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_____Merge Analysis_____

Analyst: JP
Agency/Co.: Florence & Hutcheson
Date performed: 4/5/2011
Analysis time period: PM
Freeway/Dir of Travel: I-85 NB
Junction: I-385
Jurisdiction: Greenville, SC
Analysis Year: 2015
Description: I-85/I-385 No-Build

_____Freeway Data_____

| | | |
|----------------------------|-------|-----|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 60.0 | mph |
| Volume on freeway | 3706 | vph |

_____On Ramp Data_____

| | | |
|-----------------------------------|-------|-----|
| Side of freeway | Right | |
| Number of lanes in ramp | 1 | |
| Free-flow speed on ramp | 55.0 | mph |
| Volume on ramp | 2998 | vph |
| Length of first accel/decel lane | 1500 | ft |
| Length of second accel/decel lane | | ft |

_____Adjacent Ramp Data (if one exists)_____

| | | |
|---------------------------|----------|-----|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 1331 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | On | |
| Distance to adjacent Ramp | 1060 | ft |

_____Conversion to pc/h Under Base Conditions_____

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|------------------------------|---------|-------|---------------|-----|
| Volume, V (vph) | 3706 | 2998 | 1331 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 1029 | 833 | 370 | v |
| Trucks and buses | 18 | 18 | 18 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | % | % | % | |
| Length | mi | mi | mi | |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | |

| | | | | |
|-------------------------------|-------|-------|-------|------|
| Heavy vehicle adjustment, fHV | 0.917 | 0.917 | 0.917 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 4488 | 3631 | 1612 | pcph |

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 0.619 Using Equation 1

FM

v = v (P) = 2780 pc/h

12 F FM

Capacity Checks

| | | | | |
|-----------|--------------|--|---------------------------|--------|
| | | Actual | Maximum | LOS F? |
| v | | 8119 | 6900 | Yes |
| FO | | | | |
| v or v | | 1708 pc/h | (Equation 13-14 or 13-17) | |
| 3 av34 | | | | |
| Is v or v | > 2700 pc/h? | No | | |
| 3 av34 | | | | |
| Is v or v | > 1.5 v /2 | No | | |
| 3 av34 | 12 | | | |
| If yes, v | = 2780 | (Equation 13-15, 13-16, 13-18, or 13-19) | | |
| 12A | | | | |

Flow Entering Merge Influence Area

| | | | |
|-----|--------|---------------|------------|
| | Actual | Max Desirable | Violation? |
| v | 8119 | 4600 | Yes |
| R12 | | | |

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 44.4 pc/mi/ln

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

Speed Estimation

| | | | |
|--|---|---------|-----|
| Intermediate speed variable, | M | = 2.529 | |
| | S | | |
| Space mean speed in ramp influence area, | S | = 14.5 | mph |
| | R | | |
| Space mean speed in outer lanes, | S | = 55.7 | mph |
| | 0 | | |
| Space mean speed for all vehicles, | S | = 17.1 | mph |