con	version to pc/h	unde:	r Base	Conditio	ons		
Junction Components		Free	way	Ramp		Adjacent Ramp	
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles		1216 0.92 330 6 0 Leve		62 0.92 17 4 0		354 0.92 96 5 0	vph v %
Terrain type: Grade		ne ve	00	Level	o _s		Ç.

```
0.976
                           0.971
                                    0.980
Heavy vehicle adjustment, fHV
                                            1,00
Driver population factor, fP
                           1.00
                                    1.00
                                    69
                                             394
Flow rate, vp
                           1361
                                                    pcph
                 Estimation of V12 Merge Areas_____
                 (Equation 25-2 or 25-3)
            L =
             ΕQ
            P = 1.000 Using Equation 0
            v = v (P) = 1361 pc/h
             12 F FM
            Capacity Checks_____
                                    LOS F?
                             Maximum
                   Actual
                             4800
                                        No
                   1430
   v
    FO
                   1430
                           4600
                                        No
    R12
       Level of Service Determination (if not F)
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 5.9
                                                  pc/mi/ln
     R R 12 A
Level of service for ramp-freeway junction areas of influence A
          Speed Estimation
                              M = 0.218
Intermediate speed variable,
Space mean speed in ramp influence area, S = 63.9
                               S = N/A
Space mean speed in outer lanes,
                                         mph
Space mean speed for all vehicles, S = 63.9
                                         mph
```

alysis	***************************************			
pper Rive	r Rd			
Data			·	
		_		
Data				
141 500		mph vph ft ft		
ta (II U	ie exists	' '		
Upstre On	eam	vph ft		
der Base	Conditio	ns		
eeway	Ramp		Adjacent Ramp	
92 7 evel	141 0.92 38 12 0 Level		62 0.92 17 4 0 Level	vph
	DataMerge_2 70.0 1278 DataRight 1 35.0 141 500 ta (if or Yes 62 Upstre On 1640	Merge 2 70.0 1278 Data Right 1 35.0 141 500 ta (if one exists Yes 62 Upstream On 1640 der Base Condition eeway Ramp 78 141 92 0.92 7 38 12 0 evel Level	Merge 2 70.0 mph 1278 vph Data	Merge 2 70.0 mph 1278 vph

```
0.971
                                   0.943
                                            0.980
Heavy vehicle adjustment, fHV
Driver population factor, fP
                           1.00
                                   1.00
                                            1.00
                                            69
Flow rate, vp
                           1431
                                   162
                                                   pcph
               Estimation of V12 Merge Areas_____
                      (Equation 25-2 or 25-3)
            L =
             ΕQ
            P = 1.000 Using Equation 0
            v = v (P) = 1431 pc/h
             12 F FM
            Capacity Checks_____
                                   LOS F?
                            Maximum
                   Actual
                            4800
                                        No
                   1593
   V
    ΕO
                   1593
                          4600 No
    R12
       Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 14.7 pc/mi/ln
         R 12 A
Level of service for ramp-freeway junction areas of influence B
       Speed Estimation
                              M = 0.305
Intermediate speed variable,
Space mean speed in ramp influence area, S = 61.5
Space mean speed in outer lanes,
                              S = N/A
                                         mph
Space mean speed for all vehicles, S = 61.5
                                        mph
```

Phone: Fax: E-mail:							
Dive	rge Analysi:	5					
Analyst: Jason Wiggins							
Analyst: Jason Wiggins Agency/Co.: DMJM+HARRIS	•						
Date performed: 2/15/2004							
Analysis time period: PM Peak							
Freeway/Dir of Travel: I-95 Southbou	ınd						
Junction: SB Off Ramp t							
Jurisdiction: Mercer Count							
Analysis Year: 2003 Existing							
Description: Scudder Falls	•						
Fre	eeway Data						
Tune of analysis	Dive	rae					
Type of analysis Number of lanes in freeway	2						
Free-flow speed on freeway	70.0		mph				
Volume on freeway	4074		vph				
-							
Off	Ramp Data						
Side of freeway	Righ	t					
Number of lanes in ramp	1						
Free-Flow speed on ramp	35.0		mph				
Volume on ramp	252		vph				
Length of first accel/decel lane	2000		ft				
Length of second accel/decel lane			ft				
Adjacent Ran	mp Data (if	one exist	.s)				
Does adjacent ramp exist?	Yes						
Volume on adjacent ramp	361		vph				
Position of adjacent ramp	Down	stream	-				
Type of adjacent ramp	On						
Distance to adjacent ramp	880		ft				
Conversion to pc	/h Under Bas	e Conditi	lons	·····			
Junction Components	Freeway	Ramp		Adjacent	<u>.</u>		
Yalumo Y (xxnh)	4074	252		Ramp 361	vph		
Volume, V (vph) Peak-hour factor, PHF	0.92	0.92		0.92	ΛΡιι		
Peak 15-min volume, v15	1107	68		98	v		
Trucks and buses	6	11		4	v g		
Recreational vehicles	0	0		0	p, o		
Terrain type:	Level	Level		Level	U		
Grade	0.00 %		ojo	0.00	وان		
Tamak b	0.00 %	4 0 00	mi	0.00	ro i		

```
0.971
                                     0.948
                                             0.980
Heavy vehicle adjustment, fHV
Driver population factor, fP
                            1.00
                                     1.00
                                             1.00
                            4561
                                     289
                                             400
                                                     pcph
Flow rate, vp
             Estimation of V12 Diverge Areas
                       (Equation 25-8 or 25-9)
             L ==
             ΕQ
             P = 1.000 Using Equation 0
             v = v + (v - v) P = 4561 pc/h
             12 R F R FD
              Capacity Checks
                                     LOS F?
                             Maximum
                   Actual
                             4800
                                         No
                   4561
   v = v
    Fi F
                   4561
                         4400
                                        Yes
    12
                   4272 4800
                                         No
   v = v - v
    FO F R
                   289
                             2000
                                         No
   V
    R
  Level of Service Determination (if not F)______
                 D = 4.252 + 0.0086 v - 0.009 L = 25.5 pc/mi/ln
Density,
                      12
Level of service for ramp-freeway junction areas of influence F
       Speed Estimation
                                 D = 0.454
Intermediate speed variable,
Space mean speed in ramp influence area, S = 57.3
                                S = N/A
Space mean speed in outer lanes,
                                          mph
                          s = 57.3
Space mean speed for all vehicles,
                                          mph
```

Phone: E-mail:		F	ax:				
	Merge	Analy	sis				
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Scudder E	PM Peak I-95 Southbound SB On ramp from Mercer County 2003 Existing		9				
	Free	way Da	ta				
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway			Merge 2 70.0 3822		mph vph		
	On R	amp Da	ıta				
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/c Length of second accel/	decel lane		Right 1 35.0 361 338		mph vph ft ft		
	Adjacent Ramp	Data	(if on	e exists	s)		
Does adjacent ramp existing Volume on adjacent Ramp Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp	o amp		Yes 252 Upstre Off 880	am	vph ft		
Cor	nversion to pc/h	Unde	Base	Conditio	ons		
Junction Components		Free	√ay	Ramp		Adjacent Ramp	
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v1 Trucks and buses Recreational vehicles Terrain type:	5	3822 0.92 1039 6 0 Leve	1.	361 0.92 98 4 0 Level		252 0.92 68 11 0 Level	vph v %
Grade			o,o		0,0	Ş	i

```
0.971
                                    0.980
                                             0.948
Heavy vehicle adjustment, fHV
Driver population factor, fP
                           1.00
                                    1.00
                                            1.00
                           4279
                                    400
                                             289
                                                    pcph
Flow rate, vp
               Estimation of V12 Merge Areas
                       (Equation 25-2 or 25-3)
            L =
             ΕQ
            P = 1.000 Using Equation 0
            v = v (P) = 4279 pc/h
             12 F FM
             Capacity Checks
                                    LOS F?
                             Maximum
                   Actual
                             4800
                                        No
                   4679
   v
    FO
                           4600 Yes
                   4679
    R12
        Level of Service Determination (if not F)
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 39.7 pc/mi/ln
                       12 A
         R
Level of service for ramp-freeway junction areas of influence F
 Speed Estimation_____
                              M = 0.717
Intermediate speed variable,
Space mean speed in ramp influence area, S = 49.9
Space mean speed in outer lanes,
                               S = N/A
                                         mph
                          s = 49.9
Space mean speed for all vehicles,
                                         mph
```

Phone: E-mail:										
	Diverg	je Ana	lysi	5						
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Scudder F	I-95 Northbound NB Off Ramp to Mercer County 2003 Existing		Tave	rn	Rd					
	Freev	vay Da	ta		······························				***********	
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway	_		Dive 3 70.0 1419			mph vph				
	Off Ra	amp Da	ta				**************************************		***************************************	
Side of freeway Number of lanes in ramp Free-Flow speed on ramp Volume on ramp Length of first accel/c Length of second accel/	decel lane		Righ 1 35.0 226 1210			mph vph ft ft				
	Adjacent Ramp	Data	(if	one	e exists)			-A	
Does adjacent ramp exist Volume on adjacent ramp Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp	amp		Yes 552 Down On 2545		ream	vph ft				
_	version to pc/h	Undei	~ Bas	e (Conditio	ns				
Junction Components		Free			Ramp		Adjacent Ramp			
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade	5	1419 0.92 386 6 0 Level	L %		226 0.92 61 3 0 Level 0.00	0,0	552 0.92 150 4 0 Level 0.00	o'o	vph v %	
The same and the s		0,00	-	4	0.00	mi	0 00	m i		

```
0.980
                            0.971
                                     0.985
Heavy vehicle adjustment, fHV
Driver population factor, fP
                                              1.00
                            1.00
                                     1.00
                            1589
                                     249
                                              612
                                                      pcph
Flow rate, vp
                  Estimation of V12 Diverge Areas
                        (Equation 25-8 or 25-9)
             L =
              ΕQ
             P = 0.709 Using Equation 5
             v = v + (v - v) P = 1199 pc/h
             12 R F R FD
              Capacity Checks
                                          LOS F?
                              Maximum
                    Actual
                    1589
                              7200
                                          No
   v = v
    Fi F
                    1199
                             4400
                                          No
    12
                    1340 7200
                                          No
   v = v - v
       F R
    FΟ
                    249
                              2000
                                          No
   v
    R
  Level of Service Determination (if not F)_____
                 D = 4.252 + 0.0086 v - 0.009 L = 3.7 pc/mi/ln
Density,
                      12
Level of service for ramp-freeway junction areas of influence A
   Speed Estimation_____
                                D = 0.450
Intermediate speed variable,
Space mean speed in ramp influence area,
                               S = 57.4
                                           mph
Space mean speed in outer lanes,
                                 s = 76.8
                                           mph
                            S = 61.2
Space mean speed for all vehicles,
                                           mph
```

Phone: E-mail:		E	ax:				
	Merge	Analy	sis				
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Scudder F	I-95 Northbound NB On ramp from Mercer County 2003 Existing		. Taver	n Rd			
	Free	way Da	ata				
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway			Merge 3 70.0 1193		mph vph		
	On R	amp Da	ata				
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/c Length of second accel/	lecel lane		Right 1 35.0 552 1150		mph vph ft ft		
	Adjacent Ramp	Data	(if on	e exists	;)		
Does adjacent ramp exist Volume on adjacent Ramp Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp	nmp		Yes 226 Upstre Off 2545	am	vph ft		
Cor	nversion to pc/h	Unde	r Base	Conditio	ns		
Junction Components	-	Free		Ramp		Adjacent Ramp	
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, vl: Trucks and buses Recreational vehicles Terrain type: Grade	ő	1193 0.92 324 6 0 Leve		552 0.92 150 4 0 Level	Q'O	226 0.92 61 3 0 Level	vph v %

```
0.980
                                              0.985
                            0.971
Heavy vehicle adjustment, fHV
Driver population factor, fP
                            1.00
                                     1.00
                                              1.00
                            1336
                                      612
                                              249
                                                      pcph
Flow rate, vp
                Estimation of V12 Merge Areas_____
             L = 355.67 (Equation 25-2 or 25-3)
              ΕQ
             P = 0.610 Using Equation 1
             v = v (P) = 815 pc/h
             12 F FM
              Capacity Checks_____
                                     LOS F?
                    Actual
                              Maximum
                              7200
                                          No
                    1948
   V
    FO
                            4600 No
                    1427
   v
    R12
   Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 9.1
                                                     pc/mi/ln
                      R 12
Level of service for ramp-freeway junction areas of influence A
     Speed Estimation_____
                               M = 0.257
Intermediate speed variable,
Space mean speed in ramp influence area, S = 62.8
                                 s = 69.9
Space mean speed in outer lanes,
Space mean speed for all vehicles,
                           s = 64.6
```

Phone: E-mail:	Fax:								
	Merge	Analy	sis		·····				
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Scudder F	I-95 Southboun SB On ramp fro Mercer County 2003 Existing		Taver	n E					
	Free	way Da	ta			······································			
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway	•		Merge 3 70.0 3667		mph vph				
	On F	Ramp Da	ıta	***************************************					
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/d Length of second accel/	ecel lane		Right 1 35.0 407 1203		mph vph ft ft				
	Adjacent Ramp	Data	(if or	e exists	;)				
Does adjacent ramp exis Volume on adjacent Ramp Position of adjacent Ra Type of adjacent Ramp Distance to adjacent Ra	mp		Yes 265 Upstre Off 440	eam	vph ft				
Con	version to pc/h	n Unde:	r Base	Conditio	ons				
Junction Components		Free	way	Ramp		Adjacent Ramp			
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type:		3667 0.92 996 6 0 Leve		407 0.92 111 2 0 Level		265 0.92 72 6 0 Level	vph v %		
Grade		-	 		0,0		0,0		

m i m i m i

```
Heavy vehicle adjustment, fHV
                            0.971
                                     0.990
                                              0.971
Driver population factor, fP
                            1.00
                                     1,00
                                              1.00
                                     447
                                              297
Flow rate, vp
                            4105
                                                     pcph
                  Estimation of V12 Merge Areas
             L = 936.46 (Equation 25-2 or 25-3)
             ΕQ
             P = 0.580 Using Equation 2
             FM
             v = v (P) = 2380 pc/h
             12 F FM
             Capacity Checks
                                     LOS F?
                   Actual
                              Maximum
                              7200
   v
                   4552
                                         No
    FΟ
                   2827
                            4600 No
    R12
        Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 19.8 pc/mi/ln
          R
                              12
Level of service for ramp-freeway junction areas of influence B
  Speed Estimation____
Intermediate speed variable,
                               M = 0.303
Space mean speed in ramp influence area, S = 61.5
Space mean speed in outer lanes,
                                S = 65.6
Space mean speed for all vehicles, S = 63.0
                                          mph
```

Phone: Fax: E-mail: Operational Analysis_____ Analyst: Jason Wiggins Agency/Co.: DMJM+HARRIS Date Performed: 2/16/2004 Analysis Time Period: PM Peak Freeway/Dir of Travel: I-95 Southbound Weaving Location: Bear Tavern Road Jurisdiction: Mercer County
Analysis Year: 2003 Existing Description: Scudder Falls Inputs____ 70 Freeway free-flow speed, SFF mph Weaving number of lanes, N 4 304 Weaving segment length, L ft Terrain type Level Grade 95 mi Length Weaving type A 0.15 Volume ratio, VR Weaving ratio, R 0.45 Conversion to pc/h Under Base Conditions Non-Weaving Weaving V V V V A-CB-DA-D B-C 265 0 327 veh/h 3340 Volume, V 0.92 0.92 0.92 Peak-hour factor, PHF 0.92 89 Peak 15-min volume, v15 908 0 72 6 10 Trucks and buses 0 0 0 Recreational vehicles Trucks and buses PCE, ET 1.5 1.5 1.5 1.5 Recreational vehicle PCE, ER 1.2 1.2 1.2 1.2 0.971 0.952 0.971 0.980 Heavy vehicle adjustment, fHV Driver population adjustment, fP 1.00 1.00 1.00 1.00 Flow rate, v 296 362 pc/h 3739 Weaving and Non-Weaving Speeds Weaving Non-Weaving 0.15 0.0035 a (Exhibit 24-6) 2.20 4.00 b (Exhibit 24-6)

0.97

0.80

1 07

c (Exhibit 24-6)

d (Exhibit 24-6)

Manusium intermetty factor Mi

1.30

0.75

0.75

unconstrained operation, Nw (Exhibit 24-7) 0.79
Maximum number of lanes, Nw (max) (Exhibit 24-7) 1.40
Type of operation is Unconstrained

Weaving Segment Speed, Density, Level of Service and Capacity

Weaving segment speed, S 46.61 mph Weaving segment density, D 23.58 pc/mi/ln Level of service, LOS C Capacity of base condition, cb 7005 pc/h Capacity as a 15-minute flow rate, c 6801 pc/h Capacity as a full-hour volume, ch 6257 pc/h

Limitations on Weaving Segments

		If Max Exce	eded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	658	2800	a
Average flow rate (pcphpl)	1099	2400	b
Volume ratio, VR	0.15	0.35	С
Weaving ratio, R	0.45	N/A	d
Weaving length (ft)	304	2500	e
Mohama			

Notes:

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

HCS+: Unsignalized Intersections Release 5.21 TWO-WAY STOP CONTROL SUMMARY Analyst: Jason Wiggins DMJM+HARRIS Agency/Co.: 2/17/2004 Date Performed: Analysis Time Period: PM Peak Intersection: I-95 SB Off Ramp Mercer County Jurisdiction: Units: U. S. Customary 2003 Existing Analysis Year: Project ID: Scudder Falls East/West Street: NJ 29 North/South Street: off ramp Study period (hrs): 0.25 Intersection Orientation: EW Vehicle Volumes and Adjustments Eastbound Westbound Major Street: Approach 2 5 6 Movement 1 3 | 4 l L 133 Volume 0.92 Peak-Hour Factor, PHF 144 Hourly Flow Rate, HFR Percent Heavy Vehicles Median Type/Storage Undivided RT Channelized? 1 Lanes T Configuration Upstream Signal? No No Southbound Minor Street: Approach Northbound 1 10 11 Movement 8 9 12 Т R \mathbf{T} R L L 112 Volume 0.92 Peak Hour Factor, PHF 121 Hourly Flow Rate, HFR 0 Percent Heavy Vehicles Percent Grade (%) Flared Approach: Exists?/Storage Lanes Configuration

	Delay,	Queue	Le	ngth,	and I	evel	. of	Ser	vice	?	
Approach	EB	WB		N	orthbo	ound				Southbound	
Movement	1	4	1	7	8		9	-	10	11	12
Lane Config			1					1		T	
v (vph)										121	
C(m) (vph)										751	
v/c										0.16	
95% queue length										0.57	
Control Delay										10.7	
LOS										В	
Approach Delay										10.7	
TOF										ם	

Fax: Phone: E-Mail: TWO-WAY STOP CONTROL(TWSC) ANALYSIS Analyst: Jason Wiggins DMJM+HARRIS Agency/Co.: 2/17/2004 Date Performed: Analysis Time Period: PM Peak I-95 SB Off Ramp Intersection: Mercer County Jurisdiction: Units: U. S. Customary 2003 Existing Analysis Year: Project ID: Scudder Falls East/West Street: NJ 29 North/South Street: off ramp Study period (hrs): 0.25 Intersection Orientation: EW Vehicle Volumes and Adjustments 6 3 2 Major Street Movements 1 L T R L 133 Volume 0.92 Peak-Hour Factor, PHF 36 Peak-15 Minute Volume 144 Hourly Flow Rate, HFR Percent Heavy Vehicles Median Type/Storage Undivided RT Channelized? 1 Lanes T Configuration Upstream Signal? No No 10 11 Minor Street Movements T R L T R L 112 Volume 0.92 Peak Hour Factor, PHF 3.0 Peak-15 Minute Volume 121 Hourly Flow Rate, HFR Percent Heavy Vehicles 0 Percent Grade (%) Flared Approach: Exists?/Storage RT Channelized? 1 Lanes Т Configuration

Pedestrian Volumes and Adjustments

Percent Blockage	:/sec)	-	. 0	12.0 4.0 0	12.0 4.0 0	12.0 4.0 0		
		U	pstrea	m Signa	al Dat	a		
	Prog.	Sat	Arri	val (Green	Cycle	Prog.	Distance
	Flow	Flow	Тур	e '	rime	Length	Speed	to Signal
	vph	vph	wit **-		sec	sec	mph	feet
S2 Left-Turn	·····				~			
Through								
S5 Left-Turn								
Through								
Worksheet 3-Data	for Co	mputing	, Effec	t of D	elay t	o Major	Street V	ehicles
		·	4-4		Movem	ient 2	Moveme	ent 5
Number of major s 				·····	e Calc	culation		·····
Critical Gap Cal	culatio	n			·····		·····	
			7	8	9	10		
Movement	1	4	,		9	10	11	12
Movement	L	4 L	Ĺ	T	R	T.	T	12 R
Movement t(c,base)	L	Ľ	L	T	R	L	T 6.5	R
		=			R	L	T 6.5	
t(c,base) t(c,hv) P(hv)	L	Ľ	L	T	1.0)0 1.00	6.5 0 1.00 0	1.00 0.10
t(c,base) t(c,hv)	L	Ľ	1.00	T 1.00	1.0 0.1	L 00 1.00	6.5 1.00 0 0 0.20 0 0.00	1.00
t(c,base) t(c,hv) P(hv) t(c,g)	L	Ľ	1.00 0.20	1.00 0.20 0.00	1.0 0.1 0.0	L 00 1.00 1.00 0.00	6.5 1.00 0 0.20 0.00 0.00	1.00 0.10 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Grade/100 t(3,lt) t(c,T): 1-stage	1.00 0.00	1.00 0.00	1.00 0.20 0.00	1.00 0.20 0.00	1.0 0.1 0.0	L 00 1.00 1.00 0.20 0.00 0.00 0.00	T 6.5 1.00 0 0.20 0.00 0.00	R 1.00 0.10 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Grade/100 t(3,lt) t(c,T): 1-stage 2-stage	1.00 0.00 0.00	1.00	1.00 0.20 0.00	1.00 0.20 0.00	1.0 0.1 0.0	L 0.00 0.00 0.00 0.00 0.00	6.5 1.00 0 0.20 0.00 0.00 0.00 0.00	1.00 0.10 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Grade/100 t(3,lt) t(c,T): 1-stage 2-stage t(c) 1-stage	1.00 0.00 0.00	1.00 0.00	1.00 0.20 0.00	1.00 0.20 0.00	1.0 0.1 0.0	L 00 1.00 1.00 0.20 0.00 0.00 0.00	T 6.5 1.00 0 0.20 0.00 0.00	R 1.00 0.10 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Grade/100 t(3,1t) t(c,T): 1-stage 2-stage	1.00 0.00 0.00	1.00 0.00	1.00 0.20 0.00	1.00 0.20 0.00	1.0 0.1 0.0	L 00 1.00 1.00 0.20 0.00 0.00 0.00	6.5 1.00 0 0.20 0.00 0.00 0.00 0.00	R 1.00 0.10 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Grade/100 t(3,lt) t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage Follow-Up Time C	1.00 0.00 0.00	1.00 0.00 0.00	1.00 0.20 0.00 0.00	1.00 0.20 0.00 0.00	1.0 0.1 0.0 0.0	L 00 1.00 1.00 0.00 0.00 0.00 0.00	T 6.5 1.00 0 0.20 0.00 0.00 0.00 0.00 0.5	R 1.00 0.10 0.00 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Grade/100 t(3,lt) t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage Follow-Up Time C	1.00 0.00 0.00	0.00 0.00 0.00	1.00 0.20 0.00 0.00 1.00	1.00 0.20 0.00 0.00 1.00	0.1 0.0 0.0	L 00 1.00 1.00 00 0.00 00 1.00	T 6.5 1.00 0 0.20 0.00 0.00 0.00 0.00 6.5	R 1.00 0.10 0.00 0.00 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Grade/100 t(3,lt) t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage Follow-Up Time C	1.00 0.00 0.00	1.00 0.00 0.00	1.00 0.20 0.00 0.00	1.00 0.20 0.00 0.00	1.0 0.1 0.0 0.0	L 00 1.00 1.00 0.00 0.00 0.00 0.00	T 6.5 1.00 0 0.20 0.00 0.00 0.00 1.00 6.5	R 1.00 0.10 0.00 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Grade/100 t(3,lt) t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage	1.00 0.00 0.00 alculat	0.00 0.00 0.00	1.00 0.20 0.00 0.00 1.00	T 1.00 0.20 0.00 1.00	0.1 0.0 0.0 0.0	L 00 1.00 00 0.00 00 0.00 1.00	T 6.5 1.00 0 0.20 0.00 0.00 0.00 1.00 6.5	R 1.00 0.10 0.00 0.00 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Grade/100 t(3,lt) t(c,T): 1-stage	1.00 0.00 0.00	0.00 0.00 0.00	1.00 0.20 0.00 0.00 1.00	1.00 0.20 0.00 0.00 1.00	0.1 0.0 0.0 0.0	L 00 1.00 00 0.00 00 0.00 1.00	T 6.5 1.00 0 0.20 0.00 0.00 0.00 1.00 6.5	R 1.00 0.10 0.00 0.00 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Grade/100 t(3,1t) t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage Follow-Up Time C Movement t(f,base) t(f,HV) P(HV)	1.00 0.00 0.00 alculat	0.00 0.00 0.00	1.00 0.20 0.00 0.00 1.00	T 1.00 0.20 0.00 1.00	0.1 0.0 0.0 0.0	L 00 1.00 00 0.00 00 0.00 1.00	T 6.5 1.00 0.20 0.00 0.00 0.00 1.00 6.5	R 1.00 0.10 0.00 0.00 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Grade/100 t(3,lt) t(c,T): 1-stage	1.00 0.00 0.00 alculat	0.00 0.00 0.00	1.00 0.20 0.00 0.00 1.00	T 1.00 0.20 0.00 1.00	0.1 0.0 0.0 0.0	L 00 1.00 00 0.00 00 0.00 1.00	T 6.5 1.00 0 0.20 0.00 0.00 0.00 1.00 6.5	R 1.00 0.10 0.00 0.00 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Grade/100 t(3,lt) t(c,T): 1-stage	1.00 0.00 0.00 alculat 1 L 0.90	1.00 0.00 0.00 0.00	1.00 0.20 0.00 0.00 1.00	T 1.00 0.20 0.00 1.00	0.1 0.0 0.0 0.0	L 00 1.00 00 0.00 00 0.00 1.00	T 6.5 1.00 0.20 0.00 0.00 0.00 1.00 6.5	R 1.00 0.10 0.00 0.00 0.00
t(c,base) t(c,hv) P(hv) t(c,g) Grade/100 t(3,1t) t(c,T): 1-stage 2-stage t(c) 1-stage 2-stage Follow-Up Time C Movement t(f,base) t(f,HV) P(HV)	1.00 0.00 0.00 alculat 1 L 0.90	1.00 0.00 0.00 0.00	1.00 0.20 0.00 0.00 1.00	T 1.00 0.20 0.00 1.00	0.1 0.0 0.0 0.0	L 00 1.00 00 0.00 00 0.00 1.00	T 6.5 1.00 0.20 0.00 0.00 0.00 1.00 6.5	R 1.00 0.10 0.00 0.00 0.00

77/+) 77(] nro+) 77/+) 77/] nro+)

```
Total Saturation Flow Rate, s (vph)
Arrival Type
Effective Green, g (sec)
Cycle Length, C (sec)
Rp (from Exhibit 16-11)
Proportion vehicles arriving on green P
g(q1)
g(q2)
g(q)
Computation 2-Proportion of TWSC Intersection Time blocked
                                            Movement 2
                                                               Movement 5
                                         V(t) V(l,prot) V(t) V(l,prot)
alpha
beta
Travel time, t(a) (sec)
Smoothing Factor, F
Proportion of conflicting flow, f
Max platooned flow, V(c, max)
Min platooned flow, V(c,min)
Duration of blocked period, t(p)
                                               0.000
                                                                 0.000
Proportion time blocked, p
                                         Result
Computation 3-Platoon Event Periods
                                         0.000
p(2)
                                         0.000
p(5)
p(dom)
p(subo)
Constrained or unconstrained?
Proportion
unblocked
                            (1)
                                            (2)
                                                            (3)
                                             Two-Stage Process
                        Single-stage
for minor
                                                         Stage II
movements, p(x)
                          Process
                                         Stage I
p(1)
p(4)
p(7)
p(8)
p(9)
p(10)
p(11)
p(12)
 Computation 4 and 5
 Single-Stage Process
                                                           10
                                                                   11
                                                                          12
                         1
Movement
                                                           Ľ
                                                                           R
                         L
                                                                   144
 V c,x
 Рx
 V c,u,x
Cr,x
```

C plat, x

Stagel Stagel Stagel Stagel Stagel Stagel Stagel

Stager Stagez Stager Stage	ez beager beag	ce orages orages
7(c,x)		_
		0
(x)		
(c,u,x)		
(r, x)		
(plat,x)		
orksheet 6-Impedance and Capacity Equation	ıs	
tep 1: RT from Minor St.	9	12
Conflicting Flows		
otential Capacity		
edestrian Impedance Factor	1.00	1.00
ovement Capacity		
robability of Queue free St.	1.00	1.00
tep 2: LT from Major St.	4	1
Conflicting Flows Potential Capacity		
edestrian Impedance Factor	1.00	1.00
ovement Capacity	1.00	1,00
robability of Queue free St.	1.00	1.00
aj L-Shared Prob Q free St.		
tep 3: TH from Minor St.	8	11
Conflicting Flows		144
Potential Capacity		751
Pedestrian Impedance Factor	1,00	1.00
ap. Adj. factor due to Impeding mvmnt	1.00	1.00
Novement Capacity	* 00	751
Probability of Queue free St.	1.00	0.84
Step 4: LT from Minor St.	7	10

Conflicting Flows Potential Capacity		
Pedestrian Impedance Factor	1.00	1.00
Maj. L, Min T Impedance factor	0.84	where it was age
Maj. L, Min T Adj. Imp Factor.	0.88	
Cap. Adj. factor due to Impeding mymnt	0.88	1.00
lovement Capacity		
<u> </u>		
Jorksheet 7-Computation of the Effect of T	wo-stage Gap Acc	ceptance
Step 3: TH from Minor St.	8	11
Part 1 - First Stage		
Conflicting Flows		
Potential Capacity		
Pedestrian Impedance Factor		
The Add forther don to Topodine month		

				······································	·····	
Part 2 - Second Stage						
Conflicting Flows						
Potential Capacity						
Pedestrian Impedance Factor						
Cap. Adj. factor due to Impeding	, mvmnt					
Movement Capacity						
Part 3 - Single Stage	·····					
Conflicting Flows					144	
Potential Capacity					751	
Pedestrian Impedance Factor		1	.00		1.00	
Cap. Adj. factor due to Impeding	, mvmnt	1	.00		1.00	
Movement Capacity					751	
Result for 2 stage process:						······································
a						
y C t					751	
Probability of Queue free St.		1	.00		0.84	
Trongorator or Augus tree of.						
Step 4: LT from Minor St.			7		10	
Part 1 - First Stage						
Conflicting Flows						
Potential Capacity						
Pedestrian Impedance Factor						
Cap. Adj. factor due to Impeding	g mvmnt					
Movement Capacity	-					
Part 2 - Second Stage						
Conflicting Flows						
Potential Capacity						
Pedestrian Impedance Factor						
Cap. Adj. factor due to Impeding	g mvmnt					
Movement Capacity	_					
				···	·····	
Part 3 - Single Stage						
Conflicting Flows						
Potential Capacity						
Pedestrian Impedance Factor			.00		1.00	
Maj. L, Min T Impedance factor			. 8 4			
Maj. L, Min T Adj. Imp Factor.			. 88			
Cap. Adj. factor due to Impedin	g mvmnt	0	.88		1.00	
Movement Capacity						
Results for Two-stage process:					······	
a						
У						
y C t						
				······································		
Worksheet 8-Shared Lane Calcula	tions					
Movement	7	8	9	10	11	12
	L	Т	R	L	T	R
Volume (vph)					121	
Managed Consider (sub)					751	

Worksheet 9-Computation of Effect of Flared Minor Street Approaches

Movement			7 L		8 T	9 R	10 L	11 T	12 R
C sep Volume Delay					-volume to the section of the sectio			751 121	
Q sep Q sep +1 round (Qsep +1)									
n max C sh SUM C sep				***************************************					
n C act									
Worksheet 10-Delay,	Queue	Length,	and Le	evel o	of Se	rvice			
Movement Lane Config	1.	4	7	8		9	10	11 T	12
v (vph) C(m) (vph) v/c	and and the second seco							121 751 0.16	
95% queue length Control Delay LOS								0.57 10.7 B	
Approach Delay Approach LOS								10.7 B	
Worksheet 11-Shared	Major	LT Impe	dance a	and De	elay				
						Moveme	ent 2	Move	ment 5
p(oj) v(il), Volume for st v(i2), Volume for st s(il), Saturation fl s(i2), Saturation fl P*(oj) d(M,LT), Delay for st N, Number of major st d(rank,1) Delay for	cream Low ra Low ra stream	3 or 6 te for s te for s 1 or 4 through	tream .			1.0	00	1	,00

HCS+: Unsignalized Intersections Release 5.21

	TWO-7	WAY STO	OP CONT	ROL SUI	MMARY	<i></i>			
Analyst: Agency/Co.: Date Performed: Analysis Time Period Intersection: Jurisdiction: Units: U. S. Custom Analysis Year: Project ID: Scudde East/West Street: North/South Street: Intersection Orient	DMJM+1 2/17/2 d: PM Per 1-95 Merce ary 2003 er Falls NJ 29 off r	ak NB Off r Coun Existi amp	Ramp ty	S	tudy	period	d (hrs):	0.25	
	Vehic	le Vol	umes ar	nd Adju	stme	nts			
Major Street: App:	roach		stbound			Wes	stbound	***************************************	
	ement	1	2	3	ı	4	5	6	
		L	T	R	1	L	${f T}$	R	
		·····							
Volume							230 0.92		
Peak-Hour Factor, I							249		
Hourly Flow Rate, I				****			247		
Percent Heavy Vehice Median Type/Storage		Undiv	ided			/			
RT Channelized?	=	Onav	raca			,			
Lanes							1		
Configuration							T		
Upstream Signal?			No				No		
	roach		rthbou				uthbound		
Mov	ement	7	8	9		10 L	11 T	12 R	
		L	T	R	1	.1.3	1	11	
Volume							221	····-	
Peak Hour Factor,	PHF						0.92		
Hourly Flow Rate,							240		
Percent Heavy Vehi							0		
Percent Grade (%)			0				0		
Flared Approach:	Exists?/S	Storage	9		/		_		/
Lanes							1		
Configuration							T		
	Delay, Qu	ieue Le	ength,	and Lev	rel c	f Serv	ice		
Approach	EB EB	WB		rthbour			Sout	hbound	
Movement	1	4	7	8	9	1	10	11	12
Lane Config		1						T	
	·····					······		240	
v (vph)								240 657	
C(m) (vph)								0.37	
V/C								1.67	
95% queue length Control Delay								13.6	
LOS								В	
Approach Delay								13.6	
								g	

Phone: E-Mail: Fax:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS_____

Analyst: Jason Wiggins
Agency/Co.: DMJM+HARRIS
Date Performed: 2/17/2004
Analysis Time Period: PM Peak

Intersection: I-95 NB Off Ramp Jurisdiction: Mercer County

Units: U. S. Customary

Analysis Year: 2003 Existing

Project ID: Scudder Falls
East/West Street: NJ 29
North/South Street: off ramp

Intersection Orientation: EW Study period (hrs): 0.25

	Vehicle	Volumes	and Ac	ljustmen	ıts		
Major Street Movements	1	2	3	4	5	6	
	L	Т	R	L	T	R	
Volume					230	·····	
Peak-Hour Factor, PHF					0.92		
Peak-15 Minute Volume					62		
Hourly Flow Rate, HFR					249		
Percent Heavy Vehicles	** 1		****	,	*****	****	
Median Type/Storage	una	ivided		/			
RT Channelized? Lanes					1		
Configuration					T		
Upstream Signal?		No			No		
opocicam orginar.							
Minor Street Movements	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume					221		
Peak Hour Factor, PHF					0.92		
Peak-15 Minute Volume					60		
Hourly Flow Rate, HFR					240		
Percent Heavy Vehicles					0		
Percent Grade (%)	~ (~)	0		,	0		,
Flared Approach: Exists	s:/Stora	ge		/			/
RT Channelized?					1		
Lanes Configuration					Ť		

10 14 15 16

Pedestrian Volumes and Adjustments

Lane Width (ft) Valking Speed (f Percent Blockage	t/sec)		2.0	12.0 4.0 0	12.0 4.0 0	12.0 4.0 0		
			- 					
	D			am Sig ival	nal Dat Green		Prog.	Distance
	Prog. Flow vph	Sat Flow vph			Time sec	Cycle Length sec	-	to Signal feet
S2 Left-Turn							·····	
Through								
S5 Left-Turn								
Through								
Worksheet 3-Data	for Co	mputing	g Effe	ct of	Delay t	o Major	Street V	ehicles
		····	<u> </u>		Moven	nent 2	Moveme	ent 5
Shared ln volume								
Shared ln volume Sat flow rate, m				•				
Sat flow rate, m Sat flow rate, m								
Number of major	~			s:				
,, <u></u>								
Worksheet 4-Crit			Follow	-up Ti	me Calo	culation		
oritical Gap car Movement	.curacic	4	7	8	9	10	11	12
	L	L	L	T	R		T	R
t(c,base)							6.5	
t(c, hv)	1.00	1.00	1.00	1.0	00 1.0	00 1.00		1.00
P(hv)							0	
t(c,g)			0.20					0.10
Grade/100			0.00	0.0	0.0	0.00		0.00
t(3,1t)							0.00	
t(c,T): 1-stage		0.00	0.00					0.00
2-stage		0.00	1.00	1.0	0.0	00 1.00		0.00
t(c) 1-stage 2-stage							6.5	
Follow-Up Time O		rions				***************************************		
Movement	l	4	7	8	9	10	11	12
www.r.serace.com/4-6-bet	Ĺ	L	L	T	R	L	T	R
t(f,base)							4.00	
t(f,HV)	0.90	0.90	0.90	0.9	90 0.	90 0.9		0.90
P(HV)	U.J.	0,00			- 		0	
t(f)							4.0	
Worksheet 5-Effe	ect of	ilnst rea	 m Siar	als				
							····	
Computation 1-Qu	ueue Cl	earance	Time	at Up:		Signal ement 2	м	ovement 5
					77 / ± 1	V/l pro		

```
Total Saturation Flow Rate, s (vph)
Arrival Type
Effective Green, g (sec)
Cycle Length, C (sec)
Rp (from Exhibit 16-11)
Proportion vehicles arriving on green P
q(q1)
g(q2)
g(q)
Computation 2-Proportion of TWSC Intersection Time blocked
                                             Movement 2
                                                               Movement 5
                                          V(t) V(l,prot) V(t) V(l,prot)
alpha
beta
Travel time, t(a) (sec)
Smoothing Factor, F
Proportion of conflicting flow, f
Max platooned flow, V(c, max)
Min platooned flow, V(c,min)
Duration of blocked period, t(p)
Proportion time blocked, p
                                               0.000
                                                                  0.000
Computation 3-Platoon Event Periods
                                         Result
p(2)
                                         0.000
                                         0.000
p(5)
p(dom)
p(subo)
Constrained or unconstrained?
Proportion
unblocked
                            (1)
                                            (2)
                                                             (3)
                                             Two-Stage Process
for minor
                        Single-stage
                          Process
                                         Stage I
                                                         Stage II
movements, p(x)
p(1)
p(4)
p(7)
p(8)
p(9)
p(10)
p(11)
p(12)
Computation 4 and 5
Single-Stage Process
Movement
                         1
                                              8
                                                           10
                                                                   11
                                                                          12
                         L
                               L
                                                           Ľ
                                                                   \mathbf{T}
                                                                           R
                                                                   249
V c,x
S
Рx
V c,u,x
Cr,x
C plat, x
```

