

APPENDIX G

2020 & 2040 No-Build Freeway HCS Analysis

| | | | REEWAY | <u> WEAVI</u> | NG WOR | RKSHEE | <u>T</u> | | |
|---|--|--------------------|------------|------------------|--|--------------------------|---------------------------|----------|-------------------------------|
| General | Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/Con Date Perforr Analysis Tin | ned | AECO AM | М | | Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 1-Bet Copans & Sample Analysis Year No-Build 2020 | | | | |
| Project Desc | cription SW 10t | h Street SIMF | ₹ | | | | | | |
| Inputs | | | | | • | | | | |
| Weaving seg | mber of lanes, N gment length, L _e e-flow speed, Fl | S FS | | 1820ft 70 mph | Segment typo Freeway min Freeway max Terrain type | imum speed | | | Freeway 15 2400 Leve |
| Convers | sions to po | 1 | | 1 | | | Ι, | 1 , | ((1) |
| ., | V (veh/h) | PHF | Truck (%) | RV (%) | E _T | E _R | f _{HV} | fp | v (pc/h) |
| V _{FF} | 4435 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 4738 |
| V _{RF} | 345 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 379 |
| V _{FR} | 810 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 889 |
| V_{RR} | 0 | 0.92 | 0 | 0 | 1.5 | 1.2 | 1.000 | 1.00 | 0 |
| V _{NW} | 4738 | | | | | | | V = | 6006 |
| V _W | 1268 | | | | | | | | |
| VR | 0.211 | | | | | | | | |
| Configu | ration Cha | aracteris | tics | | 1 | | | | |
| Minimum m | aneuver lanes, | N_WL | | 2 lc | | - | hanges, LC _{MIN} | ı | 1268 lc/h |
| Interchange | | | | 0.7 int/mi | Weaving lan | e changes, L | $_{C_{W}}$ | | 1640 lc/h |
| Minimum R | F lane changes, | LC_{RF} | | 1 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | 1192 lc/h |
| Minimum FF | R lane changes, | LC_{FR} | | 1 lc/pc | Total lane ch | nanges, LC _{AL} | L | | 2832 lc/h |
| Minimum R | R lane changes | , LC _{RR} | | lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | 604 |
| Weavin | g Segmen | t Speed, | Density, I | _evel of | Service, | and Cap | oacity | | |
| Weaving se | gment flow rate | , V | | 5924 veh/h | Weaving inte | • | | | 0.320 |
| Weaving se | gment capacity, | , C _W | | 8603 veh/h | Weaving seg | | | | 54.3 mph |
| Ū | gment v/c ratio | | | 0.689 | Average wea | • . | ** | | 56.7 mph |
| • | gment density, | D | 2 | 7.7 pc/mi/ln | | | | 53.7 mph | |
| I AVAL OF SAI | vice, LOS | | | С | Maximum weaving length, L _{MAX} 4650 | | | | 4650 ft |

Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
 For volumes that exceed the weaving segment capacity, the level of service is "F".

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|-----------------------------|---|---|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 2-Be Sample No-Build | et Off & On from |
| Project Description SW 10th | Street SIMR | | • | | |
| ✓ Oper.(LOS) | | | Des.(N) | Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 4780 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % | 0.95 3 0 Level mi | |
| Calculate Flow Adjustm | nents | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) | 3 70.0 | ft ft ramps/mi mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| Base free-flow Speed, BFFS | | mph | 5 . (1) | | |
| Degrational (LOS) v _p = (V or DDHV) / (PHF x N x S) D = v _p / S LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | VIII O AND | RAMP JUN | | | <u>EI</u> | | | |
|---|---|--|---|-----------------------------|---|--|--|---|---------------------------|
| General Infor | mation | | | Site Infor | | | | | |
| Analyst | | | Fr | eeway/Dir of Tr | | 95 NB | | | |
| Agency or Company | AEC | OM | | ınction | S | eg 3-On Ramp | from Sample | | |
| Date Performed Analysis Time Period | d AM | | | ırisdiction nalysis Year | N | o-Build 2020 | | | |
| Project Description | | t SIMR | 711 | lary 515 T Car | IN | O-Dulla 2020 | | | |
| nputs | | | | | | | | | |
| • | | Freeway Num | ber of Lanes, N | 3 | | | | Downstre | oom Adi |
| Jpstream Adj Ramp | | Ramp Numbe | r of Lanes. N | 1 | | | | Ramp | eam Auj |
| ☐ Yes ☐ On | 1 | 1 | ane Length, L | 500 | | | | | |
| | | 1 | Lane Length L _D | 000 | | | | ✓ Yes | ✓ On |
| ✓ No ☐ Off | f | Freeway Volu | | 4780 | | | | ☐ No | Off |
| = ft | | 1 | ' | | | | | L _{down} = | 1950 ft |
| _{-up} = ft | | Ramp Volume | | 1250 | | | | down | |
| /u = veh/h | 1 | 1 | -Flow Speed, S _{FF} | 70.0 | | | | $V_D =$ | 890 veh/h |
| | | | ow Speed, S _{FR} | 50.0 | | | | | |
| Conversion to | r | der Base (| Conditions | | 1 | | 1 | ı | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | f_{HV} | f _p | V = V/PH | $IF x f_{HV} x f_{p}$ |
| Freeway | 4780 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | | 5107 |
| Ramp | 1250 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 1372 |
| UpStream | | | | | | | | | |
| DownStream | 890 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 977 |
| | | Merge Areas | | | | | Diverge Areas | | |
| Estimation of | ^f V ₁₂ | | | | Estimation | on of v ₁₂ | | | |
| | V ₁₂ = V _F | (P _{FM}) | | | | V = | : V _R + (V _F - V _F | .)P | |
| - _{EQ} = | (Equ | ation 13-6 or | r 13-7) | | _ | * 12 | (Equation 13 | ` | 12) |
| P _{FM} = | 0.591 | using Equat | tion (Exhibit 13-6) |) | L _{EQ} = | | | | · · |
| ' ₁₂ = | 3021 | | , | | P _{FD} = | | using Equation | on (⊏xilibit | 13-7) |
| | - | = | on 13-14 or 13- | | V ₁₂ = | | pc/h | 40.4440 | 47) |
| V_3 or V_{av34} | 17) | | | | V ₃ or V _{av34} | 0.700 # 0 | pc/h (Equation | | -17) |
| Is V_3 or $V_{av34} > 2,70$ | | | | | | | ☐Yes ☐ No | | |
| Is V_3 or $V_{av34} > 1.5 *$ | 'V ₁₂ /2 √ Ye | s 🗌 No | | | Is V ₃ or V _{av34} | > 1.5 * V ₁₂ /2 | ☐Yes ☐ No | | 40.40 |
| | 3021 | pc/h (Equation | on 13-16, 13- | | If Yes,V _{12a} = | , | pc/h (Equatio 13-19) | on 13-16, | 13-18, or |
| Yes, V ₁₂₂ = | | | | | | | 10 10) | | |
| · - | | 13-19) | | | Consoitu | Chacks | | | |
| | cks | | 'anacity | 1.00.52 | Capacity | The state of the s | | nacity. | 1.00.52 |
| · | | | Capacity | LOS F? | | Checks Actual | | pacity | LOS F? |
| Capacity Che | cks | | `apacity | LOS F? | V _F | Actua | Exhibit 13- | .8 | LOS F? |
| | cks | | | LOS F? | | Actua | Exhibit 13- Exhibit 13- | 8 | LOS F? |
| Capacity Che | Actual | C | | | V _F | Actua | Exhibit 13- Exhibit 13- Exhibit 13 | 8 | LOS F? |
| Capacity Che | Actual 6479 | Exhibit 13-8 | | | V_F $V_{FO} = V_F - V_R$ | Actual V _R | Exhibit 13- Exhibit 13- Exhibit 13 10 | 8 8 | |
| Capacity Che | Actual 6479 G Merge In | Exhibit 13-8 | Area | No | V_F $V_{FO} = V_F - V_R$ | Actual V _R | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer | 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | a |
| V _{FO} | Actual 6479 G Merge In Actual | Exhibit 13-8 offluence A Max | \<i>rea</i> Desirable | No Violation? | V_{F} $V_{FO} = V_{F} - V_{R}$ Flow Enter | Actual V _R | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des | 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | |
| V _{FO} | Actual 6479 G Merge In Actual 4393 | Exhibit 13-8 Exhibit 13-8 Max Exhibit 13-8 | A rea Desirable 4600:All | No | $V_{FO} = V_{F} - V_{R}$ Flow Ento | Actual V _R ering Dive | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 | a Violation? |
| V _{FO} Flow Entering V _{R12} Level of Serv | Actual 6479 G Merge In Actual 4393 ice Determ | Exhibit 13-8 Influence A Max Exhibit 13-8 Inination (| Area Desirable 4600:All if not F) | No Violation? | V_{F} $V_{FO} = V_{F} - V_{R}$ Flow Enter V_{12} Level of S | Actual V _R ering Dive Actual Service De | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Etermination | 8 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | a Violation? |
| Capacity Che V_{FO} Flow Entering V_{R12} Level of Serve $D_{R} = 5.475 + 40$ | Actual 6479 G Merge In Actual 4393 ice Detern 0.00734 v R + 0 | Exhibit 13-8 Influence A Max Exhibit 13-8 Inination (| Area Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S | Actual VR Actual Actual Service Do R = 4.252 + 6 | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | a Violation? |
| Capacity Che V_{FO} Flow Entering V_{R12} Level of Servi $D_R = 5.475 + 0$ $D_R = 36.0 \text{ (pc/m}$ | Actual 6479 G Merge In Actual 4393 GCE Detern 0.00734 v R + 0 | Exhibit 13-8 Influence A Max Exhibit 13-8 Inination (| Area Desirable 4600:All if not F) | No Violation? | $V_{FO} = V_{F} - V_{R}$ Flow Enter V_{12} Level of S $D_{R} = (pc)$ | Actual Pering Dive Actual Service De R = 4.252 + 6 | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Etermination | 8 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | a Violation? |
