

Phone: _____ Fax: _____
 E-mail: _____

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

Analyst: _____
 Agency/Co.: Stantec
 Date performed: 11/10/2016
 Analysis time period: 2:00PM-3:00PM
 Freeway/Dir of Travel: I-85 Northbound
 Junction: I-85 NB Off Ramp to Frontage
 Jurisdiction: SCDOT
 Analysis Year: 2040 No Build Conditions
 Description: _____

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

| | | |
|----------------------------|---------|-----|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 70.3 | mph |
| Volume on freeway | 3584 | 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 | 4 | vph |
| Length of first accel/decel lane | 435 | ft |
| Length of second accel/decel lane | | ft |

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

| | | |
|---------------------------|------------|-----|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 287 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | Off | |
| Distance to adjacent ramp | 6362 | ft |

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

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|------------------------------|---------|---------|---------------|-----|
| Volume, V (vph) | 3584 | 4 | 287 | vph |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | |
| Peak 15-min volume, v15 | 953 | 1 | 76 | v |
| Trucks and buses | 30 | 0 | 0 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Rolling | Level | Level | |
| Grade | 0.00 % | 0.00 % | 0.00 % | |
| Length | 0.00 mi | 0.00 mi | 0.00 mi | |
| Trucks and buses PCE, ET | 2.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 2.0 | 1.2 | 1.2 | |

| | | | | |
|-------------------------------|-------|-------|-------|------|
| Heavy vehicle adjustment, fHV | 0.690 | 1.000 | 1.000 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 5529 | 4 | 305 | pcph |

Estimation of V12 Diverge Areas

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

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 5529 \quad \text{pc/h}$$

Capacity Checks

| | Actual | Maximum | LOS F? |
|---|--------|--|--------|
| $v_{Fi} = v_F$ | 5529 | 4800 | Yes |
| $v_{FO} = v_F - v_R$ | 5525 | 4800 | Yes |
| v_R | 4 | 2000 | No |
| v_3 or v_{av34} | 0 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, $v_{12A} = 5529$ | | (Equation 13-15, 13-16, 13-18, or 13-19) | |

Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|----------|--------|---------------|------------|
| v_{12} | 5529 | 4400 | Yes |

Level of Service Determination (if not F)

| | | | |
|---|--------------------------------------|----------|----------|
| Density, | $D = 4.252 + 0.0086 v_R - 0.009 L_D$ | $= 47.9$ | pc/mi/ln |
| Level of service for ramp-freeway junction areas of influence F | | | |

Speed Estimation

| | | |
|--|---------------|-----|
| Intermediate speed variable, | $D_S = 0.428$ | |
| Space mean speed in ramp influence area, | $S_R = 58.2$ | mph |
| Space mean speed in outer lanes, | $S_0 = N/A$ | mph |
| Space mean speed for all vehicles, | $S = 58.2$ | mph |