Stagel Stage2 Stagel Stag	ge2 Stage1	Stage2 Stage1	Stage2
V(c,x)			
s P(x)			0
V(c,u,x)			
C(r,x) C(plat,x)			
Worksheet 6-Impedance and Capacity Equation	ons		
Step 1: RT from Minor St.	9	12	
Conflicting Flows		·	
Potential Capacity			
Pedestrian Impedance Factor	1.00	1.00	
Movement Capacity Probability of Queue free St.	1.00	1.00	
Probability of Quede free St.	1.00	1.00	
Step 2: LT from Major St.	4	1	
Conflicting Flows			***************************************
Potential Capacity			
Pedestrian Impedance Factor	1.00	1.00	
Movement Capacity		4 00	
Probability of Queue free St.	1.00	1,00	
Maj L-Shared Prob Q free St.			
Step 3: TH from Minor St.	8	1.1	
Conflicting Flows		249	***************************************
Potential Capacity		657	
Pedestrian Impedance Factor	1.00	1.00	İ
Cap. Adj. factor due to Impeding mvmnt	1.00	1.00	1
Movement Capacity		657	
Probability of Queue free St.	1.00	0.63	
Step 4: LT from Minor St.	7	1.0	
Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor	1.00	1.00)
Maj. L, Min T Impedance factor	0.63		
Maj. L, Min T Adj. Imp Factor.	0.72		
Cap. Adj. factor due to Impeding mvmnt	0.72	1.00)
Movement Capacity			
Worksheet 7-Computation of the Effect of	Two-stage Ga	np Acceptance	, , , , , , , , , , , , , , , , , , ,
Step 3: TH from Minor St.	8	1.1	
-			
Part 1 - First Stage			
Conflicting Flows			
Potential Capacity			
Pedestrian Impedance Factor			

				240	·····
Movement 7 L	8 T	9 R	10 L	11 T	12 R
Worksheet 8-Shared Lane Calculations					-
t t					
y Y					
Results for Two-stage process:					
Possilts for Two-stage process:		***************************************		***************************************	************************
Movement Capacity	•				
Cap. Adj. factor due to Impeding mymnt		.72		1.00	
Maj. L, Min T Impedance factor Maj. L, Min T Adj. Imp Factor.		.63 .72			
Pedestrian Impedance Factor		.00		1.00	
Potential Capacity	**	0.0		1 ~~	
Conflicting Flows					
Part 3 - Single Stage					
Movement Capacity					
Cap. Adj. factor due to Impeding mvmnt					
Pedestrian Impedance Factor					
Potential Capacity					
Conflicting Flows					
Part 2 - Second Stage					
Movement Capacity					
Cap. Adj. factor due to Impeding mvmnt					
Redestrian Impedance Factor					
Potential Capacity					
Conflicting Flows					
Part 1 - First Stage			**************************************		
Step 4: LT from Minor St.		/		10	
Thom A. III from Missay Ch	······································	 7	·	10	·····
Probability of Queue free St.	1	- 00		0.63	
t				657	
7					
Result for z stage process:					
Result for 2 stage process:			· · · · · · · · · · · · · · · · · · ·		
Movement Capacity				657	
Cap. Adj. factor due to Impeding mvmnt	1	.00		1.00	
Pedestrian Impedance Factor	1	.00		1.00	
Potential Capacity				657	
Conflicting Flows				249	
Part 3 - Single Stage		·····			
Novement Capacity					
Cap. Adj. factor due to Impeding mvmnt					
Pedestrian Impedance Factor					

Worksheet 9-Computation of Effect of Flared Minor Street Approaches

Movement		7		8	9	10	11	12
		L		T	R	L	T	R
C sep							657	
Volume							240	
Delay								
Q sep								
Q sep +1								
round (Qsep +1)								
n max				****************	······································		***************************************	***************************************
C sh								
SUM C sep								
n								
C act								
Worksheet 10-Delay, Queuc	- Lenath	and I.e	evel o	f Se	rvice	<u> </u>		
Movement 1	4	7	8		9	10	11	12
Lane Config							Т	
v (vph)				·	***************************************		240	***************************************
C(m) (vph)							657	
v/c							0.37	
95% queue length							1.67	
Control Delay							13.6	
LOS							B	
Approach Delay							13.6	
Approach LOS							B 	
Worksheet 11-Shared Majo	r LT Impe	dance a	and De	lay				
		······································	······································		Moveme	ent 2	Move	ment 5
p(oj)					1.0	<u> </u>		.00
v(il), Volume for stream	2 or 5				,Le \		1	- 00
v(i2), Volume for stream								
s(il), Saturation flow r		stream :	2 or s)				
s(i2), Saturation flow r								
P*(oj)								
d(M,LT), Delay for stream	m 1 or 4							
N, Number of major stree		lanes						
d/rank 1) Dolay for stre								

d(rank,1) Delay for stream 2 or 5

Phone: E-mail:		Fax:	
	Operational Anal	lysis	
Analyst: Agency or Company: Date Performed:	TPR AECOM		
Analysis Time Period: Freeway/Direction: From/To:	I-95 Northbound btw exits 46 & 49 Bucks County 2030 No-Build)	
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF		3409 0.92	veh/h
Peak 15-min volume, v15 Trucks and buses Recreational vehicles		926 6 0	V % %
Terrain type: Grade		Grade 0.05	8
Segment length Trucks and buses PCE, ET Recreational vehicle PCE, ER		0.33 1.5 1.2	mi
Heavy vehicle adjustment, fHV Driver population factor, fp Flow rate, vp		0.971 1.00 1908	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 Free-flow speed:		2 Measured	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density add		0.0	mi/h
Number of lanes adjustm	nent, fN	4.5	mi/h
Free-flow speed, FFS		65.0 Urban Freeway	mi/h
LOS and Performance Measures			
			42. 42
Flow rate, vp		1908	pc/h/ln
Free-flow speed, FFS	nood C	65.0 62.8	mi/h
Average passenger-car s Number of lanes, N	preed, s	62.8	mi/h
Density, D		30.4	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ana	alysis	
Analyst:	TPR		
Agency or Company:	AECOM		
	4/12/11		
Analysis Time Period:			
_	I-95 Northbound		
From/To:	btw exits 49 &	51	
Jurisdiction:	Bucks County		
Analysis Year:	2030 No-Build		
Description: Scudder F	alls		
	Flow Inputs and	d Adjustments	
Volume, V		3659	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v15		994	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Grade	
Grade		-3.00	%
Segment length		0.47	mi
Trucks and buses PCE, ET		1.5	
Recreational vehicle PCE, ER		1.2	
Heavy vehicle adjustment, fHV		0.971	
Driver population factor, fp		1.00	(1. (2.
Flow rate, vp		2048	pc/h/ln
	Speed Inputs a	nd 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:		Measured	
FFS or BFFS	6 =	65.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density add		0.0	mi/h
Number of lanes adjustm Free-flow speed, FFS	ient, in	4.5 65.0	mi/h mi/h
riee-llow speed, rrs		Urban Freewa	·
	LOS and Perfor	mance Measures	
Elem mate		2049	ng/h/1n
Flow rate, vp		2048	pc/h/ln mi/h
Free-flow speed, FFS Average passenger-car s	rneed C	65.0 60.6	mi/h mi/h
Number of lanes, N	preca, p	2	шт / т
Density, D		33.8	pc/mi/ln
4 , =			<u> </u>

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analysis Time Period:	I-95 Northbound btw exits 51 & 1 Bucks County 2030 No-Build		
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type:	;	5719 0.92 1554 6 0 Grade	veh/h v % %
Grade Segment length Trucks and buses PCE, Recreational vehicle PC Heavy vehicle adjustment	EE, ER Lt, fHV	0.73 0.49 1.5 1.2 0.971 1.00	% mi
Flow rate, vp		3201	pc/h/ln
	Speed Inputs and	d Adjustments	
Lane width Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjustinterchange density adjustment of lanes adjustment, Free-flow speed, FFS	fLW tment, fLC ustment, fID	12.0 6.0 0.50 2 Measured 65.0 0.0 0.0 4.5 65.0 Urban Freeway	<pre>ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h</pre>
LOS and Performance Measures			
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N Density, D	speed, S	3201 65.0 2	<pre>pc/h/ln mi/h mi/h pc/mi/ln</pre>
- ·			_

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 1 & 2 Jurisdiction: Mercer County Analysis Year: 2030 No-Build Description: Scudder Falls ______Flow Inputs and Adjustments_____ 5449 Volume, V veh/h Peak-hour factor, PHF 0.92 1481 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade 3.10 % Grade 0.75 Segment length mi Trucks and buses PCE, ET 2.0 Recreational vehicle PCE, ER 3.0 Heavy vehicle adjustment, fHV 0.943 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 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 70.0 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 3.0 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 2093 70.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 62.9 mi/h Number of lanes, N

33.3

pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ana	alysis	
Analyst:	TPR		
Agency or Company:	AECOM		
Date Performed:	4/12/11		
Analysis Time Period:	AM Peak		
Freeway/Direction:	I-95 Northbound		
From/To:	btw exits 2 & 3		
Jurisdiction:	Mercer County		
Analysis Year:	2030 No-Build		
Description: Scudder	Falls		
	Flow Inputs and	d Adjustments	
Volume, V		5209	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v1	5	1415	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Level	
Grade		0.00	8
Segment length		0.00	mi
Trucks and buses PCE, ET		1.5	
Recreational vehicle PCE, ER		1.2	
Heavy vehicle adjustment, fHV Driver population factor, fp		0.971 1.00	
Flow rate, vp		1944	pc/h/ln
	Speed Inputs ar	nd Adjustments	
I and width		10 0	£L
Lane width	aloarango	12.0	ft ft
Right-shoulder lateral Interchange density	Clearance	6.0 0.50	interchange/mi
Number of lanes, N		3	incerchange/mi
Free-flow speed:		Measured	
FFS or BFFS		70.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adju		0.0	mi/h
Interchange density ad		0.0	mi/h
Number of lanes adjust	ment, fN	3.0	mi/h
Free-flow speed, FFS		70.0	mi/h
		Urban Freewa	У
	LOS and Perform	nance Measures	
Flow rate, vp		1944	pc/h/ln
Free-flow speed, FFS		70.0	mi/h
Average passenger-car speed, S		65.9	mi/h
Number of lanes, N		3	
Density, D		29.5	pc/mi/ln

Phone: E-mail:		Fax:		
	Operational Anal	lysis		
Analyst:	TPR			
Agency or Company:	AECOM			
	4/12/11			
Analysis Time Period:	AM Peak			
Freeway/Direction:	I-95 Southbound			
From/To:	btw exits 49 & 40	5		
	Bucks County			
Analysis Year:				
Description: Scudder I	Falls			
	Flow Inputs and	Adjustments		
Volume, V		3211	veh/h	
Peak-hour factor, PHF		0.92		
Peak 15-min volume, v1	5	873	V	
Trucks and buses		6	%	
Recreational vehicles		0	%	
Terrain type:		Grade	•	
Grade		-0.05	% :	
Segment length Trucks and buses PCE, I	7 TT	0.33 1.5	mi	
Recreational vehicle Po		1.2		
Heavy vehicle adjustment, fHV		0.971		
Driver population factor, fp		1.00		
Flow rate, vp	Flow rate, vp		pc/h/ln	
	Speed Inputs and	d Adjustments		
Lane width		12.0	ft	
Right-shoulder lateral	clearance	6.0	ft	
Interchange density	cicarance	0.50	interchange/mi	
Number of lanes, N		2		
Free-flow speed:		Measured		
FFS or BFFS		65.0	mi/h	
Lane width adjustment,	fLW	0.0	mi/h	
Lateral clearance adjus		0.0	mi/h	
Interchange density ad		0.0	mi/h	
Number of lanes adjustment, fN		4.5	mi/h	
Free-flow speed, FFS		65.0 Urban Freeway	mi/h	
LOS and Performance Measures				
Flow rate, vp		1797	pc/h/ln	
Free-flow speed, FFS	1 ~	65.0	mi/h	
Average passenger-car s	speed, S	63.9	mi/h	
Number of lanes, N Density, D		2 28.1	pc/mi/ln	
- ·			_	

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analysis Time Period: Freeway/Direction: From/To: Jurisdiction:	I-95 Southbound btw exits 51 & 4 Bucks County	9	
Analysis Year: Description: Scudder F	2030 No-Build		
		Adjustments	
	110W Impact and		
Volume, V		2501	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v15)	680	V
Trucks and buses		6	<u>&</u>
Recreational vehicles		0 Grade	%
Terrain type: Grade		3.00	9
Segment length		0.47	mi
Trucks and buses PCE, ET		1.5	шт
Recreational vehicle PCE, ER		1.2	
Heavy vehicle adjustment, fHV		0.971	
Driver population factor, fp		1.00	
Flow rate, vp		1400	pc/h/ln
	Speed Inputs an	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	<u> </u>
Free-flow speed:		Measured	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustment, fN		4.5	mi/h
Free-flow speed, FFS		65.0 Urban Freeway	mi/h
LOS and Performance Measures			
Flow rate, vp		1400	pc/h/ln
Free-flow speed, FFS	nood C	65.0	mi/h
Average passenger-car s Number of lanes, N	speed, S	65.0 2	mi/h
Density, D		21.5	pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Southbound From/To: btw exits 1 & 51 Jurisdiction: Mercer County Analysis Year: 2030 No-Build Description: Scudder Falls ______Flow Inputs and Adjustments_____ Volume, V 2521 veh/h Peak-hour factor, PHF 0.92 685 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade -0.73 % Grade 0.49 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 1411 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS 65.0 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 4.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures_____LOS and Performance Measures_____ pc/h/ln Flow rate, vp 1411 65.0 Free-flow speed, FFS mi/h 65.0 Average passenger-car speed, S mi/h Number of lanes, N

21.7

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Southbound From/To: btw exits 2 & 1 Jurisdiction: Mercer County Analysis Year: 2030 No-Build Description: Scudder Falls _____Flow Inputs and Adjustments_____ Volume, V 2541 veh/h Peak-hour factor, PHF 0.92 690 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade -3.10 % Grade 0.75 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 948 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 70.0 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 3.0 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway _____LOS and Performance Measures______ Flow rate, vp 948 pc/h/ln 70.0 Free-flow speed, FFS mi/h 70.0 Average passenger-car speed, S mi/h Number of lanes, N

13.5

pc/mi/ln

Phone: E-mail:		Fax:		
	Operational Anal	lysis		
Analyst:	TPR			
Agency or Company:	AECOM			
Date Performed:	4/12/11			
Analysis Time Period:				
Freeway/Direction:	I-95 Southbound			
From/To:	btw exits 3 & 2			
	Mercer County			
Analysis Year:	2030 No-Build			
Description: Scudder F	alls			
	Flow Inputs and	Adjustments		
Volume, V		2641	veh/h	
Peak-hour factor, PHF		0.92		
Peak 15-min volume, v15		718	V	
Trucks and buses		6	9	
Recreational vehicles		0	%	
Terrain type: Grade		Level	8	
		0.00	mi	
Segment length Trucks and buses PCE, ET		1.5	шт	
Recreational vehicle PCE, ER		1.2		
Heavy vehicle adjustment, fHV		0.971		
Driver population factor, fp		1.00		
Flow rate, vp		986	pc/h/ln	
	Speed Inputs and	d Adjustments		
Lane width		12.0	ft	
Right-shoulder lateral	clearance	6.0	ft	
Interchange density		0.50	interchange/mi	
Number of lanes, N		3		
Free-flow speed:		Measured		
FFS or BFFS	_	70.0	mi/h	
Lane width adjustment,		0.0	mi/h	
Lateral clearance adjus		0.0	mi/h	
Interchange density adj		0.0	mi/h	
Number of lanes adjustm Free-flow speed, FFS	ent, in	3.0 70.0	mi/h mi/h	
riee-liow speed, rrs		Urban Freeway	·	
LOS and Performance Measures				
Flow rate, vp		986	pc/h/ln	
Free-flow speed, FFS		70.0	mi/h	
Average passenger-car s	peed, S	70.0	mi/h	
Number of lanes, N	<u> </u>	3	,	
Density, D		14.1	pc/mi/ln	

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 46 & 49 Jurisdiction: Bucks County Analysis Year: 2030 No-Build Description: Scudder Falls _____Flow Inputs and Adjustments_____ Volume, V 3053 veh/h Peak-hour factor, PHF 0.92 830 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade 0.05 % Grade 0.33 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 1709 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS 65.0 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 4.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 1709 65.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 64.5 mi/h Number of lanes, N

26.5

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 49 & 51 Jurisdiction: Bucks County Analysis Year: 2030 No-Build Description: Scudder Falls _____Flow Inputs and Adjustments_____ Volume, V 2493 veh/h Peak-hour factor, PHF 0.92 677 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade -3.00 % Grade 0.47 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 1396 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS 65.0 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 4.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 1396 65.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 65.0 mi/h Number of lanes, N

21.5

pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Anal	ysis	
Analysis Time Period: Freeway/Direction: From/To:	I-95 Northbound btw exits 51 & 1 Bucks County 2030 No-Build		
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Segment length Trucks and buses PCE, E Recreational vehicle PC Heavy vehicle adjustmen	T E, ER	2643 0.92 718 6 0 Grade 0.73 0.49 1.5 1.2	veh/h v % % % mi
Driver population factor, fp		1.00	(1 (2
Flow rate, vp		1480	pc/h/ln
	Speed Inputs and	Adjustments	
Lane width Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm Free-flow speed, FFS	fLW tment, fLC ustment, fID ent, fN	12.0 6.0 0.50 2 Measured 65.0 0.0 0.0 0.0 4.5 65.0 Urban Freeway	<pre>ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h</pre>
LOS and Performance Measures			
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N Density, D	peed, S	1480 65.0 65.0 2 22.8	<pre>pc/h/ln mi/h mi/h pc/mi/ln</pre>

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 04/09/04 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 1 & 2 Jurisdiction: Mercer County Analysis Year: 2030 No-Build Description: Scudder Falls _____Flow Inputs and Adjustments_____ Volume, V 2603 veh/h Peak-hour factor, PHF 0.92 707 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade 3.10 % Grade 0.75 Segment length mi Trucks and buses PCE, ET 2.0 Recreational vehicle PCE, ER 3.0 Heavy vehicle adjustment, fHV 0.943 Driver population factor, fp 1.00 1000 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured 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 3.0 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway _____LOS and Performance Measures_____ pc/h/ln Flow rate, vp 1000 70.0 Free-flow speed, FFS mi/h 70.0 Average passenger-car speed, S mi/h Number of lanes, N

14.3

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 2 & 3 Jurisdiction: Mercer County Analysis Year: 2030 No-Build Description: Scudder Falls _____Flow Inputs and Adjustments_____ Volume, V 2883 veh/h Peak-hour factor, PHF 0.92 783 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Level 0.00 % Grade 0.00 Segment length тi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 1076 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured 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 3.0 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway _____LOS and Performance Measures_____ pc/h/ln Flow rate, vp 1076 70.0 Free-flow speed, FFS mi/h 70.0 Average passenger-car speed, S mi/h Number of lanes, N

15.4

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Southbound From/To: btw exits 49 & 46 Jurisdiction: Bucks County Analysis Year: 2030 No-Build Description: Scudder Falls _____Flow Inputs and Adjustments_____ Volume, V 3865 veh/h Peak-hour factor, PHF 0.92 1050 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade -0.05 % Grade 0.33 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 2164 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS 65.0 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 4.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 2164 65.0 Free-flow speed, FFS mi/h 58.0 Average passenger-car speed, S mi/h Number of lanes, N

37.3

pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analyst:	TPR		
Agency or Company:	AECOM		
	4/12/11		
Analysis Time Period:	PM Peak		
Freeway/Direction:	I-95 Southbound		
From/To:	btw exits 51 & 4	9	
	Bucks County		
Analysis Year:			
Description: Scudder I	Falls		
	Flow Inputs and	Adjustments	
Volume, V		3845	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v1!	5	1045	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Grade	
Grade		3.00	8
Segment length		0.47	mi
Trucks and buses PCE, ET		1.5	
Recreational vehicle PCE, ER		1.2	
Heavy vehicle adjustment, fHV		0.971	
Driver population factor, fp Flow rate, vp		1.00 2152	pc/h/ln
Speed Inputs and Adjustments			
	Speed inputs and	a 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:		Measured	4 /1-
FFS or BFFS	ET M	65.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjust Interchange density adjusted		0.0	mi/h mi/h
		4.5	mi/h
Free-flow speed, FFS	Number of lanes adjustment, fN		mi/h
rice flow speed, fib		65.0 Urban Freeway	1117 11
LOS and Performance Measures			
Elem mate		2152	ng/h/ln
Flow rate, vp		2152 65.0	pc/h/ln mi/h
Free-flow speed, FFS Average passenger-car s	aneed C	58.3	mi/h mi/h
Number of lanes, N	specu, b	2	III + / 11
Density, D		36.9	pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR AECOM Agency or Company: Date Performed: 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Southbound From/To: btw exits 1 & 51 Jurisdiction: Mercer County Analysis Year: 2030 No-Build Description: Scudder Falls _____Flow Inputs and Adjustments_____ Volume, V 4895 veh/h Peak-hour factor, PHF 0.92 1330 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade -0.73 % Grade 0.49 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 2740 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 65.0 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 4.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 2740 65.0 Free-flow speed, FFS mi/h Average passenger-car speed, S mi/h 2 Number of lanes, N

pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Anal	ysis	
Analysis Time Period: Freeway/Direction: From/To:	I-95 Southbound btw exits 2 & 1 Mercer County 2030 No-Build		
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Segment length Trucks and buses PCE, E Recreational vehicle PC Heavy vehicle adjustment	T E, ER t, fHV	4855 0.92 1319 6 0 Grade -3.10 0.75 1.5 1.2 0.971 1.00	veh/h v % % % mi
Flow rate, vp	Speed Inputs and	1812 Adjustments	pc/h/ln
	speed inputs and	-	
Lane width Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustment Free-flow speed, FFS	fLW tment, fLC ustment, fID ent, fN	12.0 6.0 0.50 3 Measured 70.0 0.0 0.0 0.0 3.0 70.0 Urban Freeway	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h
	LOS and Performa	nce Measures	
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N Density, D	peed, S	1812 70.0 67.7 3 26.8	<pre>pc/h/ln mi/h mi/h pc/mi/ln</pre>

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

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
_			
Analyst:	TPR		
Agency or Company: Date Performed:	AECOM 4/12/11		
Analysis Time Period:			
Freeway/Direction:			
From/To:	btw exits 3 & 2		
Jurisdiction:			
Analysis Year:			
Description: Scudder E			
	Flow Inputs and	Adjustments	
Volume, V		4425	veh/h
Peak-hour factor, PHF		0.92	V C11/ 11
Peak 15-min volume, v15		1202	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Level	
Grade		0.00	%
Segment length		0.00	mi
Trucks and buses PCE, E		1.5	
Recreational vehicle PO		1.2	
Heavy vehicle adjustmer		0.971	
Driver population factor Flow rate, vp	or, ip	1.00 1651	pc/h/ln
	0 1 7	1 7 1 '	_
	Speed Inputs and	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		3	
Free-flow speed:		Measured	
FFS or BFFS Lane width adjustment,	£T W	70.0	mi/h mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm		3.0	mi/h
Free-flow speed, FFS		70.0	mi/h
<u> </u>		Urban Freeway	
	LOS and Perform	ance Measures	
Flow rate, vp		1651	pc/h/ln
Free-flow speed, FFS		70.0	mi/h
Average passenger-car s	speed, S	69.1	mi/h
Number of lanes, N	-	3	
Density, D		23.9	pc/mi/ln

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

Phone: E-mail:

Fax:

mph

vph

_____Diverge Analysis_____

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB off ramp to PA 332

Jurisdiction: Bucks County
Analysis Year: 2030 No-Build

Description: Scudder Falls

______Freeway Data_____

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0
Volume on freeway 3409

_____Off Ramp Data_____

Side of freeway

Number of lanes in ramp

Free-Flow speed on ramp

Volume on ramp

Length of first accel/decel lane

Length of second accel/decel lane

ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

2530

On

Distance to adjacent ramp

______Conversion to pc/h Under Base Conditions_____

Freeway	Ramp	Adjacent
		Ramp
3409	1150	1120 vph
0.92	0.92	0.92
926	312	304 v
6	7	4 %
0	0	0 %
Level	Level	Level
0.00 %	0.00 %	0.00 %
0.00 mi	0.00 mi	0.00 mi
1.5	1.5	1.5
1.2	1.2	1.2
	3409 0.92 926 6 0 Level 0.00 % 0.00 mi	3409 1150 0.92 0.92 926 312 6 7 0 0 Level Level 0.00 % 0.00 % 0.00 mi 0.00 mi 1.5 1.5

```
1.00
Driver population factor, fP
                                              1.00
                                                         1.00
Flow rate, vp
                                   3817
                                              1294
                                                         1242
                                                                 pcph
                 _____Estimation of V12 Diverge Areas__
                              (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 3817 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        3817
                                     4700
                                                   No
     Fi F
    v = v - v
                        2523
                                     4700
                                                   No
        F R
     FΟ
                        1294
                                     2000
                                                   No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 3817
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area_____
                                Max Desirable
                                                    Violation?
                   Actual
                                4400
                    3817
                                                    No
    V
     12
            ____Level of Service Determination (if not F)______
                    D = 4.252 + 0.0086 v - 0.009 L = 29.4 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                        D = 0.544
Intermediate speed variable,
                                         S
Space mean speed in ramp influence area,
                                        S = 52.5
                                                    mph
                                         R
Space mean speed in outer lanes,
                                        S = N/A
                                                    mph
```

S = 52.5

mph

0.971

0.966

0.980

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from PA332
Jurisdiction: Bucks County
Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 3379 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 280 Volume on ramp vph Length of first accel/decel lane 1375 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1120 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp On Distance to adjacent Ramp 2530 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 3379 280 1120 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 918 76 304 V 7 0 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
3783
                                               310
Flow rate, vp
                                                          1260
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 3783 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                        Actual
                                     Maximum
                         4093
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 3783
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                    4093
                                 4600
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 28.6 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.458
                                          S
Space mean speed in ramp influence area,
                                         S = 54.5
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 54.5
                                                     mph
```

1.00

0.980

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail: Fax:

______Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB off ramp to Taylorsville

Jurisdiction: Bucks County
Analysis Year: 2030 No-Build

Description: Scudder Falls

______Freeway Data_____

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0
Volume on freeway 3659

_____Off Ramp Data_____

mph

vph

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	310	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist?

Volume on adjacent ramp
Position of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp
Does
1220
Vph
Downstream
On
Distance to adjacent ramp
1250
ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacen	.t
			Ramp	
Volume, V (vph)	3659	310	1220	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	994	84	332	V
Trucks and buses	6	5	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00	0.00	%
Length	0.00 mi	0.00 r	ni 0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                    4096
Flow rate, vp
                                               345
                                                          1366
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 4096 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        4096
                                     4700
                                                    No
     Fi F
    v = v - v
                        3751
                                     4700
                                                    No
         F R
     FΟ
                        345
                                     2000
                                                    No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 4096
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    4096
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 31.8 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.459
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 54.4
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
Space mean speed for all vehicles,
                                        S = 54.4
                                                     mph
```

0.976

0.971

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from Taylorsville E
Jurisdiction: Bucks County
Analysis Year: 2030 No-Build Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph 3349 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 1220 Volume on ramp vph Length of first accel/decel lane 455 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 310 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1250 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 3349 1220 310 vph 0.92 Peak-hour factor, PHF 0.92 0.92 84 Peak 15-min volume, v15 910 332 V 5 0 Trucks and buses 6 6 0 Recreational vehicles 왕 Level Level Level Terrain type: % % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
3749
                                               1366
Flow rate, vp
                                                          345
                                                                  pcph
                  _____Estimation of V12 Merge Areas___
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 3749 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                                      Maximum
                         Actual
                         5115
                                      4700
                                                    Yes
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
    3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 3749
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                    5115
                                 4600
                                                     Yes
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 41.9 pc/mi/ln
Level of service for ramp-freeway junction areas of influence F
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.939
                                          S
Space mean speed in ramp influence area,
                                         S = 43.4
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 43.4
                                                     mph
```

1.00

0.971

1.00

0.976

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from Taylorsville W
Jurisdiction: Bucks County
Analysis Year: 2030 No-Build Description: Scudder Falls ______Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph 4569 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 1150 Volume on ramp vph Length of first accel/decel lane 275 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1220 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp On Distance to adjacent Ramp 910 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 4569 1150 1220 vph Peak-hour factor, PHF 0.92 0.92 0.92 1242 Peak 15-min volume, v15 312 332 V 6 0 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
Driver population factor, fP
                                               1.00
                                                          1.00
                                    5115
                                               1275
Flow rate, vp
                                                          1366
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 5115 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                        Actual
                                      Maximum
                         6390
                                      4700
                                                    Yes
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                      12
If yes, v = 5115
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    6390
                                                     Yes
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 53.0 pc/mi/ln
Level of service for ramp-freeway junction areas of influence F
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 2.626
                                          S
Space mean speed in ramp influence area,
                                         S = 4.6
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 4.6
                                                     mph
```

1.00

0.980

0.971

Heavy vehicle adjustment, fHV

Phone: E-mail: Fax:

Diverge	Analysis

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound
Junction: NB Off Ramp to NJ29
Jurisdiction: Mercer County
Analysis Year: 2030 No-Build

Description: Scudder Falls

______Freeway Data______

Type of analysis Diverge Number of lanes in freeway 2

Free-flow speed on freeway 70.0 mph Volume on freeway 5719 vph

_____Off Ramp Data_____

Side of freeway

Number of lanes in ramp

Free-Flow speed on ramp

Volume on ramp

Length of first accel/decel lane

Length of second accel/decel lane

ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist? Yes
Volume on adjacent ramp 200

Volume on adjacent ramp 200 vph

Position of adjacent ramp

Type of adjacent ramp

On

Type of adjacent ramp On
Distance to adjacent ramp 545 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent
			Ramp
Volume, V (vph)	5719	760	200 vph
Peak-hour factor, PHF	0.92	0.92	0.92
Peak 15-min volume, v15	1554	207	54 v
Trucks and buses	6	5	4 %
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

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                   6403
Flow rate, vp
                                               847
                                                          222
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 6403 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        6403
                                     4800
                                                    Yes
     Fi F
    v = v - v
                        5556
                                     4800
                                                    Yes
         F R
     FΟ
                        847
                                     2000
                                                    No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 6403
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area_____
                    Actual
                                Max Desirable
                                                     Violation?
                    6403
                                 4400
                                                     Yes
    V
     12
            ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 54.4 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence F
                _____Speed Estimation_____
                                         D = 0.504
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 55.9
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
Space mean speed for all vehicles,
                                        S = 55.9
                                                     mph
```

0.976

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from NJ 29
Jurisdiction: Mercer County
Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 4959 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 200 Volume on ramp vph 500 Length of first accel/decel lane ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 760 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 545 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 4959 200 760 vph Peak-hour factor, PHF 0.92 0.92 0.92 1348 Peak 15-min volume, v15 54 207 V 5 0 Trucks and buses 6 4 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade Length mi mi шi Trucks and buses PCE, ET

1.5

1.2

Recreational vehicle PCE, ER

1.5

1.2

1.5

1.2

```
5552
Flow rate, vp
                                               222
                                                          847
                                                                   pcph
                   _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                       1.000 Using Equation 0
                 FM
                v = v (P) = 5552 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                                      Maximum
                         Actual
                         5774
                                      4800
                                                     Yes
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 5552
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                    5774
                                 4600
                                                      Yes
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 47.3 pc/mi/ln
Level of service for ramp-freeway junction areas of influence F
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 1.541
                                          S
Space mean speed in ramp influence area,
                                         S = 26.8
                                                      mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                      mph
                                          0
Space mean speed for all vehicles,
                                         S = 26.8
                                                      mph
```

1.00

0.980

1.00

0.976

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Jurisdiction:

Analysis Year:

Description:

Northbound

NB On ramp from Upper River Rd

Mercer County

2030 No D 12 Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph 5159 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 290 Volume on ramp vph 500 Length of first accel/decel lane ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 200 vph Position of adjacent Ramp Upstream Type of adjacent Ramp On Distance to adjacent Ramp 1640 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 5159 290 200 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 1402 79 54 V 4 0 Trucks and buses 6 12 Recreational vehicles 0 용 Level Level Level Terrain type: 용 % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
5776
                                               334
Flow rate, vp
                                                          222
                                                                  pcph
                  _____Estimation of V12 Merge Areas___
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      0.591 Using Equation 1
                 FM
                v = v (P) = 3417 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                                      Maximum
                         Actual
                         6110
                                      7200
                                                    No
     FO
                         2359 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                      12
If yes, v = 3417
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    6110
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 31.4 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.452
                                          S
Space mean speed in ramp influence area,
                                         S = 57.3
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = 63.1
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 59.4
                                                     mph
```

1.00

0.943

1.00

0.980

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail: Fax:

5449

mph

vph

_____Diverge Analysis_____

Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound

NB Off Ramp to Bear Tavern Rd Mercer County Junction:

Analysis Year: 2030 No-Build

Description: Scudder Falls

Volume on freeway

______Freeway Data______

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 70.0

_____Off Ramp Data_____

Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph Volume on ramp 910 vph Length of first accel/decel lane 1210 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 Downstream Type of adjacent ramp On

Distance to adjacent ramp 2545 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5449	910	670 vph	
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1481	247	182 v	
Trucks and buses	6	3	4 %	
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	

```
Driver population factor, fP
                                   1.00
                                              1.00
                                                         1.00
                                   6101
Flow rate, vp
                                              1004
                                                         743
                                                                  pcph
                 _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.561 Using Equation 5
                 FD
                v = v + (v - v) P = 3865 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        6101
                                     7200
                                                    No
     Fi F
    v = v - v
                        5097
                                     7200
                                                    No
         F R
     FΟ
                        1004
                                     2000
                                                    No
    V
     R
                        2236 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 3865
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area____
                    Actual
                                 Max Desirable
                                                     Violation?
                                 4400
                    3865
                                                     No
    V
     12
            ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 26.6 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence C
                _____Speed Estimation_____
                                         D = 0.518
Intermediate speed variable,
                                         S
Space mean speed in ramp influence area,
                                         S = 55.5
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 72.0
                                                     mph
```

S = 60.6

mph

0.971

0.985

0.980

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from Bear Tavern Rd
Jurisdiction: Mercer County
Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph 4529 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 670 Volume on ramp vph Length of first accel/decel lane 1150 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 910 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2545 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 4529 670 910 vph Peak-hour factor, PHF 0.92 0.92 0.92 1231 182 247 Peak 15-min volume, v15 V 3 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: % % 용 Grade Length mi mi

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

шi

1.5

1.2

1.5

1.2

```
5071
Flow rate, vp
                                               743
                                                          1004
                                                                   pcph
                   _____Estimation of V12 Merge Areas___
                        1183.00 (Equation 25-2 or 25-3)
                 ΕQ
                       0.610 Using Equation 1
                 FM
                v = v (P) = 3092 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                                      Maximum
                         Actual
                         5814
                                      7200
                                                     No
     FO
                         1979 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 3092
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                    5814
                                 4600
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 27.8 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.421
                                          S
Space mean speed in ramp influence area,
                                         S = 58.2
                                                      mph
                                          R
                                         S = 64.7
Space mean speed in outer lanes,
                                                      mph
                                          0
```

S = 60.3

mph

0.971

1.00

0.980

1.00

0.985

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB on ramp from PA 322
Jurisdiction: Bucks County
Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2259 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 1120 vph Length of first accel/decel lane 850 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1150 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2530 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2259 1120 1150 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 614 304 312 V 4 0 Trucks and buses 6 7 0 Recreational vehicles 용 Level Level Level Terrain type: % % Grade Length mi mi

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

шi

1.5

1.2

1.5

1.2

```
2529
                                               1260
Flow rate, vp
                                                          1275
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2529 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                                      Maximum
                         Actual
                         3789
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 2529
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    3789
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 29.1 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.434
                                          S
Space mean speed in ramp influence area,
                                         S = 55.0
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 55.0
                                                     mph
```

1.00

0.966

1.00

0.980

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Fax:

Phone:
E-mail:
_____Div

_____Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Southbound

Junction: SB Off Ramp to PA332

Jurisdiction: Bucks County
Analysis Year: 2030 No-Build

Description: Scudder Falls

Distance to adjacent ramp

_____Freeway Data______

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0

Free-flow speed on freeway 65.0 mph Volume on freeway 2501 vph

_____Off Ramp Data_____

Side of freeway

Number of lanes in ramp

Free-Flow speed on ramp

Volume on ramp

Length of first accel/decel lane

Length of second accel/decel lane

ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

On

Yes

1430 vph

Downstream

On

_____Conversion to pc/h Under Base Conditions_____

2525

ft

Junction Components	Freeway	Ramp	Adjace	nt
			Ramp	
Volume, V (vph)	2501	720	1430	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	680	196	389	V
Trucks and buses	6	7	6	%
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	

```
1.00
Driver population factor, fP
                                              1.00
                                                         1.00
                                   2800
Flow rate, vp
                                              810
                                                         1601
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 2800 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        2800
                                     4700
                                                    No
     Fi F
    v = v - v
                        1990
                                     4700
                                                    No
         F R
     FΟ
                        810
                                     2000
                                                    No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 2800
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2800
                                                     No
    V
     12
            ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 20.7 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence C
                _____Speed Estimation_____
                                         D = 0.501
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 53.5
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
```