| Flow Entering V_{R12} Level of Serv $D_{R} = 5.475 + C$ $D_{R} = 36.0 \text{ (pc/m}$ $OS = E \text{ (Exhibit)}$ | Actual 6479 G Merge In Actual 4393 ice Detern 0.00734 v R + (ni/In) 13-2) | Exhibit 13-8 Influence A Max Exhibit 13-8 Inination (| Area Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S $D_R = (pc)$ LOS = (Ex | Actual V _R ering Dive Actual Service De R = 4.252 + 6 /mi/ln) chibit 13-2) | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 | 8 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | a Violation? |
| Capacity Che V_{FO} Flow Entering V_{R12} Level of Servi $D_R = 5.475 + 0$ $O_R = 36.0 \text{ (pc/m}$ $O_S = E \text{ (Exhibit)}$ Speed Determ | Actual 6479 G Merge In Actual 4393 ice Detern 0.00734 v R + (ni/In) 13-2) | Exhibit 13-8 Influence A Max Exhibit 13-8 Inination (| Area Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S $D_R = (pc)$ $LOS = (Ex)$ Speed De | Actual Pering Diversity Actual Service Down Actual Service Down Actual Service Down Actual Service Down Actual | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 | 8 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | a Violation? |
| Capacity Che V_{FO} Flow Entering V_{R12} Level of Serve $D_R = 5.475 + 0.08 = 36.0 \text{ (pc/m}$ $OS = E \text{ (Exhibit)}$ | Actual 6479 G Merge In Actual 4393 ice Detern 0.00734 v R + (ni/ln) 13-2) mination | Exhibit 13-8 Influence A Max Exhibit 13-8 Inination (| Area Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of S $D_R = (pc)$ $LOS = (Ex)$ Speed De $D_S = (Ex)$ | Actual V _R ering Dive Actual Service De (mi/ln) chibit 13-2) etermination inibit 13-12) | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13-8 Exhibit 13- | 8 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | a Violation? |
| Capacity Che V_{FO} Flow Entering V_{R12} Level of Serve $D_R = 5.475 + 0.08 = 0.586$ (Exhibit) Speed Determ $M_S = 0.586$ (Exit | Actual 6479 G Merge In Actual 4393 ice Detern 0.00734 v R + (ni/ln) 13-2) mination | Exhibit 13-8 Influence A Max Exhibit 13-8 Inination (| Area Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S $D_R = (pc$ $LOS = (Ext)$ $Speed De$ $S_R = (pc)$ | Actual Pering Dive Actual Service De R = 4.252 + 6 /mi/ln) chibit 13-2) eterminati hibit 13-12) n (Exhibit 13-12 | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Etermination 0.0086 V ₁₂ - 0 | 8 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | a Violation? |
| Capacity Che V_{FO} Flow Entering V_{R12} Level of Serve $D_R = 36.0 \text{ (pc/m}$ $OS = E \text{ (Exhibit in Speed Deternity)}$ $M_S = 0.586 (Exit in Sign in$ | Actual 6479 G Merge In Actual 4393 ice Detern 0.00734 v R + 0 in/In) 13-2) mination bit 13-11) | Exhibit 13-8 Influence A Max Exhibit 13-8 Inination (| Area Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S $D_R = (pc$ $LOS = (Ext)$ $Speed De$ $D_S = (Ext)$ $S_R = (mpt)$ | Actual V _R ering Dive Actual Service De (mi/ln) chibit 13-2) etermination inibit 13-12) | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Etermination 0.0086 V ₁₂ - 0 | 8 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | a Violation? |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|------------------------------------|---|--|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 4-Be Exp No-Build | et On from Sample & |
| Project Description SW 10th | Street SIMR | | | | |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 6030 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % | 0.95 3 0 Level mi | |
| Calculate Flow Adjustn | nents | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| LOS and Performance | Moscuros | | Docian (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| <u> </u> | | VIPS AND | RAMP JUN | | | El | | | |
|--|---|----------------------------------|-------------------------------|------------------------|---|--|---|--|---------------------------------------|
| General Infor | mation | | | Site Infor | | | | | |
| Analyst | | | | eeway/Dir of Tr | | 95 NB | | | |
| Agency or Company Date Performed | AEC | UM | | Inction Irisdiction | S | eg 5-On from E | хр | | |
| Date Periornied Analysis Time Period | d AM | | | nalysis Year | N | o-Build 2020 | | | |
| Project Description | | t SIMR | 7.0 | laryolo i oai | IV | O-Dulia 2020 | | | |
| Inputs | | | | | | | | | |
| - | | Freeway Num | ber of Lanes, N | 3 | | | | Downstra | nam Adi |
| Upstream Adj Ramp | | Ramp Numbe | • | 1 | | | | Downstre Ramp | eam Auj |
| Yes Or | ı | 1 | ane Length, L | 600 | | | | | |
| | | 1 | ,, | 000 | | | | ✓ Yes | ☐ On |
| ☑ No ☐ Of | f | 1 | Lane Length L _D | 0000 | | | | □No | ✓ Off |
| - _{-un} = ft | | Freeway Volu | | 6030 | | | | L _{down} = | 5545 ft |
| _{-up} = ft | | Ramp Volume | | 890 | | | | down | 33 4 3 It |
| √ _u = veh/h | 1 | | e-Flow Speed, S _{FF} | 70.0 | | | | V _D = | 1070 veh/h |
| - u | ' | Ramp Free-F | low Speed, S _{FR} | 50.0 | | | | | |
| Conversion to | o pc/h Und | der Base | Conditions | | | | | | |
| (pc/h) | (\/oh/hr\ | PHF | Terrain | %Truck | %Rv | f_{HV} | f _p | v = V/PH | IF x f _{HV} x f _p |
| Freeway | (Veh/hr) 6030 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | | 6443 |
| Ramp | 890 | 0.93 | Level | 2 | 0 | 0.900 | 1.00 | | 977 |
| UpStream | 090 | 0.92 | Level | | 0 | 0.990 | 1.00 | | 311 |
| DownStream | 1070 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 1175 |
| | | Merge Areas | 2010. | | | | Diverge Areas | <u>. </u> | |
| Estimation of | | • | | | Estimation | | | | |
| | V ₁₂ = V _F | (P) | | | 1 | | | | |
| _ | .2 . | | 12 6 or 12 7) | | | | $V_R + (V_F - V_R)$ | | |
| - _{EQ} = | | | 13-6 or 13-7) | | L _{EQ} = | | (Equation 13- | 12 or 13- | 13) |
| P _{FM} = | | | tion (Exhibit 13-6) | | P _{FD} = | | using Equation | n (Exhibit 1 | 13-7) |
| / ₁₂ = | 3894 | | | | V ₁₂ = | | pc/h | | |
| V_3 or V_{av34} | 2549 17) | pc/n (Equati | on 13-14 or 13- | | V_3 or V_{av34} | | pc/h (Equation 1 | 3-14 or 13- | -17) |
| Is V ₃ or V _{av34} > 2,70 | | e V No | | | Is V ₃ or V _{av34} | > 2,700 pc/h? [| □Yes □ No | | |
| Is V_3 or $V_{av34} > 1.5$ | | | | | | | □Yes □No | | |
| | | | on 13-16, 13- | | If Yes,V _{12a} = | | pc/h (Equatio | n 13-16, 1 | 13-18, or |
| f Yes,V _{12a} = | | 13-19) | 011 13-10, 13- | | 11 163, v _{12a} – | 1 | 3-19) | | |
| Capacity Che | | • | | | Capacity | Checks | | | |
| | Actual | | Capacity | LOS F? | | Actual | Ca | pacity | LOS F? |
| | | | | | V_{F} | | Exhibit 13- | 8 | |
| | | | | Vaa | $V_{FO} = V_{F}$ - | V_{p} | Exhibit 13- | 8 | |
| V | 7/20 | I Evhihit 13-81 | | | | | | | |
| V_{FO} | 7420 | Exhibit 13-8 | | Yes | | | Exhibit 13 | - I | |
| V _{FO} | 7420 | Exhibit 13-8 | | res | V _R | | Exhibit 13 10 | - | |
| | | | | res | V _R | | rge Influen | ce Area | a |
| Flow Entering | | fluence A | | Violation? | V _R | | 10 rge Influer Max Des | ce Area | Violation? |
| V _{FO} Flow Entering V _{R12} | g Merge In | fluence A | Area | | V _R | ering Dive | rge Influen | ce Area | W. |
| Flow Entering | g Merge In Actual 5338 | fluence A Max Exhibit 13-8 | Area Desirable 4600:All | Violation? | V _R Flow Ente | ering Dive Actual | 10 rge Influer Max Des | rce Area | Violation? |
| Flow Entering V _{R12} Level of Serv | g Merge In Actual 5338 | Max Exhibit 13-8 | Area Desirable 4600:All | Violation? | Flow Ento | ering Dive Actual Service De | 10 rge Influer Max Des Exhibit 13-8 | ice Area irable n (if no | Violation? |
| V _{R12} Level of Serv D _R = 5.475 + | g Merge In Actual 5338 ice Detern 0.00734 v _R + 0 | Max Exhibit 13-8 | Area Desirable 4600:All | Violation? | V _R Flow Ento | Actual Service De | 10 rge Influer Max Des Exhibit 13-8 | ice Area irable n (if no | Violation? |
| Flow Entering V_{R12} Level of Serv $D_{R} = 5.475 + 42.9 \text{ (pc/m}$ | g Merge In Actual 5338 fice Determ 0.00734 v _R + 0 | Max Exhibit 13-8 | Area Desirable 4600:All | Violation? | V _R Flow Ento V ₁₂ Level of S D _R = (pc. | Actual Service De R = 4.252 + 0 /mi/ln) | 10 rge Influer Max Des Exhibit 13-8 | ice Area irable n (if no | Violation? |
| Flow Entering V_{R12} Level of Serv $D_R = 5.475 + D_R = 42.9 \text{ (pc/m}$ $OS = F \text{ (Exhibit)}$ | g Merge In Actual 5338 ice Detern 0.00734 v R + (ni/ln) 13-2) | Max Exhibit 13-8 | Area Desirable 4600:All | Violation? | V _R Flow Enter V ₁₂ Level of S D _R = (pc. LOS = (Ex | Actual Service De R = 4.252 + 0 /mi/ln) chibit 13-2) | Max Des Exhibit 13-8 Eterminatio | ice Area irable n (if no | Violation? |
