HCS2000: Ramps and Ramp Junctions Release 4.1b

Merge Analysis

Analyst:
Agency/Co.:
Date performed: 30/11/2016
Analysis time period:
Freeway/dir or travel:
Junction: C 1 CIERRE
Jurisdiction:
Analysis Year:
Description:

Freeway Data

Type of analysis: Merge
Number of lanes in freeway: 2
Free-flow speed on freeway: 90.0 km/h
Volume on freeway: 357 vph

On Ramp Data

Side of freeway: Right
Number of lanes in ramp: 2
Free-flow speed on ramp: 60.0 km/h
Volume on ramp: 3005 vph
Length of first accel/decel lane: 450 m
Length of second accel/decel lane: 450 m

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? No
Volume on adjacent Ramp vph
Position of adjacent Ramp
Type of adjacent Ramp
Distance to adjacent Ramp m

Conversion to pc/h Under Base Conditions

<table>
<thead>
<tr>
<th>Junction Components</th>
<th>Freeway</th>
<th>Ramp</th>
<th>Adjacent Ramp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume, V (vph)</td>
<td>357</td>
<td>3005</td>
<td>vph</td>
</tr>
<tr>
<td>Peak-hour factor, PHF</td>
<td>0.80</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>Peak 15-min volume, v15</td>
<td>112</td>
<td>939</td>
<td>v</td>
</tr>
<tr>
<td>Trucks and buses</td>
<td>5</td>
<td>5</td>
<td>%</td>
</tr>
</tbody>
</table>
Recreational vehicles                  0           0                     %
Terrain type:                          Level       Level       Level
Grade                                     %           %           %
Length                                    km          km          km
Trucks and buses PCE, ET               1.5         1.5
Recreational vehicle PCE, ER           1.2         1.2
Heavy vehicle adjustment, fHV          0.976       0.976
Driver population factor, fP           1.00        1.00
Flow rate, vp                          457         3850                  pcph

Estimation of V12 Merge Areas

\[ L = 0.00 \quad \text{(Equation 25-2 or 25-3)} \]
\[ P = 1.000 \quad \text{Using Equation 0} \]
\[ v = v (P) = 457 \quad \text{pcph} \]

Capacity Checks

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Maximum</th>
<th>LOS F?</th>
</tr>
</thead>
<tbody>
<tr>
<td>v FO</td>
<td>4307</td>
<td>4500</td>
<td>No</td>
</tr>
<tr>
<td>v R12</td>
<td>4307</td>
<td>4600</td>
<td>No</td>
</tr>
</tbody>
</table>

Level of Service Determination (if not F)

\[ D = 3.402 + 0.00456 v + 0.0048 v^2 - 0.01278 L = 5.9 \quad \text{pc/km/ln} \]
Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, \( M = 0.286 \)
Space mean speed in ramp influence area, \( S = 83.4 \quad \text{km/h} \)
Space mean speed in outer lanes, \( S = \text{N/A} \quad \text{km/h} \)
Space mean speed for all vehicles, \( S = 83.4 \quad \text{km/h} \)