S = 53.5

mph

0.971

0.966

0.971

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from PA 332
Jurisdiction: Bucks County
Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 1781 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 1430 Volume on ramp vph Length of first accel/decel lane 1375 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 720 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2525 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 1430 1781 720 vph 0.92 Peak-hour factor, PHF 0.92 0.92 196 Peak 15-min volume, v15 484 389 V 7 0 Trucks and buses 6 6 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
1994
                                               1601
Flow rate, vp
                                                          810
                                                                  pcph
                  _____Estimation of V12 Merge Areas___
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 1994 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                                     Maximum
                         Actual
                         3595
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 1994
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                    3595
                                 4600
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 24.2 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.367
                                          S
Space mean speed in ramp influence area,
                                         S = 56.6
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 56.6
                                                     mph
```

1.00

0.971

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: _____Diverge Analysis______ Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB Off Ramp to Taylorsville W Jurisdiction: Bucks County Analysis Year: 2030 No-Build Description: Scudder Falls ______Freeway Data______ Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2521 vph _____Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph Volume on ramp 240 vph Length of first accel/decel lane 550 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent ramp 200 vph

Convers	sion to pc/h	n Under Base	Conditions
---------	--------------	--------------	------------

Downstream

ft

Off

790

Position of adjacent ramp

Distance to adjacent ramp

Type of adjacent ramp

Junction Components	Freeway	Ramp	Adjacent	
			Ramp	
Volume, V (vph)	2521	240	200	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	685	65	54	V
Trucks and buses	6	4	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00	5
Length	0.00 mi	0.00 mi	0.00 m	ni
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    2822
                                               266
                                                          225
                                                                  pcph
                 _____Estimation of V12 Diverge Areas__
                L =
                               (Equation 25-8 or 25-9)
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 2822 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         2822
                                     4700
                                                    No
     Fi F
    v = v - v
                        2556
                                     4700
                                                    No
         F R
     FΟ
                         266
                                     2000
                                                    No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
                > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 2822
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2822
                                                     No
    V
     12
            ____Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 23.6 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence C
                _____Speed Estimation_____
                                         D = 0.452
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 54.6
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
Space mean speed for all vehicles,
                                        S = 54.6
                                                     mph
```

0.980

0.966

Heavy vehicle adjustment, fHV

Fax:

mph

vph

Phone: E-mail:

_____Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Southbound

Junction: SB Off Ramp to Taylorsville E

Jurisdiction: Bucks County
Analysis Year: 2030 No-Build

Description: Scudder Falls

______Freeway Data______

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0
Volume on freeway 2281

_____Off Ramp Data_____

Side of freeway

Number of lanes in ramp

Free-Flow speed on ramp

Volume on ramp

Length of first accel/decel lane
Length of second accel/decel lane

ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

1400

Test

Test

Test

Type

Typ

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacer Ramp	ıt
Volume, V (vph)	2281	200	420	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	620	54	114	V
Trucks and buses	6	7	3	%
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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    2554
                                               225
                                                          463
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 2554 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        2554
                                     4700
                                                    No
     Fi F
    v = v - v
                        2329
                                     4700
                                                    No
         F R
     FΟ
                        225
                                     2000
                                                    No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 2554
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2554
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 25.3 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence C
                _____Speed Estimation_____
                                         D = 0.448
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 54.7
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
Space mean speed for all vehicles,
                                        S = 54.7
                                                     mph
```

0.966

0.985

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from Taylorsville
Jurisdiction: Bucks County
Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph 2081 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 420 Volume on ramp vph Length of first accel/decel lane 1265 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 200 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1400 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2081 420 200 vph 0.92 Peak-hour factor, PHF 0.92 0.92 54 Peak 15-min volume, v15 565 114 V 7 0 Trucks and buses 6 3 0 Recreational vehicles 왕 Level Level Level Terrain type: % % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
2330
Flow rate, vp
                                               463
                                                          225
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2330 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                                     Maximum
                        Actual
                         2793
                                     4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 2330
                                     (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                    2793
                                 4600
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 19.1 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.296
                                         S
Space mean speed in ramp influence area,
                                         S = 58.2
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
```

S = 58.2

mph

0.971

1.00

0.985

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Diverge Analysis______ Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB Off Ramp to NJ 29 Jurisdiction: Mercer County Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data______ Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 2541 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	390	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

880

ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway		Ramp		Adjacer Ramp	nt
Volume, V (vph)	2541		390		370	dqv
Peak-hour factor, PHF	0.92		0.92		0.92	VPII
Peak 15-min volume, v15	690		106		101	V
Trucks and buses	6		11		4	8
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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    2845
                                               447
                                                          410
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.668 Using Equation 5
                 FD
                v = v + (v - v) P = 2050 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                      Maximum
                                                   LOS F?
                        Actual
    v = v
                         2845
                                      7200
                                                    No
     Fi F
    v = v - v
                         2398
                                      7200
                                                    No
         F R
     FΟ
                         447
                                      2000
                                                    No
    V
     R
                         795 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                       12
If yes, v = 2050
                                      (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2050
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 17.4 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.468
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 56.9
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 76.8
                                                     mph
Space mean speed for all vehicles,
                                        S = 61.3
                                                     mph
```

0.948

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _____Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Southbound SB On ramp from NJ 29 Mercer County Junction: Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 2151 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 370 Volume on ramp vph Length of first accel/decel lane 338 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 390 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 880 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 370 2151 390 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 585 101 106 V Trucks and buses 6 4 11 0 0 Recreational vehicles % Level Level Level Terrain type: % % 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
2408
                                               410
Flow rate, vp
                                                          447
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2408 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                         Actual
                                      Maximum
                         2818
                                      4800
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 2408
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    2818
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 25.1 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.363
                                          S
Space mean speed in ramp influence area,
                                         S = 59.8
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 59.8
                                                     mph
```

1.00

0.980

1.00

0.948

1.00

Heavy vehicle adjustment, fHV

Phone: E-mail: Fax:

______Operational Analysis_____

Analyst: TPR
Agency/Co.: AECOM
Date Performed: 4/12/11
Analysis Time Period: AM Peak

Freeway/Dir of Travel: I-95 Southbound
Weaving Location: Bear Tavern Road
Jurisdiction: Mercer County
Analysis Year: 2030 No-Build

Description: Scudder Falls

_____Inputs_____

Freeway free-flow speed, SFF Weaving number of lanes, N	70 4	mph
		£L
Weaving segment length, L	2050	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	
Volume ratio, VR	0.21	
Weaving ratio, R	0.24	

______Conversion to pc/h Under Base Conditions_____

	Non-Weaving		Non-Weaving Weaving			3	
	V	V	V	V			
	01	02	w1	w2			
Volume, V	2641	0	540	170	veh/h		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92			
Peak 15-min volume, v15	718	0	147	46	v		
Trucks and buses	6	10	6	4	%		
Recreational vehicles	0	0	0	0	%		
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5			
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2			
Heavy vehicle adjustment, fHV	0.971	0.952	0.971	0.980			
Driver population adjustment, fP	1.00	1.00	1.00	1.00			
Flow rate, v	2956	0	604	188	pc/h		

______Weaving and Non-Weaving Speeds_____

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.0035
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.39	0.18
Weaving and non-weaving speeds, Si	58.13	65.82
Number of lanes required for		

unconstrained operation,	Nw	(Exhibit 24-7)		1.22
Maximum number of lanes,	Nw	(max) (Exhibit	24-7)	1.40
Type of operation is				Unconstrained

_______Weaving Segment Speed, Density, Level of Service and Capacity______

Weaving segment speed, S	64.03	mph
Weaving segment density, D	14.63	pc/mi/ln
Level of service, LOS	В	
Capacity of base condition, cb	8889	pc/h
Capacity as a 15-minute flow rate, c	8630	pc/h
Capacity as a full-hour volume, ch	7940	pc/h

_____Limitations on Weaving Segments______

		Ii Max Exce	eded See Note	
	Analyzed	Maximum	Note	
Weaving flow rate, Vw	792	2800	a	
Average flow rate (pcphpl)	937	2400	b	
Volume ratio, VR	0.21	0.35	C	
Weaving ratio, R	0.24	N/A	d	
Weaving length (ft)	2050	2500	е	
37 1				

Notes:

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

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Jurisdiction:

Analysis Year:

Description:

Southbound

SB On ramp from Bear Tavern E

Mercer County

2030 M- -Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 2811 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 270 Volume on ramp vph Length of first accel/decel lane 1203 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 540 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 440 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 270 2811 540 vph Peak-hour factor, PHF 0.92 0.92 0.92 147 Peak 15-min volume, v15 764 73 V 6 0 Trucks and buses 6 2 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
3147
Flow rate, vp
                                               296
                                                           605
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        699.13 (Equation 25-2 or 25-3)
                 ΕQ
                        0.595 Using Equation 2
                 FM
                v = v (P) = 1872 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                                      Maximum
                         Actual
                         3443
                                      7200
                                                     No
     FO
                         1275 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1872
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    3443
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 14.7 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.271
                                          S
Space mean speed in ramp influence area,
                                          S = 62.4
                                                      mph
                                          R
                                          S = 67.2
Space mean speed in outer lanes,
                                                      mph
                                          0
Space mean speed for all vehicles,
                                          S = 64.1
                                                      mph
```

1.00

0.990

1.00

0.971

1.00

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Diverge Analysis______ Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound NB off ramp to PA 332 Bucks County Junction: Jurisdiction: Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data______ Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 3053 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 1250 vph Length of first accel/decel lane 850 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent ramp 600 vph Position of adjacent ramp Downstream Type of adjacent ramp On Distance to adjacent ramp 2530 ft ______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	3053	1250	600 vph
Peak-hour factor, PHF	0.92	0.92	0.92
Peak 15-min volume, v15	830	340	163 v
Trucks and buses	6	7	4 %
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

```
1.00
                                              1.00
Driver population factor, fP
                                                         1.00
                                   3418
Flow rate, vp
                                              1406
                                                         665
                                                                 pcph
                 _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 3418 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        3418
                                     4700
                                                    No
     Fi F
    v = v - v
                        2012
                                     4700
                                                   No
        F R
     FΟ
                        1406
                                     2000
                                                   No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 3418
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area_____
                                Max Desirable
                                                     Violation?
                   Actual
                                4400
                    3418
                                                     No
    V
     12
            ____Level of Service Determination (if not F)______
                    D = 4.252 + 0.0086 v - 0.009 L = 26.0 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence C
                _____Speed Estimation_____
                                         D = 0.555
Intermediate speed variable,
                                         S
Space mean speed in ramp influence area,
                                        S = 52.2
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
Space mean speed for all vehicles,
                                        S = 52.2
                                                     mph
```

0.966

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound NB On ramp from PA332 n: Bucks County Junction: Analysis Year:
Description 2030 No-Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2403 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph Volume on ramp 90 vph 1375 Length of first accel/decel lane ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 600 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2530 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp 90 Volume, V (vph) 2403 600 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 653 24 163 V 7 0 Trucks and buses 6 4 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
2690
Flow rate, vp
                                               100
                                                          675
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2690 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                                     Maximum
                        Actual
                         2790
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 2690
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    2790
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 18.6 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.288
                                         S
Space mean speed in ramp influence area,
                                         S = 58.4
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 58.4
                                                     mph
```

1.00

0.980

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Phone: E-mail: Fax:

______Diverge Analysis______

Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Northbound

NB off ramp to Taylorsville Bucks County Junction:

Jurisdiction: Analysis Year: 2030 No-Build

Description: Scudder Falls

Distance to adjacent ramp

______Freeway Data______

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 65.0 Volume on freeway 2493

_____Off Ramp Data_____

mph

ft

vph

Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph Volume on ramp 390 vph Length of first accel/decel lane 850 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

______Conversion to pc/h Under Base Conditions_____

1250

Junction Components	Freeway	Ramp		Adjacen Ramp	t
Volume, V (vph)	2493	390		300	vph
Peak-hour factor, PHF	0.92	0.92		0.92	
Peak 15-min volume, v15	677	106		82	V
Trucks and buses	6	5		б	%
Recreational vehicles	0	0		0	%
Terrain type:	Level	Level		Level	
Grade	0.00 %	0.00	%	0.00	%
Length	0.00 m:	L 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	

```
Driver population factor, fP
                                    1.00
                                               1.00
                                                          1.00
Flow rate, vp
                                    2791
                                               435
                                                          336
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                L =
                               (Equation 25-8 or 25-9)
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 2791 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         2791
                                     4700
                                                    No
     Fi F
    v = v - v
                        2356
                                     4700
                                                    No
         F R
     FΟ
                         435
                                     2000
                                                    No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 2791
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2791
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 20.6 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence C
                _____Speed Estimation_____
                                         D = 0.467
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 54.3
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
Space mean speed for all vehicles,
                                        S = 54.3
                                                     mph
```

0.976

0.971

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from Taylorsville E
Jurisdiction: Bucks County
Analysis Year: 2030 No-Build Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2183 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 300 Volume on ramp vph Length of first accel/decel lane 455 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 390 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1250 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp 300 Volume, V (vph) 2183 390 vph 0.92 Peak-hour factor, PHF 0.92 0.92 106 Peak 15-min volume, v15 593 82 V 6 0 5 0 Trucks and buses 6 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
2444
Flow rate, vp
                                               336
                                                          435
                                                                  pcph
                  _____Estimation of V12 Merge Areas___
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2444 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                                      Maximum
                         Actual
                         2780
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 2444
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    2780
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 24.2 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.352
                                          S
Space mean speed in ramp influence area,
                                         S = 56.9
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 56.9
                                                     mph
```

1.00

0.971

1.00

0.976

1.00

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from Taylorsville W
Jurisdiction: Bucks County
Analysis Year: 2030 No-Build Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2403 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph Volume on ramp 240 vph Length of first accel/decel lane 275 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 300 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp On Distance to adjacent Ramp 910 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2403 240 300 vph 0.92 Peak-hour factor, PHF 0.92 0.92 Peak 15-min volume, v15 653 65 82 V 6 0 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
2690
Flow rate, vp
                                               266
                                                          336
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2690 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                                     Maximum
                        Actual
                         2956
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 2690
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    2956
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 26.7 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.377
                                         S
Space mean speed in ramp influence area,
                                         S = 56.3
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
```

S = 56.3

mph

0.971

1.00

0.980

1.00

0.971

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: E-mail:

Fax:

______Diverge Analysis______

Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Northbound NB Off Ramp to NJ29 Mercer County Junction: Analysis Year:
Descript: 2030 No-Build

Description: Scudder Falls

_____Freeway Data______

Type of analysis Diverge Number of lanes in freeway

Free-flow speed on freeway 70.0 mph Volume on freeway 2643 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 400 vph Length of first accel/decel lane 550 ft Length of second accel/decel lane ft

_____Adjacent Ramp Data (if one exists)_____

vph

ft

Does adjacent ramp exist? Yes Volume on adjacent ramp 140

Position of adjacent ramp Downstream

Type of adjacent ramp On Distance to adjacent ramp 545

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2643	400	140 vph	
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	718	109	38 v	
Trucks and buses	6	5	4 %	
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	

```
1.00
Driver population factor, fP
                                              1.00
                                                         1.00
                                   2959
Flow rate, vp
                                              446
                                                         155
                                                                 pcph
                 _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 2959 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        2959
                                     4800
                                                    No
     Fi F
    v = v - v
                        2513
                                     4800
                                                    No
         F R
     FΟ
                        446
                                     2000
                                                    No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 2959
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2959
                                                     No
    V
     12
            ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 24.7 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence C
                _____Speed Estimation_____
                                         D = 0.468
Intermediate speed variable,
                                         S
Space mean speed in ramp influence area,
                                         S = 56.9
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
Space mean speed for all vehicles,
                                        S = 56.9
                                                     mph
```

0.976

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _____Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from NJ 29
Jurisdiction: Mercer County
Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 2243 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 140 Volume on ramp vph Length of first accel/decel lane 500 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 400 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 545 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 140 2243 400vph Peak-hour factor, PHF 0.92 0.92 0.92 109 Peak 15-min volume, v15 610 38 V 5 0 Trucks and buses 6 4 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
2511
Flow rate, vp
                                               155
                                                          446
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2511 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                         Actual
                                      Maximum
                         2666
                                      4800
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                      12
If yes, v = 2511
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    2666
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 23.1 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.342
                                          S
Space mean speed in ramp influence area,
                                         S = 60.4
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 60.4
                                                     mph
```

1.00

0.980

1.00

0.976

1.00

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Jurisdiction:

Analysis Year:

Description:

Northbound

NB On ramp from Upper River Rd

Mercer County

2030 No D ... Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph 2383 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 220 Volume on ramp vph 500 Length of first accel/decel lane 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 1640 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2383 220 140 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 648 60 38 V 4 0 Trucks and buses 6 12 0 Recreational vehicles 용 Level Level Level Terrain type: 용 % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
2668
Flow rate, vp
                                               253
                                                          155
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2668 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                        Actual
                                     Maximum
                         2921
                                     4800
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 2668
                                     (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    2921
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 25.0 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.358
                                         S
Space mean speed in ramp influence area,
                                         S = 60.0
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
```

S = 60.0

mph

0.971

1.00

0.943

1.00

0.980

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: E-mail:

Fax:

_____Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB Off Ramp to Bear Tavern Rd

Jurisdiction: Mercer County
Analysis Year: 2030 No-Build

Description: Scudder Falls

_____Freeway Data______

Type of analysis Diverge
Number of lanes in freeway 3
Free-flow speed on freeway 70.0

Free-flow speed on freeway 70.0 mph Volume on freeway 2603 vph

_____Off Ramp Data_____

Side of freeway

Number of lanes in ramp

Free-Flow speed on ramp

Volume on ramp

Length of first accel/decel lane

Length of second accel/decel lane

ft

______Adjacent Ramp Data (if one exists)_____

vph

ft

Does adjacent ramp exist? Yes
Volume on adjacent ramp 650

Position of adjacent ramp Downstream

Type of adjacent ramp On
Distance to adjacent ramp 2545

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2603	370	650	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	707	101	177	v
Trucks and buses	6	3	4	%
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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    2914
                                               408
                                                          721
                                                                  pcph
                 _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.668 Using Equation 5
                 FD
                v = v + (v - v) P = 2083 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        2914
                                     7200
                                                    No
     Fi F
    v = v - v
                        2506
                                     7200
                                                    No
         F R
     FΟ
                        408
                                     2000
                                                    No
    V
     R
                        831 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 2083
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2083
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 11.3 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.465
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 57.0
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 76.8
                                                     mph
Space mean speed for all vehicles,
                                        S = 61.5
                                                     mph
```

0.985

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from Bear Tavern Rd
Jurisdiction: Mercer County
Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 2223 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 650 Volume on ramp vph Length of first accel/decel lane 1150 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 370 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2545 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 650 2223 370 vph Peak-hour factor, PHF 0.92 0.92 177 0.92 Peak 15-min volume, v15 604 101 V 3 Trucks and buses 6 4 0 Recreational vehicles ે Level Level Level Terrain type: % % 용 Grade Length mi mi

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

шi

1.5

1.2

1.5

1.2

```
2489
Flow rate, vp
                                               721
                                                          408
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        625.74 (Equation 25-2 or 25-3)
                 ΕQ
                       0.610 Using Equation 1
                 FM
                v = v (P) = 1518 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         3210
                                      7200
                                                     No
     FO
                         971 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1518
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    3210
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 15.4 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.277
                                          S
Space mean speed in ramp influence area,
                                         S = 62.2
                                                      mph
                                          R
                                         S = 68.3
Space mean speed in outer lanes,
                                                      mph
                                          0
Space mean speed for all vehicles,
                                         S = 64.0
                                                      mph
```

1.00

0.980

1.00

0.985

1.00

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _____Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/201
Analysis time period: PM Peak 4/12/2011 Freeway/Dir of Travel: I-95 Northbound Junction: NB on ramp from PA 322
Jurisdiction: Bucks County
Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 1793 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 600 Volume on ramp vph Length of first accel/decel lane 850 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1150 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2530 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 1793 600 1150 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 487 163 312 V 4 0 Trucks and buses 6 7 0 Recreational vehicles ે Level Level Level Terrain type: 용 % 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
2007
                                               675
Flow rate, vp
                                                          1275
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2007 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                         Actual
                                     Maximum
                         2682
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 2007
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    2682
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 20.8 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.318
                                          S
Space mean speed in ramp influence area,
                                         S = 57.7
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 57.7
                                                     mph
```

1.00

0.966

1.00

0.980

1.00

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _____Diverge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB Off Ramp to PA332 Jurisdiction: Bucks County Analysis Year: 2030 No-Build Description: Scudder Falls ______Freeway Data______

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0 r	mph
Volume on freeway	3845	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	1350	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

2525

On

Distance to adjacent ramp

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp		Adjacer	nt
				Ramp	
Volume, V (vph)	3845	1350		1370	vph
Peak-hour factor, PHF	0.92	0.92		0.92	
Peak 15-min volume, v15	1045	367		372	V
Trucks and buses	6	7		6	%
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
                                   0.971
                                              0.966
                                                         0.971
                                   1.00
                                              1.00
Driver population factor, fP
                                                         1.00
Flow rate, vp
                                   4305
                                              1519
                                                         1534
                                                                 pcph
                 _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 4305 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        4305
                                     4700
                                                    No
     Fi F
    v = v - v
                        2786
                                     4700
                                                    No
        F R
     FΟ
                        1519
                                     2000
                                                    No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 4305
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area_____
                                Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    4305
                                                     No
    V
     12
            ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 33.6 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.565
Intermediate speed variable,
                                         S
Space mean speed in ramp influence area,
                                         S = 52.0
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
```

S = 52.0

mph

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound SB On ramp from PA 332 n: Bucks County Junction: Ourisdiction:
Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2495 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 1370 Volume on ramp vph Length of first accel/decel lane 1375 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1350 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2525 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2495 1370 1350 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 372 678 367 V 7 0 Trucks and buses 6 6 0 Recreational vehicles 왕 Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
2793
                                               1534
Flow rate, vp
                                                          1519
                                                                  pcph
                  _____Estimation of V12 Merge Areas___
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2793 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                        Actual
                                      Maximum
                         4327
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 2793
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    4327
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 29.9 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.520
                                          S
Space mean speed in ramp influence area,
                                         S = 53.0
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 53.0
                                                     mph
```

1.00

0.971

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Analyst: TPR
Agency/Co.: AECOM`
Date performed: 4/12/11
Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Southbound

Junction: SB Off Ramp to Taylorsville W

Jurisdiction: Bucks County Analysis Year: 2030 No-Build

Description: Scudder Falls

______Freeway Data______

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 4895 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	750	vph
Length of first accel/decel lane	550	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

790

ft

_____Conversion to pc/h Under Base Conditions_____

Freeway	Ramp	Adjacen	t
		Ramp	
4895	750	610	vph
0.92	0.92	0.92	
1330	204	166	V
6	4	7	%
0	0	0	%
Level	Level	Level	
0.00 %	0.00	0.00	%
0.00 mi	0.00 n	ni 0.00	mi
1.5	1.5	1.5	
1.2	1.2	1.2	
	4895 0.92 1330 6 0 Level 0.00 % 0.00 mi	4895 750 0.92 0.92 1330 204 6 4 0 0 Level Level 0.00 % 0.00 % 0.00 mi 0.00 m 1.5 1.5	Ramp 4895 750 610 0.92 0.92 0.92 1330 204 166 6 4 7 0 0 0 0 Level Level Level 0.00 % 0.00 % 0.00 0.00 mi 0.00 mi 0.00 1.5 1.5

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                    5480
Flow rate, vp
                                               832
                                                          686
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 5480 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         5480
                                     4700
                                                    Yes
     Fi F
    v = v - v
                        4648
                                     4700
                                                    No
         F R
     FΟ
                        832
                                     2000
                                                    No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 5480
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area_____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    5480
                                                     Yes
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 46.4 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence F
                _____Speed Estimation_____
                                         D = 0.503
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 53.4
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
Space mean speed for all vehicles,
                                        S = 53.4
                                                     mph
```

0.980

0.966

Heavy vehicle adjustment, fHV

Phone: E-mail: Fax:

Diverge	Analysis

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Southbound

Junction: SB Off Ramp to Taylorsville E

Jurisdiction: Bucks County
Analysis Year: 2030 No-Build

Description: Scudder Falls

_____Freeway Data_____

Type of analysis Diverge
Number of lanes in freeway 2
Free-flow speed on freeway 65.0 mph
Volume on freeway 4145 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	610	vph
Length of first accel/decel lane	100	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

1400

Test

Test

Type

Typ

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp		Adjacer	nt
	44.4-			Ramp	
Volume, V (vph)	4145	610		310	vph
Peak-hour factor, PHF	0.92	0.92		0.92	
Peak 15-min volume, v15	1126	166		84	V
Trucks and buses	6	7		3	%
Recreational vehicles	0	0		0	%
Terrain type:	Level	Level		Level	
Grade	0.00 %	0.00	%	0.00	%
Length	0.00 m	ni 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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    4641
                                               686
                                                          342
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 4641 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        4641
                                     4700
                                                    No
     Fi F
    v = v - v
                        3955
                                     4700
                                                    No
         F R
     FΟ
                        686
                                     2000
                                                    No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
                > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 4641
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area_____
                    Actual
                                 Max Desirable
                                                     Violation?
                                 4400
                    4641
                                                     Yes
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 43.3 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence E
                _____Speed Estimation_____
                                         D = 0.490
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 53.7
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
Space mean speed for all vehicles,
                                        S = 53.7
                                                     mph
```

0.971

0.966

0.985

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from Taylorsville
Jurisdiction: Bucks County
Analysis Year: 2030 No-Build Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 3535 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph Volume on ramp 310 vph Length of first accel/decel lane 1265 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 610 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1400 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 3535 310 610 vph 0.92 0.92 Peak-hour factor, PHF 0.92 Peak 15-min volume, v15 961 84 166 V 3 7 0 Trucks and buses 6 Recreational vehicles 용 Level Level Level Terrain type: % % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
3958
Flow rate, vp
                                               342
                                                          686
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 3958 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                        Actual
                                      Maximum
                         4300
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 3958
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    4300
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 30.9 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.520
                                          S
Space mean speed in ramp influence area,
                                         S = 53.0
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 53.0
                                                     mph
```

0.971

1.00

0.985

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: ______Diverge Analysis______ Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound SB Off Ramp to NJ 29 Junction: Jurisdiction: Mercer County Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data______ Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 4855 vph _____Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph Volume on ramp 410 vph Length of first accel/decel lane 500 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent ramp 450 vph Position of adjacent ramp Downstream Type of adjacent ramp On Distance to adjacent ramp 880 ft ______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	4855		410		450	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	1319		111		122	V
Trucks and buses	6		11		4	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00 %	;	0.00	%	0.00	%
Length	0.00 m	ιi	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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                    5435
Flow rate, vp
                                               470
                                                          499
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 5435 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         5435
                                     4800
                                                    Yes
     Fi F
    v = v - v
                        4965
                                     4800
                                                    Yes
         F R
     FΟ
                         470
                                     2000
                                                    No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 5435
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area_____
                                 Max Desirable
                                                     Violation?
                    Actual
                    5435
                                 4400
                                                     Yes
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 46.5 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence F
                _____Speed Estimation_____
                                         D = 0.470
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 56.8
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
Space mean speed for all vehicles,
                                        S = 56.8
                                                     mph
```

0.971

0.948

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound SB On ramp from NJ 29 n: Mercer County Junction: Ourisdiction:
Analysis Year: 2030 No-Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 4445 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 450 Volume on ramp vph Length of first accel/decel lane 338 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 410 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 880 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 450 4445 410 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 1208 122 111 V Trucks and buses 6 4 11 0 Recreational vehicles 0 % Level Level Level Terrain type: % % Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
4976
                                               499
Flow rate, vp
                                                          470
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 4976 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                                      Maximum
                         Actual
                         5475
                                      4800
                                                    Yes
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 4976
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                    5475
                                 4600
                                                     Yes
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 45.8 pc/mi/ln
Level of service for ramp-freeway junction areas of influence F
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 1.228
                                          S
Space mean speed in ramp influence area,
                                         S = 35.6
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 35.6
                                                     mph
```

0.971

1.00

0.980

1.00

0.948

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail: Fax:

______Operational Analysis_____

Analyst: TPR
Agency/Co.: AECOM
Date Performed: 4/12/11
Analysis Time Period: PM Peak

Freeway/Dir of Travel: I-95 Southbound
Weaving Location: Bear Tavern Road
Jurisdiction: Mercer County
Analysis Year: 2030 No-Build

Description: Scudder Falls

_____Inputs_____

Freeway free-flow speed, SFF Weaving number of lanes, N	70 4	mph
Weaving segment length, L	2050	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	
Volume ratio, VR	0.15	
Weaving ratio, R	0.49	

______Conversion to pc/h Under Base Conditions_____

Non-Wea	aving	Weaving	3	
V	V	V	V	
01	02	w1	w2	
4425	0	400	380	veh/h
0.92	0.92	0.92	0.92	
1202	0	109	103	V
6	10	6	4	%
0	0	0	0	%
1.5	1.5	1.5	1.5	
1.2	1.2	1.2	1.2	
0.971	0.952	0.971	0.980	
1.00	1.00	1.00	1.00	
4954	0	447	421	pc/h
	V 01 4425 0.92 1202 6 0 1.5 1.2 0.971 1.00	V V 01 02 4425 0 0.92 0.92 1202 0 6 10 0 0 1.5 1.5 1.2 1.2 0.971 0.952 1.00 1.00	V V V 01 02 w1 4425 0 400 0.92 0.92 0.92 1202 0 109 6 10 6 0 0 0 1.5 1.5 1.5 1.2 1.2 1.2 0.971 0.952 0.971 1.00 1.00 1.00	o1 o2 w1 w2 4425 0 400 380 0.92 0.92 0.92 0.92 1202 0 109 103 6 10 6 4 0 0 0 0 1.5 1.5 1.5 1.5 1.2 1.2 1.2 1.2 0.971 0.952 0.971 0.980 1.00 1.00 1.00 1.00

______Weaving and Non-Weaving Speeds______

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.0035
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.53	0.26
Weaving and non-weaving speeds, Si	54.11	62.65
Numbers of length security of form		

Number of lanes required for

unconstrained operation	ı, Nw	(Exhibit 24-7)		1.04
Maximum number of lanes	, Nw	(max) (Exhibit	24-7)	1.40
Type of operation is				Unconstrained

_______Weaving Segment Speed, Density, Level of Service and Capacity______

Weaving segment speed, S	61.21	mph
Weaving segment density, D	23.78	pc/mi/ln
Level of service, LOS	C	
Capacity of base condition, cb	9195	pc/h
Capacity as a 15-minute flow rate, c	8927	pc/h
Capacity as a full-hour volume, ch	8213	pc/h

_____Limitations on Weaving Segments______

		If Max Exceed	
	Analyzed	Maximum	Note
Weaving flow rate, Vw	868	2800	а
Average flow rate (pcphpl)	1455	2400	b
Volume ratio, VR	0.15	0.35	С
Weaving ratio, R	0.49	N/A	d
Weaving length (ft)	2050	2500	е
No. to a second			

Notes:

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

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Jurisdiction:

Analysis Year:

Description:

Southbound

SB On ramp from Bear Tavern E

Mercer County

2030 No D Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 4405 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 450 Volume on ramp vph Length of first accel/decel lane 1203 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 400 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 440 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 4405 450 400vph 0.92 Peak-hour factor, PHF 0.92 0.92 1197 109 Peak 15-min volume, v15 122 V 6 0 Trucks and buses 6 2 0 Recreational vehicles ે Level Level Level Terrain type: % % 용 Grade Length mi mi

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

шi

1.5

1.2

1.5

1.2