| Flow Entering V_{R12} Level of Serve $D_R = 5.475 + 0$ $O_R = 42.9 \text{ (pc/m}$ $OS = F \text{ (Exhibit)}$ Speed Determ | g Merge In Actual 5338 fice Determ 0.00734 v R + 0 ni/ln) 13-2) mination | Max Exhibit 13-8 | Area Desirable 4600:All | Violation? | V _R Flow Ento V ₁₂ Level of S D _R = (pc LOS = (Ex Speed De | Actual Service De R = 4.252 + 0 /mi/ln) chibit 13-2) | Max Des Exhibit 13-8 Eterminatio | ice Area irable n (if no | Violation? |
| Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 42.9 \text{ (pc/m}$ $OS = F \text{ (Exhibit)}$ Speed Determ $M_S = 1.073 \text{ (Exilor)}$ | g Merge In Actual 5338 fice Determ 0.00734 v _R + 0 ni/ln) 13-2) mination bit 13-11) | Max Exhibit 13-8 | Area Desirable 4600:All | Violation? | V _R Flow Ento V ₁₂ Level of S D _R = (pc. LOS = (Ex. Speed De D _s = (Ext | Actual Service De R = 4.252 + 0 /mi/ln) chibit 13-2) etermination inibit 13-12) | Max Des Exhibit 13-8 Eterminatio 0.0086 V ₁₂ - 0 | ice Area irable n (if no | Violation? |
| Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 42.9 \text{ (pc/m}$ $OS = F \text{ (Exhibit)}$ Speed Determ $M_S = 1.073 \text{ (Exilor of Server)}$ $M_S = 40.0 \text{ mph}$ | g Merge In Actual 5338 ice Detern 0.00734 v _R + 0 ni/ln) 13-2) mination bit 13-11) (Exhibit 13-11) | Max Exhibit 13-8 | Area Desirable 4600:All | Violation? | V _R Flow Enter V ₁₂ Level of S D _R = (pc. LOS = (Ex. Speed De D _S = (Ext. S _R = mph | Actual Service De R = 4.252 + 0 /mi/ln) chibit 13-2) etermination ibit 13-12) in (Exhibit 13-12) | Max Des Exhibit 13-8 Eterminatio 0.0086 V ₁₂ - 0 | ice Area irable n (if no | Violation? |
| Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 42.9 \text{ (pc/m}$ $OS = F \text{ (Exhibit)}$ Speed Determ $M_S = 1.073 \text{ (Exilon)}$ $M_S = 40.0 \text{ mph}$ ($M_S = 60.0 \text{ mph}$ (| g Merge In Actual 5338 fice Determ 0.00734 v _R + 0 ni/ln) 13-2) mination bit 13-11) | Max Exhibit 13-8 | Area Desirable 4600:All | Violation? | V_R Flow Ento V_{12} Level of S $D_R = (pc. LOS = (Ext. Speed Deck SR = mpt. SR = mpt.$ | Actual Service De R = 4.252 + 0 /mi/ln) chibit 13-2) etermination inibit 13-12) | Max Des Exhibit 13-8 Eterminatio 0.0086 V ₁₂ - 0 | ice Area irable n (if no | Violation? |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|--|------------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB No-Build | 2020 |
| Project Description SW 10t | | | Allalysis i cal | 140-Balla | 2020 |
| ✓ Oper.(LOS) | | Пг | Des.(N) | □Plai | nning Data |
| Flow Inputs | , | | 2 00 (1.1) | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K | 6920 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R | 0.95 3 0 | |
| Peak-Hr Direction Prop, D DDHV = AADT x K x D | | veh/h | General Terrain: Grade % Length Up/Down % | Level mi | |
| Calculate Flow Adjusti | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$ LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | f _{HV} x f _p) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | RAMP | S AND RAM | P JUNCTI | ONS WO | RKS | HEET | | | |
|--|----------------------------------|--------------------|-------------------------------|-----------------|-------------------------------------|---------------------|-------------------|---|------------------|------------------------------------|
| General Info | rmation | | | Site Infor | mation | | | | | |
| Analyst | | | Fr | eeway/Dir of Tr | Travel I-95 NB | | | | | |
| Agency or Compar | ıy AEC | OM | | ınction | | Seg 7-0 | Off Ramp to | o 10th St | | |
| Date Performed | | | | ırisdiction | | N 5 " | 1.0000 | | | |
| Analysis Time Perion Project Description | | + CIMD | Ar | nalysis Year | | No-Buil | d 2020 | | | |
| Inputs | SW TOUT SHEE | EL SIIVIN | | | | | | | | |
| • | _ | Freeway Num | nber of Lanes, N | 3 | | | | | | |
| Upstream Adj | Ramp | Ramp Numbe | | 1 | | | | | Downstre Ramp | am Adj |
| □Yes | On | | | ļ | | | | | • | _ |
| | | | Lane Length, L _A | 050 | | | | | Yes | ✓ On |
| ✓ No | Off | | Lane Length L _D | 250 | I No | | | | | Off |
| | £L. | Freeway Volu | • | 6920 | lı . | | | | | 1370 ft |
| L _{up} = | ft | Ramp Volume | | 1070 | | | | L _{down} = | 1370 11 | |
| V,, = | veh/h | 1 | e-Flow Speed, S _{FF} | 70.0 | | | | V _D = | 1460 veh/h | |
| u | | Ramp Free-F | low Speed, S _{FR} | 45.0 | | | | | | |
| Conversion | | der Base | Conditions | | | | | | | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | | f_HV | f _p | v = V/PHF | x f _{HV} x f _p |
| Freeway | 6920 | 0.95 | Level | 3 | 0 | 0. | 985 | 1.00 | 7 | 393 |
| Ramp | 1070 | 0.92 | Level | 2 | 0 | | 990 | 1.00 | | 175 |
| UpStream | | | | | | | | | | - |
| DownStream | 1460 | 0.92 | Level | 2 | 0 | 0. | 990 | 1.00 | 1 | 603 |
| | | Merge Areas | | | | | | iverge Areas | | |
| Estimation of | of v ₁₂ | | | | Estimat | ion o | f v ₁₂ | | | |
| | V ₁₂ = V _F | (P _{EM}) | | | | | V ₁₂ = | V _R + (V _F - V _F | P _{FD} | |
| L _{EQ} = | .= . | ation 13-6 or | 13-7) | | L _{EQ} = | | (1 | Equation 13-1 | 2 or 13-13 | 3) |
| P _{FM} = | | Equation (| • | | P _{FD} = | | 0. | 521 using Equ | uation (Exh | ibit 13-7) |
| V ₁₂ = | pc/h | , , | , | | V ₁₂ = | | | 15 pc/h | • | , |
| V ₃ or V _{av34} | • | Fouation 13 | -14 or 13-17) | | V ₃ or V _{av34} | | | 78 pc/h (Equa | ation 13-1 | 4 or 13-17) |
| Is V ₃ or V _{av34} > 2,7 | | | | | | ₂₄ > 2,7 | | ✓ Yes □ No | | , , |
| Is V ₃ or V _{av34} > 1.5 | | | | | | | | Yes ☑ No | | |
| | | | -16, 13-18, or | | | | | 93 pc/h (Equa | ation 13-1 | 6. 13-18. |
| If Yes,V _{12a} = | 13-19 | | | | If Yes,V _{12a} = | = | | 13-19) | | o, .o .o, |
| Capacity Ch | ecks | | | | Capacit | y Ch | ecks | | | |
| | Actual | | Capacity | LOS F? | | | Actual | Ca | pacity | LOS F? |
| | | | | | V_{F} | | 7393 | Exhibit 13-8 | 7200 | Yes |
| V_{FO} | | Exhibit 13-8 | | | $V_{FO} = V_{F}$ | - V _R | 6218 | Exhibit 13-8 | 7200 | No |
| | | | | | V _R | | 1175 | Exhibit 13-10 | 2100 | No |
| Flow Enterir | na Merae Ir | fluence A | \rea | | | terin | a Dive | rge Influen | ce Area | |
| | Actual | | Desirable | Violation? | 7 1011 211 | | Actual | Max Desirab | | Violation? |
| V _{R12} | | Exhibit 13-8 | | | V ₁₂ | 4 | 415 | Exhibit 13-8 | 4400:All | Yes |
| Level of Ser | vice Deterr | | if not F) | <u> </u> | ·- | | | terminatio | n (if not | |
| D _R = 5.475 + 0 | | | | | + | | | .0086 V ₁₂ - 0.0 | • | , |
| D _R = (pc/mi/l | | 12 | A | | | 2.4 (pc/ | | 12 | D | |
| LOS = (Exhibi | • | | | | l '' | | oit 13-2) | | | |
| | <u> </u> | | | | Speed L | | | <u> </u> | | |
| Speed Deter | | | | | +-' | | | | | |
| $M_S = (Exibit)$ | • | | | | ľ | | xhibit 13- | • | | |
| | (hibit 13-11) | | | | | | (Exhibit | - | | |
| | (hibit 13-11) | | | | 1 - | | (Exhibit | - | | |
| S = mph (Ex | (hibit 13-13) | | | | S = 62 | 2.4 mph | (Exhibit | 13-13) | | |
| right © 2016 Univers | sity of Florida All F | Rights Reserved | | | HCS2010 TM | Varcia | 26.00 | (| Generated ! | 5/20/2019 12: |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 8-Bo No-Build | et Off & On 10th St |
| Project Description SW 10t | th Street SIMR | | | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K | 5850 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R | 0.95 3 0 | |
| Peak-Hr Direction Prop, D DDHV = AADT x K x D | | veh/h | General Terrain: Grade % Length Up/Down % | Level mi | |
| Calculate Flow Adjustr | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | · |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 2083 61.0 34.2 D | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-5 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| -ADALIATA" | | WII O AITD | KAWIF JUN | | ORKSHE | <u> </u> | | | | |
|---|--|---|---|------------------------|--|--|--|--|--------------------------------------|--|
| General Infor | mation | | | Site Infor | | 05.115 | | | | |
| Analyst | , ,,, | OM | | eeway/Dir of Tr | | 95 NB | 40th Ot ED 4 14 | , | | |
| Agency or Company Date Performed | AEC | OM | | ınction ırisdiction | 5 | eg 9-On Ramp | 10th St EB & WE | 3 | | |
| Analysis Time Period | d AM | | | nalysis Year | N | lo-Build 2020 | | | | |
| Project Description | | et SIMR | | | | | | | | |
| nputs | | | | | | | | | | |
| Jpstream Adj Ramp | | Freeway Num | ber of Lanes, N | 3 | | | | Downstre | am Adi | |
| psticani Auj Namp | | Ramp Number | r of Lanes, N | 1 | | | | Ramp | ani Auj | |
| ✓ Yes □ Or | ı | | ane Length, L | 1345 | | | | | □ o | |
