

Florence & Hutcheson
501 Huger Street
Columbia, SC 29201

Phone: (803)254-5800
E-mail:

Fax: (803)929-0334

-----Diverge Analysis-----

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

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

| | | | |
|----------------------------|---------|-----|--|
| Type of analysis | Diverge | | |
| Number of lanes in freeway | 3 | | |
| Free-flow speed on freeway | 55.0 | mph | |
| Volume on freeway | 3729 | vph | |

-----Off Ramp Data-----

| | | | |
|-----------------------------------|-------|-----|--|
| Side of freeway | Right | | |
| Number of lanes in ramp | 1 | | |
| Free-Flow speed on ramp | 45.0 | mph | |
| Volume on ramp | 1327 | vph | |
| Length of first accel/decel lane | 1000 | ft | |
| Length of second accel/decel lane | | ft | |

-----Adjacent Ramp Data (if one exists)-----

| | | | |
|---------------------------|------------|-----|--|
| Does adjacent ramp exist? | Yes | | |
| Volume on adjacent ramp | 213 | vph | |
| Position of adjacent ramp | Downstream | | |
| Type of adjacent ramp | On | | |
| Distance to adjacent ramp | 3400 | ft | |

-----Conversion to pc/h Under Base Conditions-----

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | |
|------------------------------|---------|----|-------|----|---------------|-----|
| Volume, V (vph) | 3729 | | 1327 | | 213 | vph |
| Peak-hour factor, PHF | 0.90 | | 0.90 | | 0.90 | |
| Peak 15-min volume, v15 | 1036 | | 369 | | 59 | v |
| Trucks and buses | 18 | | 18 | | 18 | % |
| 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 | 0.917 | 0.917 | 0.917 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 4516 | 1607 | 258 | pcph |

Estimation of V12 Diverge Areas

$$L = \text{(Equation 13-12 or 13-13)}$$

EQ

$$P = 0.573 \quad \text{Using Equation 5}$$

FD

$$v_{12} = v_R + (v_F - v_R) P = 3274 \quad \text{pc/h}$$

Capacity Checks

| | Actual | Maximum | LOS F? |
|---|-----------|--|--------|
| $v_{Fi} = v_F$ | 4516 | 6750 | No |
| $v_{FO} = v_F - v_R$ | 2909 | 6750 | No |
| v_R | 1607 | 2100 | No |
| v_3 or v_{av34} | 1242 pc/h | (Equation 13-14 or 13-17) | |
| Is v_3 or $v_{av34} > 2700$ pc/h? | | No | |
| Is v_3 or $v_{av34} > 1.5 v_{12} / 2$ | | No | |
| If yes, $v_{12A} = 3274$ | | (Equation 13-15, 13-16, 13-18, or 13-19) | |

Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|----------|--------|---------------|------------|
| v_{12} | 3274 | 4400 | No |

Level of Service Determination (if not F)

| | | | |
|---|--------------------------------------|----------|----------|
| Density, | $D = 4.252 + 0.0086 v_R - 0.009 L_D$ | $= 23.4$ | pc/mi/ln |
| Level of service for ramp-freeway junction areas of influence C | | | |

Speed Estimation

| | | |
|--|--------------|-----|
| Intermediate speed variable, | $D = 0.443$ | |
| Space mean speed in ramp influence area, | $S_R = 49.2$ | mph |
| Space mean speed in outer lanes, | $S_0 = 59.4$ | mph |
| Space mean speed for all vehicles, | $S = 51.7$ | mph |