```
Driver population factor, fP
                                    1.00
                                                          1.00
                                    4932
                                               494
Flow rate, vp
                                                          448
                                                                   pcph
                   _____Estimation of V12 Merge Areas___
                        1123.50 (Equation 25-2 or 25-3)
                 ΕQ
                       0.568 Using Equation 2
                 FM
                v = v (P) = 2801 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                                      Maximum
                         Actual
                         5426
                                      7200
                                                     No
     FO
                         2131 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
Is
    v v
                                      Yes
     3 or av34
                      12
If yes, v = 2818
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                    5426
                                 4600
                                                      No
     12A
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 23.5 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.344
                                          S
Space mean speed in ramp influence area,
                                         S = 60.4
                                                      mph
                                          R
Space mean speed in outer lanes,
                                         S = 64.2
                                                      mph
                                          0
```

S = 61.8

mph

0.971

0.990

1.00

0.971

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 46 & 49 Jurisdiction: Bucks County Analysis Year: 2030 Build Description: Scudder Falls _____Flow Inputs and Adjustments_____ Volume, V 3773 veh/h Peak-hour factor, PHF 0.92 1025 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade 0.05 % Grade 0.33 Segment length тi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 2112 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS 65.0 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 4.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 2112 65.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 59.3 mi/h Number of lanes, N

35.6

pc/mi/ln

Density, D

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 49 & 51 Jurisdiction: Bucks County Analysis Year: 2030 Build Description: Scudder Falls _____Flow Inputs and Adjustments_____ Volume, V 4083 veh/h Peak-hour factor, PHF 0.92 1110 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade -3.00 % Grade 0.47 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 1524 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 65.0 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 3.0 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 1524 65.0 Free-flow speed, FFS mi/h 65.0 Average passenger-car speed, S mi/h Number of lanes, N

23.5

pc/mi/ln

Density, D

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analyst:	TPR		
Agency or Company:	AECOM		
Date Performed:	4/12/11		
Analysis Time Period:	AM Peak		
Freeway/Direction:			
From/To:	btw exits 51 & 1		
	Bucks County		
Analysis Year:			
Description: Scudder B	dalls		
	Flow Inputs and	Adjustments	
Volume, V		6343	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v15	5	1724	V
Trucks and buses		6	%
Recreational vehicles Terrain type:		0 Grade	8
Grade		0.73	%
Segment length		0.75	mi
Trucks and buses PCE, E	CT	1.5	
Recreational vehicle Po		1.2	
Heavy vehicle adjustmer	nt, fHV	0.971	
Driver population factor	or, fp	1.00	
Flow rate, vp		1420	pc/h/ln
	Speed Inputs and	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		5	
Free-flow speed:		Measured	
FFS or BFFS	£ T T.T	65.0	mi/h
Lane width adjustment, Lateral clearance adjus		0.0	mi/h mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustr		0.0	mi/h
Free-flow speed, FFS		65.0	mi/h
- ,		Urban Freeway	
	LOS and Perform	ance Measures	
Flow rate, vp		1420	pc/h/ln
Free-flow speed, FFS		65.0	mi/h
Average passenger-car s	speed, S	65.0	mi/h
Number of lanes, N		5	
Density, D		21.8	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analyst:	TPR		
Agency or Company:	AECOM		
Date Performed:	4/12/11		
Analysis Time Period:	AM Peak		
Freeway/Direction:	I-95 Northbound		
From/To:	btw exits 1 & 2		
	Mercer County		
Analysis Year:			
Description: Scudder B	Falls		
	Flow Inputs and	Adjustments	
Volume, V		5923	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v15	5	1610	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Grade	
Grade		3.10	%
Segment length		0.75	mi
Trucks and buses PCE, I		2.0	
Recreational vehicle PO		3.0	
Heavy vehicle adjustmen		0.943	
Driver population factor Flow rate, vp	or, ip	1.00 1706	pc/h/ln
riow face, vp		1700	pe/11/111
	Speed Inputs and	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		4	
Free-flow speed:		Measured	
FFS or BFFS	ET M	70.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density adj Number of lanes adjustr		0.0 1.5	mi/h mi/h
Free-flow speed, FFS	menc, in	70.0	mi/h
rice flow speed, rrs		Urban Freeway	1111/11
	LOS and Perform	ance Measures	
Elem mate		1706	ng/h/lr
Flow rate, vp		1706	pc/h/ln mi/h
Free-flow speed, FFS Average passenger-car s	aneed C	70.0 68.8	mi/h mi/h
Number of lanes, N	specu, s	4	m ± / 11
Density, D		24.8	pc/mi/ln

Phone: E-mail:		Fax:		
	Operational Ana	lysis		
Analyst:	TPR			
Agency or Company:	AECOM			
	4/12/11			
Analysis Time Period:	AM Peak			
Freeway/Direction:	I-95 Northbound			
From/To:	btw exits 2 & 3			
	Mercer County			
Analysis Year:				
Description: Scudder I	Falls			
	Flow Inputs and	Adjustments		
Volume, V		5513	veh/h	
Peak-hour factor, PHF		0.92		
Peak 15-min volume, v1!	5	1498	V	
Trucks and buses		6	%	
Recreational vehicles		0	%	
Terrain type:		Level		
Grade		0.00	%	
Segment length		0.00	mi	
Trucks and buses PCE, ET		1.5		
Recreational vehicle PCE, ER		1.2		
Heavy vehicle adjustment, fHV		0.971		
Driver population factor, fp Flow rate, vp		1.00 2057	pc/h/ln	
Speed Inputs and Adjustments				
		a Adjubemeneb		
Lane width		12.0	ft	
Right-shoulder lateral	clearance	6.0	ft	
Interchange density		0.50	interchange/mi	
Number of lanes, N		3		
Free-flow speed:		Measured		
FFS or BFFS	ST M	70.0	mi/h	
Lane width adjustment,		0.0	mi/h	
Lateral clearance adjust Interchange density adjusted		0.0	mi/h mi/h	
Number of lanes adjustr		3.0	mi/h	
Free-flow speed, FFS	menc, in	70.0	mi/h	
rice flow speed, rrs		Urban Freeway	1117 11	
LOS and Performance Measures				
Elem mete		2057	ma/h/lm	
Flow rate, vp		2057	pc/h/ln mi/h	
Free-flow speed, FFS Average passenger-car s	sneed S	70.0 63.7	mi/h mi/h	
Number of lanes, N	specu, b	3	m ± / 11	
Density, D		32.3	pc/mi/ln	

Phone: E-mail:		Fax:	
	Operational Analy	/sis	
Analysis Time Period: Freeway/Direction: From/To:	I-95 Southbound btw exits 49 & 46 Bucks County 2030 Build		
	Flow Inputs and ${\it P}$	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Segment length Trucks and buses PCE, E	T	3427 0.92 931 6 0 Grade -0.05 0.33 1.5	veh/h v % % % mi
Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV Driver population factor, fp Flow rate, vp		1.2 0.971 1.00 1918	pc/h/ln
	Speed Inputs and	Adjustments	
Lane width Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustment Free-flow speed, FFS	clearance fLW tment, fLC ustment, fID ent, fN	12.0 6.0 0.50 2 Measured 65.0 0.0 0.0 0.0 4.5 65.0 Urban Freeway	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h
LOS and Performance Measures			
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N Density, D	peed, S	1918 65.0 62.7 2 30.6	<pre>pc/h/ln mi/h mi/h pc/mi/ln</pre>

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analysis Time Period:	I-95 Southbound btw exits 51 & 4 Bucks County 2030 Build	9	
Description: Scudder i		Adjustments	
Volume, V		2727	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v15		741	V
Trucks and buses		6	8
Recreational vehicles		0	%
Terrain type:		Grade	
Grade		3.00	8
Segment length		0.47	mi
Trucks and buses PCE, E	T.	1.5	
Recreational vehicle PCE, ER		1.2	
Heavy vehicle adjustment, fHV		0.971	
Driver population factor, fp		1.00	
Flow rate, vp	, -	1018	pc/h/ln
	Speed Inputs an	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density	0100101100	0.50	interchange/mi
Number of lanes, N		3	inceremange, mi
Free-flow speed:		Measured	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fT.W	0.0	mi/h
Lateral clearance adjustment, fLC		0.0	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm		3.0	mi/h
Free-flow speed, FFS	iciic, liv	65.0	mi/h
riee-liow speed, rrs		Urban Freeway	·
LOS and Performance Measures			
Flow rate, vp		1018	pc/h/ln
Free-flow speed, FFS		65.0	mi/h
Average passenger-car s	need S	65.0	mi/h
Number of lanes, N	שלים ביים ביים ביים ביים ביים ביים ביים ב	3	m±/11
Density, D		15.7	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analyst:	TPR		
Agency or Company:	AECOM		
Date Performed:	4/12/11		
Analysis Time Period:	AM Peak		
Freeway/Direction:	I-95 Southbound		
From/To:	btw exits 1 & 51		
Jurisdiction:	Mercer County		
Analysis Year:			
Description: Scudder I	Falls		
	Flow Inputs and	Adjustments	
Volume, V		2797	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v1!	5	760	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Grade	
Grade		-0.73	%
Segment length		0.49	mi
Trucks and buses PCE, ET		1.5	
Recreational vehicle PCE, ER		1.2	
Heavy vehicle adjustment, fHV		0.971	
Driver population factor, fp		1.00	/1- /1
Flow rate, vp		783	pc/h/ln
	Speed Inputs and	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		4	
Free-flow speed:		Measured	. 71
FFS or BFFS	ET M	65.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density ad: Number of lanes adjusts		0.0 1.5	mi/h mi/h
Free-flow speed, FFS	menc, in	65.0	mi/h
riee-iiow speed, rrs		Urban Freeway	1111/11
LOS and Performance Measures			
Flow rate wa		702	ng/h/ln
Flow rate, vp		783 65.0	pc/h/ln mi/h
Free-flow speed, FFS Average passenger-car s	aneed S	65.0	mi/h
Number of lanes, N	speed, b	4	m1/11
Density, D		12.0	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analyst:	TPR		
Agency or Company:	AECOM		
Date Performed:	4/12/11		
Analysis Time Period:			
Freeway/Direction:	I-95 Southbound		
From/To:	btw exits 2 & 1		
	Mercer County		
Analysis Year:	2030 Build		
Description: Scudder F	alls		
	Flow Inputs and	Adjustments	
Volume, V		2907	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v15		790	V
Trucks and buses		6	%
Recreational vehicles		0	8
Terrain type: Grade		Grade	8
Segment length		-3.10 0.75	mi
Trucks and buses PCE, E	T	1.5	шт
Recreational vehicle PCE, ER		1.2	
Heavy vehicle adjustment, fHV		0.971	
Driver population factor, fp		1.00	
Flow rate, vp		1085	pc/h/ln
	Speed Inputs an	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		3	
Free-flow speed:		Measured	
FFS or BFFS	_	70.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm Free-flow speed, FFS	ent, in	3.0 70.0	mi/h mi/h
riee-ilow speed, rrs		Urban Freeway	·
LOS and Performance Measures			
Flow rate, vp		1085	pc/h/ln
Free-flow speed, FFS		70.0	mi/h
Average passenger-car s	peed, S	70.0	mi/h
Number of lanes, N	<u>.</u> / -	3	- ,
Density, D		15.5	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analyst:	TPR		
Agency or Company:	AECOM		
Date Performed:	4/12/11		
Analysis Time Period:	AM Peak		
Freeway/Direction:	I-95 Southbound		
From/To:	btw exits 3 & 2		
	Mercer County		
Analysis Year:			
Description: Scudder I	Falls		
	Flow Inputs and	Adjustments	
Volume, V		2997	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v1!	5	814	V
Trucks and buses		6	8
Recreational vehicles		0	%
Terrain type:		Level	
Grade		0.00	%
Segment length		0.00	mi
Trucks and buses PCE, ET		1.5	
Recreational vehicle PCE, ER		1.2	
Heavy vehicle adjustment, fHV		0.971	
Driver population factor, fp		1.00	/l- /l
Flow rate, vp		1118	pc/h/ln
	Speed Inputs and	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		3	
Free-flow speed:		Measured	
FFS or BFFS	ST M	70.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		0.0	mi/h mi/h
Interchange density ad Number of lanes adjustr		3.0	mi/h
Free-flow speed, FFS	menc, in	70.0	mi/h
rice flow speed, ris		Urban Freeway	1111/11
LOS and Performance Measures			
Flow rate wa		1110	ng/h/ln
Flow rate, vp		1118	pc/h/ln mi/h
Free-flow speed, FFS	aneed C	70.0 70.0	mi/h mi/h
Average passenger-car s Number of lanes, N	speed, s	3	шт/П
Density, D		16.0	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analyst:	TPR		
Agency or Company:	AECOM		
Date Performed:	4/12/11		
Analysis Time Period:	PM Peak		
Freeway/Direction:	I-95 Northbound		
From/To:	btw exits 46 & 49		
	Bucks County		
Analysis Year:			
Description: Scudder B	dalis		
	Flow Inputs and	Adjustments	
Volume, V		3290	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v15	5	894	V
Trucks and buses		6	8
Recreational vehicles		0	8
Terrain type: Grade		Grade 0.05	90
Segment length		0.03	mi
Trucks and buses PCE, E	cT	1.5	шт
Recreational vehicle PCE, ER		1.2	
Heavy vehicle adjustment, fHV		0.971	
Driver population factor, fp		1.00	
Flow rate, vp		1842	pc/h/ln
	Speed Inputs and	d 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:		Measured	
FFS or BFFS		65.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjust Interchange density adj		0.0	mi/h mi/h
Number of lanes adjustr		4.5	mi/h
Free-flow speed, FFS	iiciic, iii	65.0	mi/h
and the second second		Urban Freeway	
LOS and Performance Measures			
Flow rate, vp		1842	pc/h/ln
Free-flow speed, FFS		65.0	mi/h
Average passenger-car s	speed, S	63.5	mi/h
Number of lanes, N	-	2	
Density, D		29.0	pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 49 & 51 Jurisdiction: Bucks County Analysis Year: 2030 Build Description: Scudder Falls _____Flow Inputs and Adjustments_____ veh/h Volume, V 2740 Peak-hour factor, PHF 0.92 745 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade -3.00 % Grade 0.47 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 1023 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 65.0 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 3.0 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 1023 65.0 Free-flow speed, FFS mi/h 65.0 Average passenger-car speed, S mi/h Number of lanes, N

15.7

pc/mi/ln

Density, D

Phone: E-mail:		Fax:	
	Operational Analy	/sis	
Analysis Time Period: Freeway/Direction: From/To:	I-95 Northbound btw exits 51 & 1 Bucks County 2030 Build		
	Flow Inputs and ${\it P}$	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Segment length Trucks and buses PCE, E Recreational vehicle PC Heavy vehicle adjustment	T E, ER t, fHV	2950 0.92 802 6 0 Grade 0.73 0.49 1.5 1.2 0.971	veh/h v % % % mi
Flow rate, vp	-, -F	661	pc/h/ln
	Speed Inputs and	Adjustments	
Lane width Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustment Free-flow speed, FFS	fLW tment, fLC ustment, fID ent, fN	12.0 6.0 0.50 5 Measured 65.0 0.0 0.0 0.0 0.0 Urban Freeway	<pre>ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h</pre>
	LOS and Performar	nce Measures	
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N Density, D	peed, S	661 65.0 65.0 5	<pre>pc/h/ln mi/h mi/h pc/mi/ln</pre>

Phone: E-mail:		Fax:	
	Operational Anal	lysis	
Analyst:	TPR		
Agency or Company:	AECOM		
Date Performed:	4/12/11		
Analysis Time Period:			
Freeway/Direction:	I-95 Northbound		
From/To:	btw exits 1 & 2		
	Mercer County		
Analysis Year:	2030 Build		
Description: Scudder F	alls		
	Flow Inputs and	Adjustments	
Volume, V		2870	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v15		780	V
Trucks and buses		6	9
Recreational vehicles		0	%
Terrain type: Grade		Grade	8
Segment length		3.10 0.75	mi
Trucks and buses PCE, E	T	2.0	шт
Recreational vehicle PC		3.0	
Heavy vehicle adjustmen		0.943	
Driver population facto		1.00	
Flow rate, vp	· -	827	pc/h/ln
	Speed Inputs and	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		4	
Free-flow speed:		Measured	
FFS or BFFS	_	70.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density adj		0.0 1.5	mi/h
Number of lanes adjustm Free-flow speed, FFS	ent, in	70.0	mi/h mi/h
riee-liow speed, rrs		Urban Freeway	·
	LOS and Performa	ance Measures	
Flow rate, vp		827	pc/h/ln
Free-flow speed, FFS		70.0	mi/h
Average passenger-car s	peed, S	70.0	mi/h
Number of lanes, N	/	4	,
Density, D		11.8	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Anal	ysis	
Analyst:	TPR		
Agency or Company:	AECOM		
Date Performed:	4/12/11		
Analysis Time Period:	PM Peak		
Freeway/Direction:	I-95 Northbound		
From/To:	btw exits 2 & 3		
	Mercer County		
Analysis Year:			
Description: Scudder F	alls		
	Flow Inputs and	Adjustments	
Volume, V		3130	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v15		851	V
Trucks and buses		6	8
Recreational vehicles		0	%
Terrain type:		Level	
Grade		0.00	%
Segment length		0.00	mi
Trucks and buses PCE, E		1.5	
Recreational vehicle PC		1.2	
Heavy vehicle adjustmen		0.971	
Driver population facto	r, ip	1.00	ng/h/ln
Flow rate, vp		1168	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		3	
Free-flow speed:		Measured	. 71
FFS or BFFS	ET M	70.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus Interchange density adj		0.0	mi/h mi/h
Number of lanes adjustm		3.0	mi/h
Free-flow speed, FFS	elic, in	70.0	mi/h
rice flow speed, Frb		Urban Freeway	11117 11
	LOS and Performa	nce Measures	
Flow rate		1160	ng/h/ln
Flow rate, vp		1168	pc/h/ln mi/h
Free-flow speed, FFS	need C	70.0 70.0	mi/h mi/h
Average passenger-car s Number of lanes, N	heer' p	3	шт/11
Density, D		16.7	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ana	alysis	
Analyst:	TPR		
Agency or Company:	AECOM		
	4/12/11		
Analysis Time Period:			
Freeway/Direction:			
From/To:	btw exits 49 & 4	16	
Jurisdiction:	Bucks County		
Analysis Year:	2030 Build		
Description: Scudder			
	Flow Inputs and	d Adjustments	
Volume, V		4237	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v1	5	1151	V
Trucks and buses		6	8
Recreational vehicles		0	8
Terrain type:		Grade	
Grade		-0.05	%
Segment length		0.33	mi
Trucks and buses PCE, I	ΞT	1.5	
Recreational vehicle Po		1.2	
Heavy vehicle adjustmen		0.971	
Driver population factor		1.00	
Flow rate, vp		2372	pc/h/ln
	Speed Inputs ar	nd 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:		Measured	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus	stment, fLC	0.0	mi/h
Interchange density ad	justment, fID	0.0	mi/h
Number of lanes adjust	ment, fN	4.5	mi/h
Free-flow speed, FFS		65.0	mi/h
		Urban Freeway	
	LOS and Perform	nance Measures	
Flow rate, vp		2372	pc/h/ln
Free-flow speed, FFS		65.0	mi/h
Average passenger-car	speed, S		mi/h
Number of lanes, N		2	
Density, D			pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Anal	ysis	
From/To:	I-95 Southbound btw exits 51 & 49 Bucks County 2030 Build		
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15	j	4257 0.92 1157	veh/h v
Trucks and buses Recreational vehicles Terrain type: Grade		6 0 Grade 3.00	80 80
Segment length Trucks and buses PCE, E Recreational vehicle PC	CE, ER	0.47 1.5 1.2	mi
Heavy vehicle adjustment Driver population factor Flow rate, vp		0.971 1.00 1589	pc/h/ln
	Speed Inputs and	Adjustments	
Lane width Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed:	clearance	12.0 6.0 0.50 3 Measured	ft ft interchange/mi
FFS or BFFS Lane width adjustment, Lateral clearance adjust Interchange density adjustment	tment, fLC ustment, fID	65.0 0.0 0.0 0.0	mi/h mi/h mi/h mi/h
Number of lanes adjustm Free-flow speed, FFS		3.0 65.0 Urban Freeway	mi/h mi/h
	LOS and Performa	nce Measures	
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N	speed, S	1589 65.0 64.9 3	pc/h/ln mi/h mi/h
Density, D		24.5	pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Southbound From/To: btw exits 1 & 51 Jurisdiction: Mercer County Analysis Year: 2030 Build Description: Scudder Falls _____Flow Inputs and Adjustments_____ Volume, V 5427 veh/h Peak-hour factor, PHF 0.92 1475 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade -0.73 % Grade 0.49 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 1519 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS 65.0 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 1.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 1519 65.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 65.0 mi/h Number of lanes, N

23.4

pc/mi/ln

Density, D

Phone: E-mail:		Fax:	
	Operational Anal	ysis	
Analysis Time Period:	I-95 Southbound btw exits 2 & 1 Mercer County 2030 Build		
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Segment length Trucks and buses PCE, E Recreational vehicle PC Heavy vehicle adjustment	T E, ER	5247 0.92 1426 6 0 Grade -3.10 0.75 1.5 1.2	veh/h v % % % mi
Driver population factor Flow rate, vp	er, fp	1.00 1958	pc/h/ln
	Speed Inputs and	l Adjustments	
Lane width Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm Free-flow speed, FFS	fLW tment, fLC ustment, fID	12.0 6.0 0.50 3 Measured 70.0 0.0 0.0 0.0 0.0 0.0 Urban Freeway	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h
	LOS and Performa	ance Measures	
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N Density, D		1958 70.0 65.6 3 29.8	pc/h/ln mi/h mi/h pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Anal	ysis	
Analysis Time Period: Freeway/Direction: From/To:	I-95 Southbound btw exits 3 & 2 Mercer County 2030 Build		
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type:		4787 0.92 1301 6 0 Level	veh/h v %
Grade Segment length Trucks and buses PCE, E' Recreational vehicle PC: Heavy vehicle adjustment Driver population factor Flow rate, vp	E, ER t, fHV	0.00 0.00 1.5 1.2 0.971 1.00 1786	% mi pc/h/ln
	Speed Inputs and	Adiustments	
Lane width Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjustifications	clearance fLW tment, fLC ustment, fID	12.0 6.0 0.50 3 Measured 70.0 0.0	<pre>ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h</pre>
Number of lanes adjustmoments of Free-flow speed, FFS	ent, fN	3.0 70.0 Urban Freeway	mi/h mi/h
	LOS and Performa	nce Measures	
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N Density, D	peed, S	1786 70.0 68.0 3 26.3	pc/h/ln mi/h mi/h pc/mi/ln

Phone: Fax: E-mail: _____Diverge Analysis______ Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Northbound NB off ramp to PA 332 Bucks County Junction: Jurisdiction: Analysis Year: 2030 Build Description: Scudder Falls ______Freeway Data______ Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 3773 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 1180 vph Length of first accel/decel lane 850 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____

______Conversion to pc/h Under Base Conditions_____

Does adjacent ramp exist?

Position of adjacent ramp

Distance to adjacent ramp

Volume on adjacent ramp

Type of adjacent ramp

Junction Components	Freeway	Ramp	Adjacent	
			Ramp	
Volume, V (vph)	3773	1180	1190	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1025	321	323	V
Trucks and buses	6	7	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	i
Length	0.00 mi	0.00 mi	0.00 m	ni
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Yes 1190

On

2530

Downstream

vph

ft

```
1.00
Driver population factor, fP
                                              1.00
                                                         1.00
Flow rate, vp
                                   4224
                                              1327
                                                         1319
                                                                 pcph
                 _____Estimation of V12 Diverge Areas__
                              (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 4224 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                  LOS F?
                        Actual
    v = v
                        4224
                                     4700
                                                   No
     Fi F
    v = v - v
                        2897
                                     4700
                                                   No
        F R
     FΟ
                        1327
                                     2000
                                                   No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 4224
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area_____
                                Max Desirable
                                                    Violation?
                   Actual
                                4400
                    4224
                                                    No
    V
     12
            ____Level of Service Determination (if not F)______
                    D = 4.252 + 0.0086 v - 0.009 L = 32.9 pc/mi/ln
Density,
                                      12
                     R
Level of service for ramp-freeway junction areas of influence D
               _____Speed Estimation_____
Intermediate speed variable,
                                        D = 0.547
                                         S
Space mean speed in ramp influence area,
                                        S = 52.4
                                                    mph
                                         R
Space mean speed in outer lanes,
                                        S = N/A
                                                    mph
Space mean speed for all vehicles,
                                       S = 52.4
                                                    mph
```

0.966

0.980

Heavy vehicle adjustment, fHV

Phone: E-mail:		Fax:					
	Merg	e Analysis	s				
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/Dir of Travel: Junction: Jurisdiction: Analysis Year: Description: Scudder F	AM Peak I-95 Northbou NB On ramp fr Bucks County 2030 Build						
	Fre	eway Data_					
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway	-		_		mph vph		
	On	Ramp Data_					
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/d Length of second accel/	ecel lane	300	0		mph vph ft ft		
	Adjacent Ram	p Data (if	on	e exista	s)		
Does adjacent ramp exis Volume on adjacent Ramp Position of adjacent Ra Type of adjacent Ramp Distance to adjacent Ra	mp	On 253	00 stre 30		vph ft		
Con	version to pc/	h Under Ba	se	Condition	ons		
Junction Components		Freeway		Ramp		Adjace: Ramp	nt
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type:		3783 0.92 1028 6 0 Level		300 0.92 82 4 0 Level		1190 0.92 323 7 0 Level	vph v % %
Grade Length Trucks and buses PCE, E		1.5	% mi	1.5	% mi	1.5	% mi
Recreational vehicle PC	E. ER	1.2		1.2		1.2	

1.2

1.2

1.2

Recreational vehicle PCE, ER

```
4235
Flow rate, vp
                                               333
                                                          1339
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 4235 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                        Actual
                                      Maximum
                         4568
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 4235
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    4568
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 32.3 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.601
                                          S
Space mean speed in ramp influence area,
                                         S = 51.2
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 51.2
                                                     mph
```

1.00

0.980

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Fax:

Phone: E-mail:

______Diverge Analysis______

Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound

NB off ramp to Taylorsville Bucks County Junction:

Jurisdiction: Analysis Year: 2030 Build

Description: Scudder Falls

______Freeway Data______

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 4083 vph

_____Off Ramp Data_____

Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph 310 Volume on ramp vph Length of first accel/decel lane 850 ft Length of second accel/decel lane ft

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist? Yes 1330 Volume on adjacent ramp vph Position of adjacent ramp Downstream Type of adjacent ramp On Distance to adjacent ramp 1250 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp		Adjacer Ramp	ıt
Volume, V (vph)	4083	310		1330	vph
Peak-hour factor, PHF	0.92	0.92		0.92	
Peak 15-min volume, v15	1110	84		361	V
Trucks and buses	6	5		6	%
Recreational vehicles	0	0		0	%
Terrain type:	Level	Level		Level	
Grade	0.00 %	0.00	%	0.00	%
Length	0.00 m	i 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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    4571
                                               345
                                                          1489
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.630 Using Equation 5
                 FD
                v = v + (v - v) P = 3007 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         4571
                                     7050
                                                    No
     Fi F
    v = v - v
                        4226
                                     7050
                                                    No
         F R
     FΟ
                        345
                                     2000
                                                    No
    V
     R
                        1564 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 3007
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                    Actual
                                 Max Desirable
                                                     Violation?
                                 4400
                    3007
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 22.5 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence C
                _____Speed Estimation_____
                                         D = 0.459
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 54.4
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 69.1
                                                     mph
```

S = 58.7

mph

0.971

0.976

0.971

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Jurisdiction:

Analysis Year:

Description:

Northbound

NB On rmp frm Tylrsvl E ADD LN

Bucks County

2030 Purill Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph 3773 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 1330 Volume on ramp vph Length of first accel/decel lane 455 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 310 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1250 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 3773 1330 310 vph Peak-hour factor, PHF 0.92 0.92 0.92 1025 Peak 15-min volume, v15 361 84 V 5 0 Trucks and buses 6 6 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 용 Grade Length mi mi

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

шi

1.5

1.2

1.5

1.2

```
1.00
Driver population factor, fP
                                    1.00
                                                           1.00
                                    4224
                                                1489
Flow rate, vp
                                                           345
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        852.80 (Equation 25-2 or 25-3)
                 ΕQ
                        0.590 Using Equation 1
                 FM
                v = v (P) = 2493 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                                      Maximum
                         Actual
                         5713
                                      7050
                                                     No
     FO
                         1731 pc/h
                                     (Equation 25-4 or 25-5)
     3 \text{ or } av34
Is
                > 2700 pc/h?
                                      No
          V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 2493
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                      Violation?
                    5713
                                 4600
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 33.0 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.498
                                          S
Space mean speed in ramp influence area,
                                          S = 53.5
                                                      mph
                                          R
Space mean speed in outer lanes,
                                          S = 60.6
                                                      mph
                                          0
```

S = 55.5

mph

0.971

0.971

0.976

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On rmp frm Tylrsvl W ADD LN Jurisdiction: Bucks County Analysis Year: 2030 Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 5103 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 1240 Volume on ramp vph Length of first accel/decel lane 275 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1330 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp On Distance to adjacent Ramp 910 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 5103 1240 1330 vph 0.92 Peak-hour factor, PHF 0.92 0.92 1387 337 Peak 15-min volume, v15 361 V 6 0 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
5713
                                               1375
Flow rate, vp
                                                          1489
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      0.046 Using Equation 4
                 FM
                v = v (P) = 262
                                     pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                                      Maximum
                         Actual
                         7088
                                      9400
                                                    No
     FO
                         2725 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     Yes
         V
     3 or av34
                > 1.5 v / 2
Is
    v v
                                     Yes
     3 or av34
                      12
If yes, v = 2285
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    7088
                                                     No
     12A
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 31.7 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.453
                                          S
Space mean speed in ramp influence area,
                                         S = 54.6
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = 60.6
                                                     mph
                                          0
```

S = 57.3

mph

0.971

1.00

0.980

1.00

0.971

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: E-mail:

Fax:

______Diverge Analysis______

Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB Off Ramp to NJ29 DROP LANE
Jurisdiction: Mercer County
Analysis Year: 2030 Build

Description: Scudder Falls

______Freeway Data______

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 6343

_____Off Ramp Data_____

vph

Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph Volume on ramp 910 vph Length of first accel/decel lane 550 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 545 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	6343	910	490	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1724	247	133	V
Trucks and buses	6	5	4	8
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 m	i
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

```
Driver population factor, fP
                                   1.00
                                               1.00
                                                          1.00
                                   7101
Flow rate, vp
                                               1014
                                                          543
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.436 Using Equation 8
                 FD
                v = v + (v - v) P = 3668 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         7101
                                     9600
                                                    No
     Fi F
    v = v - v
                        6087
                                     9600
                                                    No
         F R
     FΟ
                        1014
                                     2000
                                                    No
    V
     R
                        1716 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 3668
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                    Actual
                                 Max Desirable
                                                     Violation?
                                 4400
                    3668
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 30.8 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.519
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 55.5
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 74.0
                                                     mph
```

S = 63.1

mph

0.971

0.976

0.980

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: _____Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from NJ 29
Jurisdiction: Mercer County
Analysis Year: 2030 Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 5433 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 490 Volume on ramp vph Length of first accel/decel lane 500 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 910 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 545 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 5433 490 910 vph Peak-hour factor, PHF 0.92 0.92 0.92 1476 247 Peak 15-min volume, v15 133 V 5 0 Trucks and buses 6 4 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
6083
Flow rate, vp
                                               543
                                                          1014
                                                                  pcph
                  _____Estimation of V12 Merge Areas___
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                       0.150 Using Equation 4
                 FM
                v = v (P) = 912
                                     pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                         Actual
                                      Maximum
                         6626
                                      9600
                                                    No
     FO
                         2585 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
Is
    v v
                                     Yes
     3 or av34
                      12
If yes, v = 2433
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    6626
                                                     No
     12A
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 25.3 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.362
                                          S
Space mean speed in ramp influence area,
                                         S = 59.9
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = 65.2
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 62.7
                                                     mph
```

1.00

0.980

1.00

0.976

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Fax:

mph

vph

Phone: E-mail:

_____Diverge Analysis_____

Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB OffRmp to Br Tvrn Rd DRP LN
Jurisdiction: Mercer County
Analysis Year: 2030 Build

Description: Scudder Falls

_____Freeway Data_____

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 70.0 Volume on freeway 5923

_____Off Ramp Data_____

Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph Volume on ramp 1090 vph Length of first accel/decel lane 1210 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 2545 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5923	1090	680	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1610	296	185	V
Trucks and buses	6	3	4	8
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00	왕
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	

```
1.00
Driver population factor, fP
                                              1.00
                                                         1.00
Flow rate, vp
                                   6631
                                              1203
                                                         754
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.539 Using Equation 5
                 FD
                v = v + (v - v) P = 4128 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        6631
                                     7200
                                                    No
     Fi F
    v = v - v
                        5428
                                     7200
                                                    No
        F R
     FΟ
                        1203
                                     2000
                                                    No
    V
     R
                        2503 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 4128
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    4128
                                                     No
    V
     12
            ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 28.9 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation____
                                         D = 0.536
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 55.0
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 70.9
                                                     mph
```

S = 60.1

mph

0.971

0.985

0.980

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: _____Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from Bear Tavern Rd
Jurisdiction: Mercer County
Analysis Year: 2030 Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 4833 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 680 vph Length of first accel/decel lane 1150 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1090 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2545 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 4833 680 1090 vph 0.92 Peak-hour factor, PHF 0.92 0.92 1313 185 296 Peak 15-min volume, v15 V 3 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: % % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
5411
Flow rate, vp
                                               754
                                                          1203
                                                                  pcph
                   ____Estimation of V12 Merge Areas___
                        1258.11 (Equation 25-2 or 25-3)
                 ΕQ
                       0.610 Using Equation 1
                 FM
                v = v (P) = 3299 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                                      Maximum
                         Actual
                         6165
                                      7200
                                                    No
     FO
                         2112 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 3299
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    6165
                                                      No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 29.5 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.465
                                          S
Space mean speed in ramp influence area,
                                         S = 57.0
                                                      mph
                                          R
Space mean speed in outer lanes,
                                         S = 64.2
                                                      mph
                                          0
Space mean speed for all vehicles,
                                         S = 59.3
                                                      mph
```

1.00

0.980

1.00

0.985

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: _____Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from PA332 EB
Jurisdiction: Bucks County
Analysis Year: 2030 Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2593 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph Volume on ramp 1190 vph Length of first accel/decel lane 1200 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1180 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off 1300 Distance to adjacent Ramp ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2593 1190 1180 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 705 323 321 V 3 Trucks and buses 6 6 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
Driver population factor, fP
                                    1.00
                                               1.00
                                                           1.00
                                    2903
                                               1332
Flow rate, vp
                                                           1302
                                                                   pcph
                  _____Estimation of V12 Merge Areas___
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2903 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         4235
                                      4700
                                                     No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 \text{ or } av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 2903
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    4235
                                                      No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 30.4 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation____
Intermediate speed variable,
                                          M = 0.506
                                          S
Space mean speed in ramp influence area,
                                          S = 53.4
                                                      mph
                                          R
                                          S = N/A
Space mean speed in outer lanes,
                                                      mph
                                          0
Space mean speed for all vehicles,
                                          S = 53.4
                                                      mph
```

0.971

0.985

Heavy vehicle adjustment, fHV

Phone: E-mail:

Fax:

mph

ft

vph

_____Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Southbound

Junction: SB Off Ramp to PA332 DROP LANE

Jurisdiction: Bucks County Analysis Year: 2030 Build

Description: Scudder Falls

Distance to adjacent ramp

_____Freeway Data______

Type of analysis Diverge
Number of lanes in freeway 3
Free-flow speed on freeway 65.0
Volume on freeway 2727

_____Off Ramp Data_____

Side of freeway

Number of lanes in ramp

Free-Flow speed on ramp

Volume on ramp

Length of first accel/decel lane

Length of second accel/decel lane

ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

On

Yes

1460 vph

Downstream

On

_____Conversion to pc/h Under Base Conditions_____

2525

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2727	760	1460 vph
Peak-hour factor, PHF	0.92	0.92	0.92
Peak 15-min volume, v15	741	207	397 v
Trucks and buses	6	7	6 %
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

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                    3053
Flow rate, vp
                                               855
                                                          1635
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.644 Using Equation 5
                 FD
                v = v + (v - v) P = 2271 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                      Maximum
                                                   LOS F?
                        Actual
    v = v
                         3053
                                      7050
                                                    No
     Fi F
    v = v - v
                         2198
                                      7050
                                                    No
         F R
     FΟ
                         855
                                      2000
                                                    No
    V
     R
                         782 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
                > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 2271
                                      (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                    Actual
                                 Max Desirable
                                                     Violation?
                                 4400
                    2271
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 16.1 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.505
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 53.4
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 71.3
                                                     mph
Space mean speed for all vehicles,
                                        S = 57.1
                                                     mph
```

0.966

0.971

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from PA332
Jurisdiction: Bucks County
Analysis Year: 2030 Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 1967 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 1460 vph Length of first accel/decel lane 1375 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 720 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2525 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 1967 1460 720 vph Peak-hour factor, PHF 0.92 0.92 0.92 196 Peak 15-min volume, v15 535 397 V 7 0 Trucks and buses 6 6 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
2202
                                               1635
Flow rate, vp
                                                          810
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2202 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                         Actual
                                     Maximum
                         3837
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 2202
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    3837
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 26.0 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.406
                                          S
                                         S = 55.7
Space mean speed in ramp influence area,
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 55.7
                                                     mph
```

1.00

0.971

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Fax:

Phone:
E-mail:
_____Diverge

_____Diverge Analysis_____

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Southbound

Junction: SB Off rmp to Tylrsvlle DRP LN

Jurisdiction: Bucks County
Analysis Year: 2030 Build

Description: Scudder Falls

_____Freeway Data______

Type of analysis

Number of lanes in freeway

Free-flow speed on freeway

Volume on freeway

Diverge

3

Free-flow speed on freeway

65.0

mph

2797

vph

_____Off Ramp Data_____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	490	vph
Length of first accel/decel lane	550	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

790

ft

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp		Adjacer Ramp	nt
Volume, V (vph)	2797	490		420	vph
Peak-hour factor, PHF	0.92	0.92		0.92	_
Peak 15-min volume, v15	760	133		114	V
Trucks and buses	6	4		7	%
Recreational vehicles	0	0		0	%
Terrain type:	Level	Level		Level	
Grade	0.00 %	0.00	%	0.00	%
Length	0.00 m	i 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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    3131
                                               543
                                                          472
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.657 Using Equation 5
                 FD
                v = v + (v - v) P = 2243 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                      Maximum
                                                   LOS F?
                        Actual
    v = v
                         3131
                                      7050
                                                    No
     Fi F
    v = v - v
                         2588
                                      7050
                                                    No
         F R
     FΟ
                         543
                                      2000
                                                    No
    V
     R
                         888 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
                > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 2243
                                      (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2243
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 18.6 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.477
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 54.0
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 71.3
                                                     mph
```

S = 58.0

mph

0.971

0.980

0.966

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from Taylorsville
Jurisdiction: Bucks County
Analysis Year: 2030 Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph 2307 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 420 Volume on ramp vph Length of first accel/decel lane 1265 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 490 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1400 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2307 420 490 vph 0.92 Peak-hour factor, PHF 0.92 0.92 114 133 Peak 15-min volume, v15 627 V 7 0 Trucks and buses 6 3 0 Recreational vehicles ે Level Level Level Terrain type: % % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
2583
Flow rate, vp
                                               463
                                                          551
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        641.70 (Equation 25-2 or 25-3)
                 ΕQ
                       0.613 Using Equation 1
                 FM
                v = v (P) = 1583 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                         Actual
                                      Maximum
                         3046
                                      7050
                                                     No
     FO
                         1000 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1583
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    3046
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 13.3 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.263
                                          S
Space mean speed in ramp influence area,
                                          S = 59.0
                                                      mph
                                          R
Space mean speed in outer lanes,
                                          S = 63.2
                                                      mph
                                          0
```

S = 60.3

mph

0.971

1.00

0.985

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: E-mail:

Fax:

_____Diverge Analysis_____

Analyst: TPR
Agency/Co.: AECOM
Date performed: 04/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Southbound
Junction: SB Off Ramp to NJ 29

Jurisdiction: Mercer County
Analysis Year: 2030 Build

Description: Scudder Falls

______Freeway Data______

Type of analysis Diverge
Number of lanes in freeway 3
Free-flow speed on freeway 70.0

Free-flow speed on freeway 70.0 mph Volume on freeway 2907 vph

_____Off Ramp Data_____

Side of freeway

Number of lanes in ramp

Free-Flow speed on ramp

Volume on ramp

Length of first accel/decel lane

Length of second accel/decel lane

ft

______Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

On

Yes

410 vph

Downstream

On

Distance to adjacent ramp 880 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2907	520	410 7	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	790	141	111 7	V
Trucks and buses	6	11	4	9
Recreational vehicles	0	0	0 8	ુ (
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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    3255
                                               596
                                                          455
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.651 Using Equation 5
                 FD
                v = v + (v - v) P = 2328 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         3255
                                      7200
                                                    No
     Fi F
    v = v - v
                        2659
                                     7200
                                                    No
         F R
     FΟ
                        596
                                     2000
                                                    No
    V
     R
                        927 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
                > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 2328
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2328
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 19.8 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.482
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 56.5
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 76.8
                                                     mph
Space mean speed for all vehicles,
                                        S = 61.1
                                                     mph
```

0.948

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from NJ 29 ADD LANE
Jurisdiction: Mercer County
Analysis Year: 2030 Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph 2387 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 410 Volume on ramp vph Length of first accel/decel lane 338 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 520 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 880 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2387 410 520 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 649 111 141 V Trucks and buses 6 4 11 0 0 Recreational vehicles ે Level Level Level Terrain type: % 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
2672
                                                455
Flow rate, vp
                                                           596
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        247.45 (Equation 25-2 or 25-3)
                 ΕQ
                        0.587 Using Equation 1
                 FM
                v = v (P) = 1568 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                         Actual
                                      Maximum
                         3127
                                      7200
                                                     No
     FO
                         1104 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1568
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                      Violation?
                                 4600
                    3127
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 18.9 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.327
                                          S
Space mean speed in ramp influence area,
                                          S = 60.8
                                                      mph
                                          R
Space mean speed in outer lanes,
                                          S = 67.8
                                                      mph
                                          0
Space mean speed for all vehicles,
                                          S = 63.1
                                                      mph
```

1.00

0.980

1.00

0.948

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail: Fax:

______Operational Analysis_____

Analyst: TPR
Agency/Co.: AECOM
Date Performed: 4/12/11
Analysis Time Period: AM Peak

Freeway/Dir of Travel: I-95 Southbound
Weaving Location: Bear Tavern Road
Jurisdiction: Mercer County
Analysis Year: 2030 Build

Description: Scudder Falls

_____Inputs_____

Freeway free-flow speed, SFF	70	mph
Weaving number of lanes, N	4	
Weaving segment length, L	2050	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	
Volume ratio, VR	0.19	
Weaving ratio, R	0.26	

______Conversion to pc/h Under Base Conditions_____

	Non-Weaving		Weaving		
	V	V	V	V	
	01	02	w1	w2	
Volume, V	3187	0	550	190	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	866	0	149	52	v
Trucks and buses	6	10	4	6	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.971	0.952	0.980	0.971	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	3568	0	609	212	pc/h

______Weaving and Non-Weaving Speeds_____

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.0035
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.44	0.20
Weaving and non-weaving speeds, Si	56.78	64.82
Number of lengt model for		

Number of lanes required for

unconstrained operatio	n, Nw	(Exhibit 24-7)	1.	15
Maximum number of lane	s, Nw	(max) (Exhibit	24-7) 1.	40
Type of operation is			Un	constrained

_______Weaving Segment Speed, Density, Level of Service and Capacity______

Weaving segment speed, S	63.14	mph
Weaving segment density, D	17.38	pc/mi/ln
Level of service, LOS	В	
Capacity of base condition, cb	9032	pc/h
Capacity as a 15-minute flow rate,	c 8769	pc/h
Capacity as a full-hour volume, ch	8067	pc/h

_____Limitations on Weaving Segments______

		If Max Exce	eded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	821	2800	a
Average flow rate (pcphpl)	1097	2400	b
Volume ratio, VR	0.19	0.35	C
Weaving ratio, R	0.26	N/A	d
Weaving length (ft)	2050	2500	е
Not on the second			

Notes:

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

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Jurisdiction:

Analysis Year:

Descript:

Southbound

SB On ramp from Bear Tavern E

Mercer County

2030 Perill Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph 2637 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 270 Volume on ramp vph Length of first accel/decel lane 1203 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 550 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 440 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2637 270 550 vph 0.92 Peak-hour factor, PHF 0.92 0.92 149 Peak 15-min volume, v15 717 73 V 6 0 Trucks and buses 6 2 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
2952
Flow rate, vp
                                               296
                                                          616
                                                                  pcph
                   ____Estimation of V12 Merge Areas__
                       657.40 (Equation 25-2 or 25-3)
                 ΕQ
                       0.597 Using Equation 2
                 FM
                v = v (P) = 1764 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                         Actual
                                      Maximum
                         3248
                                      7200
                                                    No
     FO
                         1188 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v /2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 1764
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    3248
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 13.9 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.267
                                          S
Space mean speed in ramp influence area,
                                         S = 62.5
                                                     mph
                                          R
                                         S = 67.5
Space mean speed in outer lanes,
                                                     mph
                                          0
```

S = 64.3

mph

0.971

1.00

0.990

1.00

0.971

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: Fax: E-mail: _____Diverge Analysis______ Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound NB off ramp to PA 332 Bucks County Junction: Jurisdiction: Analysis Year: 2030 Build Description: Scudder Falls _____Freeway Data______ Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 3290 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 1290 vph Length of first accel/decel lane 850 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent ramp 640 vph Position of adjacent ramp Downstream Type of adjacent ramp On Distance to adjacent ramp 2530 ft ______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent
			Ramp
Volume, V (vph)	3290	1290	640 vph
Peak-hour factor, PHF	0.92	0.92	0.92
Peak 15-min volume, v15	894	351	174 v
Trucks and buses	6	7	4 %
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

```
1.00
Driver population factor, fP
                                              1.00
                                                         1.00
Flow rate, vp
                                   3683
                                              1451
                                                         710
                                                                 pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 3683 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        3683
                                     4700
                                                    No
     Fi F
    v = v - v
                        2232
                                     4700
                                                    No
         F R
     FΟ
                        1451
                                     2000
                                                    No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 3683
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area____
                    Actual
                                Max Desirable
                                                     Violation?
                                 4400
                    3683
                                                     No
    V
     12
            ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 28.3 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.559
Intermediate speed variable,
                                         S
Space mean speed in ramp influence area,
                                         S = 52.2
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
```

S = 52.2

mph

0.971

0.966

0.980

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from PA332 ADD LANE
Jurisdiction: Bucks County
Analysis Year: 2030 Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph 2640 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 100 Volume on ramp vph Length of first accel/decel lane 1375 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 640 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2530 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp 100 Volume, V (vph) 2640 640 vph 0.92 0.92 Peak-hour factor, PHF 0.92 174 Peak 15-min volume, v15 717 27 V 7 0 6 Trucks and buses 4 0 Recreational vehicles 용 Level Level Level Terrain type: % % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
2956
Flow rate, vp
                                               111
                                                          720
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2956 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         3067
                                      4700
                                                     No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 2956
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    3067
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 20.7 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.309
                                          S
Space mean speed in ramp influence area,
                                         S = 57.9
                                                      mph
                                          R
Space mean speed in outer lanes,
                                         S = N/A
                                                      mph
                                          0
Space mean speed for all vehicles,
                                         S = 57.9
                                                      mph
```

1.00

0.980

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail: Fax:

Diverge	Analysis

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB off ramp to Taylorsville

Jurisdiction: Bucks County Analysis Year: 2030 Build

Description: Scudder Falls

Freewa	ĮΥ	Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2740	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	390	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

1250

On

Distance to adjacent ramp

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp		Adjacer	nt
				Ramp	
Volume, V (vph)	2740	390		330	vph
Peak-hour factor, PHF	0.92	0.92		0.92	
Peak 15-min volume, v15	745	106		90	V
Trucks and buses	6	5		6	%
Recreational vehicles	0	0		0	%
Terrain type:	Level	Level		Level	
Grade	0.00 %	0.00	%	0.00	%
Length	0.00 m:	i 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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                    3068
Flow rate, vp
                                               435
                                                          369
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.663 Using Equation 5
                 FD
                v = v + (v - v) P = 2181 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                      Maximum
                                                    LOS F?
                        Actual
    v = v
                         3068
                                      7050
                                                    No
     Fi F
    v = v - v
                         2633
                                      7050
                                                    No
         F R
     FΟ
                         435
                                      2000
                                                    No
    V
     R
                         887 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
                > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                      No
Is
        V
     3 or av34
                       12
If yes, v = 2181
                                      (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2181
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 15.4 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.467
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 54.3
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 71.3
                                                     mph
Space mean speed for all vehicles,
                                        S = 58.3
                                                     mph
```

0.976

0.971

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak Jurisdiction:

Analysis Year:

Description:

Northbound

NB On rmp frm Tylrsvl E ADD LN

Bucks County

2030 Purill Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2350 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 330 Volume on ramp vph Length of first accel/decel lane 455 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 390 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1250 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2350 330 390 vph Peak-hour factor, PHF 0.92 0.92 0.92 106 Peak 15-min volume, v15 639 90 V 5 0 Trucks and buses 6 6 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade Length mi mi

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

шi

1.5

1.2

1.5

1.2

```
2631
                                                369
Flow rate, vp
                                                           435
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        272.22 (Equation 25-2 or 25-3)
                 ΕQ
                        0.590 Using Equation 1
                 FM
                v = v (P) = 1553 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                                      Maximum
                         Actual
                         3000
                                      7050
                                                     No
     FO
                         1078 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v /2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1553
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                      Violation?
                    3000
                                 4600
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 17.4 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                   _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.316
                                          S
Space mean speed in ramp influence area,
                                          S = 57.7
                                                      mph
                                          R
Space mean speed in outer lanes,
                                          S = 62.9
                                                      mph
                                          0
Space mean speed for all vehicles,
                                          S = 59.5
                                                      mph
```

1.00

0.971

1.00

0.976

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak Jurisdiction:

Analysis Year:

Description:

Description:

Northbound

NB On rmp frm Tylrsvl W ADD LN

Bucks County

2030 Purill Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2680 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 270 Volume on ramp vph Length of first accel/decel lane 275 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 330 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp On Distance to adjacent Ramp 910 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2680 270 330 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 728 73 90 V 6 0 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 용 Grade Length mi mi

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

шi

1.5

1.2

1.5

1.2

```
3000
                                               299
Flow rate, vp
                                                          369
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                       0.180 Using Equation 4
                 FM
                v = v (P) = 541
                                     pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         3299
                                      9400
                                                    No
     FO
                         1229 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
Is
    v v
                                      Yes
     3 or av34
                      12
If yes, v = 1200
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                    3299
                                 4600
                                                      No
     12A
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 15.3 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.319
                                          S
Space mean speed in ramp influence area,
                                         S = 57.7
                                                      mph
                                          R
Space mean speed in outer lanes,
                                         S = 63.6
                                                      mph
                                          0
Space mean speed for all vehicles,
                                         S = 60.7
                                                      mph
```

1.00

0.980

1.00

0.971

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Fax:

Phone:
E-mail:

______Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB Off Ramp to NJ29 DROP LANE

Jurisdiction: Mercer County Analysis Year: 2030 Build

Description: Scudder Falls

_____Freeway Data______

Type of analysis Diverge
Number of lanes in freeway 4
Free-flow speed on freeway 70.0 mph
Volume on freeway 2950 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	440	vph
Length of first accel/decel lane	550	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp
Position of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp
Distance to adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp
Type of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp		Adjacer Ramp	nt
Volume, V (vph)	2950	440		130	vph
Peak-hour factor, PHF	0.92	0.92		0.92	
Peak 15-min volume, v15	802	120		35	V
Trucks and buses	6	5		4	%
Recreational vehicles	0	0		0	%
Terrain type:	Level	Level		Level	
Grade	0.00 %	0.00	%	0.00	%
Length	0.00 m	i 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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                    3303
Flow rate, vp
                                               490
                                                          144
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.436 Using Equation 8
                 FD
                v = v + (v - v) P = 1716 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         3303
                                     9600
                                                    No
     Fi F
    v = v - v
                        2813
                                     9600
                                                    No
         F R
     FΟ
                         490
                                     2000
                                                    No
    V
     R
                        793 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 1716
                                     (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    1716
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 14.1 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.472
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 56.8
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 76.8
                                                     mph
Space mean speed for all vehicles,
                                        S = 64.9
                                                     mph
```

0.976

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound NB On ramp from NJ 29 n: Mercer County Junction: Analysis Year:
Description 2030 Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 2510 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 360 Volume on ramp vph 500 Length of first accel/decel lane ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 440 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 545 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2510 360 440vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 682 98 120 V 5 0 Trucks and buses 6 4 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
2810
                                               399
Flow rate, vp
                                                          490
                                                                  pcph
                   ____Estimation of V12 Merge Areas__
                        336.93 (Equation 25-2 or 25-3)
                 ΕQ
                        0.591 Using Equation 1
                 FM
                v = v (P) = 1662 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         3209
                                      7200
                                                    No
     FO
                         1148 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1662
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                    3209
                                 4600
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 18.2 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.317
                                          S
Space mean speed in ramp influence area,
                                         S = 61.1
                                                     mph
                                          R
                                         S = 67.7
Space mean speed in outer lanes,
                                                     mph
                                          0
```

S = 63.3

mph

0.971

1.00

0.980

1.00

0.976

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Fax:

mph

vph

Phone: E-mail:

_____Diverge Analysis______

Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB OffRmp to Br Tvrn Rd DRP LN
Jurisdiction: Mercer County
Analysis Year: 2030 Build

Description: Scudder Falls

_____Freeway Data_____

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 70.0 Volume on freeway 2870

_____Off Ramp Data_____

Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph Volume on ramp 400 vph Length of first accel/decel lane 1210 ft Length of second accel/decel lane ft

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist? Yes Volume on adjacent ramp 660 vph Position of adjacent ramp Downstream Type of adjacent ramp On

Distance to adjacent ramp 2545 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2870	400	660 vph
Peak-hour factor, PHF	0.92	0.92	0.92
Peak 15-min volume, v15	780	109	179 v
Trucks and buses	6	3	4 %
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

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    3213
                                               441
                                                          732
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.659 Using Equation 5
                 FD
                v = v + (v - v) P = 2269 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         3213
                                     7200
                                                    No
     Fi F
    v = v - v
                        2772
                                     7200
                                                    No
         F R
     FΟ
                         441
                                     2000
                                                    No
    V
     R
                         944 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 2269
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2269
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 12.9 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.468
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 56.9
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 76.8
                                                     mph
Space mean speed for all vehicles,
                                        S = 61.6
                                                     mph
```

0.985

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Jurisdiction:

Analysis Year:

Description:

Morthbound

NB On ramp from Bear Tavern Rd

Mercer County

2030 Puil 3 Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph 2470 Volume on freeway 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 660 vph Length of first accel/decel lane 1150 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 400 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2545 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2470 660 400vph Peak-hour factor, PHF 0.92 0.92 0.92 109 Peak 15-min volume, v15 179 671 V 3 Trucks and buses 6 4 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
2765
Flow rate, vp
                                               732
                                                           441
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        687.16 (Equation 25-2 or 25-3)
                 ΕQ
                        0.610 Using Equation 1
                 FM
                v = v (P) = 1686 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                                      Maximum
                         Actual
                         3497
                                      7200
                                                     No
     FO
                         1079 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1686
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual
                           Max Desirable
                                                      Violation?
                    3497
                                 4600
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 16.8 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.284
                                          S
Space mean speed in ramp influence area,
                                          S = 62.0
                                                      mph
                                          R
                                          S = 67.9
Space mean speed in outer lanes,
                                                      mph
                                          0
```

S = 63.7

mph

0.971

1.00

0.980

1.00

0.985

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: Fax: E-mail: _____Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from PA332 EB
Jurisdiction: Bucks County
Analysis Year: 2030 Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2000 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 640 vph Length of first accel/decel lane 1200 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1290 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off 1300 Distance to adjacent Ramp ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2000 640 1290 vph 0.92 0.92 Peak-hour factor, PHF 0.92 174 Peak 15-min volume, v15 543 351 V 3 Trucks and buses 6 6 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
2239
Flow rate, vp
                                               717
                                                          1423
                                                                  pcph
                  _____Estimation of V12 Merge Areas___
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2239 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                                     Maximum
                        Actual
                         2956
                                     4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 2239
                                     (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    2956
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 20.7 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.312
                                         S
Space mean speed in ramp influence area,
                                         S = 57.8
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
                                          0
```

S = 57.8

mph

0.971

1.00

0.971

1.00

0.985

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Southbound

Junction: SB Off Ramp to PA332 DROP LANE

Jurisdiction: Bucks County
Analysis Year: 2030 Build

Description: Scudder Falls

_____Freeway Data_____

Type of analysis

Number of lanes in freeway

Free-flow speed on freeway

Volume on freeway

Diverge

3

65.0 mph

4257 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	1420	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp
Position of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp
Distance to adjacent ramp
2525

ft

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp		Adjacer	nt
				Ramp	
Volume, V (vph)	4257	1420		1400	vph
Peak-hour factor, PHF	0.92	0.92		0.92	
Peak 15-min volume, v15	1157	386		380	v
Trucks and buses	6	7		6	%
Recreational vehicles	0	0		0	%
Terrain type:	Level	Level		Level	
Grade	0.00 %	0.00	%	0.00	%
Length	0.00 m	i 0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5		1.5	
Recreational vehicle PCE, ER	1.2	1.2		1.2	

```
Heavy vehicle adjustment, fHV
                                   1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    4766
                                               1597
                                                          1567
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.567 Using Equation 5
                 FD
                v = v + (v - v) P = 3395 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         4766
                                     7050
                                                    No
     Fi F
    v = v - v
                        3169
                                     7050
                                                    No
         F R
     FΟ
                        1597
                                     2000
                                                    No
    V
     R
                        1371 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 3395
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    3395
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 25.8 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence C
                _____Speed Estimation_____
                                         D = 0.572
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 51.9
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 69.9
                                                     mph
```

S = 56.0

mph

Space mean speed for all vehicles,

0.971

0.966

0.971

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On rmp from PA 332
Jurisdiction: Bucks County
Analysis Year: 2030 Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2837 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 1400 vph Length of first accel/decel lane 1375 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1420 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2525 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2837 1400 1420 vph 0.92 Peak-hour factor, PHF 0.92 0.92 Peak 15-min volume, v15 771 380 386 V 7 0 Trucks and buses 6 6 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
3176
                                               1567
Flow rate, vp
                                                          1597
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 3176 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                                     Maximum
                        Actual
                         4743
                                      4700
                                                    Yes
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 3176
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                    4743
                                 4600
                                                     Yes
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 33.1 pc/mi/ln
Level of service for ramp-freeway junction areas of influence F
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.672
                                          S
Space mean speed in ramp influence area,
                                         S = 49.5
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 49.5
                                                     mph
```

0.971

1.00

0.971

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Fax:

Phone:
E-mail:

______Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Southbound

Junction: SB Off Rmp to Tylrsvle DRP LN

Jurisdiction: Bucks County
Analysis Year: 2030 Build

Description: Scudder Falls

Distance to adjacent ramp

______Freeway Data______

Type of analysis Diverge
Number of lanes in freeway 3
Free-flow speed on freeway 65.0 mph
Volume on freeway 5427 vph

_____Off Ramp Data_____

Side of freeway

Number of lanes in ramp

Free-Flow speed on ramp

Volume on ramp

Length of first accel/decel lane

Length of second accel/decel lane

ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

On

Yes

310 vph

Downstream

On

_____Conversion to pc/h Under Base Conditions_____

790

ft

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5427	1480	310	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1475	402	84	v
Trucks and buses	6	4	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00	8
Length	0.00 mi	0.00 m	i 0.00 r	ni
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

```
1.00
                                               1.00
Driver population factor, fP
                                                          1.00
                                    6076
Flow rate, vp
                                               1641
                                                          349
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.533 Using Equation 5
                 FD
                v = v + (v - v) P = 4003 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         6076
                                      7050
                                                    No
     Fi F
    v = v - v
                        4435
                                     7050
                                                    No
         F R
     FΟ
                        1641
                                     2000
                                                    No
    V
     R
                        2073 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 4003
                                     (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                    Actual
                                 Max Desirable
                                                     Violation?
                    4003
                                 4400
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 33.7 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.576
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 51.8
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 67.1
                                                     mph
```

S = 56.1

mph

0.971

0.980

0.966

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: _____Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from Taylorsville
Jurisdiction: Bucks County
Analysis Year: 2030 Build Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph 3947 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph Volume on ramp 310 vph Length of first accel/decel lane 1265 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1480 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1400 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 3947 310 1480 vph 0.92 Peak-hour factor, PHF 0.92 1073 0.92 Peak 15-min volume, v15 84 402 V 3 0 7 0 Trucks and buses 6 Recreational vehicles 용 Level Level Level Terrain type: % % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
4419
Flow rate, vp
                                               342
                                                          1665
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        1008.71 (Equation 25-2 or 25-3)
                 ΕQ
                        0.613 Using Equation 1
                 FM
                v = v (P) = 2708 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                                      Maximum
                         Actual
                         4761
                                      7050
                                                     No
     FO
                         1711 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 2708
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    4761
                                                      No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 21.2 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.315
                                          S
Space mean speed in ramp influence area,
                                         S = 57.8
                                                      mph
                                          R
Space mean speed in outer lanes,
                                         S = 60.6
                                                      mph
                                          0
```

S = 58.8

mph

0.971

1.00

0.985

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: Fax: E-mail: _____Diverge Analysis_____ Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Southbound SB Off Ramp to NJ 29 Junction:

Jurisdiction: Mercer County Analysis Year: 2030 Build

Description: Scudder Falls

______Freeway Data______

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 5247

_____Off Ramp Data_____

vph

Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph Volume on ramp 420 vph Length of first accel/decel lane 500 ft Length of second accel/decel lane ft

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist? Yes Volume on adjacent ramp 600 vph Position of adjacent ramp Downstream Type of adjacent ramp On Distance to adjacent ramp 880 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp		Adjacer Ramp	nt
Volume, V (vph)	5247	420		600	vph
Peak-hour factor, PHF	0.92	0.92		0.92	_
Peak 15-min volume, v15	1426	114		163	V
Trucks and buses	6	11		4	%
Recreational vehicles	0	0		0	%
Terrain type:	Level	Level		Level	
Grade	0.00 %	0.00	%	0.00	%
Length	0.00 m	i 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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    5874
                                               482
                                                          665
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.591 Using Equation 5
                 FD
                v = v + (v - v) P = 3669 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         5874
                                     7200
                                                    No
     Fi F
    v = v - v
                        5392
                                     7200
                                                    No
         F R
     FΟ
                         482
                                     2000
                                                    No
    V
     R
                        2205 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 3669
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                    Actual
                                 Max Desirable
                                                     Violation?
                                 4400
                    3669
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 31.3 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.471
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 56.8
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 72.1
                                                     mph
Space mean speed for all vehicles,
                                        S = 61.7
                                                     mph
```

0.971

0.948

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Jurisdiction:

Analysis Year:

Descript: Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 4827 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 600 Volume on ramp vph Length of first accel/decel lane 338 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 420 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 880 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 4827 600 420 vph Peak-hour factor, PHF 0.92 0.92 0.92 1312 163 Peak 15-min volume, v15 114 V Trucks and buses 6 4 11 0 0 Recreational vehicles ે Level Level Level Terrain type: % 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
5404
                                                665
Flow rate, vp
                                                           482
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        877.04 (Equation 25-2 or 25-3)
                 ΕQ
                        0.587 Using Equation 1
                 FM
                v = v (P) = 3172 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                         Actual
                                      Maximum
                         6069
                                      7200
                                                     No
     FO
                         2232 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 3172
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual
                           Max Desirable
                                                      Violation?
                                 4600
                    6069
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 33.0 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                   _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.478
                                          S
Space mean speed in ramp influence area,
                                          S = 56.6
                                                      mph
                                          R
Space mean speed in outer lanes,
                                          S = 63.8
                                                      mph
                                          0
```

S = 59.0

mph

0.971

1.00

0.980

1.00

0.948

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: E-mail: Fax:

______Operational Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date Performed: 4/12/11
Analysis Time Period: PM Peak

Freeway/Dir of Travel: I-95 Southbound
Weaving Location: Bear Tavern Road
Jurisdiction: Mercer County
Analysis Year: 2030 Build

Description: Scudder Falls

_____Inputs_____

Freeway free-flow speed, SFF	70	mph
Weaving number of lanes, N	4	
Weaving segment length, L	2050	ft
Terrain type	Level	
Grade		%
Length		mi
Weaving type	A	
Volume ratio, VR	0.15	
Weaving ratio, R	0.49	

______Conversion to pc/h Under Base Conditions_____

	Non-Wea	aving	Weaving	3	
	V	V	V	V	
	01	02	w1	w2	
Volume, V	4787	0	420	410	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	1301	0	114	111	V
Trucks and buses	6	10	6	4	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.971	0.952	0.971	0.980	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	5359	0	470	454	pc/h

______Weaving and Non-Weaving Speeds_____

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.0035
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.57	0.28
Weaving and non-weaving speeds, Si	53.15	61.72
Number of lanes required for		

unconstrained operation,	Nw	(Exhib:	it 24-7)		1.04
Maximum number of lanes,	Nw	(max)	(Exhibit	24-7)	1.40
Type of operation is					Unconstrained

_______Weaving Segment Speed, Density, Level of Service and Capacity______

Weaving segment speed, S	60.29	mph
Weaving segment density, D	26.05	pc/mi/ln
Level of service, LOS	C	
Capacity of base condition, cb	9204	pc/h
Capacity as a 15-minute flow rate, c	8936	pc/h
Capacity as a full-hour volume, ch	8221	pc/h

_____Limitations on Weaving Segments______

		Ii Max Exce	eded See Note	
	Analyzed	Maximum	Note	
Weaving flow rate, Vw	924	2800	a	
Average flow rate (pcphpl)	1570	2400	b	
Volume ratio, VR	0.15	0.35	C	
Weaving ratio, R	0.49	N/A	d	
Weaving length (ft)	2050	2500	е	
37 1				

Notes:

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

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Jurisdiction:

Analysis Year:

Descript:

Southbound

SB On ramp from Bear Tavern E

Mercer County

2030 Perill Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph 4797 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 450 Volume on ramp vph Length of first accel/decel lane 1203 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 410 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 440 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 4797 450 410 vph Peak-hour factor, PHF 0.92 0.92 0.92 1304 111 Peak 15-min volume, v15 122 V 6 0 Trucks and buses 6 2 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
5371
                                                494
Flow rate, vp
                                                           459
                                                                   pcph
                   ____Estimation of V12 Merge Areas___
                        1217.44 (Equation 25-2 or 25-3)
                 ΕQ
                        0.562 Using Equation 2
                 FM
                v = v (P) = 3019 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                                      Maximum
                         Actual
                         5865
                                      7200
                                                     No
     FO
                         2352 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
          V
     3 or av34
                > 1.5 v / 2
Is
    v v
                                      Yes
     3 or av34
                      12
If yes, v = 3069
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                      Violation?
                                 4600
                    5865
                                                      No
     12A
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 25.5 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                   _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.374
                                          S
Space mean speed in ramp influence area,
                                          S = 59.5
                                                      mph
                                          R
                                          S = 63.5
Space mean speed in outer lanes,
                                                      mph
                                          0
```

S = 61.0

mph

0.971

1.00

0.990

1.00

0.971

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: E-mail:		Fax:	
	Operational Analy	/sis	
Analysis Time Period: Freeway/Direction: From/To: Jurisdiction:	I-95 Northbound btw exits 46 & 49 Bucks County 2030 Build with Lo	ow Toll	
	$_{}$ Flow Inputs and $^{\prime\prime}$	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses		3773 0.92 1025 6	veh/h v %
Recreational vehicles Terrain type: Grade Segment length		0 Grade 0.05 0.33	% % mi
Trucks and buses PCE, E Recreational vehicle PC Heavy vehicle adjustmer Driver population factor	EE, ER Lt, fHV	1.5 1.2 0.971 1.00	
Flow rate, vp		2112	pc/h/ln
	Speed Inputs and	Adjustments	
Lane width Right-shoulder lateral Interchange density	clearance	12.0 6.0 0.50	ft ft interchange/mi
Number of lanes, N Free-flow speed: FFS or BFFS		Measured 65.0	mi/h
Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustm	tment, fLC ustment, fID	0.0 0.0 0.0 4.5	mi/h mi/h mi/h mi/h
Free-flow speed, FFS		65.0 Urban Freeway	mi/h
	LOS and Performan	nce Measures	
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N	speed, S	2112 65.0 59.3 2	pc/h/ln mi/h mi/h
Density, D		35.6	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Analy	sis	
Date Performed: Analysis Time Period: Freeway/Direction: From/To:	I-95 Northbound btw exits 49 & 51 Bucks County 2030 Build with Lo	ow Toll	
	$_$ _Flow Inputs and I	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses		4083 0.92 1110 6	veh/h v %
Recreational vehicles Terrain type: Grade Segment length		0 Grade -3.00 0.47	% % mi
Trucks and buses PCE, E Recreational vehicle PC Heavy vehicle adjustmen Driver population facto	E, ER t, fhV	1.5 1.2 0.971 1.00	(1. / 1
Flow rate, vp		1524	pc/h/ln
	Speed Inputs and	Adjustments	
Lane width Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm Free-flow speed, FFS	fLW tment, fLC ustment, fID	12.0 6.0 0.50 3 Measured 65.0 0.0 0.0 0.0 0.0 0.0 Urban Freeway	<pre>ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h</pre>
	LOS and Performan	nce Measures	
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N Density, D	peed, S	1524 65.0 65.0 3 23.5	<pre>pc/h/ln mi/h mi/h pc/mi/ln</pre>

Phone: E-mail:		Fax:	
	Operational Ana	alysis	
Analyst:	TPR		
Agency or Company:	AECOM		
	4/12/11		
Analysis Time Period:	AM Peak		
Freeway/Direction:	I-95 Northbound		
From/To:	btw exits 51 & 1		
Jurisdiction:	Bucks County		
Analysis Year:		Low Toll	
Description: Scudder	Falls		
	Flow Inputs and	d Adjustments	
Volume, V		6343	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v1	5	1724	V
Trucks and buses		6	96
Recreational vehicles		0	%
Terrain type:		Grade	
Grade		0.73	%
Segment length		0.49	mi
Trucks and buses PCE,		1.5	
Recreational vehicle PCE, ER		1.2	
Heavy vehicle adjustment, fHV		0.971 1.00	
Driver population factor, fp Flow rate, vp		1420	pc/h/ln
	Speed Inputs an	nd Adjustments	
Lane width	-	12.0	ft
Right-shoulder lateral clearance		6.0	ft
Interchange density		0.50 5	interchange/mi
Free-flow speed:	Number of lanes, N		
FFS or BFFS		Measured 65.0	mi/h
Lane width adjustment,	fīw	0.0	mi/h
Lateral clearance adju		0.0	mi/h
Interchange density ad		0.0	mi/h
Number of lanes adjust		0.0	mi/h
Free-flow speed, FFS		65.0	mi/h
		Urban Freewa	ay
	LOS and Perform	mance Measures	
Flow rate, vp		1420	pc/h/ln
Free-flow speed, FFS		65.0	mi/h
Average passenger-car speed, S		65.0	mi/h
Number of lanes, N		5	
Density, D		21.8	pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 1 & 2 Jurisdiction: Mercer County Analysis Year: 2030 Build with Low Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 5923 Peak-hour factor, PHF 0.92 1610 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade 3.10 % Grade 0.75 Segment length mi Trucks and buses PCE, ET 2.0 Recreational vehicle PCE, ER 3.0 Heavy vehicle adjustment, fHV 0.943 Driver population factor, fp 1.00 Flow rate, vp 1706 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 70.0 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 1.5 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 1706 70.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 68.8 mi/h Number of lanes, N

24.8

pc/mi/ln

Density, D

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 2 & 3 Jurisdiction: Mercer County Analysis Year: 2030 Build with Low Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 5513 Peak-hour factor, PHF 0.92 1498 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Level 0.00 % Grade 0.00 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 2057 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 70.0 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 3.0 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway _____LOS and Performance Measures______ Flow rate, vp 2057 pc/h/ln 70.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 63.7 mi/h Number of lanes, N

32.3

pc/mi/ln

Density, D

Phone: E-mail:		Fax:		
	Operational Anal	ysis		
Analyst: Agency or Company: Date Performed: Analysis Time Period: Freeway/Direction: From/To: Jurisdiction: Analysis Year: Description: Scudder F	I-95 Southbound btw exits 49 & 46 Bucks County 2030 Build with I			
	Flow Inputs and	Adjustments		
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15		3053 0.92 830	veh/h v	
Trucks and buses Recreational vehicles Terrain type: Grade		6 0 Grade -0.05	ફ ફ ફ	
Segment length Trucks and buses PCE, ET Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV		0.33 1.5 1.2 0.971	mi	
Driver population factor Flow rate, vp		1.00 1709	pc/h/ln	
	Speed Inputs and	l Adjustments		
Lane width Right-shoulder lateral Interchange density Number of lanes, N	clearance	12.0 6.0 0.50 2	ft ft interchange/mi	
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus	tment, fLC	Measured 65.0 0.0 0.0	mi/h mi/h mi/h	
Interchange density add Number of lanes adjustm Free-flow speed, FFS		0.0 4.5 65.0 Urban Freeway	mi/h mi/h mi/h	
LOS and Performance Measures				
Flow rate wa		1700	ng/h/ln	
Flow rate, vp Free-flow speed, FFS Average passenger-car s	peed, S	1709 65.0 64.5	pc/h/ln mi/h mi/h	
Number of lanes, N Density, D		2 26.5	pc/mi/ln	

Phone: E-mail:		Fax:	
	Operational Ana	alysis	
Analysis Time Period: Freeway/Direction: From/To:	I-95 Southbound btw exits 51 & 4 Bucks County 2030 Build with		
		d Adjustments	
Volume, V Peak-hour factor, PHF		2353 0.92	veh/h
Peak 15-min volume, v15 Trucks and buses		639 6 0	V % %
Recreational vehicles Terrain type: Grade		Grade 3.00 0.47	° mi
Segment length Trucks and buses PCE, ET Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV		1.5 1.2 0.971	ш
Driver population factor, fp Flow rate, vp		1.00 878	pc/h/ln
	Speed Inputs ar	nd Adjustments	
Lane width Right-shoulder lateral Interchange density	clearance	12.0 6.0 0.50	ft ft interchange/mi
Number of lanes, N Free-flow speed: FFS or BFFS		3 Measured 65.0	mi/h
Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID		0.0 0.0 0.0	mi/h mi/h mi/h
Number of lanes adjustm Free-flow speed, FFS	nent, iN	3.0 65.0 Urban Freewa	mi/h mi/h Y
LOS and Performance Measures			
Flow rate, vp		878	pc/h/ln
Free-flow speed, FFS Average passenger-car s Number of lanes, N	speed, S	65.0 65.0 3	mi/h mi/h
Density, D		13.5	pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Southbound From/To: btw exits 1 & 51 Jurisdiction: Mercer County Analysis Year: 2030 Build with Low Toll Description: Scudder Falls _____Flow Inputs and Adjustments_____ veh/h Volume, V 2373 Peak-hour factor, PHF 0.92 645 Peak 15-min volume, v15 V Trucks and buses 0 Recreational vehicles Terrain type: Grade -0.73 % Grade 0.49 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 664 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 65.0 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 1.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ Flow rate, vp 664 pc/h/ln 65.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 65.0 mi/h Number of lanes, N

10.2

pc/mi/ln

Density, D

Phone: E-mail:		Fax:		
	Operational Ana	lysis		
Analyst:	TPR			
Agency or Company:	AECOM			
	4/12/11			
Analysis Time Period:				
	I-95 Southbound			
From/To:	btw exits 2 & 1			
Jurisdiction:				
Analysis Year:	2030 Build with Low Toll			
Description: Scudder I	Description: Scudder Falls			
	Flow Inputs and	Adjustments		
Volume, V		2553	veh/h	
Peak-hour factor, PHF		0.92	V CII / II	
Peak 15-min volume, v1:	- -	694	V	
Trucks and buses		6	%	
Recreational vehicles		0	%	
Terrain type:		Grade		
Grade		-3.10	%	
Segment length		0.75	mi	
Trucks and buses PCE, I	ET	1.5		
Recreational vehicle Po	CE, ER	1.2		
Heavy vehicle adjustment, fHV		0.971		
Driver population factor, fp		1.00		
Flow rate, vp		953	pc/h/ln	
	Speed Inputs an	d Adjustments		
Lane width		12.0	ft	
Right-shoulder lateral	clearance	6.0	ft	
Interchange density		0.50	interchange/mi	
Number of lanes, N		3		
Free-flow speed:		Measured		
FFS or BFFS		70.0	mi/h	
Lane width adjustment,		0.0	mi/h	
Lateral clearance adjus		0.0	mi/h	
Interchange density ad		0.0	mi/h	
Number of lanes adjustment, fN		3.0	mi/h	
Free-flow speed, FFS		70.0 Urban Freewa	mi/h v	
LOS and Performance Measures				
bos and refroimance measures				
Flow rate, vp		953	pc/h/ln	
Free-flow speed, FFS		70.0	mi/h	
Average passenger-car speed, S		70.0	mi/h	
Number of lanes, N		3		
Density, D		13.6	pc/mi/ln	

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analysis Time Period: Freeway/Direction: From/To: Jurisdiction:	I-95 Southbound btw exits 3 & 2 Mercer County 2030 Build with	Low Toll	
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF		2678 0.92	veh/h
Peak 15-min volume, v15 Trucks and buses Recreational vehicles		728 6 0	V % %
Terrain type: Grade Segment length	ım.	Level 0.00 0.00	% mi
Trucks and buses PCE, ET Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV Driver population factor, fp		1.5 1.2 0.971 1.00	
Flow rate, vp	- / - E	999	pc/h/ln
	Speed Inputs an	d Adjustments	
Lane width Right-shoulder lateral Interchange density	clearance	12.0 6.0 0.50	ft ft interchange/mi
Number of lanes, N Free-flow speed: FFS or BFFS		3 Measured 70.0	mi/h
Lane width adjustment, Lateral clearance adjus Interchange density adj	tment, fLC	0.0 0.0 0.0	mi/h mi/h mi/h
Number of lanes adjustm Free-flow speed, FFS		3.0 70.0 Urban Freeway	mi/h mi/h
LOS and Performance Measures			
Flow rate, vp		999	pc/h/ln
Free-flow speed, FFS Average passenger-car s Number of lanes, N	peed, S	70.0 70.0 3	mi/h mi/h
Density, D		14.3	pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 46 & 49 Jurisdiction: Bucks County Analysis Year: 2030 Build with Low Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 3309 Peak-hour factor, PHF 0.92 899 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade 0.05 % Grade 0.33 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 1852 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 65.0 Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC mi/h 0.0 Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 1852 65.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 63.4 mi/h Number of lanes, N

29.2

pc/mi/ln

Density, D

Phone: E-mail:		Fax:	
	Operational Anal	lysis	
Analyst: Agency or Company: Date Performed: Analysis Time Period: Freeway/Direction: From/To: Jurisdiction: Analysis Year: Description: Scudder F	I-95 Northbound btw exits 49 & 53 Bucks County 2030 Build with I		
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses		2740 0.92 745 6	veh/h v %
Recreational vehicles Terrain type: Grade		0 Grade -3.00	8
Segment length Trucks and buses PCE, E Recreational vehicle PC Heavy vehicle adjustment Driver population factor	E, ER t, fhV	0.47 1.5 1.2 0.971 1.00	mi
Flow rate, vp		1023	pc/h/ln
	Speed Inputs and	d Adjustments	
Lane width Right-shoulder lateral Interchange density	clearance	12.0 6.0 0.50	ft ft interchange/mi
Number of lanes, N Free-flow speed: FFS or BFFS		3 Measured 65.0	mi/h
Lane width adjustment, Lateral clearance adjust Interchange density adj	tment, fLC ustment, fID	0.0 0.0 0.0	mi/h mi/h mi/h
Number of lanes adjustm Free-flow speed, FFS	leiic, IN	3.0 65.0 Urban Freeway	mi/h mi/h
	LOS and Performa	ance Measures	
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N	speed, S	1023 65.0 65.0 3	pc/h/ln mi/h mi/h
Density, D		15.7	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ana	alysis	
Analyst:	TPR		
Agency or Company:	AECOM		
	4/12/11		
Analysis Time Period:	PM Peak		
Freeway/Direction:	I-95 Northbound		
From/To:	btw exits 51 & 1	L	
Jurisdiction:	Bucks County		
Analysis Year:		Low Toll	
Description: Scudder	Falls		
	Flow Inputs and	d Adjustments	
Volume, V		2950	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v1	5	802	V
Trucks and buses		6	%
Recreational vehicles		0	용
Terrain type:		Grade	
Grade		0.73	8
Segment length	n.m.	0.49	mi
Trucks and buses PCE, Recreational vehicle Po		1.5 1.2	
Heavy vehicle adjustmen		0.971	
Driver population fact		1.00	
Flow rate, vp	OI, IP	661	pc/h/ln
	Speed Inputs ar	nd Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	alearange	6.0	ft
Interchange density	Clearance	0.50	interchange/mi
Number of lanes, N		5	incerenange/mi
Free-flow speed:		Measured	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adju	stment, fLC	0.0	mi/h
Interchange density ad	justment, fID	0.0	mi/h
Number of lanes adjust	ment, fN	0.0	mi/h
Free-flow speed, FFS		65.0	mi/h
		Urban Freeway	У
	LOS and Perform	mance Measures	
Flow rate, vp		661	pc/h/ln
Free-flow speed, FFS		65.0	mi/h
Average passenger-car	speed, S	65.0	mi/h
Number of lanes, N		5	
Density, D		10.2	pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 1 & 2 Jurisdiction: Mercer County Analysis Year: 2030 Build with Low Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 2870 Peak-hour factor, PHF 0.92 780 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade 3.10 % Grade 0.75 Segment length mi Trucks and buses PCE, ET 2.0 Recreational vehicle PCE, ER 3.0 Heavy vehicle adjustment, fHV 0.943 Driver population factor, fp 1.00 Flow rate, vp 827 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 70.0 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 1.5 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway _____LOS and Performance Measures______ Flow rate, vp 827 pc/h/ln 70.0 Free-flow speed, FFS mi/h 70.0 Average passenger-car speed, S mi/h Number of lanes, N

11.8

pc/mi/ln

Density, D

Phone: E-mail:		Fax:	
	Operational Anal	lysis	
Analysis Time Period: Freeway/Direction: From/To: Jurisdiction:	I-95 Northbound btw exits 2 & 3 Mercer County 2030 Build with 1	Low Toll	
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15		3130 0.92 851	veh/h v
Trucks and buses Recreational vehicles Terrain type:		6 0 Level	% %
Grade Segment length Trucks and buses PCE, E Recreational vehicle PC		0.00 0.00 1.5 1.2	% mi
Heavy vehicle adjustmen Driver population facto Flow rate, vp	t, fHV	0.971 1.00 1168	pc/h/ln
	Speed Inputs and	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral Interchange density Number of lanes, N	clearance	6.0 0.50 3	ft interchange/mi
Free-flow speed: FFS or BFFS	et u	Measured 70.0	mi/h
Lane width adjustment, Lateral clearance adjus Interchange density adj	tment, fLC ustment, fID	0.0 0.0 0.0	mi/h mi/h mi/h
Number of lanes adjustm Free-flow speed, FFS	ent, in	3.0 70.0 Urban Freeway	mi/h mi/h
	LOS and Performa	ance Measures	
Flow rate, vp Free-flow speed, FFS		1168 70.0	pc/h/ln mi/h
Average passenger-car s Number of lanes, N Density, D	peed, S	70.0 3 16.7	mi/h pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Southbound From/To: btw exits 49 & 46 Jurisdiction: Bucks County Analysis Year: 2030 Build with Low Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 4056 Peak-hour factor, PHF 0.92 1102 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade -0.05 % Grade 0.33 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 2270 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 65.0 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 4.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures_____ pc/h/ln Flow rate, vp 2270 65.0 Free-flow speed, FFS mi/h 55.0 Average passenger-car speed, S mi/h Number of lanes, N

41.3

pc/mi/ln

Density, D

Phone:		Fax:	
E-mail:		1 02.	
	Operational Ana	alysis	
Analyst:	TPR		
Agency or Company:			
Date Performed:	4/12/11		
Analysis Time Period:			
Freeway/Direction:			
From/To:	btw exits 51 &	1 9	
	Bucks County		
Analysis Year:		Low Toll	
Description: Scudder		2011 2022	
	Flow Inputs and	d Adjustments	
Volume, V		4036	veh/h
Peak-hour factor, PHF		0.92	. 552, 52
Peak 15-min volume, v1	5	1097	V
Trucks and buses		6	8
Recreational vehicles		0	90
Terrain type:		Grade	
Grade		3.00	%
Segment length		0.47	mi
Trucks and buses PCE,	ET	1.5	
Recreational vehicle P	CE, ER	1.2	
Heavy vehicle adjustme	nt, fHV	0.971	
Driver population fact	or, fp	1.00	
Flow rate, vp		1506	pc/h/ln
	Speed Inputs ar	nd Adjustments_	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		3	
Free-flow speed:		Measured	1
FFS or BFFS	£ T T.I	65.0	mi/h
Lane width adjustment,		0.0	mi/h mi/h
Lateral clearance adju- Interchange density ad		0.0 0.0	mi/h
Number of lanes adjust		3.0	mi/h
Free-flow speed, FFS	neire, in	65.0	mi/h
rice riow speed, ris		Urban Free	·
	LOS and Perform	mance Measures_	
Flow rate, vp		1506	pc/h/ln
Free-flow speed, FFS		65.0	mi/h
Average passenger-car	speed. S	65.0	mi/h
Number of lanes, N		3	,
Density, D		23.2	pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Anal	ysis	
Analyst:	TPR		
Agency or Company:	AECOM		
Date Performed:	4/12/11		
Analysis Time Period:	PM Peak		
Freeway/Direction:	I-95 Southbound		
From/To:	btw exits 1 & 51		
Jurisdiction:	Mercer County		
Analysis Year:		ow Toll	
Description: Scudder B	Falls		
	Flow Inputs and	Adjustments	
Volume, V		5126	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v15	5	1393	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Grade	
Grade		-0.73	8
Segment length		0.49	mi
Trucks and buses PCE, I		1.5	
Recreational vehicle PO		1.2	
Heavy vehicle adjustmer		0.971	
Driver population factor Flow rate, vp	or, ip	1.00 1435	pc/h/ln
, <u>-</u>	Speed Inputs and	Adjustmonts	<u>.</u>
	speed inputs and	Ad Justments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		4	
Free-flow speed:		Measured	1.73
FFS or BFFS	C	65.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density adj Number of lanes adjustr		0.0 1.5	mi/h mi/h
Free-flow speed, FFS	menc, in	65.0	mi/h
riee-ilow speed, rrs		Urban Freeway	111 / 11
	LOS and Performa		
Flow rate, vp		1435	pc/h/ln
Free-flow speed, FFS		65.0	mi/h
Average passenger-car s	speea, S	65.0	mi/h
Number of lanes, N Density, D		$4 \\ 22.1$	pc/mi/ln
			F - / /

Phone: E-mail:		Fax:	
	Operational Analy	sis	
Analysis Time Period: Freeway/Direction: From/To: Jurisdiction:	I-95 Southbound btw exits 2 & 1 Mercer County 2030 Build with Lo	ow Toll	
	Flow Inputs and A	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses	i e	5021 0.92 1364 6	veh/h v %
Recreational vehicles Terrain type: Grade Segment length		0 Grade -3.10 0.75	% mi
Trucks and buses PCE, E Recreational vehicle PC Heavy vehicle adjustment Driver population factor	EE, ER Lt, fHV	1.5 1.2 0.971 1.00	
Flow rate, vp		1874	pc/h/ln
	Speed Inputs and	Adjustments	
Lane width Right-shoulder lateral Interchange density Number of lanes, N	clearance	12.0 6.0 0.50 3	ft ft interchange/mi
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjustment	stment, fLC	Measured 70.0 0.0 0.0	mi/h mi/h mi/h
Interchange density adj Number of lanes adjustm Free-flow speed, FFS		0.0 3.0 70.0 Urban Freeway	mi/h mi/h mi/h
	LOS and Performar	nce Measures	
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N Density, D	speed, S	1874 70.0 66.9 3 28.0	<pre>pc/h/ln mi/h mi/h pc/mi/ln</pre>
<u>.</u> .			

Phone: E-mail:		Fax:	
	Operational Ana	alysis	
Analyst:	TPR		
Agency or Company:	AECOM		
	4/12/11		
Analysis Time Period:	PM Peak		
_	I-95 Southbound		
From/To:	btw exits 3 & 2		
Jurisdiction:	Mercer County		
Analysis Year:	2030 Build with	Low Toll	
Description: Scudder 1	Falls		
	Flow Inputs and	d Adjustments	
Volume, V		4591	veh/h
Peak-hour factor, PHF		0.92	
Peak 15-min volume, v1	5	1248	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Level	
Grade		0.00	%
Segment length		0.00	mi
Trucks and buses PCE, 1		1.5	
Recreational vehicle Po	CE, ER	1.2	
Heavy vehicle adjustmen	nt, fHV	0.971	
Driver population factor	or, fp	1.00	
Flow rate, vp		1713	pc/h/ln
	Speed Inputs ar	nd Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		3	
Free-flow speed:		Measured	
FFS or BFFS		70.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density ad		0.0	mi/h
Number of lanes adjusts	ment, iN	3.0	mi/h
Free-flow speed, FFS		70.0 Urban Freewa	mi/h
	LOS and Perform		y
	nob and remon		
Flow rate, vp		1713	pc/h/ln
Free-flow speed, FFS	_	70.0	mi/h
Average passenger-car	speed, S	68.7	mi/h
Number of lanes, N		3	/
Density, D		24.9	pc/mi/ln

Phone: E-mail: Fax:

_____Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB off ramp to PA 332

Jurisdiction: Bucks County

Analysis Year: 2030 Build with Low Toll

Description: Scudder Falls

Freeway	Data
---------	------

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0 mpl	h
Volume on freeway	3773 vpl	h

_____Off Ramp Data______

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	1180	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

2530

On

Distance to adjacent ramp

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp		Adjacer	nt
				Ramp	
Volume, V (vph)	3773	1180		1190	vph
Peak-hour factor, PHF	0.92	0.92		0.92	
Peak 15-min volume, v15	1025	321		323	V
Trucks and buses	6	7		4	%
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	