| | _ | 1 | ane Length L _D | 1010 | | | | □Yes | ☐ On | |
| ☐ No ☑ Of | f | Freeway Volum | | 5850 | | | | ✓ No | Off | |
| un = 1370 | ft | 1 | | | | | | L _{down} = | ft | |
| _{up} = 1370 | 11 | Ramp Volume | | 1460 | | | | down | | |
| / _u = 1070 \ | veh/h | 1 | -Flow Speed, S _{FF} | 70.0 | | | | V _D = | veh/h | |
| | | | ow Speed, S _{FR} | 50.0 | | | | | | |
| Conversion to | | der Base (| Conditions | | , | 1 | | r | | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | f_HV | f _p | v = V/PH | F x f _{HV} x f _p | |
| Freeway | 5850 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | | 6250 | |
| Ramp | 1460 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 1603 | |
| UpStream | 1070 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 1175 | |
| DownStream | 1070 | 0.92 | Level | | 0 | 0.550 | 1.00 | | 1173 | |
| 2011101100111 | | Merge Areas | | | | <u> </u> | Diverge Areas | <u>. </u> | | |
| Stimation of | F V ₁₂ | | | | Estimation | | | | | |
| | V ₁₂ = V _F | (P) | | | 1 | ·- | | | | |
| _ | .2 . | | 40.0 40.7) | | | V ₁₂ = | $V_R + (V_F - V_F)$ | P _{FD} | | |
| EQ = | | | 13-6 or 13-7) | | L _{EQ} = | | (Equation 13- | 12 or 13- | 13) | |
| P _{FM} = | | | ion (Exhibit 13-6) | | P _{FD} = | | using Equation | n (Exhibit 1 | 13-7) | |
| ' ₁₂ = | 3402 | • | | | V ₁₂ = | | pc/h | , | | |
| ′ ₃ or V _{av34} | 2848 17) | pc/h (Equation | on 13-14 or 13- | | V_3 or V_{av34} | | pc/h (Equation | 13-14 or 13- | 17) | |
| s V ₃ or V _{av34} > 2,70 | | o No | | | | > 2,700 pc/h? | ☐Yes ☐ No | | | |
| s V ₃ or V _{av34} > 1.5 * | | | | | | | Yes No | | | |
| 3 v ₃ or v _{av34} - 1.5 | | | on 13-16, 13- | | | | pc/h (Equatio | n 13-16, 1 | 13-18, or | |
| | 2571 | | JII 13-10, 13- | | If Yes,V _{12a} = | 1 | 3-19) | | | |
| | | | | | | | | | | |
| Yes,V _{12a} = | 18, or | 13-19) | | | Capacity | Checks | | | | |
| f Yes,V _{12a} = | 18, or | 13-19) | apacity | LOS F? | Capacity | Checks Actual | Ca | pacity | LOS F? | |
| Yes,V _{12a} = | 18, or | 13-19) | apacity | LOS F? | Capacity V _F | | Ca Exhibit 13- | 1 | LOS F? | |
| Yes,V _{12a} = Capacity Che | 18, or ecks | 13-19) C | apacity | | V _F | Actual | Exhibit 13- | 8 | LOS F? | |
| Yes,V _{12a} = | 18, or | 13-19) | apacity | LOS F? | V_F $V_{FO} = V_F$ | Actual | Exhibit 13- Exhibit 13- | 8 | LOS F? | |
| Yes,V _{12a} = Capacity Che | 18, or ecks | 13-19) C | apacity | | V _F | Actual | Exhibit 13- | 8 | LOS F? | |
| fYes,V _{12a} = Capacity Che V _{FO} | 18, or ecks Actual 7853 | C Exhibit 13-8 | | | V_F $V_{FO} = V_F - V_R$ | Actual V _R | Exhibit 13- Exhibit 13- Exhibit 13 | 8 - | | |
| Yes,V _{12a} = Capacity Che | 18, or ecks Actual 7853 | Exhibit 13-8 | | | V_F $V_{FO} = V_F - V_R$ | Actual V _R | Exhibit 13- Exhibit 13- Exhibit 13 10 | 8 8 | | |
| Yes,V _{12a} = Capacity Che V _{FO} | 18, or ecks Actual 7853 | Exhibit 13-8 | rea | Yes | V_F $V_{FO} = V_F - V_R$ | Actual V _R ering Dive | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer | 8 8 | 3 | |
| Yes,V _{12a} = Capacity Che V _{FO} Flow Entering V _{R12} | 18, or ecks Actual 7853 g Merge In Actual 5174 | Exhibit 13-8 Max I Exhibit 13-8 | I rea Desirable 4600:All | Yes Violation? | $V_{FO} = V_{F} - V_{R}$ Flow Ent | Actual V _R ering Dive Actual | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des | 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation | |
| V _{FO} Flow Entering V _{R12} Level of Serv | 18, or ecks Actual 7853 g Merge In Actual 5174 rice Determ | Exhibit 13-8 Max I Exhibit 13-8 mination (i | I rea Desirable 4600:All if not F) | Yes Violation? | V_{F} $V_{FO} = V_{F} - V_{R}$ Flow Ent | Actual V _R ering Dive Actual Service De | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation | |
| V _{FO} Flow Entering V _{R12} Level of Serv D _R = 5.475 + | 7853 G Merge In Actual 5174 Fice Determ 0.00734 v R + 1 | Exhibit 13-8 Max I Exhibit 13-8 | I rea Desirable 4600:All if not F) | Yes Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of S | Actual V _R ering Dive Actual Service De R = 4.252 + 0 | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation | |
| Flow Entering V_{R12} $Evel of Serv$ $D_{R} = 36.7 (pc/m)$ | 18, or ecks Actual 7853 7853 7853 7854 Actual 5174 Fice Determ 0.00734 v R + 0 | Exhibit 13-8 Max I Exhibit 13-8 mination (i | I rea Desirable 4600:All if not F) | Yes Violation? | $V_{FO} = V_{F} - V_{R}$ Flow Enter V_{12} Level of Signature of the point of the property | Actual V _R ering Dive Actual Service De R = 4.252 + (c/mi/ln) | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation | |
| FYes, V_{12a} = Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv D_R = 5.475 + D_R = 36.7 (pc/m .OS = F (Exhibit | 18, or ecks Actual 7853 Merge In Actual 5174 5174 Cice Deterministry 13-2) | Exhibit 13-8 Max I Exhibit 13-8 mination (i | I rea Desirable 4600:All if not F) | Yes Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ent. V_{12} Level of S $D_R = D_R$ LOS = (Ex | Actual V _R ering Dive Actual Service De R = 4.252 + (c/mi/ln) khibit 13-2) | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation | |
| FYes, V_{12a} = Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $O_R = 36.7$ (pc/m $O_S = F$ (Exhibit Speed Determ | 18, or ecks Actual 7853 7853 7853 7854 Actual 5174 Fice Determ 0.00734 v R + (ni/ln) 13-2) mination | Exhibit 13-8 Max I Exhibit 13-8 mination (i | I rea Desirable 4600:All if not F) | Yes Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of S $D_R = (pc)$ $LOS = (Ex)$ Speed De | Actual VR ering Dive Actual Service De R = 4.252 + (c/mi/ln) chibit 13-2) etermination | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation | |
| FYes, V_{12a} = Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv D_R = 5.475 + D_R = 36.7 (pc/m D_R = 5.475 + D_R = 36.7 (pc/m D_R = 0.875 (Exiliary) | 18, or ecks Actual 7853 Merge In Actual 5174 Sice Detern 0.00734 v R + (in) 13-2) Mination bit 13-11) | Exhibit 13-8 Max I Exhibit 13-8 mination (i | I rea Desirable 4600:All if not F) | Yes Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of Signature V_{12} $V_{13} = V_{14}$ $V_{15} = V_{15}$ $V_{15} =$ | Actual V _R ering Dive Actual Service De R = 4.252 + (c/mi/ln) chibit 13-2) etermination | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- In the second of the sec | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation | |
| FYes, V_{12a} = Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv D_R = 5.475 + D_R = 36.7 (pc/m D_R = 5.475 + D_R = 36.7 (pc/m D_R = 0.875 (Exil | 18, or ecks Actual 7853 7853 7853 7854 Actual 5174 Fice Determ 0.00734 v R + (ni/ln) 13-2) mination | Exhibit 13-8 Max I Exhibit 13-8 mination (i | I rea Desirable 4600:All if not F) | Yes Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of S $D_R = (pc)$ $LOS = (Ex)$ $Speed De$ $S_R = (Ex)$ $S_R = (Ex)$ | Actual VR ering Dive Actual Service De R = 4.252 + (c/mi/ln) chibit 13-2) etermination hibit 13-12) n (Exhibit 13-12) | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation | |
| Flow Entering V_{R12} Evel of Serv $D_R = 5.475 + 36.7 \text{ (pc/m}$ $OS = F \text{ (Exhibit)}$ Speed Determ $M_S = 0.875 \text{ (Exilographic)}$ $M_S = 45.5 \text{ mph}$ | 18, or ecks Actual 7853 Merge In Actual 5174 Sice Detern 0.00734 v R + (in) 13-2) Mination bit 13-11) | Exhibit 13-8 Max I Exhibit 13-8 mination (i | I rea Desirable 4600:All if not F) | Yes Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of S $D_R = (pc)$ $LOS = (Ex)$ $D_S = (Ex)$ $D_S = (Ex)$ $D_S = (Ex)$ | Actual V _R ering Dive Actual Service De R = 4.252 + (c/mi/ln) chibit 13-2) etermination | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|--|-------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB No-Build | 2020 |
| Project Description SW 10t | | | 7 inaryolo 1 oai | 7.10 20,10 | |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | · , | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 7310 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjustr | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 2603 47.2 55.2 F | pc/h/ln mph pc/mi/ln | Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | RAMP | S AND RAM | P JUNCTI | ONS WO | ORKS | HEET | | | |
|--|---|----------------|----------------------------|----------------------------|---|-----------------------|-------------------|---------------------------|-------------------------------|------------------------------------|
| General Info | rmation | | | Site Infor | mation | | | | | |
| Analyst | | | | eeway/Dir of Tr | | | | | | |
| Agency or Company | y AEC | OM | | inction | | Seg 11 | -Off Ramp I | Hillsboro EB | | |
| Date Performed Analysis Time Perio | od AM | | | risdiction nalysis Year | | No-Bui | ld 2020 | | | |
| Project Description | | et SIMR | 7 11 | laryolo i oai | | 140 Bui | 10 2020 | | | |
| Inputs | | | | | | | | | | |
| Upstream Adj F | Ramp | Freeway Num | ber of Lanes, N | 3 | | | | | Downstrea | ım Adi |
| | · | Ramp Number | r of Lanes, N | 1 | | | | | Ramp | , |
| ✓ Yes | ✓ On | Acceleration L | ane Length, L _A | | | | | | ☐Yes | On |
| □No [| Off | Deceleration L | ane Length L _D | 220 V | | | | | | Off |
| | | Freeway Volui | ne, V _F | 7310 | | | | | | |
| L _{up} = 30 | 085 ft | Ramp Volume | , V _R | 720 | | | | L _{down} = | ft | |
| V ₁₁ = 14 | Freeway Free-Flow Speed, S _{FF} 70.0 | | | | | | | | V _D = | veh/h |
| v _u – 1 | 400 Ven/II | Ramp Free-Flo | ow Speed, S _{FR} | 45.0 | | | | | ן - ט | 7011 |
| Conversion t | to pc/h Un | der Base (| Conditions | | | | | | | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | | f_{HV} | f _p | v = V/PHF | x f _{HV} x f _D |
| Freeway | 7310 | 0.95 | Level | 3 | 0 | 0. | 985 | 1.00 | 78 | 10 |
| Ramp | 720 | 0.92 | Level | 2 | 0 | _ | 990 | 1.00 | 79 | |
| UpStream | 1460 | 0.92 | Level | 2 | 0 | 0. | 990 | 1.00 | 16 | 03 |
| DownStream | | | | | | | | | | |
| | | Merge Areas | | | F - 4' | | | iverge Areas | | |
| Estimation o | 7 V ₁₂ | | | | Estima | tion o | τν ₁₂ | | | |
| | $V_{12} = V_{F}$ | (P_{FM}) | | | | | V ₁₂ = | $V_R + (V_F - V_F)$ | _R)P _{FD} | |
| L _{EQ} = | (Equa | ation 13-6 or | 13-7) | | L _{EQ} = | | | 10.72 (Equati | | • |
| P _{FM} = | using | Equation (E | xhibit 13-6) | | P _{FD} = | | 0.5 | 528 using Equ | uation (Exhi | bit 13-7) |
| V ₁₂ = | pc/h | | | | V ₁₂ = | | 44 | 99 pc/h | | |
| V ₃ or V _{av34} | | | -14 or 13-17) | | V_3 or V_{av34} | | | 11 pc/h (Equ | ation 13-14 | or 13-17) |
| Is V ₃ or V _{av34} > 2,7 | | | | | | | | Yes No | | |
| Is V ₃ or V _{av34} > 1.5 | | | | | Is V ₃ or V _a | _{Iv34} > 1.5 | | Yes ✓ No | | |
| If Yes,V _{12a} = | pc/h (13-19) | | -16, 13-18, or | | If Yes,V _{12a} | = | | 10 pc/h (Equ | ation 13-16 | 5, 13-18, |
| Capacity Che | <i>'</i> |) | | | Capaci | ty Ch | | 13-19) | | |
| | Actual | С | apacity | LOS F? | Joapaon | ty Uni | Actual | Ca | pacity | LOS F? |
| | | | эрин | 1 | V _F | | 7810 | Exhibit 13-8 | · r | Yes |
| V_{FO} | | Exhibit 13-8 | | | V _{FO} = V | | 7020 | Exhibit 13-8 | 7200 | No |
| FO | | | | | V _R | | 790 | Exhibit 13-1 | | No |
| Flow Enterin | a Morae Ir | ofluence A | <u></u> | | | ` | | ge Influen | | 110 |
| . 10W LIILGIIII | Actual | | Desirable | Violation? | I IOW E | _ | Actual | Max Desirab | | Violation? |
| V _{R12} | | Exhibit 13-8 | | | V ₁₂ | _ | 1499 | Exhibit 13-8 | 4400:All | Yes |
| Level of Serv | /ice Detern | | f not F) | <u> </u> | | | | terminatio | n (if not l | |
| D _R = 5.475 + 0 | | <u>`</u> | | | | | | 0086 V ₁₂ - 0. | | , |
| D _R = (pc/mi/lr | | 12 | ^ | | $D_R = 4$ | 16.2 (pc | | 12 | D | |
| LOS = (Exhibit | • | | | | 1 | | oit 13-2) | | | |
| Speed Deter | • | | | | <u> </u> | | minatio | n | | |
| $M_S = $ (Exibit 1 | | | | | ' | | xhibit 13- | | | |
| _ | hibit 13-11) | | | | | | (Exhibit | • | | |
| | hibit 13-11) | | | | | • | (Exhibit | • | | |
| | hibit 13-11) | | | | 1 - | - | (Exhibit | | | |
| vright © 2016 Universi | - | | | | , , , , , , , , , , , , , , , , , , , | | | <u> </u> | | 20/2010 12:2 |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 12-L No-Build | Bet Off & On Hillsboro |
| Project Description SW 10t | h Street SIMR | | | | |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K | 6590 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R | 0.95 3 0 | |
| Peak-Hr Direction Prop, D DDHV = AADT x K x D | | veh/h | General Terrain: Grade % Length Up/Down % | Level mi | |
| Calculate Flow Adjustr | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | · |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 2347 54.7 42.9 <i>E</i> | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | · | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | REEWAY | WEAV | | | <u> </u> | | |
|---|---|---------------------|------------|-----------------------------------|--|--------------------------|---------------------------|------|-------------------------------|
| Genera | ıl Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/Co Date Perfo Analysis Ti | rmed | AECO AM | М | | Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 13-Bet On & Off Hillsbr Analysis Year No-Build 2020 | | | | |
| Project De | scription SW 10 | th Street SIMF | ₹ | | ı | | | | |
| Inputs | | | | | | | | | |
| Weaving n Weaving se Freeway fr | onfiguration umber of lanes, egment length, L ee-flow speed, F | s FS | | One-Sided 4 790ft 70 mph | Segment type Freeway min Freeway max Terrain type | imum speed | | | Freeway 19 2400 Leve |
| Conve | rsions to p | c/h Unde | r Base Co | ndition | S | | | | |
| | V (veh/h) | PHF | Truck (%) | RV (%) | Ε _Τ | E _R | f_{HV} | fp | v (pc/h) |
| V_{FF} | 6000 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 6411 |
| V_{RF} | 560 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 615 |
| V_{FR} | 590 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 648 |
| V_{RR} | 0 | 0.95 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 0 |
| V_{NW} | 6411 | | | | | | | V = | 7674 |
| V_W | 1263 | | | | | | | | |
| VR | 0.165 | | | | | | | | |
| Config | uration Ch | aracteris | tics | | 1 | | | | |
| Minimum r | maneuver lanes, | N_{WL} | | 2 lc | Minimum we | aving lane c | hanges, LC _{MIN} | l | 1263 lc/h |
| | je density, ID | | | 0.7 int/mi | Weaving lan | e changes, L | $-C_{W}$ | | 1474 lc/h |
| Minimum F | RF lane changes | , LC _{RF} | | 1 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | 978 lc/h |
| | R lane changes | 110 | | 1 lc/pc | Total lane ch | nanges, LC _{AL} | L | | 2452 lc/h |
| Minimum F | RR lane changes | s, LC _{RR} | | lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | 355 |
| Weavir | ng Segmen | t Speed, | Density, I | _evel of | · | | _ | | |
| | egment flow rate | • | | 7566 veh/h | Weaving inte | • | | | 0.552 |
| | egment capacity | ', C _w | | 8437 veh/h | Weaving seg | | | | 51.5 mph |
| _ | egment v/c ratio | D | 0- | 0.897 | Average wea | | ** | | 50.4 mph |
| _ | egment density, ervice, LOS | ט | 31 | 7.3 pc/mi/ln E | Average non | | | | 51.7 mph |
| Feaci Oi 9 | GI VICE, LOS | | | | Maximum we | eaving length | I, L _{MAX} | | 4177 ft |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|--|----------------------------|--|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 14-E No-Build | Bet Off & On Hillsboro |
| | th Street SIMR | | , | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 6560 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| JEHN AND ANAB | | V 31 I/11 | Up/Down % | **** | |
| Calculate Flow Adjusti | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | S | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$ LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base free | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | FREEWAY | / WEAVI | NG WOR | RKSHEE | T | | |
|---|--|---------------|------------|--------------------------|--|--------------------------|---------------------------|------|-------------------------------|
| Genera | l Informatio | on | | | Site Info | rmation | | | |
| Analyst Agency/Co Date Perfo Analysis Ti | med | AECO AM | M | | Freeway/Dir of Travel Weaving Segment Location Analysis Year I-95 NB Seg 15-Bet On & Off to Exp No-Build 2020 | | | | |
| Project Des | cription SW 10th | n Street SIMI | ₹ | | | | | | |
| Inputs | | | | | 1 | | | | |
| Weaving se Freeway fre | umber of lanes, Negment length, L _s ee-flow speed, FF | FS | Bass Co | 4665ft 70 mph | Segment type Freeway min Freeway max Terrain type | imum speed | | | Freeway 15 2400 Leve |
| Conver | v (veh/h) | PHF | Truck (%) | RV (%) | E _T | E _R | f _{HV} | fp | v (pc/h) |
| V _{FF} | 5275 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 5636 |
| V _{RF} | 635 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 697 |
| V _{FR} | 1285 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1411 |
| V _{RR} | 75 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 82 |
| V _{NW} | 7744 | | 1 | <u> </u> | | | 1 | V = | 7826 |