```
1.00
Driver population factor, fP
                                              1.00
                                                         1.00
Flow rate, vp
                                   4224
                                              1327
                                                         1319
                                                                 pcph
                 _____Estimation of V12 Diverge Areas__
                              (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 4224 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                  LOS F?
                        Actual
    v = v
                        4224
                                     4700
                                                   No
     Fi F
    v = v - v
                        2897
                                     4700
                                                   No
        F R
     FΟ
                        1327
                                     2000
                                                   No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 4224
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area_____
                                Max Desirable
                                                    Violation?
                   Actual
                                4400
                    4224
                                                    No
    V
     12
            ____Level of Service Determination (if not F)______
                    D = 4.252 + 0.0086 v - 0.009 L = 32.9 pc/mi/ln
Density,
                                      12
                     R
Level of service for ramp-freeway junction areas of influence D
               _____Speed Estimation_____
Intermediate speed variable,
                                        D = 0.547
                                         S
Space mean speed in ramp influence area,
                                        S = 52.4
                                                    mph
                                         R
Space mean speed in outer lanes,
                                        S = N/A
                                                    mph
Space mean speed for all vehicles,
                                       S = 52.4
                                                    mph
```

0.971

0.966

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Northbound Junction:

NB On ramp from PA332 ADD LANE

Jurisdiction:

Bucks County

Analysis Year:

2030 Build with Low Toll Description: Scudder Falls ______Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 3783 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 300 Volume on ramp vph Length of first accel/decel lane 1375 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1190 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp On Distance to adjacent Ramp 2530 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 3783 300 1190 vph Peak-hour factor, PHF 0.92 0.92 0.92 1028 Peak 15-min volume, v15 82 323 V 7 0 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: % % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
4235
Flow rate, vp
                                               333
                                                          1339
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 4235 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                        Actual
                                      Maximum
                         4568
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 4235
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    4568
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 32.3 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.601
                                          S
Space mean speed in ramp influence area,
                                         S = 51.2
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 51.2
                                                     mph
```

0.971

1.00

0.980

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail:

Fax:

vph

_____Diverge Analysis_____

Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound

NB off ramp to Taylorsville Bucks County Junction:

Analysis Year:

2030 Build with Low Toll

Description: Scudder Falls

_____Freeway Data_____

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 4083

_____Off Ramp Data_____

Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph 310 Volume on ramp vph Length of first accel/decel lane 850 ft Length of second accel/decel lane ft

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist? Yes 1330 Volume on adjacent ramp vph Position of adjacent ramp Downstream Type of adjacent ramp On Distance to adjacent ramp 1250 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway		Ramp		Adjacen	.t
					Ramp	
Volume, V (vph)	4083		310		1330	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	1110		84		361	V
Trucks and buses	6		5		6	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	왕	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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    4571
                                               345
                                                          1489
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.630 Using Equation 5
                 FD
                v = v + (v - v) P = 3007 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         4571
                                     7050
                                                    No
     Fi F
    v = v - v
                        4226
                                     7050
                                                    No
         F R
     FΟ
                        345
                                     2000
                                                    No
    V
     R
                        1564 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 3007
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                    Actual
                                 Max Desirable
                                                     Violation?
                                 4400
                    3007
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 22.5 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence C
                _____Speed Estimation_____
                                         D = 0.459
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 54.4
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 69.1
                                                     mph
```

S = 58.7

mph

0.971

0.976

0.971

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On rmp frm Tylrsvl E ADD LN
Jurisdiction: Bucks County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph 3773 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 1330 Volume on ramp vph Length of first accel/decel lane 455 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 310 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1250 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 3773 1330 310 vph Peak-hour factor, PHF 0.92 0.92 0.92 1025 Peak 15-min volume, v15 361 84 V 5 0 Trucks and buses 6 6 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
1.00
Driver population factor, fP
                                    1.00
                                                           1.00
                                    4224
                                                1489
Flow rate, vp
                                                           345
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        852.80 (Equation 25-2 or 25-3)
                 ΕQ
                        0.590 Using Equation 1
                 FM
                v = v (P) = 2493 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                                      Maximum
                         Actual
                         5713
                                      7050
                                                     No
     FO
                         1731 pc/h
                                     (Equation 25-4 or 25-5)
     3 \text{ or } av34
Is
                > 2700 pc/h?
                                      No
          V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 2493
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                      Violation?
                    5713
                                 4600
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 33.0 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.498
                                          S
Space mean speed in ramp influence area,
                                          S = 53.5
                                                      mph
                                          R
Space mean speed in outer lanes,
                                          S = 60.6
                                                      mph
                                          0
```

S = 55.5

mph

0.971

0.971

0.976

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On rmp frm Tylrsvl W ADD LN Jurisdiction: Bucks County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 5103 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 1240 Volume on ramp vph Length of first accel/decel lane 275 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1330 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp On Distance to adjacent Ramp 910 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 5103 1240 1330 vph Peak-hour factor, PHF 0.92 0.92 0.92 1387 337 Peak 15-min volume, v15 361 V 6 0 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: % % Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
5713
                                               1375
Flow rate, vp
                                                          1489
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      0.046 Using Equation 4
                 FM
                v = v (P) = 262
                                     pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                                      Maximum
                         Actual
                         7088
                                      9400
                                                    No
     FO
                         2725 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     Yes
         V
     3 or av34
                > 1.5 v / 2
Is
    v v
                                     Yes
     3 or av34
                      12
If yes, v = 2285
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    7088
                                                     No
     12A
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 31.7 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.453
                                          S
Space mean speed in ramp influence area,
                                         S = 54.6
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = 60.6
                                                     mph
                                          0
```

S = 57.3

mph

0.971

1.00

0.980

1.00

0.971

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: E-mail: Fax:

______Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB Off Ramp to NJ29 DROP LANE

Jurisdiction: Mercer County

Analysis Year: 2030 Build with Low Toll

Description: Scudder Falls

______Freeway Data______

Type of analysis Diverge
Number of lanes in freeway 4
Free-flow speed on freeway 70.0 mph
Volume on freeway 6343 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	910	vph
Length of first accel/decel lane	550	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

545

Yes

490

vph

Downstream

On

Distance to adjacent ramp

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway		Ramp		Adjacer	ıt
					Ramp	
Volume, V (vph)	6343		910		490	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	1724		247		133	V
Trucks and buses	6		5		4	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	왕	0.00	8	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	

```
Driver population factor, fP
                                   1.00
                                               1.00
                                                          1.00
                                   7101
Flow rate, vp
                                               1014
                                                          543
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.436 Using Equation 8
                 FD
                v = v + (v - v) P = 3668 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         7101
                                     9600
                                                    No
     Fi F
    v = v - v
                        6087
                                     9600
                                                    No
         F R
     FΟ
                        1014
                                     2000
                                                    No
    V
     R
                        1716 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 3668
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                    Actual
                                 Max Desirable
                                                     Violation?
                                 4400
                    3668
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 30.8 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.519
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 55.5
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 74.0
                                                     mph
```

S = 63.1

mph

0.971

0.976

0.980

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: _____Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from NJ 29
Jurisdiction: Mercer County
Analysis Year: 2030 Build with Low To 2030 Build with Low Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 5433 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 490 Volume on ramp vph Length of first accel/decel lane 500 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 910 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 545 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 5433 490 910 vph Peak-hour factor, PHF 0.92 0.92 0.92 1476 133 247 Peak 15-min volume, v15 V 5 0 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 Grade Length mi mi

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

шi

1.5

1.2

1.5

1.2

```
6083
Flow rate, vp
                                               543
                                                          1014
                                                                  pcph
                  _____Estimation of V12 Merge Areas___
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                       0.150 Using Equation 4
                 FM
                v = v (P) = 912
                                     pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                         Actual
                                      Maximum
                         6626
                                      9600
                                                    No
     FO
                         2585 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
Is
    v v
                                     Yes
     3 or av34
                      12
If yes, v = 2433
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    6626
                                                     No
     12A
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 25.3 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.362
                                          S
Space mean speed in ramp influence area,
                                         S = 59.9
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = 65.2
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 62.7
                                                     mph
```

0.971

1.00

0.980

1.00

0.976

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail: Fax:

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB OffRmp to Br Tvrn Rd DRP LN

Jurisdiction: Mercer County

Analysis Year: 2030 Build with Low Toll

Description: Scudder Falls

Freeway	Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5923	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	1090	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

2545

Yes

vph

Downstream

On

Distance to adjacent ramp

_____Conversion to pc/h Under Base Conditions_____

Junction Components	tion Components Freeway		Ramp		Adjacent		
					Ramp		
Volume, V (vph)	5923		1090		680	vph	
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1610		296		185	V	
Trucks and buses	6		3		4	%	
Recreational vehicles	0		0		0	%	
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	8	0.00	%	
Length	0.00 r	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		

```
1.00
Driver population factor, fP
                                              1.00
                                                          1.00
Flow rate, vp
                                   6631
                                              1203
                                                          754
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.539 Using Equation 5
                 FD
                v = v + (v - v) P = 4128 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        6631
                                     7200
                                                    No
     Fi F
    v = v - v
                        5428
                                     7200
                                                    No
        F R
     FΟ
                        1203
                                     2000
                                                    No
    V
     R
                        2503 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 4128
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    4128
                                                     No
    V
     12
            ____Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 28.9 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation____
                                         D = 0.536
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 55.0
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 70.9
                                                     mph
```

S = 60.1

mph

0.971

0.985

0.980

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from Bear Tavern Rd
Jurisdiction: Mercer County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 4833 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 680 vph Length of first accel/decel lane 1150 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1090 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2545 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 4833 680 1090 vph 0.92 Peak-hour factor, PHF 0.92 0.92 185 1313 296 Peak 15-min volume, v15 V 3 0 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: % % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
5411
Flow rate, vp
                                               754
                                                          1203
                                                                  pcph
                   ____Estimation of V12 Merge Areas___
                        1258.11 (Equation 25-2 or 25-3)
                 ΕQ
                       0.610 Using Equation 1
                 FM
                v = v (P) = 3299 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                                      Maximum
                         Actual
                         6165
                                      7200
                                                    No
     FO
                         2112 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 3299
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    6165
                                                      No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 29.5 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.465
                                          S
Space mean speed in ramp influence area,
                                         S = 57.0
                                                      mph
                                          R
Space mean speed in outer lanes,
                                         S = 64.2
                                                      mph
                                          0
Space mean speed for all vehicles,
                                         S = 59.3
                                                      mph
```

1.00

0.980

1.00

0.985

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from PA332 EB
Jurisdiction: Bucks County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2593 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph Volume on ramp 1190 vph Length of first accel/decel lane 1200 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1180 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1300 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2593 1190 1180 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 705 323 321 V 3 Trucks and buses 6 6 0 Recreational vehicles 용 Level Level Level Terrain type: % % Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
Driver population factor, fP
                                    1.00
                                               1.00
                                                           1.00
                                    2903
                                               1332
Flow rate, vp
                                                           1302
                                                                   pcph
                  _____Estimation of V12 Merge Areas___
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2903 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         4235
                                      4700
                                                     No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 \text{ or } av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 2903
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    4235
                                                      No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 30.4 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation____
Intermediate speed variable,
                                          M = 0.506
                                          S
Space mean speed in ramp influence area,
                                          S = 53.4
                                                      mph
                                          R
                                          S = N/A
Space mean speed in outer lanes,
                                                      mph
                                          0
Space mean speed for all vehicles,
                                          S = 53.4
                                                      mph
```

0.971

0.985

Heavy vehicle adjustment, fHV

Phone: E-mail: Fax:

_____Diverge Analysis_____

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Southbound

Junction: SB Off Ramp to PA332 DROP LANE

Jurisdiction: Bucks County

Analysis Year: 2030 Build with Low Toll

Description: Scudder Falls

Freeway Data	
--------------	--

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2353	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	760	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp
Position of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp
Distance to adjacent ramp
2525

ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2353	760	1460 vph
Peak-hour factor, PHF	0.92	0.92	0.92
Peak 15-min volume, v15	639	207	397 v
Trucks and buses	6	7	6 %
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

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    2634
                                               855
                                                          1635
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.655 Using Equation 5
                 FD
                v = v + (v - v) P = 2020 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         2634
                                     7050
                                                    No
     Fi F
    v = v - v
                        1779
                                     7050
                                                    No
         F R
     FΟ
                        855
                                     2000
                                                    No
    V
     R
                        614 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 2020
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2020
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 14.0 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.505
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 53.4
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 71.3
                                                     mph
Space mean speed for all vehicles,
                                        S = 56.7
                                                     mph
```

0.966

0.971

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from PA332
Jurisdiction: Bucks County
Analysis Year: 2030 Build with Low To 2030 Build with Low Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 1593 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 1460 vph Length of first accel/decel lane 1375 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 760 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2525 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 1593 1460 760 vph 0.92 Peak-hour factor, PHF 0.92 0.92 207 Peak 15-min volume, v15 433 397 V 7 0 Trucks and buses 6 6 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
1783
                                               1635
Flow rate, vp
                                                          855
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 1783 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                        Actual
                                     Maximum
                         3418
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 1783
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    3418
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 22.8 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.344
                                          S
Space mean speed in ramp influence area,
                                         S = 57.1
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 57.1
                                                     mph
```

1.00

0.971

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail: Fax:

______Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Southbound

Junction: SB Off rmp to Tylrsvlle DRP LN

Jurisdiction: Bucks County

Analysis Year: 2030 Build with Low Toll

Description: Scudder Falls

_____Freeway Data_____

Type of analysis Diverge
Number of lanes in freeway 3
Free-flow speed on freeway 65.0 mph
Volume on freeway 2373 vph

_____Off Ramp Data______

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	460	vph
Length of first accel/decel lane	550	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Downstream

On

Distance to adjacent ramp

790

ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2373	460	490 vph
Peak-hour factor, PHF	0.92	0.92	0.92
Peak 15-min volume, v15	645	125	133 v
Trucks and buses	6	4	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

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    2657
                                               510
                                                          551
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                       0.670 Using Equation 5
                 FD
                v = v + (v - v) P = 1949 pc/h
                 12 R
                          F R FD
                   _____Capacity Checks____
                                      Maximum
                                                    LOS F?
                         Actual
    v = v
                         2657
                                      7050
                                                    No
     Fi F
                         2147
                                      7050
                                                    No
    v = v - v
         F R
     FΟ
                         510
                                      2000
                                                    No
    V
     R
                         708 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
                > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                      No
Is
        V
     3 or av34
                       12
If yes, v = 1949
                                      (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    1949
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 16.1 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.474
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 54.1
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 71.3
                                                     mph
Space mean speed for all vehicles,
                                        S = 57.8
                                                     mph
```

0.980

0.966

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from Taylorsville
Jurisdiction: Bucks County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 1863 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 490 Volume on ramp vph Length of first accel/decel lane 1265 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 460 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1400 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 490 1863 460 vph 0.92 Peak-hour factor, PHF 0.92 0.92 133 125 Peak 15-min volume, v15 506 V 7 0 Trucks and buses 6 3 0 Recreational vehicles 용 Level Level Level Terrain type: % % Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
2086
Flow rate, vp
                                               541
                                                          517
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        552.04 (Equation 25-2 or 25-3)
                 ΕQ
                       0.613 Using Equation 1
                 FM
                v = v (P) = 1279 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                         Actual
                                      Maximum
                         2627
                                      7050
                                                     No
     FO
                         807 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1279
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual
                           Max Desirable
                                                     Violation?
                                 4600
                    2627
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 11.5 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.257
                                          S
Space mean speed in ramp influence area,
                                         S = 59.1
                                                      mph
                                          R
Space mean speed in outer lanes,
                                         S = 63.9
                                                      mph
                                          0
```

S = 60.5

mph

0.971

1.00

0.985

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: E-mail:

Fax:

______Diverge Analysis______

Analyst: TPR Agency/Co.: AECOM Date performed: 04/12/11 Date performed: 04/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Southbound SB Off Ramp to NJ 29 Junction:

Analysis Year: Mercer County

2030 Build with Low Toll

Description: Scudder Falls

_____Freeway Data______

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 2528 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 565 vph Length of first accel/decel lane 500 ft Length of second accel/decel lane ft

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist? Yes Volume on adjacent ramp 410 vph Position of adjacent ramp Downstream Type of adjacent ramp On Distance to adjacent ramp 880 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway		Ramp		Adjacer Ramp	nt
Volume, V (vph)	2528		565		410	vph
Peak-hour factor, PHF	0.92		0.92		0.92	_
Peak 15-min volume, v15	687		154		111	V
Trucks and buses	6		11		4	%
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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                    2830
Flow rate, vp
                                               648
                                                          455
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                       0.659 Using Equation 5
                 FD
                v = v + (v - v) P = 2087 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                      Maximum
                                                    LOS F?
                        Actual
    v = v
                         2830
                                      7200
                                                    No
     Fi F
                         2182
                                      7200
                                                    No
    v = v - v
         F R
     FΟ
                         648
                                      2000
                                                    No
    V
     R
                         743 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
                > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                       12
If yes, v = 2087
                                      (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2087
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 17.7 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.486
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 56.4
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 76.8
                                                     mph
Space mean speed for all vehicles,
                                        S = 60.6
                                                     mph
```

0.948

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from NJ 29 ADD LANE
Jurisdiction: Mercer County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 1963 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 410 Volume on ramp vph Length of first accel/decel lane 338 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 565 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 880 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 410 1963 565 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 533 111 154 V Trucks and buses 6 4 11 0 0 Recreational vehicles ે Level Level Level Terrain type: % 용 Grade Length mi mi

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

шi

1.5

1.2

1.5

1.2

```
2198
                                               455
Flow rate, vp
                                                          648
                                                                  pcph
                   ____Estimation of V12 Merge Areas__
                       146.01 (Equation 25-2 or 25-3)
                 ΕQ
                       0.587 Using Equation 1
                 FM
                v = v (P) = 1290 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                                      Maximum
                         Actual
                         2653
                                      7200
                                                    No
     FO
                         908 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                      12
If yes, v = 1290
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    2653
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 16.8 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.320
                                          S
Space mean speed in ramp influence area,
                                         S = 61.0
                                                     mph
                                          R
                                         S = 68.5
Space mean speed in outer lanes,
                                                     mph
                                          0
```

S = 63.4

mph

0.971

1.00

0.980

1.00

0.948

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: E-mail: Fax:

_____Operational Analysis_____

Analyst: TPR
Agency/Co.: AECOM
Date Performed: 4/12/11
Analysis Time Period: AM Peak

Freeway/Dir of Travel: I-95 Southbound
Weaving Location: Bear Tavern Road
Jurisdiction: Mercer County

Analysis Year: 2030 Build with Low Toll

Description: Scudder Falls

_____Inputs_____ Freeway free-flow speed, SFF 70 mph Weaving number of lanes, N 4 Weaving segment length, L 2050 ft Terrain type Level % Grade Length mi Weaving type A Volume ratio, VR 0.21 0.24 Weaving ratio, R

______Conversion to pc/h Under Base Conditions_____

	Non-Weaving		Weaving		
	V	V	V	V	
	01	02	w1	w2	
Volume, V	2863	0	580	185	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	778	0	158	50	v
Trucks and buses	6	10	4	б	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.971	0.952	0.980	0.971	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	3205	0	643	207	pc/h

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.0035
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.42	0.20
Weaving and non-weaving speeds, Si	57.22	65.05
Number of lanes required for		

unconstrained opera	ation, Nw	(Exhibit 24-7)	1.23	
Maximum number of 1	anes, Nw	(max) (Exhibit	24-7) 1.40	
Type of operation i	s		Unco	nstrained

_______Weaving Segment Speed, Density, Level of Service and Capacity______

Weaving segment speed, S	63.24	mph
Weaving segment density, D	16.03	pc/mi/ln
Level of service, LOS	В	
Capacity of base condition, cb	8902	pc/h
Capacity as a 15-minute flow rate, c	8643	pc/h
Capacity as a full-hour volume, ch	7952	pc/h

_____Limitations on Weaving Segments______

		If Max Exce	eded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	850	2800	a
Average flow rate (pcphpl)	1013	2400	b
Volume ratio, VR	0.21	0.35	C
Weaving ratio, R	0.24	N/A	d
Weaving length (ft)	2050	2500	е
Not on the second			

Notes:

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

Phone: Fax: E-mail: _____Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from Bear Tavern E
Jurisdiction: Mercer County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 2258 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 270 Volume on ramp vph Length of first accel/decel lane 1203 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 580 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 440 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2258 270 580 vph Peak-hour factor, PHF 0.92 0.92 0.92 158 Peak 15-min volume, v15 614 73 V 6 0 Trucks and buses 6 2 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade Length mi mi

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

шi

1.5

1.2

1.5

1.2

```
2528
Flow rate, vp
                                               296
                                                          649
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        566.67 (Equation 25-2 or 25-3)
                 ΕQ
                        0.603 Using Equation 2
                 FM
                v = v (P) = 1525 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         2824
                                      7200
                                                     No
     FO
                         1003 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1525
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    2824
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 12.0 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.261
                                          S
Space mean speed in ramp influence area,
                                         S = 62.7
                                                      mph
                                          R
Space mean speed in outer lanes,
                                         S = 68.2
                                                      mph
                                          0
Space mean speed for all vehicles,
                                         S = 64.5
                                                      mph
```

1.00

0.990

1.00

0.971

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Fax:

Phone: E-mail:

_____Diverge Analysis_____

TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Northbound

NB off ramp to PA 332 Bucks County Junction:

Jurisdiction:

Analysis Year: 2030 Build with Low Toll

Description: Scudder Falls

_____Freeway Data______

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 3309 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	1309	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist? Yes Volume on adjacent ramp 640 vph Position of adjacent ramp Downstream Type of adjacent ramp On Distance to adjacent ramp 2530 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3309	1309	640 vph	1
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	899	356	174 v	
Trucks and buses	6	7	4 %	
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	

```
1.00
                                              1.00
Driver population factor, fP
                                                         1.00
                                   3705
Flow rate, vp
                                              1473
                                                         710
                                                                 pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 3705 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        3705
                                     4700
                                                    No
     Fi F
    v = v - v
                        2232
                                     4700
                                                    No
         F R
     FΟ
                        1473
                                     2000
                                                    No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 3705
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area____
                                Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    3705
                                                     No
    V
     12
            ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 28.5 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.561
Intermediate speed variable,
                                         S
Space mean speed in ramp influence area,
                                         S = 52.1
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
```

S = 52.1

mph

0.971

0.966

0.980

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from PA332 ADD LANE
Jurisdiction: Bucks County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls ______Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2640 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 100 Volume on ramp vph Length of first accel/decel lane 1375 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 640 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2530 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp 100 Volume, V (vph) 2640 640 vph 0.92 0.92 Peak-hour factor, PHF 0.92 Peak 15-min volume, v15 717 27 174 V 7 0 6 Trucks and buses 4 0 Recreational vehicles 용 Level Level Level Terrain type: % % Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
2956
Flow rate, vp
                                               111
                                                          720
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2956 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         3067
                                      4700
                                                     No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 2956
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    3067
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 20.7 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.309
                                          S
Space mean speed in ramp influence area,
                                         S = 57.9
                                                      mph
                                          R
Space mean speed in outer lanes,
                                         S = N/A
                                                      mph
                                          0
Space mean speed for all vehicles,
                                         S = 57.9
                                                      mph
```

1.00

0.980

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail: Fax:

_____Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB off ramp to Taylorsville

Jurisdiction: Bucks County

Analysis Year: 2030 Build with Low Toll

Description: Scudder Falls

Free	way Data
	1

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2740	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	390	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

1250

On

Distance to adjacent ramp

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp		Adjace Ramp	nt
Volume, V (vph)	2740	390		330	vph
Peak-hour factor, PHF	0.92	0.92		0.92	
Peak 15-min volume, v15	745	106		90	V
Trucks and buses	6	5		6	%
Recreational vehicles	0	0		0	%
Terrain type:	Level	Level		Level	
Grade	0.00	0.00	%	0.00	%
Length	0.00 r	ni 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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                    3068
Flow rate, vp
                                               435
                                                          369
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.663 Using Equation 5
                 FD
                v = v + (v - v) P = 2181 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                      Maximum
                                                    LOS F?
                        Actual
    v = v
                         3068
                                      7050
                                                    No
     Fi F
    v = v - v
                         2633
                                      7050
                                                    No
         F R
     FΟ
                         435
                                      2000
                                                    No
    V
     R
                         887 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
                > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                      No
Is
        V
     3 or av34
                       12
If yes, v = 2181
                                      (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2181
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 15.4 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.467
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 54.3
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 71.3
                                                     mph
Space mean speed for all vehicles,
                                        S = 58.3
                                                     mph
```

0.976

0.971

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On rmp frm Tylrsvl E ADD LN
Jurisdiction: Bucks County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2350 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 330 Volume on ramp vph Length of first accel/decel lane 455 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 390 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1250 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2350 330 390 vph Peak-hour factor, PHF 0.92 0.92 0.92 106 Peak 15-min volume, v15 639 90 V 5 0 Trucks and buses 6 6 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
2631
                                                369
Flow rate, vp
                                                           435
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        272.22 (Equation 25-2 or 25-3)
                 ΕQ
                        0.590 Using Equation 1
                 FM
                v = v (P) = 1553 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                                      Maximum
                         Actual
                         3000
                                      7050
                                                     No
     FO
                         1078 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v /2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1553
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                      Violation?
                    3000
                                 4600
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 17.4 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                   _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.316
                                          S
Space mean speed in ramp influence area,
                                          S = 57.7
                                                      mph
                                          R
Space mean speed in outer lanes,
                                          S = 62.9
                                                      mph
                                          0
Space mean speed for all vehicles,
                                          S = 59.5
                                                      mph
```

1.00

0.971

1.00

0.976

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On rmp frm Tylrsvl W ADD LN Jurisdiction: Bucks County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2680 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 270 Volume on ramp vph Length of first accel/decel lane 275 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 330 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp On Distance to adjacent Ramp 910 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2680 270 330 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 728 73 90 V 6 0 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
3000
                                               299
Flow rate, vp
                                                          369
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                       0.180 Using Equation 4
                 FM
                v = v (P) = 541
                                     pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         3299
                                      9400
                                                    No
     FO
                         1229 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
Is
    v v
                                      Yes
     3 or av34
                      12
If yes, v = 1200
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                    3299
                                 4600
                                                      No
     12A
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 15.3 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.319
                                          S
Space mean speed in ramp influence area,
                                         S = 57.7
                                                      mph
                                          R
Space mean speed in outer lanes,
                                         S = 63.6
                                                      mph
                                          0
Space mean speed for all vehicles,
                                         S = 60.7
                                                      mph
```

1.00

0.980

1.00

0.971

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail: Fax:

_____Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB Off Ramp to NJ29 DROP LANE

Jurisdiction: Mercer County

Analysis Year: 2030 Build with Low Toll

Description: Scudder Falls

B-1	D. L.
Freeway	Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	70.0 m	nph
Volume on freeway	2950 v	ph

_____Off Ramp Data_____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	440	vph
Length of first accel/decel lane	550	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

545

Yes

Voh

Pownstream

On

Distance to adjacent ramp

545

ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway		Ramp		Adjacen	ıt
					Ramp	
Volume, V (vph)	2950		440		360	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	802		120		98	V
Trucks and buses	6		5		4	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	왕	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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                    3303
Flow rate, vp
                                               490
                                                          399
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.436 Using Equation 8
                 FD
                v = v + (v - v) P = 1716 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         3303
                                      9600
                                                    No
     Fi F
    v = v - v
                         2813
                                     9600
                                                    No
         F R
     FΟ
                         490
                                     2000
                                                    No
    V
     R
                         793 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 1716
                                     (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    1716
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 14.1 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.472
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 56.8
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 76.8
                                                     mph
Space mean speed for all vehicles,
                                        S = 64.9
                                                     mph
```

0.976

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from NJ 29
Jurisdiction: Mercer County
Analysis Year: 2030 Build with Low To 2030 Build with Low Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 2510 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 360 Volume on ramp vph Length of first accel/decel lane 500 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 440 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 545 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2510 360 440vph Peak-hour factor, PHF 0.92 0.92 0.92 120 Peak 15-min volume, v15 682 98 V 5 0 Trucks and buses 6 4 0 Recreational vehicles ે Level Level Level Terrain type: % % Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
2810
                                               399
Flow rate, vp
                                                          490
                                                                  pcph
                   ____Estimation of V12 Merge Areas__
                        336.93 (Equation 25-2 or 25-3)
                 ΕQ
                        0.591 Using Equation 1
                 FM
                v = v (P) = 1662 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         3209
                                      7200
                                                    No
     FO
                         1148 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                      12
If yes, v = 1662
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                    3209
                                 4600
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 18.2 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.317
                                          S
Space mean speed in ramp influence area,
                                         S = 61.1
                                                     mph
                                          R
                                         S = 67.7
Space mean speed in outer lanes,
                                                     mph
                                          0
```

S = 63.3

mph

0.971

1.00

0.980

1.00

0.976

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from Bear Tavern Rd
Jurisdiction: Mercer County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls ______Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph 2470 Volume on freeway 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 660 vph Length of first accel/decel lane 1150 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 400 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2545 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2470 660 400vph 0.92 0.92 Peak-hour factor, PHF 0.92 109 Peak 15-min volume, v15 179 671 V 3 Trucks and buses 6 4 0 Recreational vehicles ે Level Level Level Terrain type: % % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
2765
Flow rate, vp
                                               732
                                                           441
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        687.16 (Equation 25-2 or 25-3)
                 ΕQ
                        0.610 Using Equation 1
                 FM
                v = v (P) = 1686 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                                      Maximum
                         Actual
                         3497
                                      7200
                                                     No
     FO
                         1079 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1686
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual
                           Max Desirable
                                                      Violation?
                    3497
                                 4600
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 16.8 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.284
                                          S
Space mean speed in ramp influence area,
                                          S = 62.0
                                                      mph
                                          R
                                          S = 67.9
Space mean speed in outer lanes,
                                                      mph
                                          0
Space mean speed for all vehicles,
                                          S = 63.7
                                                      mph
```

1.00

0.980

1.00

0.985

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from PA332 EB
Jurisdiction: Bucks County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2000 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 640 vph Length of first accel/decel lane 1200 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1309 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1300 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2000 640 1309 vph 0.92 Peak-hour factor, PHF 0.92 174 0.92 Peak 15-min volume, v15 543 356 V 3 0 Trucks and buses 6 6 0 Recreational vehicles 용 Level Level Level Terrain type: % % 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
2239
                                                          1444
Flow rate, vp
                                               717
                                                                  pcph
                  _____Estimation of V12 Merge Areas___
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2239 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                                      Maximum
                         Actual
                         2956
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 2239
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    2956
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 20.7 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.312
                                          S
Space mean speed in ramp influence area,
                                         S = 57.8
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 57.8
                                                     mph
```

0.971

1.00

0.971

1.00

0.985

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail: Fax:

Diverge	Analysis

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Southbound

Junction: SB Off Ramp to PA332 DROP LANE

Jurisdiction: Bucks County

Analysis Year: 2030 Build with Low Toll

Description: Scudder Falls

Freeway I	Data
-----------	------

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4036	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	1380	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp
Position of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp
Distance to adjacent ramp
2525