| V _W | 82 | | | | | | | | |
| VR | 0.010 | | | | | | | | |
| Config | uration Cha | racteris | tics | | • | | | | |
| Minimum n | naneuver lanes, l | N_{WL} | | 0 lc | Minimum we | aving lane c | hanges, LC _{MIN} | | lc/h |
| Interchang | e density, ID | | | 0.7 int/mi | Weaving lan | e changes, L | $-C_{W}$ | | lc/h |
| Minimum F | RF lane changes, | LC_{RF} | | 0 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | lc/h |
| Minimum F | R lane changes, | LC_{FR} | | 0 lc/pc | Total lane ch | nanges, LC _{AL} | L | | lc/h |
| Minimum F | RR lane changes, | LC_{RR} | | 3 lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | |
| Weavin | g Segment | Speed, | Density, I | _evel of | Service, | and Cap | oacity | | |
| | egment flow rate, egment capacity, | | | 7722 veh/h 6831 veh/h | Weaving inte | gment speed | , S | | mph |
| _ | egment v/c ratio | | | 1.130 | Average wea | | ** | | mph |
| | egment density, [|) | | pc/mi/ln | Average non | | | | mph |
| Level of Se | ervice, LOS | | | F | Maximum we | eaving length | n, L _{MAX} | | 5824 ft |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F". Copyright © 2016 University of Florida, All Rights Reserved

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|---|--|----------------------------|---|-------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 16-l | North of Hillsboro |
| Project Description SW 10 | | | | | |
| ✓ Oper.(LOS | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5910 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 4 0 Level mi | |
| DDITY /VIDI XIXXD | | VC11/11 | Up/Down % | 1111 | |
| Calculate Flow Adjust | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T-1)+P_R(E_R-1)]$ | 1.2 0.980 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$ LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h | S - Speed D - Density FFS - Free-flow BFFS - Base free | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | F | REEWAY | <u>' WEAVI</u> | NG WOR | RKSHEE | T | | |
|---|--|--------------------|------------|------------------|--|--------------------------|---------------------------|------|-------------------------------|
| General | Information | on | | | Site Info | rmation | | | |
| Analyst Agency/Con Date Perforr Analysis Tin | med | AECOM PM | Л | | Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 1-Bet Copans & Sa Analysis Year No-Build 2020 | | | | |
| Project Desc | cription SW 10th | n Street SIMF | (| | | | | | |
| Inputs | | | | | | | | | |
| Weaving seg | mber of lanes, N gment length, L _s e-flow speed, FF | S FS | | 1820ft 70 mph | Segment typo Freeway min Freeway max Terrain type | imum speed | | | Freeway 15 2400 Leve |
| Convers | sions to po | :/h Unde | r Base Co | nditions | | | | | _ |
| | V (veh/h) | PHF | Truck (%) | RV (%) | Ε _Τ | E _R | f_{HV} | fp | v (pc/h) |
| V_{FF} | 4400 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 4701 |
| V_{RF} | 410 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 450 |
| V_{FR} | 1570 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1724 |
| V_{RR} | 0 | 0.92 | 0 | 0 | 1.5 | 1.2 | 1.000 | 1.00 | 0 |
| V_{NW} | 4701 | | | | | | | V = | 6875 |
| V_{W} | 2174 | | | | | | | | |
| VR | 0.316 | | | | | | | | |
| Configu | ration Cha | aracterist | tics | | | | | | |
| Minimum m | aneuver lanes, I | N _{WL} | | 2 lc | Minimum we | aving lane c | hanges, LC _{MIN} | | 2174 lc/h |
| Interchange | - | | | 0.7 int/mi | Weaving land | e changes, L | $-C_{W}$ | | 2546 lc/h |
| Minimum R | F lane changes, | LC_{RF} | | 1 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | 1184 lc/h |
| | R lane changes, | | | 1 lc/pc | Total lane ch | nanges, LC _{AL} | L | | 3730 lc/h |
| Minimum R | R lane changes, | , LC _{RR} | | lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | 599 |
| Weaving | g Segment | Speed, | Density, I | _evel of | Service, | and Cap | oacity | | |
| | gment flow rate, | | (| 6784 veh/h | Weaving inte | • | | | 0.398 |
| Weaving se | gment capacity, | C _w | | 7478 veh/h | Weaving seg | | | | 48.4 mph |
| • | gment v/c ratio | _ | 0.1 | 0.907 | Average wea | | •• | | 54.3 mph |
| Weaving se Level of Sei | gment density, I | J | 35 | ' | Average non | • . | 1111 | | 46.1 mph |
| Level of Sel | vice, LOS | | | Е | Maximum we | eaving length | า, L _{MAX} | | 5759 ft |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|------------------------------------|---|---|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 2-Be Sample No-Build | et Off & On from |
| Project Description SW 10th | Street SIMR | | • | | |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 4810 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % | 0.95 3 0 Level mi | |
| Calculate Flow Adjustn | nents | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS | (f _{HV} x f _p) 1713 66.9 25.6 C | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | WPS AND | RAMP JUN | | | El | | | |
|--|---|--|--|------------------------|--|---|--|--|--------------------------------|
| General Infor | mation | | | Site Infor | | | | | |
| Analyst | | | | eeway/Dir of Tr | | 95 NB | | | |
| Agency or Company Date Performed | AEC | OM | | ınction ırisdiction | S | eg 3-On Ramp | from Sample | | |
| Analysis Time Period | d PM | | | nalysis Year | N | o-Build 2020 | | | |
| Project Description | | t SIMR | | , | | o Balla 2020 | | | |
| nputs | | | | | | | | | |
| - | | Freeway Num | ber of Lanes, N | 3 | | | | Downstre | om Adi |
| Jpstream Adj Ramp | | Ramp Numbe | r of Lanes. N | 1 | | | | Ramp | am Auj |
| ☐ Yes ☐ Or | า | | ane Length, L | 500 | | | | | |
| | | 1 | ane Length L _D | 300 | | | | ✓ Yes | ✓ On |
| ☑ No ☐ Of | f | 1 | - 5 | 4040 | | | | ☐ No | Off |
| un = ft | | Freeway Volu | ' | 4810 | | | | L _{down} = | 1950 ft |
| _{-up} = ft | | Ramp Volume | | 970 | | | | down | 1000 10 |
| / _u = veh/h | 1 | | -Flow Speed, S _{FF} | 70.0 | | | | V _D = | 730 veh/h |
| <u> </u> | | | ow Speed, S _{FR} | 50.0 | | | | | |
| Conversion t | T . | der Base | Conditions | 1 | 1 | 1 | 1 | | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | f_HV | f _p | v = V/PH | $F \times f_{HV} \times f_{p}$ |
| Freeway | 4810 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | | 5139 |
| Ramp | 970 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 1065 |
| UpStream | | 0.02 | | | | 0.000 | | | |
| DownStream | 730 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 801 |
| | | Merge Areas | | • | | | Diverge Areas | • | |
| Estimation of | f v ₁₂ | | | | Estimation | on of v ₁₂ | | | |
| | V ₁₂ = V _F | (P _{EM}) | | | | \/ | \/ · (\/ \/ | \D | |
| - _{EQ} = | | των ation 13-6 οι | r 13-7) | | | v ₁₂ = | $V_R + (V_F - V_R)$ | | |
| | | | tion (Exhibit 13-6) | | L _{EQ} = | | (Equation 13- | | - |
| P _{FM} = / = | 3040 | | ion (Exhibit 15-0) | | P _{FD} = | | using Equation | n (Exhibit 1 | 3-7) |
| / ₁₂ = | | • | on 13-14 or 13- | | V ₁₂ = | | pc/h | | |
| V_3 or V_{av34} | 17) | pc/ii (Equati | 011 13-14 01 13- | | V_3 or V_{av34} | | pc/h (Equation 1 | | 17) |
| Is V ₃ or V _{av34} > 2,70 | | s 🗹 No | | | Is V_3 or V_{av34} | > 2,700 pc/h? | ☐Yes ☐No | | |
| Is V ₃ or V _{av34} > 1.5 | | | | | Is V_3 or V_{av34} | > 1.5 * V ₁₂ /2 | ☐Yes ☐No | | |
| f Yes,V _{12a} = | | | on 13-16, 13- | | If Yes,V _{12a} = | | pc/h (Equatio | n 13-16, 1 | 3-18, or |
| | 18, or | 13-19) | | | | | 3-19) | | |
| Capacity Che | ecks | | | | Capacity | Checks | | | |
| | Actual | C | Capacity | LOS F? | | Actual | | pacity | LOS F? |
| | | | | | V_{F} | | Exhibit 13- | 8 | |
| V | 6204 | Exhibit 13-8 | | No | $V_{FO} = V_{F}$ - | V_R | Exhibit 13- | 8 | |
| V F∩ | | | | | V _R | | Exhibit 13 | - | |
| V_{FO} | | | | | | | 10 | <u> </u> | |
| | <u> </u> | | V00 | | | ering Dive | rge Influen | | ii . |
| | 1 | | | 1 10 0 | Flow Ente | | I 14 D | | Violation? |
| Flow Entering | Actual | Max | Desirable | Violation? | | Actual | Max Des | liable | |
| Flow Entering | Actual 4105 | Max Exhibit 13-8 | Desirable 4600:All | Violation? | V ₁₂ | Actual | Exhibit 13-8 | | |
| Flow Entering V _{R12} Level of Serv | Actual 4105 rice Deterr | Max Exhibit 13-8 mination (| Desirable 4600:All if not F) | i e | V ₁₂ Level of S | Actual Service De | Exhibit 13-8 Eterminatio | n (if not | : F) |
| V _{R12} Level of Serv D _R = 5.475 + | Actual 4105 rice Detern 0.00734 v _R + 0 | Max Exhibit 13-8 mination (| Desirable 4600:All if not F) | i e | V ₁₂ Level of S | Actual Service De | Exhibit 13-8 | n (if not | : <i>F</i>) |