Type Distance to adjacent ramp

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway		Ramp		Adjacer	nt
					Ramp	
Volume, V (vph)	4036		1380		1400	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	1097		375		380	v
Trucks and buses	6		7		6	%
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
Driver population factor, fP
                                    1.00
                                               1.00
                                                          1.00
                                    4519
Flow rate, vp
                                               1552
                                                          1567
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.576 Using Equation 5
                 FD
                v = v + (v - v) P = 3260 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         4519
                                      7050
                                                    No
     Fi F
    v = v - v
                        2967
                                     7050
                                                    No
         F R
     FΟ
                        1552
                                     2000
                                                    No
    V
     R
                        1259 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 3260
                                     (Equation 25-18)
       12A
                    _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    3260
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 24.6 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence C
                _____Speed Estimation_____
                                         D = 0.568
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 51.9
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 70.3
                                                     mph
```

S = 56.0

mph

Space mean speed for all vehicles,

0.971

0.966

0.971

Phone: Fax: E-mail: ______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from PA 332
Jurisdiction: Bucks County
Analysis Year: 2030 Build with Low Tollows 2030 Build with Low Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2656 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 1400 vph Length of first accel/decel lane 1375 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1380 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2525 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2656 1400 1380 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 722 380 375 V 7 0 Trucks and buses 6 6 0 Recreational vehicles 용 Level Level Level Terrain type: % % 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
2974
                                               1567
Flow rate, vp
                                                          1552
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2974 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         4541
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 \text{ or } av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                     12
If yes, v = 2974
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                    4541
                                 4600
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 31.6 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.591
                                          S
Space mean speed in ramp influence area,
                                         S = 51.4
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
```

S = 51.4

mph

0.971

1.00

0.971

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: E-mail: Fax:

______Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Southbound

Junction: SB Off Rmp to Tylrsvl W DRP LN

Jurisdiction: Bucks County

Analysis Year: 2030 Build with Low Toll

Description: Scudder Falls

Freeway	Data

Type of analysis	Diverge
Number of lanes in freeway	3
Free-flow speed on freeway	65.0 mph
Volume on freeway	5126 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	1430	vph
Length of first accel/decel lane	550	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

790

ft

_____Conversion to pc/h Under Base Conditions_____

	Freeway	•	Ramp		Adjacen	it
					Ramp	
	5126		1430		340	vph
	0.92		0.92		0.92	
	1393		389		92	V
	6		4		7	%
	0		0		0	%
	Level		Level		Level	
	0.00	%	0.00	%	0.00	%
	0.00	mi	0.00	mi	0.00	mi
	1.5		1.5		1.5	
ER	1.2		1.2		1.2	
	ER	5126 0.92 1393 6 0 Level 0.00 0.00	0.92 1393 6 0 Level 0.00 % 0.00 mi 1.5	5126 1430 0.92 0.92 1393 389 6 4 0 0 Level Level 0.00 % 0.00 0.00 mi 0.00 1.5 1.5	5126 1430 0.92 0.92 1393 389 6 4 0 0 Level Level 0.00 % 0.00 % 0.00 mi 0.00 mi 1.5 1.5	Ramp 5126 1430 340 0.92 0.92 0.92 1393 389 92 6 4 7 0 0 0 Level Level Level 0.00 % 0.00 % 0.00 0.00 mi 0.00 mi 0.00 1.5 1.5 1.5

```
1.00
Driver population factor, fP
                                   1.00
                                                          1.00
                                    5739
Flow rate, vp
                                               1585
                                                          382
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.544 Using Equation 5
                 FD
                v = v + (v - v) P = 3843 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        5739
                                     7050
                                                    No
     Fi F
    v = v - v
                        4154
                                     7050
                                                    No
         F R
     FΟ
                        1585
                                     2000
                                                    No
    V
     R
                        1896 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 3843
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    3843
                                                     No
    V
     12
            ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 32.4 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.571
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 51.9
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 67.8
                                                     mph
Space mean speed for all vehicles,
                                        S = 56.2
                                                     mph
```

0.971

0.980

0.966

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from Taylorsville
Jurisdiction: Bucks County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph 3696 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 340 Volume on ramp vph Length of first accel/decel lane 1265 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1430 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1400 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 3696 340 1430 vph 0.92 1004 Peak-hour factor, PHF 0.92 0.92 389 Peak 15-min volume, v15 92 V 7 0 3 0 Trucks and buses 6 Recreational vehicles 왕 Level Level Level Terrain type: % % Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
4138
Flow rate, vp
                                               375
                                                          1609
                                                                  pcph
                   ____Estimation of V12 Merge Areas__
                        955.64 (Equation 25-2 or 25-3)
                 ΕQ
                       0.613 Using Equation 1
                 FM
                v = v (P) = 2536 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                                      Maximum
                         Actual
                         4513
                                      7050
                                                    No
     FO
                         1602 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                      12
If yes, v = 2536
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                    4513
                                 4600
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 20.1 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.304
                                          S
Space mean speed in ramp influence area,
                                         S = 58.0
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = 61.0
                                                     mph
                                          0
```

S = 59.0

mph

0.971

1.00

0.985

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: Fax: E-mail: _____Diverge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB Off Ramp to NJ 29
Jurisdiction: Mercer County
Analysis Year: 2030 Build with Low 2030 Build with Low Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 70.0 mph 4996 Volume on freeway vph _____Off Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph Volume on ramp 470 vph Length of first accel/decel lane 500 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent ramp 600 vph Position of adjacent ramp Downstream Type of adjacent ramp On Distance to adjacent ramp 880 ft _____Conversion to pc/h Under Base Conditions_____ Junction Components Freeway Ramp Adjacent Ramp Volume, V (vph) 4996 470 600 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 1358 128 163 V Trucks and buses 6 11 4 % 0 0 Recreational vehicles 0 ે Level Level Level 0.00 % 0.00

용

mi

1.5

1.2

0.00 mi 0.00 mi 0.00

1.2

1.5

1.5

1.2

Terrain type:

Grade

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                    5593
Flow rate, vp
                                               539
                                                          665
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.595 Using Equation 5
                 FD
                v = v + (v - v) P = 3548 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        5593
                                     7200
                                                    No
     Fi F
    v = v - v
                        5054
                                     7200
                                                    No
         F R
     FΟ
                        539
                                     2000
                                                    No
    V
     R
                        2045 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 3548
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    3548
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 30.3 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.477
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 56.7
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 72.7
                                                     mph
Space mean speed for all vehicles,
                                        S = 61.6
                                                     mph
```

0.971

0.948

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from NJ 29 ADD LANE
Jurisdiction: Mercer County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 4526 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 600 Volume on ramp vph Length of first accel/decel lane 338 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 470 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 880 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 4526 600 470 vph Peak-hour factor, PHF 0.92 0.92 0.92 1230 Peak 15-min volume, v15 163 128 V Trucks and buses 6 4 11 0 0 Recreational vehicles % Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
5067
                                               665
Flow rate, vp
                                                          539
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        804.92 (Equation 25-2 or 25-3)
                 ΕQ
                        0.587 Using Equation 1
                 FM
                v = v (P) = 2974 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                                      Maximum
                         Actual
                         5732
                                      7200
                                                     No
     FO
                         2093 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 2974
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                    5732
                                 4600
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 31.4 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.446
                                          S
Space mean speed in ramp influence area,
                                         S = 57.5
                                                      mph
                                          R
Space mean speed in outer lanes,
                                         S = 64.3
                                                      mph
                                          0
Space mean speed for all vehicles,
                                         S = 59.8
                                                      mph
```

0.971

1.00

0.980

1.00

0.948

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail: Fax:

_____Operational Analysis_____

Analyst: TPR
Agency/Co.: AECOM
Date Performed: 4/12/11
Analysis Time Period: PM Peak

Freeway/Dir of Travel: I-95 Southbound
Weaving Location: Bear Tavern Road
Jurisdiction: Mercer County

Analysis Year: 2030 Build with Low Toll

Description: Scudder Falls

_____Inputs_____ Freeway free-flow speed, SFF 70 mph Weaving number of lanes, N 4 Weaving segment length, L 2050 ft Terrain type Level 응 Grade Length mi Weaving type A Volume ratio, VR 0.14 0.49 Weaving ratio, R

______Conversion to pc/h Under Base Conditions_____

	Non-Weaving		Weaving		
	V	V	V	V	
	01	02	w1	w2	
Volume, V	5001	0	430	410	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	1359	0	117	111	v
Trucks and buses	6	10	4	6	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.971	0.952	0.980	0.971	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	5598	0	476	459	pc/h

______Weaving and Non-Weaving Speeds_____

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.0035
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.59	0.29
Weaving and non-weaving speeds, Si	52.73	61.34
Number of lance required for		

Number of lanes required for

unconstrained operat	tion, Nw	(Exhibit 24-7)	1.02	
Maximum number of la	anes, Nw	(max) (Exhibit	24-7) 1.40	
Type of operation is	S		Uncon	strained

_______Weaving Segment Speed, Density, Level of Service and Capacity______

Weaving segment speed, S	59.94	mph
Weaving segment density, D	27.25	pc/mi/ln
Level of service, LOS	С	
Capacity of base condition, cb	9221	pc/h
Capacity as a 15-minute flow rate, c	8952	pc/h
Capacity as a full-hour volume, ch	8236	pc/h

_____Limitations on Weaving Segments______

		If Max Exce	eded See Note
	Analyzed	Maximum	Note
Weaving flow rate, Vw	935	2800	a
Average flow rate (pcphpl)	1633	2400	b
Volume ratio, VR	0.14	0.35	C
Weaving ratio, R	0.49	N/A	d
Weaving length (ft)	2050	2500	е
N - + •			

Notes:

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

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from Bear Tavern E
Jurisdiction: Mercer County
Analysis Year: 2030 Build with Low Toll Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph 4546 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 450 Volume on ramp vph Length of first accel/decel lane 1203 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 430 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 440 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 4546 450 430 vph 0.92 Peak-hour factor, PHF 0.92 0.92 1235 122 Peak 15-min volume, v15 117 V 6 0 Trucks and buses 6 2 0 Recreational vehicles ે Level Level Level Terrain type: % % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
Driver population factor, fP
                                                           1.00
                                    5090
                                               494
Flow rate, vp
                                                           481
                                                                   pcph
                   _____Estimation of V12 Merge Areas___
                        1157.31 (Equation 25-2 or 25-3)
                 ΕQ
                        0.566 Using Equation 2
                 FM
                v = v (P) = 2880 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                                      Maximum
                         Actual
                         5584
                                      7200
                                                     No
     FO
                         2210 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
Is
    v v
                                      Yes
     3 or av34
                      12
If yes, v = 2908
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    5584
                                                      No
     12A
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 24.2 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.354
                                          S
Space mean speed in ramp influence area,
                                          S = 60.1
                                                      mph
                                          R
Space mean speed in outer lanes,
                                          S = 63.9
                                                      mph
                                          0
```

S = 61.5

mph

0.971

1.00

0.990

1.00

0.971

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 46 & 49 Jurisdiction: Bucks County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 3773 Peak-hour factor, PHF 0.92 1025 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade 0.05 % Grade 0.33 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 2112 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC mi/h 0.0 Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 2112 65.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 59.3 mi/h Number of lanes, N

35.6

pc/mi/ln

Density, D

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 49 & 51 Jurisdiction: Bucks County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 4083 Peak-hour factor, PHF 0.92 1110 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade -3.00 용 Grade 0.47 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 1524 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 65.0 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 3.0 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 1524 65.0 Free-flow speed, FFS mi/h 65.0 Average passenger-car speed, S mi/h Number of lanes, N

23.5

pc/mi/ln

Density, D

Phone: E-mail:		Fax:	
	Operational Anal	ysis	
Analysis Time Period: Freeway/Direction: From/To:	TPR any: AECOM : 4/12/11 Period: AM Peak ion: I-95 Northbound btw exits 51 & 1 Bucks County 2030 Build with High Toll		
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses		6343 0.92 1724 6	veh/h v %
Recreational vehicles Terrain type: Grade Segment length		0 Grade 0.73 0.49	% mi
Trucks and buses PCE, E Recreational vehicle PC Heavy vehicle adjustmen Driver population facto	E, ER t, fHV	1.5 1.2 0.971 1.00	
Flow rate, vp		1420	pc/h/ln
	Speed Inputs and	Adjustments	
Lane width Right-shoulder lateral Interchange density Number of lanes, N	clearance	12.0 6.0 0.50	ft ft interchange/mi
Free-flow speed: FFS or BFFS Lane width adjustment,		Measured 65.0 0.0	mi/h mi/h
Lateral clearance adjus Interchange density adj Number of lanes adjustm Free-flow speed, FFS	ustment, fID	0.0 0.0 0.0 65.0 Urban Freeway	mi/h mi/h mi/h mi/h
LOS and Performance Measures			
Dob and refformance measures			
Flow rate, vp		1420	pc/h/ln
Free-flow speed, FFS Average passenger-car s	need S	65.0 65.0	mi/h mi/h
Number of lanes, N Density, D	r = = = = = = = = = = = = = = = = = = =	5 21.8	pc/mi/ln

Phone: E-mail:		Fax:		
	Operational Ana	alysis		
Analyst:	TPR			
Agency or Company:	AECOM			
	4/12/11			
Analysis Time Period:				
Freeway/Direction:	I-95 Northbound			
From/To:	btw exits 1 & 2			
Jurisdiction:	Mercer County			
Analysis Year:		High Toll		
_	Analysis Year: 2030 Build with High Toll Description: Scudder Falls			
	Flow Inputs and	d Adjustments		
Volume, V		5923	veh/h	
Peak-hour factor, PHF		0.92	V 322, 12	
Peak 15-min volume, v1	5	1610	V	
Trucks and buses		6	8	
Recreational vehicles		0	8	
Terrain type:		Grade		
Grade		3.10	%	
Segment length		0.75	mi	
Trucks and buses PCE,	ET	2.0		
Recreational vehicle P		3.0		
Heavy vehicle adjustment, fHV		0.943		
Driver population factor, fp		1.00		
Flow rate, vp		1706	pc/h/ln	
	Speed Inputs ar	nd Adjustments		
Lane width		12.0	ft	
Right-shoulder lateral clearance		6.0	ft	
Interchange density		0.50	interchange/mi	
Number of lanes, N		4	_	
Free-flow speed:		Measured		
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		1.5	mi/h	
Free-flow speed, FFS		70.0	mi/h	
		Urban Freew	ay	
	LOS and Perform	mance Measures		
Flow rate, vp		1706	pc/h/ln	
Free-flow speed, FFS		70.0	mi/h	
Average passenger-car speed, S		68.8	mi/h	
Number of lanes, N		4		
Density D		24 8	nc/mi/ln	

24.8

Density, D

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 2 & 3 Jurisdiction: Mercer County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 5513 Peak-hour factor, PHF 0.92 1498 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Level 0.00 % Grade 0.00 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 2057 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 70.0 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 3.0 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway _____LOS and Performance Measures______ Flow rate, vp 2057 pc/h/ln 70.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 63.7 mi/h Number of lanes, N

32.3

pc/mi/ln

Density, D

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Southbound From/To: btw exits 49 & 46 Jurisdiction: Bucks County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 2938 Peak-hour factor, PHF 0.92 798 Peak 15-min volume, v15 V Trucks and buses 0 Recreational vehicles Terrain type: Grade -0.05 % Grade 0.33 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 1645 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC mi/h 0.0 Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 1645 65.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 64.8 mi/h Number of lanes, N

25.4

pc/mi/ln

Density, D

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Southbound From/To: btw exits 51 & 49 Jurisdiction: Bucks County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 2208 Peak-hour factor, PHF 0.92 600 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade 3.00 % Grade 0.47 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 824 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 65.0 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 3.0 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures_____ Flow rate, vp 824 pc/h/ln 65.0 Free-flow speed, FFS mi/h 65.0 Average passenger-car speed, S mi/h Number of lanes, N

12.7

pc/mi/ln

Density, D

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: AM Peak
Freeway/Direction: I-95 Southbound From/To: btw exits 1 & 51 Jurisdiction: Mercer County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 2128 Peak-hour factor, PHF 0.92 578 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade -0.73 % Grade 0.49 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 596 Flow rate, vp pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 65.0 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 1.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures_____ Flow rate, vp 596 pc/h/ln 65.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 65.0 mi/h Number of lanes, N

9.2

pc/mi/ln

Density, D

Phone: E-mail:		Fax:		
	Operational Ana	lysis		
Analysis Time Period: Freeway/Direction: From/To: Jurisdiction: Analysis Year:	TPR AECOM 4/12/11			
Description: Scudder E		7 4		
	FIOW Inputs and	Adjustments		
Volume, V Peak-hour factor, PHF		2338	veh/h	
Peak 15-min volume, v15 Trucks and buses Recreational vehicles)	635 6 0	V % %	
Terrain type: Grade Segment length		Grade -3.10 0.75	% mi	
Trucks and buses PCE, Recreational vehicle PC Heavy vehicle adjustmen	CE, ER nt, fHV	1.5 1.2 0.971		
Driver population factor Flow rate, vp	or, ip	1.00 873	pc/h/ln	
	Speed Inputs an	d Adjustments		
Lane width Right-shoulder lateral Interchange density	clearance	12.0 6.0 0.50	ft ft interchange/mi	
Number of lanes, N Free-flow speed: FFS or BFFS		3 Measured 70.0	mi/h	
Lane width adjustment, Lateral clearance adjus	stment, fLC	0.0	mi/h mi/h	
Interchange density add Number of lanes adjustm Free-flow speed, FFS		0.0 3.0 70.0 Urban Freeway	mi/h mi/h mi/h	
LOS and Performance Measures				
Flow rate wa		072	ng/h/ln	
Flow rate, vp Free-flow speed, FFS Average passenger-car s	speed, S	873 70.0 70.0	pc/h/ln mi/h mi/h	
Number of lanes, N Density, D		3 12.5	pc/mi/ln	

Phone: E-mail:		Fax:			
	Operational Ana	lysis			
Analyst: Agency or Company: Date Performed:	TPR AECOM 4/12/11				
Analysis Time Period:					
From/To: Jurisdiction: Analysis Year:	btw exits 3 & 2 Mercer County 2030 Build with	High Toll			
Description: Scudder H					
	Flow Inputs and	Adjustments			
Volume, V		2488	veh/h		
Peak-hour factor, PHF Peak 15-min volume, v15	5	0.92 676	v		
Trucks and buses Recreational vehicles		6 0	oo oo		
Terrain type:		Level			
Grade Segment length		0.00 0.00	% mi		
Trucks and buses PCE, Recreational vehicle PC		1.5 1.2			
Heavy vehicle adjustmen	nt, fHV	0.971			
Driver population factor Flow rate, vp	or, fp	1.00 928	pc/h/ln		
	Speed Inputs an	d Adjustments			
Lane width	_	12.0	ft		
Right-shoulder lateral Interchange density	clearance	6.0 0.50	ft interchange/mi		
Number of lanes, N Free-flow speed:		3 Measured			
FFS or BFFS Lane width adjustment,	£T W	70.0	mi/h		
Lateral clearance adjus	stment, fLC	0.0 0.0	mi/h mi/h		
Interchange density adj Number of lanes adjustr		0.0 3.0	mi/h mi/h		
Free-flow speed, FFS		70.0 Urban Freeway	mi/h		
LOS and Performance Measures					
Flow rate, vp		928	pc/h/ln		
Free-flow speed, FFS	_	70.0	mi/h		
Average passenger-car s Number of lanes, N	speed, S	70.0 3	mi/h		
Density, D		13.3	pc/mi/ln		

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 46 & 49 Jurisdiction: Bucks County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 3320 Peak-hour factor, PHF 0.92 902 Peak 15-min volume, v15 V Trucks and buses 0 Recreational vehicles Terrain type: Grade 0.05 % Grade 0.33 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 1858 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC mi/h 0.0 Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 1858 65.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 63.4 mi/h Number of lanes, N

29.3

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 49 & 51 Jurisdiction: Bucks County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 2740 Peak-hour factor, PHF 0.92 745 Peak 15-min volume, v15 V Trucks and buses 0 Recreational vehicles Terrain type: Grade -3.00 % Grade 0.47 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 1023 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS 65.0 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 3.0 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 1023 65.0 Free-flow speed, FFS mi/h 65.0 Average passenger-car speed, S mi/h Number of lanes, N

15.7

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 51 & 1 Jurisdiction: Bucks County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 2950 Peak-hour factor, PHF 0.92 802 Peak 15-min volume, v15 V Trucks and buses 0 Recreational vehicles Terrain type: Grade 0.73 % Grade 0.49 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 661 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS 65.0 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, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures_____ Flow rate, vp 661 pc/h/ln 65.0 Free-flow speed, FFS mi/h 65.0 Average passenger-car speed, S mi/h Number of lanes, N

10.2

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 1 & 2 Jurisdiction: Mercer County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 2870 Peak-hour factor, PHF 0.92 780 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade 3.10 % Grade 0.75 Segment length тi Trucks and buses PCE, ET 2.0 Recreational vehicle PCE, ER 3.0 Heavy vehicle adjustment, fHV 0.943 Driver population factor, fp 1.00 Flow rate, vp 827 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 70.0 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 1.5 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway _____LOS and Performance Measures______ Flow rate, vp 827 pc/h/ln 70.0 Free-flow speed, FFS mi/h 70.0 Average passenger-car speed, S mi/h Number of lanes, N

11.8

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Northbound From/To: btw exits 2 & 3 Jurisdiction: Mercer County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 3130 Peak-hour factor, PHF 0.92 851 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Level 0.00 % Grade 0.00 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 1168 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 70.0 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 3.0 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway _____LOS and Performance Measures_____ pc/h/ln Flow rate, vp 1168 70.0 Free-flow speed, FFS mi/h 70.0 Average passenger-car speed, S mi/h Number of lanes, N

16.7

pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Southbound From/To: btw exits 49 & 46 Jurisdiction: Bucks County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 3953 Peak-hour factor, PHF 0.92 1074 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade -0.05 % Grade 0.33 Segment length тi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 2213 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 65.0 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 4.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures_____ pc/h/ln Flow rate, vp 2213 65.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 56.7 mi/h Number of lanes, N

39.0

pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Ana	lysis	
Analyst: Agency or Company: Date Performed: Analysis Time Period: Freeway/Direction: From/To: Jurisdiction: Analysis Year: Description: Scudder F	I-95 Southbound btw exits 51 & 4 Bucks County 2030 Build with		
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15	;	3913 0.92 1063	veh/h
Trucks and buses Recreational vehicles Terrain type: Grade		6 0 Grade 3.00	% %
Segment length Trucks and buses PCE, E Recreational vehicle PC Heavy vehicle adjustmen	CE, ER	0.47 1.5 1.2 0.971	mi
Driver population factor Flow rate, vp	or, fp	1.00	pc/h/ln
	Speed Inputs an	d Adjustments	
Lane width Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed:	clearance	12.0 6.0 0.50 3 Measured	ft ft interchange/mi
FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj	stment, fLC	65.0 0.0 0.0 0.0	mi/h mi/h mi/h mi/h
Number of lanes adjustm Free-flow speed, FFS	nent, fN	3.0 65.0 Urban Freeway	mi/h mi/h
	LOS and Perform	ance Measures	
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N	speed, S	1460 65.0 65.0 3	pc/h/ln mi/h mi/h
Density, D		22.5	pc/mi/ln

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Southbound From/To: btw exits 1 & 51 Jurisdiction: Mercer County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 4953 Peak-hour factor, PHF 0.92 1346 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Grade -0.73 % Grade 0.49 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 1386 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 65.0 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 1.5 mi/h Free-flow speed, FFS 65.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 1386 65.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 65.0 mi/h Number of lanes, N

21.3

pc/mi/ln

Phone: E-mail:		Fax:	
	Operational Anal	lysis	
Analyst: Agency or Company: Date Performed: Analysis Time Period: Freeway/Direction: From/To: Jurisdiction: Analysis Year: Description: Scudder F	I-95 Southbound btw exits 2 & 1 Mercer County 2030 Build with B	High Toll	
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Segment length Trucks and buses PCE, E Recreational vehicle PC Heavy vehicle adjustment	T E, ER t, fhV	4893 0.92 1330 6 0 Grade -3.10 0.75 1.5 1.2 0.971 1.00	veh/h v % % % mi
Flow rate, vp	, -	1826	pc/h/ln
	Speed Inputs and	d Adjustments	
Lane width Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustment Free-flow speed, FFS	fLW tment, fLC ustment, fID ent, fN	12.0 6.0 0.50 3 Measured 70.0 0.0 0.0 0.0 0.0 0.0 Urban Freeway	<pre>ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h</pre>
	LOS and Performa	ance Measures	
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N Density, D	peed, S	1826 70.0 67.6 3 27.0	<pre>pc/h/ln mi/h mi/h pc/mi/ln</pre>

Phone: Fax: E-mail: _____Operational Analysis_____ Analyst: TPR Agency or Company: Date Performed: AECOM 4/12/11 Analysis Time Period: PM Peak
Freeway/Direction: I-95 Southbound From/To: btw exits 3 & 2 Jurisdiction: Mercer County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Flow Inputs and Adjustments_____ veh/h Volume, V 4478 Peak-hour factor, PHF 0.92 1217 Peak 15-min volume, v15 V Trucks and buses Recreational vehicles 0 Terrain type: Level 0.00 % Grade 0.00 Segment length mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 1.2 Heavy vehicle adjustment, fHV 0.971 Driver population factor, fp 1.00 Flow rate, vp 1671 pc/h/ln _____Speed Inputs and Adjustments_____ Lane width 12.0 ft. Right-shoulder lateral clearance 6.0 ft 0.50 Interchange density interchange/mi Number of lanes, N Free-flow speed: Measured FFS or BFFS mi/h 70.0 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 3.0 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway _____LOS and Performance Measures______ pc/h/ln Flow rate, vp 1671 70.0 Free-flow speed, FFS mi/h 69.0 Average passenger-car speed, S mi/h Number of lanes, N

24.2

pc/mi/ln

Phone: E-mail:

Fax:

vph

_____Diverge Analysis______

Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound

NB off ramp to PA 332 Bucks County Junction:

Ourisaiction:
Analysis Year: 2030 Build with High Toll

Description: Scudder Falls

______Freeway Data______

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 3773

_____Off Ramp Data_____

Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph Volume on ramp 1180 vph Length of first accel/decel lane 850 ft Length of second accel/decel lane ft

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist? Yes 1190 Volume on adjacent ramp vph Position of adjacent ramp Downstream Type of adjacent ramp On Distance to adjacent ramp 2530 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp		Adjacen	it
				Ramp	
Volume, V (vph)	3773	1180		1190	vph
Peak-hour factor, PHF	0.92	0.92		0.92	
Peak 15-min volume, v15	1025	321		323	v
Trucks and buses	6	7		4	%
Recreational vehicles	0	0		0	%
Terrain type:	Level	Level		Level	
Grade	0.00 %	0.00	%	0.00	%
Length	0.00 m:	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	

```
1.00
Driver population factor, fP
                                              1.00
                                                         1.00
Flow rate, vp
                                   4224
                                              1327
                                                         1319
                                                                 pcph
                 _____Estimation of V12 Diverge Areas__
                              (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 4224 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                  LOS F?
                        Actual
    v = v
                        4224
                                     4700
                                                   No
     Fi F
    v = v - v
                        2897
                                     4700
                                                   No
        F R
     FΟ
                        1327
                                     2000
                                                   No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 4224
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area_____
                                Max Desirable
                                                    Violation?
                   Actual
                                4400
                    4224
                                                    No
    V
     12
            ____Level of Service Determination (if not F)______
                    D = 4.252 + 0.0086 v - 0.009 L = 32.9 pc/mi/ln
Density,
                                      12
                     R
Level of service for ramp-freeway junction areas of influence D
               _____Speed Estimation_____
Intermediate speed variable,
                                        D = 0.547
                                         S
Space mean speed in ramp influence area,
                                        S = 52.4
                                                    mph
                                         R
Space mean speed in outer lanes,
                                        S = N/A
                                                    mph
Space mean speed for all vehicles,
                                       S = 52.4
                                                    mph
```

0.971

0.966

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from PA332 ADD LANE
Jurisdiction: Bucks County
Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 3783 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 300 Volume on ramp vph Length of first accel/decel lane 1375 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1190 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp On Distance to adjacent Ramp 2530 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 3783 300 1190 vph Peak-hour factor, PHF 0.92 0.92 0.92 1028 Peak 15-min volume, v15 82 323 V 7 0 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: % % Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
4235
Flow rate, vp
                                               333
                                                          1339
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 4235 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                        Actual
                                      Maximum
                         4568
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 4235
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    4568
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 32.3 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.601
                                          S
Space mean speed in ramp influence area,
                                         S = 51.2
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 51.2
                                                     mph
```

0.971

1.00

0.980

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Fax:

Phone: E-mail: _____Diverge Analysis______

Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound

NB off ramp to Taylorsville Bucks County Junction:

Ourisdiction:
Analysis Year: 2030 Build with High Toll

Description: Scudder Falls

______Freeway Data_____

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 4083 vph

_____Off Ramp Data_____

Side of freeway Right Number of lanes in ramp 1 Free-Flow speed on ramp 35.0 mph 310 Volume on ramp vph Length of first accel/decel lane 850 ft Length of second accel/decel lane ft

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist? Yes 1330 Volume on adjacent ramp vph Position of adjacent ramp Downstream Type of adjacent ramp On Distance to adjacent ramp 1250 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp		Adjacer	nt
				Ramp	
Volume, V (vph)	4083	310		1330	vph
Peak-hour factor, PHF	0.92	0.92		0.92	
Peak 15-min volume, v15	1110	84		361	V
Trucks and buses	6	5		6	%
Recreational vehicles	0	0		0	%
Terrain type:	Level	Level		Level	
Grade	0.00 %	0.00	%	0.00	%
Length	0.00 m	i 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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    4571
                                               345
                                                          1489
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.630 Using Equation 5
                 FD
                v = v + (v - v) P = 3007 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         4571
                                     7050
                                                    No
     Fi F
    v = v - v
                        4226
                                     7050
                                                    No
         F R
     FΟ
                        345
                                     2000
                                                    No
    V
     R
                        1564 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 3007
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                    Actual
                                 Max Desirable
                                                     Violation?
                                 4400
                    3007
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 22.5 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence C
                _____Speed Estimation_____
                                         D = 0.459
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 54.4
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 69.1
                                                     mph
```

S = 58.7

mph

0.971

0.976

0.971

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On rmp frm Tylrsvl E ADD LN
Jurisdiction: Bucks County
Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph 3773 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 1330 Volume on ramp vph Length of first accel/decel lane 455 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 310 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1250 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 3773 1330 310 vph Peak-hour factor, PHF 0.92 0.92 0.92 1025 Peak 15-min volume, v15 361 84 V 5 0 Trucks and buses 6 6 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
1.00
Driver population factor, fP
                                    1.00
                                                           1.00
                                    4224
                                                1489
Flow rate, vp
                                                           345
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        852.80 (Equation 25-2 or 25-3)
                 ΕQ
                        0.590 Using Equation 1
                 FM
                v = v (P) = 2493 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                                      Maximum
                         Actual
                         5713
                                      7050
                                                     No
     FO
                         1731 pc/h
                                     (Equation 25-4 or 25-5)
     3 \text{ or } av34
Is
                > 2700 pc/h?
                                      No
          V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 2493
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                      Violation?
                    5713
                                 4600
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 33.0 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.498
                                          S
Space mean speed in ramp influence area,
                                          S = 53.5
                                                      mph
                                          R
Space mean speed in outer lanes,
                                          S = 60.6
                                                      mph
                                          0
```

S = 55.5

mph

0.971

0.971

0.976

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On rmp frm Tylrsvl W ADD LN Jurisdiction: Bucks County
Analysis Year: 2030 Build with High Toll Description: Scudder Falls _____Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 5103 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 1240 Volume on ramp vph Length of first accel/decel lane 275 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1330 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp On Distance to adjacent Ramp 910 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 5103 1240 1330 vph Peak-hour factor, PHF 0.92 0.92 0.92 1387 337 Peak 15-min volume, v15 361 V 6 0 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: 용 % Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
5713
                                               1375
Flow rate, vp
                                                          1489
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      0.046 Using Equation 4
                 FM
                v = v (P) = 262
                                     pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                                      Maximum
                         Actual
                         7088
                                      9400
                                                    No
     FO
                         2725 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     Yes
         V
     3 or av34
                > 1.5 v / 2
Is
    v v
                                     Yes
     3 or av34
                      12
If yes, v = 2285
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    7088
                                                     No
     12A
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 31.7 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.453
                                          S
Space mean speed in ramp influence area,
                                         S = 54.6
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = 60.6
                                                     mph
                                          0
```

S = 57.3

mph

0.971

1.00

0.980

1.00

0.971

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: E-mail: Fax:

_____Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB Off Ramp to NJ29 DROP LANE

Jurisdiction: Mercer County

Analysis Year: 2030 Build with High Toll

Description: Scudder Falls

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	70.0 mp	h
Volume on freeway	6343 vp	h

_____Off Ramp Data_____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	910	vph
Length of first accel/decel lane	550	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

545

Yes

490

vph

Downstream

On

Distance to adjacent ramp

_____Conversion to pc/h Under Base Conditions_____

Freeway	Ramp	Adjacent
		Ramp
6343	910	490 vph
0.92	0.92	0.92
1724	247	133 v
6	5	4 %
0	0	0 %
Level	Level	Level
0.00 %	0.00 %	0.00 %
0.00 mi	0.00 mi	0.00 mi
1.5	1.5	1.5
1.2	1.2	1.2
	6343 0.92 1724 6 0 Level 0.00 % 0.00 mi	6343 910 0.92 0.92 1724 247 6 5 0 0 Level Level 0.00 % 0.00 % 0.00 mi 0.00 mi 1.5 1.5

```
Driver population factor, fP
                                   1.00
                                               1.00
                                                          1.00
                                   7101
Flow rate, vp
                                               1014
                                                          543
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.436 Using Equation 8
                 FD
                v = v + (v - v) P = 3668 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         7101
                                     9600
                                                    No
     Fi F
    v = v - v
                        6087
                                     9600
                                                    No
         F R
     FΟ
                        1014
                                     2000
                                                    No
    V
     R
                        1716 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 3668
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                    Actual
                                 Max Desirable
                                                     Violation?
                                 4400
                    3668
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 30.8 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.519
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 55.5
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 74.0
                                                     mph
```

S = 63.1

mph

0.971

0.976

0.980

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: _____Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from NJ 29
Jurisdiction: Mercer County
Analysis Year: 2030 Build with High 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 5433 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 490 Volume on ramp vph Length of first accel/decel lane 500 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 910 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 545 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 490 5433 910 vph Peak-hour factor, PHF 0.92 0.92 0.92 1476 133 247 Peak 15-min volume, v15 V 5 0 Trucks and buses 6 4 0 Recreational vehicles ે Level Level Level Terrain type: 용 % Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

```
6083
Flow rate, vp
                                               543
                                                          1014
                                                                  pcph
                  _____Estimation of V12 Merge Areas___
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      0.150 Using Equation 4
                 FM
                v = v (P) = 912
                                     pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                         Actual
                                     Maximum
                         6626
                                     9600
                                                    No
     FO
                         2585 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
Is
    v v
                                     Yes
     3 or av34
                     12
If yes, v = 2433
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    6626
                                                     No
     12A
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 25.3 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.362
                                          S
Space mean speed in ramp influence area,
                                         S = 59.9
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = 65.2
                                                     mph
                                          0
```

S = 62.7

mph

0.971

1.00

0.980

1.00

0.976

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: E-mail: Fax:

D	7 7
Diverge	Analysis

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB OffRmp to Br Tvrn Rd DRP LN

Jurisdiction: Mercer County

Analysis Year: 2030 Build with High Toll

Description: Scudder Falls

______Freeway Data______

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5923	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	1090	vph
Length of first accel/decel lane	1210	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

2545

Yes

Vph

Downstream

On

Distance to adjacent ramp

2545

ft

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway		Ramp		Adjacer	nt
					Ramp	
Volume, V (vph)	5923		1090		660	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	1610		296		179	V
Trucks and buses	6		3		4	%
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	

```
1.00
Driver population factor, fP
                                              1.00
                                                          1.00
Flow rate, vp
                                   6631
                                              1203
                                                          732
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.539 Using Equation 5
                 FD
                v = v + (v - v) P = 4128 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        6631
                                     7200
                                                    No
     Fi F
    v = v - v
                        5428
                                     7200
                                                    No
        F R
     FΟ
                        1203
                                     2000
                                                    No
    V
     R
                        2503 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 4128
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    4128
                                                     No
    V
     12
            ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 28.9 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.536
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 55.0
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 70.9
                                                     mph
```

S = 60.1

mph

0.971

0.985

0.980

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from Bear Tavern Rd Jurisdiction: Mercer County Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 4833 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 680 vph Length of first accel/decel lane 1150 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1090 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2545 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 4833 680 1090 vph 0.92 Peak-hour factor, PHF 0.92 0.92 185 1313 296 Peak 15-min volume, v15 V 3 0 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: % % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
5411
Flow rate, vp
                                               754
                                                          1203
                                                                  pcph
                   ____Estimation of V12 Merge Areas___
                        1258.11 (Equation 25-2 or 25-3)
                 ΕQ
                       0.610 Using Equation 1
                 FM
                v = v (P) = 3299 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                                      Maximum
                         Actual
                         6165
                                      7200
                                                    No
     FO
                         2112 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 3299
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    6165
                                                      No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 29.5 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.465
                                          S
Space mean speed in ramp influence area,
                                         S = 57.0
                                                      mph
                                          R
Space mean speed in outer lanes,
                                         S = 64.2
                                                      mph
                                          0
Space mean speed for all vehicles,
                                         S = 59.3
                                                      mph
```

1.00

0.980

1.00

0.985

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: _____Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from PA332 EB
Jurisdiction: Bucks County
Analysis Year: 2030 Build with High Toll 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2593 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph Volume on ramp 1190 vph Length of first accel/decel lane 1200 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1180 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1300 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2593 1190 1180 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 705 323 321 V 3 Trucks and buses 6 6 0 Recreational vehicles 용 Level Level Level Terrain type: % % Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
Driver population factor, fP
                                    1.00
                                               1.00
                                                           1.00
                                    2903
                                               1332
Flow rate, vp
                                                           1302
                                                                   pcph
                  _____Estimation of V12 Merge Areas___
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2903 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         4235
                                      4700
                                                     No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 \text{ or } av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 2903
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    4235
                                                      No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 30.4 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation____
Intermediate speed variable,
                                          M = 0.506
                                          S
Space mean speed in ramp influence area,
                                          S = 53.4
                                                      mph
                                          R
                                          S = N/A
Space mean speed in outer lanes,
                                                      mph
                                          0
Space mean speed for all vehicles,
                                          S = 53.4
                                                      mph
```

0.971

0.985

Heavy vehicle adjustment, fHV

Phone: E-mail: Fax:

_____Diverge Analysis_____

Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Southbound

SB Off Ramp to PA332 DROP LANE Bucks County Junction:

ourisdiction: Analysis Year: 2030 Build with High Toll

Description: Scudder Falls

Distance to adjacent ramp

______Freeway Data______

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2208 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 730 vph Length of first accel/decel lane 850 ft Length of second accel/decel lane ft

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist? Yes 1460 Volume on adjacent ramp vph Position of adjacent ramp Downstream Type of adjacent ramp On ft

______Conversion to pc/h Under Base Conditions_____

2525

Junction Components	Freeway	Ramp	Adjacen	.t
			Ramp	
Volume, V (vph)	2208	730	1460	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	600	198	397	v
Trucks and buses	6	7	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00	%
Length	0.00 mi	0.00 m	i 0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    2472
                                               821
                                                          1635
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.660 Using Equation 5
                 FD
                v = v + (v - v) P = 1911 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        2472
                                     7050
                                                    No
     Fi F
    v = v - v
                        1651
                                     7050
                                                    No
        F R
     FΟ
                        821
                                     2000
                                                    No
    V
     R
                        561 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
                > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 1911
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    1911
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 13.0 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.502
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 53.5
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 71.3
                                                     mph
Space mean speed for all vehicles,
                                        S = 56.7
                                                     mph
```

0.966

0.971

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from PA332
Jurisdiction: Bucks County
Analysis Year: 2030 Build with High 2030 Build with High Toll Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 1478 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 1460 vph Length of first accel/decel lane 1375 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 730 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2525 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 1478 1460 730 vph Peak-hour factor, PHF 0.92 0.92 0.92 198 Peak 15-min volume, v15 402 397 V 7 0 Trucks and buses 6 6 0 Recreational vehicles 용 Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
1655
                                               1635
Flow rate, vp
                                                          821
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 1655 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                         Actual
                                     Maximum
                         3290
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 1655
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    3290
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 21.8 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.329
                                          S
Space mean speed in ramp influence area,
                                         S = 57.4
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 57.4
                                                     mph
```

1.00

0.971

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail: Fax:

_____Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Southbound

Junction: SB Off rmp to Tylrsvlle DRP LN

Jurisdiction: Bucks County

Analysis Year: 2030 Build with High Toll

Description: Scudder Falls

______Freeway Data_____

Type of analysis Diverge
Number of lanes in freeway 3
Free-flow speed on freeway 65.0 mph
Volume on freeway 2128 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	440	vph
Length of first accel/decel lane	550	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

790

ft

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway		Ramp		Adjacer Ramp	nt
Volume, V (vph)	2128		440		520	vph
Peak-hour factor, PHF	0.92		0.92		0.92	_
Peak 15-min volume, v15	578		120		141	V
Trucks and buses	6		4		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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    2382
                                               488
                                                          585
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                L =
                               (Equation 25-8 or 25-9)
                 ΕQ
                      0.678 Using Equation 5
                 FD
                v = v + (v - v) P = 1772 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                      Maximum
                                                    LOS F?
                        Actual
    v = v
                         2382
                                      7050
                                                    No
     Fi F
                         1894
                                      7050
                                                    No
    v = v - v
         F R
     FΟ
                         488
                                      2000
                                                    No
    V
     R
                         610 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
                > 2700 pc/h?
                                     No
     3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                       12
If yes, v = 1772
                                      (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    1772
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 14.5 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.472
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 54.1
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 71.3
                                                     mph
Space mean speed for all vehicles,
                                        S = 57.7
                                                     mph
```

0.980

0.966

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from Taylorsville
Jurisdiction: Bucks County
Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 1688 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 520 Volume on ramp vph Length of first accel/decel lane 1265 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 440 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1400 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 1688 520 440vph 0.92 0.92 Peak-hour factor, PHF 0.92 141 120 Peak 15-min volume, v15 459 V 7 0 Trucks and buses 6 3 0 Recreational vehicles 용 Level Level Level Terrain type: % % Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
1890
Flow rate, vp
                                               574
                                                          495
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        517.16 (Equation 25-2 or 25-3)
                 ΕQ
                        0.613 Using Equation 1
                 FM
                v = v (P) = 1158 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         2464
                                      7050
                                                     No
     FO
                         732 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1158
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                    2464
                                 4600
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 10.8 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.254
                                          S
Space mean speed in ramp influence area,
                                         S = 59.1
                                                      mph
                                          R
                                         S = 64.2
Space mean speed in outer lanes,
                                                      mph
                                          0
Space mean speed for all vehicles,
                                         S = 60.6
                                                      mph
```

1.00

0.985

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Fax:

Phone: E-mail:

_____Diverge Analysis______

TPR Analyst: Agency/Co.: AECOM Date performed: 04/12/11 Analysis time period: AM Peak

Freeway/Dir of Travel: I-95 Southbound Junction: SB Off Ramp to NJ 29

Jurisdiction: Mercer County

Analysis Year: 2030 Build with High Toll

Description: Scudder Falls

_____Freeway Data_____

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 2338 vph

_____Off Ramp Data_____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	580	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist? Yes Volume on adjacent ramp 370 vph Position of adjacent ramp Downstream Type of adjacent ramp On Distance to adjacent ramp 880 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2338	580	370	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	635	158	101	v
Trucks and buses	6	11	4	용
Recreational vehicles	0	0	0	용
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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    2618
                                               665
                                                          410
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.664 Using Equation 5
                 FD
                v = v + (v - v) P = 1962 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks_____
                                      Maximum
                                                   LOS F?
                        Actual
    v = v
                         2618
                                      7200
                                                    No
     Fi F
    v = v - v
                         1953
                                      7200
                                                    No
         F R
     FΟ
                         665
                                      2000
                                                    No
    V
     R
                         656 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
                > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                       12
If yes, v = 1962
                                      (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    1962
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 16.6 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.488
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 56.3
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 76.8
                                                     mph
```

S = 60.4

mph

0.971

0.948

0.980

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: Fax: E-mail: ______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co..

Date performed: 4/12/11

Analysis time period: AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from NJ 29 ADD LANE
Jurisdiction: Mercer County
Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 1758 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 370 Volume on ramp vph Length of first accel/decel lane 338 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 580 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 880 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 1758 370 580 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 478 101 158 V Trucks and buses 6 4 11 0 0 Recreational vehicles % Level Level Level Terrain type: 용 % Grade કૃ Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
Driver population factor, fP
                                    1.00
                                                           1.00
                                    1968
                                                410
Flow rate, vp
                                                           665
                                                                   pcph
                    ____Estimation of V12 Merge Areas__
                        87.16
                               (Equation 25-2 or 25-3)
                 ΕQ
                        0.587 Using Equation 1
                 FM
                v = v (P) = 1155 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                         Actual
                                      Maximum
                         2378
                                      7200
                                                     No
     FO
                         813 pc/h
                                      (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
          V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1155
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                      Violation?
                                 4600
                    2378
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 15.4 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                   _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.316
                                          S
Space mean speed in ramp influence area,
                                          S = 61.2
                                                      mph
                                          R
                                          S = 68.9
Space mean speed in outer lanes,
                                                      mph
                                           0
```

S = 63.6

mph

0.971

0.980

1.00

0.948

Heavy vehicle adjustment, fHV

Space mean speed for all vehicles,

Phone: E-mail: Fax:

_____Operational Analysis_____

Analyst: TPR
Agency/Co.: AECOM
Date Performed: 4/12/11
Analysis Time Period: AM Peak

Freeway/Dir of Travel: I-95 Southbound
Weaving Location: Bear Tavern Road
Jurisdiction: Mercer County

Analysis Year: 2030 Build with High Toll

Description: Scudder Falls

Weaving ratio, R

_____Inputs_____ Freeway free-flow speed, SFF 70 mph Weaving number of lanes, N 4 Weaving segment length, L 2050 ft Terrain type Level 응 Grade Length mi Weaving type A Volume ratio, VR 0.22

______Conversion to pc/h Under Base Conditions_____

0.23

	Non-Weaving		Weaving		
	V	V	V	V	
	01	02	w1	w2	
Volume, V	2668	0	600	180	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	725	0	163	49	V
Trucks and buses	6	10	4	6	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.971	0.952	0.980	0.971	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	2986	0	665	201	pc/h

______Weaving and Non-Weaving Speeds_____

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.0035
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.41	0.20
Weaving and non-weaving speeds, Si	57.50	65.19
Number of lanes required for		

unconstrained operation	ı, Nw	(Exhibit 24-7)	1.27
Maximum number of lanes	s, Nw	(max) (Exhibit 24-	7) 1.40
Type of operation is			Unconstrained

_______Weaving Segment Speed, Density, Level of Service and Capacity______

Weaving segment speed, S	63.29	mph
Weaving segment density, D	15.22	pc/mi/ln
Level of service, LOS	В	
Capacity of base condition, cb	8785	pc/h
Capacity as a 15-minute flow rate, c	8529	pc/h
Capacity as a full-hour volume, ch	7847	pc/h

_____Limitations on Weaving Segments______

		If Max Exceeded See Not		
	Analyzed	Maximum	Note	
Weaving flow rate, Vw	866	2800	a	
Average flow rate (pcphpl)	963	2400	b	
Volume ratio, VR	0.22	0.35	C	
Weaving ratio, R	0.23	N/A	d	
Weaving length (ft)	2050	2500	е	
Notos:				

Notes:

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

Phone: Fax: E-mail: ______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Agency/Co.:

Date performed:

Analysis time period:

AM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from Bear Tavern E
Jurisdiction: Mercer County
Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph 2068 Volume on freeway vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 270 Volume on ramp vph Length of first accel/decel lane 1203 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes Volume on adjacent Ramp 600 vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 440 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2068 270 600 vph 0.92 Peak-hour factor, PHF 0.92 0.92 Peak 15-min volume, v15 562 73 163 V 6 0 Trucks and buses 6 2 0 Recreational vehicles ે Level Level Level Terrain type: 용 % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
2315
Flow rate, vp
                                               296
                                                          672
                                                                  pcph
                   ____Estimation of V12 Merge Areas__
                        521.09 (Equation 25-2 or 25-3)
                 ΕQ
                      0.606 Using Equation 2
                 FM
                v = v (P) = 1403 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                                     Maximum
                         Actual
                         2611
                                     7200
                                                    No
     FO
                         912 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                      12
If yes, v = 1403
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                    2611
                                 4600
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 11.0 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.258
                                          S
Space mean speed in ramp influence area,
                                         S = 62.8
                                                     mph
                                          R
                                         S = 68.5
Space mean speed in outer lanes,
                                                     mph
                                          0
```

S = 64.7

mph

0.971

1.00

0.990

1.00

0.971

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: Fax: E-mail: _____Diverge Analysis______ Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction:

NB off ramp to PA 332

Jurisdiction:

Bucks County

Analysis Year:

2030 Build with Wich T 2030 Build with High Toll Description: Scudder Falls _____Freeway Data______ Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 3320 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 1320 vph Length of first accel/decel lane 850 ft Length of second accel/decel lane ft

Volume on adjacent ramp 640 vph
Position of adjacent ramp Downstream
Type of adjacent ramp On
Distance to adjacent ramp 2530 ft

Does adjacent ramp exist?

______Conversion to pc/h Under Base Conditions_____

_____Adjacent Ramp Data (if one exists)_____

Yes

Junction Components	Freeway	Ramp	Adjacent	
			Ramp	
Volume, V (vph)	3320	1320	640	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	902	359	174	V
Trucks and buses	6	7	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	5
Length	0.00 mi	0.00 mi	0.00 m	ni
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

```
1.00
                                              1.00
Driver population factor, fP
                                                         1.00
                                   3717
Flow rate, vp
                                              1485
                                                         710
                                                                 pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      1.000 Using Equation 0
                 FD
                v = v + (v - v) P = 3717 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                        3717
                                     4700
                                                    No
     Fi F
                        2232
                                     4700
                                                    No
    v = v - v
         F R
     FΟ
                        1485
                                     2000
                                                    No
    V
     R
                        0 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 3717
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area____
                                Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    3717
                                                     No
    V
     12
            ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 28.6 pc/mi/ln
Density,
                                       12
                     R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.562
Intermediate speed variable,
                                         S
Space mean speed in ramp influence area,
                                         S = 52.1
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
Space mean speed for all vehicles,
                                        S = 52.1
                                                     mph
```

0.966

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from PA332 ADD LANE
Jurisdiction: Bucks County
Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2640 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 100 Volume on ramp vph Length of first accel/decel lane 1375 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 640 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2530 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp 100 Volume, V (vph) 2640 640 vph 0.92 Peak-hour factor, PHF 0.92 0.92 Peak 15-min volume, v15 717 27 174 V 7 0 6 Trucks and buses 4 0 Recreational vehicles 용 Level Level Level Terrain type: % % Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
2956
Flow rate, vp
                                               111
                                                          720
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2956 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         3067
                                      4700
                                                     No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 2956
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    3067
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 20.7 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.309
                                          S
Space mean speed in ramp influence area,
                                         S = 57.9
                                                      mph
                                          R
Space mean speed in outer lanes,
                                         S = N/A
                                                      mph
                                          0
Space mean speed for all vehicles,
                                         S = 57.9
                                                      mph
```

1.00

0.980

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail:

Fax:

______Diverge Analysis______

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB off ramp to Taylorsville

Jurisdiction: Bucks County

Analysis Year: 2030 Build with High Toll

Description: Scudder Falls

______Freeway Data______

Type of analysis Diverge
Number of lanes in freeway 3
Free-flow speed on freeway 65.0 mph
Volume on freeway 2740 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	390	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

Distance to adjacent ramp

1250

On

Distance to adjacent ramp

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway		Ramp		Adjacen	t
					Ramp	
Volume, V (vph)	2740		390		330	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	745		106		90	V
Trucks and buses	6		5		6	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	%	0.00	8	0.00	%
Length	0.00 m	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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                    3068
Flow rate, vp
                                               435
                                                          369
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.663 Using Equation 5
                 FD
                v = v + (v - v) P = 2181 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                      Maximum
                                                    LOS F?
                        Actual
    v = v
                         3068
                                      7050
                                                    No
     Fi F
    v = v - v
                         2633
                                      7050
                                                    No
         F R
     FΟ
                         435
                                      2000
                                                    No
    V
     R
                         887 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
                > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                      No
Is
        V
     3 or av34
                       12
If yes, v = 2181
                                      (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2181
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 15.4 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.467
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 54.3
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 71.3
                                                     mph
Space mean speed for all vehicles,
                                        S = 58.3
                                                     mph
```

0.976

0.971

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On rmp frm Tylrsvl E ADD LN
Jurisdiction: Bucks County
Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2350 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph Volume on ramp 330 vph Length of first accel/decel lane 455 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 390 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1250 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2350 330 390 vph Peak-hour factor, PHF 0.92 0.92 0.92 106 Peak 15-min volume, v15 639 90 V 5 0 Trucks and buses 6 6 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
2631
                                                369
Flow rate, vp
                                                           435
                                                                   pcph
                    ____Estimation of V12 Merge Areas__
                        272.22 (Equation 25-2 or 25-3)
                 ΕQ
                        0.590 Using Equation 1
                 FM
                v = v (P) = 1553 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                                      Maximum
                         Actual
                         3000
                                      7050
                                                     No
     FO
                         1078 pc/h
                                      (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
          V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1553
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                      Violation?
                    3000
                                 4600
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 17.4 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                   _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.316
                                          S
Space mean speed in ramp influence area,
                                          S = 57.7
                                                      mph
                                          R
Space mean speed in outer lanes,
                                          S = 62.9
                                                      mph
                                          0
Space mean speed for all vehicles,
                                          S = 59.5
                                                      mph
```

1.00

0.971

1.00

0.976

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On rmp frm Tylrsvl W ADD LN Jurisdiction: Bucks County
Analysis Year: 2030 Build with High Toll Description: Scudder Falls _____Freeway Data_____ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2680 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 270 Volume on ramp vph Length of first accel/decel lane 275 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 330 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp On Distance to adjacent Ramp 910 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2680 270 330 vph Peak-hour factor, PHF 0.92 0.92 0.92 Peak 15-min volume, v15 728 73 90 V 6 0 Trucks and buses 6 4 0 Recreational vehicles 용 Level Level Level Terrain type: 용 % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
3000
                                               299
Flow rate, vp
                                                          369
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                       0.180 Using Equation 4
                 FM
                v = v (P) = 541
                                     pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         3299
                                      9400
                                                    No
     FO
                         1229 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
Is
    v v
                                      Yes
     3 or av34
                      12
If yes, v = 1200
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                    3299
                                 4600
                                                      No
     12A
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 15.3 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.319
                                          S
Space mean speed in ramp influence area,
                                         S = 57.7
                                                      mph
                                          R
Space mean speed in outer lanes,
                                         S = 63.6
                                                      mph
                                          0
Space mean speed for all vehicles,
                                         S = 60.7
                                                      mph
```

1.00

0.980

1.00

0.971

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail: Fax:

_____Diverge Analysis_____

TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Northbound

NB Off Ramp to NJ29 DROP LANE Junction:

Jurisdiction: Mercer County

Analysis Year: 2030 Build with High Toll

Description: Scudder Falls

______Freeway Data_____

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 2950 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	440	vph
Length of first accel/decel lane	550	ft
Length of second accel/decel lane		ft

______Adjacent Ramp Data (if one exists)______

Does adjacent ramp exist? Yes Volume on adjacent ramp 360 vph Position of adjacent ramp Downstream Type of adjacent ramp On Distance to adjacent ramp 545 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2950	440	360	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	802	120	98	v
Trucks and buses	6	5	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00	용
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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                    3303
Flow rate, vp
                                               490
                                                          399
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.436 Using Equation 8
                 FD
                v = v + (v - v) P = 1716 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         3303
                                      9600
                                                    No
     Fi F
    v = v - v
                         2813
                                     9600
                                                    No
         F R
     FΟ
                         490
                                     2000
                                                    No
    V
     R
                         793 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 1716
                                     (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    1716
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 14.1 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.472
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 56.8
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 76.8
                                                     mph
Space mean speed for all vehicles,
                                        S = 64.9
                                                     mph
```

0.976

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from NJ 29
Jurisdiction: Mercer County
Analysis Year: 2030 Build with High 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 2510 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 360 Volume on ramp vph Length of first accel/decel lane 500 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 440 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 545 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2510 360 440vph Peak-hour factor, PHF 0.92 0.92 0.92 120 Peak 15-min volume, v15 682 98 V 5 0 Trucks and buses 6 4 0 Recreational vehicles ે Level Level Level Terrain type: % 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
2810
                                               399
Flow rate, vp
                                                          490
                                                                  pcph
                   ____Estimation of V12 Merge Areas__
                        336.93 (Equation 25-2 or 25-3)
                 ΕQ
                        0.591 Using Equation 1
                 FM
                v = v (P) = 1662 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                    LOS F?
                         Actual
                                      Maximum
                         3209
                                      7200
                                                    No
     FO
                         1148 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                      12
If yes, v = 1662
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                    3209
                                 4600
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 18.2 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.317
                                          S
Space mean speed in ramp influence area,
                                         S = 61.1
                                                     mph
                                          R
                                         S = 67.7
Space mean speed in outer lanes,
                                                     mph
                                          0
```

S = 63.3

mph

0.971

1.00

0.980

1.00

0.976

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Space mean speed for all vehicles,

Phone: E-mail: Fax:

Diverge	Analysis_
---------	-----------

Analyst: TPR
Agency/Co.: AECOM
Date performed: 4/12/11
Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Northbound

Junction: NB OffRmp to Br Tvrn Rd DRP LN

Jurisdiction: Mercer County

Analysis Year: 2030 Build with High Toll

Description: Scudder Falls

Distance to adjacent ramp

______Freeway Data______

Type of analysis Diverge
Number of lanes in freeway 3
Free-flow speed on freeway 70.0 mph
Volume on freeway 2870 vph

_____Off Ramp Data_____

Side of freeway

Number of lanes in ramp

Free-Flow speed on ramp

Volume on ramp

Length of first accel/decel lane

Length of second accel/decel lane

ft

______Adjacent Ramp Data (if one exists)______

2545

ft

Does adjacent ramp exist?

Volume on adjacent ramp

Position of adjacent ramp

Type of adjacent ramp

On

Yes

660 vph

Downstream

On

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp		Adjacen ^a Ramp	t
Volume, V (vph)	2870	400		660	vph
Peak-hour factor, PHF	0.92	0.92		0.92	
Peak 15-min volume, v15	780	109		179	v
Trucks and buses	6	3		4	%
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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
Flow rate, vp
                                    3213
                                               441
                                                          732
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.659 Using Equation 5
                 FD
                v = v + (v - v) P = 2269 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         3213
                                     7200
                                                    No
     Fi F
    v = v - v
                        2772
                                     7200
                                                    No
         F R
     FΟ
                         441
                                     2000
                                                    No
    V
     R
                         944 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 2269
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    2269
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 12.9 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence B
                _____Speed Estimation_____
                                         D = 0.468
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 56.9
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 76.8
                                                     mph
Space mean speed for all vehicles,
                                        S = 61.6
                                                     mph
```

0.985

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from Bear Tavern Rd
Jurisdiction: Mercer County
Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph 2470 Volume on freeway 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 660 vph Length of first accel/decel lane 1150 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 400 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2545 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2470 660 400vph 0.92 0.92 Peak-hour factor, PHF 0.92 109 Peak 15-min volume, v15 179 671 V 3 Trucks and buses 6 4 0 Recreational vehicles ે Level Level Level Terrain type: % % 용 Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
2765
Flow rate, vp
                                               732
                                                           441
                                                                   pcph
                   ____Estimation of V12 Merge Areas__
                        687.16 (Equation 25-2 or 25-3)
                 ΕQ
                        0.610 Using Equation 1
                 FM
                v = v (P) = 1686 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                                      Maximum
                         Actual
                         3497
                                      7200
                                                     No
     FO
                         1079 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 1686
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual
                           Max Desirable
                                                      Violation?
                    3497
                                 4600
                                                      No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 16.8 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.284
                                          S
Space mean speed in ramp influence area,
                                          S = 62.0
                                                      mph
                                          R
                                          S = 67.9
Space mean speed in outer lanes,
                                                      mph
                                          0
```

S = 63.7

mph

0.971

1.00

0.980

1.00

0.985

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: Fax: E-mail: ______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Northbound Junction: NB On ramp from PA332 EB
Jurisdiction: Bucks County
Analysis Year: 2030 Build with High Toll 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2000 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 640 vph Length of first accel/decel lane 1200 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1320 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1300 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2000 640 1320 vph 0.92 0.92 Peak-hour factor, PHF 0.92 174 359 Peak 15-min volume, v15 543 V 3 0 Trucks and buses 6 6 0 Recreational vehicles 왕 Level Level Level Terrain type: % % 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
2239
Flow rate, vp
                                               717
                                                          1456
                                                                  pcph
                  _____Estimation of V12 Merge Areas___
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2239 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                                      Maximum
                         Actual
                         2956
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
     3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 2239
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    2956
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 20.7 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.312
                                          S
Space mean speed in ramp influence area,
                                         S = 57.8
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = N/A
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 57.8
                                                     mph
```

1.00

0.971

1.00

0.985

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail:

Fax:

_____Diverge Analysis_____

Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Southbound

SB Off Ramp to PA332 DROP LANE Bucks County Junction:

ourisdiction: Analysis Year: 2030 Build with High Toll

Description: Scudder Falls

Distance to adjacent ramp

______Freeway Data______

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 3913 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 1360 vph Length of first accel/decel lane 850 ft Length of second accel/decel lane ft

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist? Yes 1400 Volume on adjacent ramp vph Position of adjacent ramp Downstream Type of adjacent ramp On ft

______Conversion to pc/h Under Base Conditions_____

2525

Junction Components	Freeway	Ramp	Adjacer	Adjacent	
			Ramp		
Volume, V (vph)	3913	1360	1400	vph	
Peak-hour factor, PHF	0.92	0.92	0.92		
Peak 15-min volume, v15	1063	370	380	V	
Trucks and buses	6	7	6	%	
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
                                    0.971
                                               0.966
                                                          0.971
                                    1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                               1530
Flow rate, vp
                                    4381
                                                          1567
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.580 Using Equation 5
                 FD
                v = v + (v - v) P = 3184 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         4381
                                     7050
                                                    No
     Fi F
    v = v - v
                        2851
                                     7050
                                                    No
         F R
     FΟ
                        1530
                                     2000
                                                    No
    V
     R
                        1197 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
       V
     3 or av34
                      12
If yes, v = 3184
                                     (Equation 25-18)
       12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                                 4400
                    3184
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 24.0 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence C
                _____Speed Estimation_____
                                         D = 0.566
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 52.0
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 70.5
                                                     mph
```

S = 56.0

mph

Phone: Fax: E-mail: ______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from PA 332
Jurisdiction: Bucks County
Analysis Year: 2030 Build with High To 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 2553 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 1400 vph Length of first accel/decel lane 1375 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1360 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 2525 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 2553 1400 1360 vph 0.92 Peak-hour factor, PHF 0.92 0.92 Peak 15-min volume, v15 694 380 370 V 7 0 Trucks and buses 6 6 0 Recreational vehicles 왕 Level Level Level Terrain type: % % 용 Grade Length mi mi

1.5

1.2

Trucks and buses PCE, ET

Recreational vehicle PCE, ER

шi

1.5

1.2

1.5

1.2

```
2858
                                               1567
                                                          1530
Flow rate, vp
                                                                  pcph
                  _____Estimation of V12 Merge Areas__
                L =
                               (Equation 25-2 or 25-3)
                 ΕQ
                      1.000 Using Equation 0
                 FM
                v = v (P) = 2858 pc/h
                 12 F FM
                    _____Capacity Checks_____
                                                   LOS F?
                        Actual
                                     Maximum
                         4425
                                      4700
                                                    No
     FO
                            pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                     No
         V
    3 or av34
                > 1.5 v / 2
                                     No
Is
    v v
     3 or av34
                     12
If yes, v = 2858
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area__
                    Actual Max Desirable
                                                     Violation?
                    4425
                                 4600
                                                     No
     R12
            ____Level of Service Determination (if not F)_____
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 30.6 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation____
Intermediate speed variable,
                                         M = 0.550
                                         S
Space mean speed in ramp influence area,
                                         S = 52.3
                                                     mph
                                          R
                                         S = N/A
Space mean speed in outer lanes,
                                                     mph
                                          0
Space mean speed for all vehicles,
                                         S = 52.3
                                                     mph
```

1.00

0.971

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Fax:

Phone: E-mail:

_____Diverge Analysis_____

Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Southbound

Junction: SB Off Rmp to Tylrsvle DRP LN
Jurisdiction: Bucks County
Analysis Year: 2030 Build with High Toll

Description: Scudder Falls

_____Freeway Data_____

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 4953 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 1395 vph Length of first accel/decel lane 550 ft Length of second accel/decel lane ft

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist? Yes 355 Volume on adjacent ramp vph Position of adjacent ramp Downstream Type of adjacent ramp On

Distance to adjacent ramp 790 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4953	1395	355	vph
Peak-hour factor, PHF	0.92	0.92	0.92	
Peak 15-min volume, v15	1346	379	96	V
Trucks and buses	6	4	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 m	ni
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

```
Driver population factor, fP
                                    1.00
                                               1.00
                                                          1.00
Flow rate, vp
                                    5545
                                               1547
                                                          399
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.550 Using Equation 5
                 FD
                v = v + (v - v) P = 3747 pc/h
                 12 R
                         F R FD
                  _____Capacity Checks_____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         5545
                                     7050
                                                    No
     Fi F
                        3998
                                     7050
                                                    No
    v = v - v
         F R
     FΟ
                        1547
                                     2000
                                                    No
    V
     R
                        1798 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 3747
                                     (Equation 25-18)
        12A
                   _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                    3747
                                 4400
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 31.5 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.567
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 52.0
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 68.2
                                                     mph
Space mean speed for all vehicles,
                                        S = 56.3
                                                     mph
```

0.980

0.966

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: ______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from Taylorsville
Jurisdiction: Bucks County
Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 65.0 mph Volume on freeway 3558 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 355 Volume on ramp vph Length of first accel/decel lane 1265 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 1395 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 1400 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp 355 Volume, V (vph) 3558 1395 vph 0.92 Peak-hour factor, PHF 0.92 0.92 379 Peak 15-min volume, v15 967 96 V 7 0 3 0 6 Trucks and buses Recreational vehicles Level Level Level Terrain type: % % Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
3983
Flow rate, vp
                                               392
                                                          1569
                                                                  pcph
                   ____Estimation of V12 Merge Areas__
                        926.11 (Equation 25-2 or 25-3)
                 ΕQ
                       0.613 Using Equation 1
                 FM
                v = v (P) = 2441 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                                      Maximum
                         Actual
                         4375
                                      7050
                                                    No
     FO
                         1542 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 2441
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    4375
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 19.5 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.299
                                          S
Space mean speed in ramp influence area,
                                         S = 58.1
                                                     mph
                                          R
Space mean speed in outer lanes,
                                         S = 61.2
                                                     mph
                                          0
```

S = 59.2

mph

0.971

1.00

0.985

1.00

0.966

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Fax:

Phone: E-mail:

_____Diverge Analysis______

Analyst: TPR Agency/Co.: AECOM Date performed: 4/12/11 Analysis time period: PM Peak

Freeway/Dir of Travel: I-95 Southbound Junction: SB Off Ramp to NJ 29
Jurisdiction: Mercer County
Analysis Year: 2030 Build with High

2030 Build with High Toll

Description: Scudder Falls

_____Freeway Data_____

Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 4893 vph

_____Off Ramp Data_____

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

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist? Yes Volume on adjacent ramp 550 vph Position of adjacent ramp Downstream Type of adjacent ramp On Distance to adjacent ramp 880 ft

______Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway				Adjacen	t
(1)	4000				Ramp	,
Volume, V (vph)	4893		490		550	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	1330		133		149	v
Trucks and buses	6		11		4	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	ે	0.00	%	0.00	%
Length	0.00 r	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	

```
1.00
Driver population factor, fP
                                               1.00
                                                          1.00
                                    5478
Flow rate, vp
                                               562
                                                          610
                                                                  pcph
                  _____Estimation of V12 Diverge Areas__
                               (Equation 25-8 or 25-9)
                L =
                 ΕQ
                      0.597 Using Equation 5
                 FD
                v = v + (v - v) P = 3498 pc/h
                 12 R
                          F R FD
                  _____Capacity Checks____
                                     Maximum
                                                   LOS F?
                        Actual
    v = v
                         5478
                                      7200
                                                    No
     Fi F
    v = v - v
                         4916
                                     7200
                                                    No
         F R
     FΟ
                         562
                                     2000
                                                    No
    V
     R
                        1980 pc/h (Equation 25-15 or 25-16)
    3 or av34
Is
    v v
               > 2700 pc/h?
                                     No
    3 or av34
                > 1.5 v /2
                                     No
Is
        V
     3 or av34
                      12
If yes, v = 3498
                                     (Equation 25-18)
        12A
                    _Flow Entering Diverge Influence Area____
                                 Max Desirable
                                                     Violation?
                    Actual
                    3498
                                 4400
                                                     No
    V
     12
             ___Level of Service Determination (if not F)______
                     D = 4.252 + 0.0086 v - 0.009 L = 29.8 pc/mi/ln
Density,
                                       12
                      R
Level of service for ramp-freeway junction areas of influence D
                _____Speed Estimation_____
                                         D = 0.479
Intermediate speed variable,
                                          S
Space mean speed in ramp influence area,
                                         S = 56.6
                                                     mph
                                         R
Space mean speed in outer lanes,
                                         S = 73.0
                                                     mph
Space mean speed for all vehicles,
                                        S = 61.6
                                                     mph
```

0.948

0.980

Heavy vehicle adjustment, fHV

Phone: Fax: E-mail: _______Merge Analysis______ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from NJ 29 ADD LANE
Jurisdiction: Mercer County
Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 4403 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 550 Volume on ramp vph Length of first accel/decel lane 338 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 490 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 880 ft _____Conversion to pc/h Under Base Conditions_____ Freeway Junction Components Ramp Adjacent Ramp 550 Volume, V (vph) 4403 490 vph Peak-hour factor, PHF 0.92 0.92 0.92 1196 149 Peak 15-min volume, v15 133 V Trucks and buses 6 4 11 0 0 Recreational vehicles ે Level Level Level Terrain type: % 용 용 Grade Length mi mi шi

1.5

1.2

1.5

1.2

1.5

1.2

Trucks and buses PCE, ET

```
4929
                                               610
Flow rate, vp
                                                          562
                                                                  pcph
                   ____Estimation of V12 Merge Areas__
                       763.62 (Equation 25-2 or 25-3)
                 ΕQ
                        0.587 Using Equation 1
                 FM
                v = v (P) = 2893 pc/h
                 12 F FM
                     _____Capacity Checks_____
                                                   LOS F?
                                      Maximum
                         Actual
                         5539
                                      7200
                                                    No
     FO
                         2036 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
                                      No
Is
    v v
     3 or av34
                      12
If yes, v = 2893
                                      (Equation 25-8)
        12A
                    __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    5539
                                                     No
     R12
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 30.4 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D
                  _____Speed Estimation___
Intermediate speed variable,
                                         M = 0.427
                                          S
Space mean speed in ramp influence area,
                                         S = 58.0
                                                     mph
                                          R
                                         S = 64.5
Space mean speed in outer lanes,
                                                     mph
                                          0
```

S = 60.3

mph

0.971

1.00

0.980

1.00

0.948

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP

Phone: E-mail: Fax:

_____Operational Analysis_____

Analyst: TPR
Agency/Co.: AECOM
Date Performed: 4/12/11
Analysis Time Period: PM Peak

Freeway/Dir of Travel: I-95 Southbound
Weaving Location: Bear Tavern Road
Jurisdiction: Mercer County

Analysis Year: 2030 Build with High Toll

Description: Scudder Falls

_____Inputs_____ Freeway free-flow speed, SFF 70 mph Weaving number of lanes, N 4 Weaving segment length, L 2050 ft Terrain type Level 응 Grade Length mi Weaving type Α Volume ratio, VR 0.15 0.48 Weaving ratio, R

______Conversion to pc/h Under Base Conditions_____

	Non-Weaving		Weaving		
	V	V	V	V	
	01	02	w1	w2	
Volume, V	4888	0	445	410	veh/h
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	
Peak 15-min volume, v15	1328	0	121	111	V
Trucks and buses	б	10	4	6	%
Recreational vehicles	0	0	0	0	%
Trucks and buses PCE, ET	1.5	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.971	0.952	0.980	0.971	
Driver population adjustment, fP	1.00	1.00	1.00	1.00	
Flow rate, v	5472	0	493	459	pc/h

______Weaving and Non-Weaving Speeds_____

	Weaving	Non-Weaving
a (Exhibit 24-6)	0.15	0.0035
b (Exhibit 24-6)	2.20	4.00
c (Exhibit 24-6)	0.97	1.30
d (Exhibit 24-6)	0.80	0.75
Weaving intensity factor, Wi	0.59	0.29
Weaving and non-weaving speeds, Si	52.82	61.38
Number of lanes required for		

unconstrained operation,	Nw	(Exhib:	it 24-7)		1.04
Maximum number of lanes,	Nw	(max)	(Exhibit	24-7)	1.40
Type of operation is					Unconstrained

_______Weaving Segment Speed, Density, Level of Service and Capacity______

Weaving segment speed, S	59.94	mph
Weaving segment density, D	26.79	pc/mi/ln
Level of service, LOS	С	
Capacity of base condition, cb	9199	pc/h
Capacity as a 15-minute flow rate, o	8931	pc/h
Capacity as a full-hour volume, ch	8217	pc/h

_____Limitations on Weaving Segments______

		If Max Exceeded Se		
	Analyzed	Maximum	Note	
Weaving flow rate, Vw	952	2800	a	
Average flow rate (pcphpl)	1606	2400	b	
Volume ratio, VR	0.15	0.35	C	
Weaving ratio, R	0.48	N/A	d	
Weaving length (ft)	2050	2500	е	
N - + •				

Notes:

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

Phone: Fax: E-mail: ______Merge Analysis_____ TPR Analyst: Agency/Co.: AECOM Date performed: 4/12/11
Analysis time period: PM Peak Freeway/Dir of Travel: I-95 Southbound Junction: SB On ramp from Bear Tavern E
Jurisdiction: Mercer County
Analysis Year: 2030 Build with High Toll Description: Scudder Falls ______Freeway Data______ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 4443 vph _____On Ramp Data_____ Side of freeway Right Number of lanes in ramp 1 Free-flow speed on ramp 35.0 mph 450 Volume on ramp vph Length of first accel/decel lane 1203 ft Length of second accel/decel lane ft _____Adjacent Ramp Data (if one exists)_____ Does adjacent ramp exist? Yes 445 Volume on adjacent Ramp vph Position of adjacent Ramp Upstream Type of adjacent Ramp Off Distance to adjacent Ramp 440 ft _____Conversion to pc/h Under Base Conditions______ Freeway Junction Components Ramp Adjacent Ramp Volume, V (vph) 450 4443 445 vph Peak-hour factor, PHF 0.92 0.92 122 0.92 1207 Peak 15-min volume, v15 121 V 6 0 Trucks and buses 6 2 0 Recreational vehicles 용 Level Level Level Terrain type: % % Grade

mi

1.5

1.2

1.5

1.2

mi

1.5

1.2

шi

Length

Trucks and buses PCE, ET

```
4974
                                               494
Flow rate, vp
                                                           498
                                                                   pcph
                   ____Estimation of V12 Merge Areas___
                        1132.48 (Equation 25-2 or 25-3)
                 ΕQ
                       0.567 Using Equation 2
                 FM
                v = v (P) = 2822 pc/h
                 12 F FM
                     _____Capacity Checks____
                                                    LOS F?
                         Actual
                                      Maximum
                         5468
                                      7200
                                                     No
     FO
                         2152 pc/h
                                     (Equation 25-4 or 25-5)
     3 or av34
Is
                > 2700 pc/h?
                                      No
         V
     3 or av34
                > 1.5 v / 2
Is
    v v
                                      Yes
     3 or av34
                      12
If yes, v = 2842
                                      (Equation 25-8)
        12A
                     __Flow Entering Merge Influence Area_
                    Actual Max Desirable
                                                     Violation?
                                 4600
                    5468
                                                      No
     12A
            ____Level of Service Determination (if not F)______
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 23.7 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation___
Intermediate speed variable,
                                          M = 0.346
                                          S
Space mean speed in ramp influence area,
                                          S = 60.3
                                                      mph
                                          R
Space mean speed in outer lanes,
                                          S = 64.1
                                                      mph
                                          0
```

S = 61.7

mph

0.971

1.00

0.990

1.00

0.971

1.00

Heavy vehicle adjustment, fHV

Driver population factor, fP