| V _{R12} Level of Serv D _R = 5.475 + | Actual 4105 rice Detern 0.00734 v _R + 0 | Max Exhibit 13-8 mination (| Desirable 4600:All if not F) | i e | V ₁₂ Level of S | Actual Service De | Exhibit 13-8 Eterminatio | n (if not | [: F) |
| Flow Entering V_{R12} Level of Serv $D_{R} = 5.475 + D_{R} = 33.9 \text{ (pc/m)}$ | Actual 4105 Fice Determ 0.00734 v _R + (ni/ln) | Max Exhibit 13-8 mination (| Desirable 4600:All if not F) | i e | V ₁₂ Level of S D _R = (pc. | Actual Service De R = 4.252 + 0 | Exhibit 13-8 Eterminatio | n (if not | :F) |
| Flow Entering V_{R12} Level of Serv $D_{R} = 5.475 + D_{R} = 33.9 \text{ (pc/m)}$ | Actual 4105 rice Determ 0.00734 v _R + 0 ni/ln) 13-2) | Max Exhibit 13-8 mination (| Desirable 4600:All if not F) | i e | V ₁₂ Level of S D ₁ D _R = (pc. LOS = (Ex | Actual Service De R = 4.252 + (/mi/ln) | Exhibit 13-8 Exerminatio 0.0086 V ₁₂ - 0 | n (if not | [: F) |
| Flow Entering V_{R12} Level of Serv $D_R = 5.475 + D_R = 33.9 \text{ (pc/m}$ $.OS = D \text{ (Exhibit)}$ Speed Determ | Actual 4105 Fice Determ 0.00734 v _R + 0 ni/ln) 13-2) mination | Max Exhibit 13-8 mination (| Desirable 4600:All if not F) | i e | V ₁₂ Level of S D _R = (pc. LOS = (Ex | Actual Service De R = 4.252 + (/mi/ln) chibit 13-2) | Exhibit 13-8 Exerminatio 0.0086 V ₁₂ - 0 | n (if not | [: F) |
| Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $O_S = 0$ $O_S = 0$ (Exhibit Speed Determ $M_S = 0.508$ (Exi | Actual 4105 cice Determ 0.00734 v _R + 0 ni/ln) 13-2) mination bit 13-11) | Max Exhibit 13-8 mination (| Desirable 4600:All if not F) | i e | V_{12} Level of S $D_R = (pc)$ LOS = (Ex Speed De $D_S = (Ex)$ | Actual Service De R = 4.252 + (/mi/ln) chibit 13-2) eterminati hibit 13-12) | Exhibit 13-8 exterminatio 0.0086 V ₁₂ - 0 | n (if not | [: F) |
| Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 33.9 \text{ (pc/m)}$ $OS = D \text{ (Exhibit)}$ Speed Determ $M_S = 0.508 \text{ (Exist)}$ $G_R = 55.8 \text{ mph}$ | Actual 4105 ice Determ 0.00734 v _R + (ni/ln) 13-2) mination (Exhibit 13-11) | Max Exhibit 13-8 mination (| Desirable 4600:All if not F) | i e | V_{12} Level of S $D_R = (pc.$ LOS = (Ex Speed De $D_S = (Ext)$ $D_S = (Ext)$ $D_S = (Ext)$ | Actual Service De R = 4.252 + (/mi/ln) chibit 13-2) eterminati hibit 13-12) n (Exhibit 13-12 | Exhibit 13-8 Exerminatio 0.0086 V ₁₂ - 0 On | n (if not | [|
| Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0.08 = 0.508$ (Exhibit Speed Determine) $M_S = 0.508$ (Exhibit Speed Determine) | Actual 4105 cice Determ 0.00734 v _R + 0 ni/ln) 13-2) mination bit 13-11) | Max Exhibit 13-8 mination (| Desirable 4600:All if not F) | i e | V_{12} Level of S $D_R = \text{(pc. LOS} = \text{(Ex. Speed De De S}_R = \text{(Ext. S}_R = \text{mph}$ $S_0 = \text{mph}$ | Actual Service De R = 4.252 + (/mi/ln) chibit 13-2) eterminati hibit 13-12) | Exhibit 13-8 eterminatio 0.0086 V ₁₂ - 0 on | n (if not | [|

| General Information | | | Site Information | | |
|--|---|----------------------------|--|----------------------|--|
| Analyst | | | Highway/Direction of Travel | I-95 NB | |
| Agency or Company | AECOM | | From/To | Seg 4-Be Exp | et On from Sample & |
| Date Performed Analysis Time Period | PM | | Jurisdiction Analysis Year | L∧p No-Build | 1 2020 |
| Project Description SW 10th | | | | | |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | · , | | |
| Volume, V AADT | 5780 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T | 0.95 3 | |
| Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | | veh/h | %RVs, P _R General Terrain: Grade % Length Up/Down % | 0 Level mi | |
| Calculate Flow Adjustn | nents | | * | | |
| f _p | 1.00 | | E _R | 1.2 | |
| E _T | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | • |
| LOS and Performance I | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N x S D = v _p / S | (f _{HV} × f _p) 2058 61.5 33.5 | pc/h/ln mph pc/mi/ln | Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S | $f_{HV} \times f_p)$ | pc/h/ln mph pc/mi/ln |
| LOS | D | | Required Number of Lanes, N | | <u>'</u> |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base fre | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

| Onne ::: 11 f | | AND SAID | RAMP JUN | | | | | | |
|--|---|---|------------------------------|------------------------|-------------------------------------|-------------------|----------------------------|---------------------|--------------------------------------|
| General Infor | mation | | | Site Infor | | | | | |
| Analyst | . = - | 214 | | eeway/Dir of Tr | | 95 NB | | | |
| Agency or Company Date Performed | AEC | MC | | ınction ırisdiction | S | eg 5-On from E | xp | | |
| Date Periormed Analysis Time Period | l PM | | | nalysis Year | N | o-Build 2020 | | | |
| Project Description | | t SIMR | 7.0 | laryolo i oai | IN | O-Dulid 2020 | | | |
| Inputs | | | | | | | | | |
| - | | Freeway Num | ber of Lanes, N | 3 | | | | Daywatra | A di |
| Upstream Adj Ramp | | Ramp Numbe | • | 1 | | | | Downstre Ramp | eam Adj |
| ☐ Yes ☐ Or | 1 | | ane Length, L _A | 600 | | | | | _ |
| | | 1 | ** | 000 | | | | ✓ Yes | ☐ On |
| ☑ No ☐ Of | f | 1 | ane Length L _D | F700 | | | | ☐ No | ✓ Off |
| - tı | | Freeway Volu | | 5780 | | | | l = | 5545 ft |
| _{rup} = ft | | Ramp Volume | • • • | 730 | | | | L _{down} = | 5545 II |
| $V_{u} = veh/h$ | | Freeway Free | -Flow Speed, S _{FF} | 70.0 | | | | V _D = | 1300 veh/h |
| u VCII/II | | Ramp Free-Fl | ow Speed, S _{FR} | 50.0 | | | | | |
| Conversion t | o pc/h Und | der Base (| Conditions | | | | | | |
| (pc/h) | V () (= = (= =) | PHF | Terrain | %Truck | %Rv | f_HV | fp | v = V/PH | F x f _{HV} x f _p |
| . , | (Veh/hr) | | Laval | | | | · | | · · |
| Freeway | 5780 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | | 6175 |
| Ramp UpStream | 730 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 801 |
| DownStream | 1300 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 1427 |
| <u> </u> | | Merge Areas | LOVOI | | | | Diverge Areas | | 1721 |
| Estimation of | | go :ouc | | | Estimatio | | | | |
| | V ₁₂ = V _F | / D \ | | | | · | | | |
| _ | | • | 10.0 10.7) | | | V ₁₂ = | $V_R + (V_F - V_F)$ | P _{FD} | |
| L _{EQ} = | | | 13-6 or 13-7) | | L _{EQ} = | | (Equation 13- | 12 or 13- | 13) |
| P _{FM} = | | | ion (Exhibit 13-6) | | P _{FD} = | | using Equation | n (Exhibit 1 | 13-7) |
| / ₁₂ = | 3806 | | | | V ₁₂ = | | pc/h | | |
| V_3 or V_{av34} | | pc/h (Equation | on 13-14 or 13- | | V ₃ or V _{av34} | | pc/h (Equation | 13-14 or 13- | 17) |
| Is V ₃ or V _{av34} > 2,70 | 17) | - (1) NI - | | | | > 2.700 pc/h? | ☐Yes ☐ No | | , |
| | | | | | | | □Yes □No | | |
| Is V_3 or $V_{av34} > 1.5$ | | | 40 40 40 | | | 12 | pc/h (Equatio | n 13-16. 1 | 13-18. or |
| f Yes,V _{12a} = | | pc/n (Equation 13-19) | on 13-16, 13- | | If Yes,V _{12a} = | 1 | 13-19) | , | |
| Capacity Che | | 10 10) | | | Capacity | Checks | | | |
| a para di para | Actual | | apacity | LOS F? | | Actual | l Ca | pacity | LOS F? |
| | | | , , | | V _F | | Exhibit 13- | 1 | |
| | 0070 | E 1 11 11 40 0 | | l | $V_{FO} = V_F -$ | V_ | Exhibit 13- | | _ |
| V_{FO} | 6976 | Exhibit 13-8 | | No | | *R | Exhibit 13 | | + |
| | | | | | V_R | | 10 | | |
| Flow Entering | n Merge In | fluence A | rea | | Flow Ente | ering Dive | erge Influer | ce Area | |
| | Actual | | Desirable | Violation? | | Actual | Max Des | | Violation? |
| V _{R12} | 5063 | Exhibit 13-8 | 4600:All | Yes | V ₁₂ | | Exhibit 13-8 | | |
| Level of Serv | ice Detern | nination (| if not F) | | | Service De | eterminatio | n (if no | t F) |
| | 0.00734 v _R + 0 | • | | | 1 | | 0.0086 V ₁₂ - 0 | | / |
| D _R = 40.8 (pc/m | • | 12 | А | | | /mi/ln) | 112 | Б | |
| | • | | | | | * | | | |
| ` | · · | | | | - | hibit 13-2) | · | | |
| Speed Detern | nination | | | | † ′ | eterminati | on | | |
| | bit 13-11) | | | | | nibit 13-12) | | | |
| $M_{\rm S} = 0.877 (Exi$ | | | | | S _R = mph | (Exhibit 13-12 | 2) | | |
| • | (Exhibit 13-11) | | | | K I | • | | | |
| S _R = 45.4 mph | (Exhibit 13-11) (Exhibit 13-11) | | | | | (Exhibit 13-12 | <u>'</u>) | | |
| $S_R = 45.4 \text{ mph}$ $S_0 = 64.9 \text{ mph}$ | | | | | $S_0 = mph$ | • | • | | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|--|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 6-Be No-Build | et Exp On & Off to 10th |
| Project Description I-95 AT | | | | | |
| Oper.(LOS) | | | Des.(N) | ∐Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 6510 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjustr | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | · |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N s S D = v _p / S LOS | x f _{HV} x f _p) 2318 55.5 41.8 E | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | RAMPS | S AND RAM | | | RKS | HEET | | | |
|---|---|--|------------------------------|----------------------|--|---|---|--|---|----------------------|
| General Infor | mation | | | Site Infor | | | | | | |
| nalyst | 450 | | | eeway/Dir of Tr | | I-95 NE | | 4011 01 | | |
| Agency or Company Oate Performed | AEC | ОМ | | nction risdiction | , | Seg /- | Off Ramp to | 10th St | | |
| nalysis Time Period | l PM | | | alysis Year | ı | No-Bui | ld 2020 | | | |
| Project Description | | et SIMR | | , | | | | | | |
| nputs | | | | | | | | | | |
| Upstream Adj Ra | amp | Freeway Numb | per of Lanes, N | 3 | | | | | Downstre | am Adi |
| opoliodiii / taj / ti | amp | Ramp Number | of Lanes, N | 1 | | | | | Ramp | ani 7 taj |
| □Yes □ | On | Acceleration La | | | | | | | ✓ Yes | C/On |
| | 7.0% | Deceleration La | ,, | 250 | | | | | res ₩ | ☑ On |
| ✓ No | Off | Freeway Volun | - 5 | 6510 | | | | | □ No | Off |
| L _{up} = ft | t | Ramp Volume, | • | 1300 | | | | | L _{down} = | 1370 ft |
| -up ··· | | | 13 | | | | | | down | |
| V,, = V6 | eh/h | - | Flow Speed, S _{FF} | 70.0 | | | | | V _D = | 1160 veh/h |
| | | Ramp Free-Flo | . 117 | 45.0 | | | | | | |
| Conversion to | r | der Base C | conditions: | 1 | | | | | 1 | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | | f_{HV} | f_p | v = V/PHI | $= x f_{HV} x f_{p}$ |
| reeway | 6510 | 0.95 | Level | 3 | 0 | | 985 | 1.00 | | 955 |
| Ramp | 1300 | 0.92 | Level | 2 | 0 | + | 990 | 1.00 | | 427 |
| JpStream | 1000 | 0.02 | LOVOI | | | °. | 330 | 1.00 | <u>'</u> | TL1 |
| DownStream | 1160 | 0.92 | Level | 2 | 0 | 0. | 990 | 1.00 | 1 | 273 |
| | | Merge Areas | | | | | D | iverge Areas | | |
| Estimation of | V ₁₂ | | | | Estimati | on o | f v ₁₂ | | | |
| | V ₁₂ = V _F | (P) | | | | | | V _R + (V _F - V _F | _\P | |
| _ | | ation 13-6 or 1 | 12 7) | | l = | | | Equation 13-1 | | 37 |
| _{EQ} = | | | • | | L _{EQ} = | | • | - | | • |
|) = / _ | _ | Equation (E | xhibit 13-0) | | P _{FD} = | | | 520 using Equ | uation (Exi | 11DIT 13-7) |
| / ₁₂ = | pc/h | | | | V ₁₂ = | | | 04 pc/h | | |
| 7 ₃ or V _{av34} | | (Equation 13- | 14 or 13-17) | | $\rm V_3$ or $\rm V_{av34}$ | | | 51 pc/h (Equ | ation 13-1 | 4 or 13-17) |
| s V_3 or $V_{av34} > 2,70$ | | | | | | | | Yes ☑ No | | |
| s V ₃ or V _{av34} > 1.5 * | | | | | Is V ₃ or V _{av3} | ₃₄ > 1.5 | | Yes ☑ No | | |
| Yes,V _{12a} = | pc/h (13-19) | (Equation 13- | 16, 13-18, or | | If Yes,V _{12a} = | | p: 19 | c/h (Equation | 13-16, 13 | 3-18, or 13- |
| | | <u>) </u> | | | | | | ') | | |
| Capacity Che | CKS | | | | Capacity | v Ch | ecks | | | |
| Capacity Che | 1 | Ca | pacity | LOS F? | Capacity | y Ch | | Ca | pacity | LOS F? |
| Capacity Che | Actual | Ca | apacity | LOS F? | | y Ch | Actual | | pacity 7200 | LOS F? |
| | 1 | | apacity | LOS F? | V _F | | Actual 6955 | Exhibit 13-8 | 3 7200 | No |
| V _{FO} | 1 | Ca Exhibit 13-8 | apacity | LOS F? | V_F $V_{FO} = V_F$ | | Actual 6955 5528 | Exhibit 13-8 Exhibit 13-8 | 3 7200 3 7200 | No No |
| V _{FO} | Actual | Exhibit 13-8 | | LOS F? | V_F $V_{FO} = V_F$ V_R | - V _R | Actual 6955 5528 1427 | Exhibit 13-8 Exhibit 13-1 | 7200 7200 7200 72100 | No No No |
| | Actual g Merge In | Exhibit 13-8 | rea | | V_F $V_{FO} = V_F$ V_R | - V _R | Actual 6955 5528 1427 g Diver | Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 | 7200 7200 7200 72100 72100 | No No No |
| V _{FO} Flow Entering | Actual | Exhibit 13-8 offluence A Max D | | LOS F? Violation? | V_{FO} $V_{FO} = V_{F}$ V_{R} Flow En | - V _R | Actual 6955 5528 1427 g Diver Actual | Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-8 Exhibit 13-8 | 7200 7200 7200 7200 72100 72100 72100 | No No No Violation? |
| V _{FO} Flow Entering V _{R12} | Actual g Merge In Actual | Exhibit 13-8 Influence A Max D Exhibit 13-8 | rea Desirable | | $V_{FO} = V_{F}$ $V_{RO} = V_{RO}$ Flow En | - V _R | Actual 6955 5528 1427 g Diver Actual | Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-8 | 7200 7200 7200 7200 72100 7200 7200 7200 | No No No Violation? |
| V _{FO} Flow Entering V _{R12} Level of Servi | Actual G Merge In Actual | Exhibit 13-8 Influence AI Max E Exhibit 13-8 Inination (in | rea Desirable f not F) | | $V_{FO} = V_{FO}$ $V_{RO} = V_{FO}$ Flow En V_{12} Level of | terin | Actual 6955 5528 1427 g Diver Actual 1304 vice Det | Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-8 Exhibit 13-8 | 7200 7200 7200 721 | No No No Violation? |
| V _{FO} Flow Entering V _{R12} | Actual G Merge In Actual | Exhibit 13-8 Influence AI Max E Exhibit 13-8 Inination (in | rea Desirable f not F) | | $V_{FO} = V_{FO}$ $V_{RO} = V_{FO}$ Flow En V_{12} Level of | terin | Actual 6955 5528 1427 g Diver Actual 1304 vice Det | Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-8 | 7200 7200 7200 721 | No No No Violation? |
| V _{FO} Flow Entering V _{R12} Level of Servi | Actual G Merge In Actual ice Determ 00734 v R + | Exhibit 13-8 Influence AI Max E Exhibit 13-8 Inination (in | rea Desirable f not F) | | V_F $V_{FO} = V_F$ V_R Flow En V_{12} Level of | terin | Actual 6955 5528 1427 g Diver Actual 1304 vice Det | Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-8 Exhibit 13-8 | 7200 7200 7200 721 | No No No Violation? |
| V _{FO} Flow Entering V _{R12} Level of Server D _R = 5.475 + 0.0 | Actual Actual ice Determ 00734 v R + | Exhibit 13-8 Influence AI Max E Exhibit 13-8 Inination (in | rea Desirable f not F) | | V_F $V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 39$ | terin Serv D _R = 4 | Actual 6955 5528 1427 g Diver Actual 1304 //ice Det | Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-8 Exhibit 13-8 | 7200 7200 7200 721 | No No No Violation? |
| V_{FO} Flow Entering V_{R12} Level of Serve $D_R = 5.475 + 0.0$ $D_R = (pc/mi/ln)$ $D_R = (Exhibit)$ | Actual G Merge In Actual ice Detern 00734 v R +) 13-2) | Exhibit 13-8 Influence AI Max E Exhibit 13-8 Inination (in | rea Desirable f not F) | | V_F $V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 39$ | terin Serv O _R = 4 0.0 (pc. | Actual 6955 5528 1427 g Diver Actual 1304 /ice Det 1.252 + 0. /mi/ln) bit 13-2) | Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 | 7200 7200 7200 721 | No No No Violation? |
| V_{FO} Flow Entering V_{R12} Level of Servi $D_R = 5.475 + 0.0$ $D_R = (pc/mi/ln)$ $D_R = (Exhibit 1)$ Speed Determ | Actual O Merge In Actual ice Detern 00734 v R +) 13-2) nination | Exhibit 13-8 Influence AI Max E Exhibit 13-8 Inination (in | rea Desirable f not F) | | V_F $V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 39$ $LOS = E$ Speed D | terim Serv D _R = 4 (Exhibit | Actual 6955 5528 1427 19 Diver Actual 1304 1:252 + 0. (mi/ln) bit 13-2) minatio | Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-8 | 7200 7200 7200 721 | No No No Violation? |
| V_{FO} Flow Entering V_{R12} Level of Servi $D_R = 5.475 + 0.0$ $D_R = (pc/mi/ln)$ $D_R = (Exhibit)$ Speed Determ | Actual Actual ice Determ 00734 v R + 13-2) inination 3-11) | Exhibit 13-8 Influence AI Max E Exhibit 13-8 Inination (in | rea Desirable f not F) | | V_F $V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 39$ $LOS = E$ Speed D $D_S = 0.4$ | terin Serv OR = 4 0 (pc) (Exhib | Actual 6955 5528 1427 g Diver Actual 1304 /ice Det 1.252 + 0. /mi/ln) bit 13-2) minatio xhibit 13- | Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-8 Exhibit 13-1 Exhib | 7200 7200 7200 721 | No No No Violation? |
| V_{FO} Flow Entering V_{R12} Level of Service $D_R = 5.475 + 0.0$ $D_R = (pc/mi/ln)$ $D_R = (Exhibit 13)$ Speed Determing $D_R = (Exhibit 13)$ | Actual Actual ice Determ 00734 v R +) 13-2) mination 3-11) ibit 13-11) | Exhibit 13-8 Influence AI Max E Exhibit 13-8 Inination (in | rea Desirable f not F) | | V_F $V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 39$ $LOS = E$ $Speed D$ $D_S = 0.4$ $S_R = 58$ | terin Serv D _R = 4 0.0 (pc. (Exhibit 426 (E 3.1 mph | Actual 6955 5528 1427 19 Diver Actual 1304 1.252 + 0. /mi/ln) bit 13-2) minatio xhibit 13- (Exhibit | Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-8 Exhibit 13-12 Exhibit 13-12 | 7200 7200 7200 721 | No No No Violation? |
| V_{FO} Flow Entering V_{R12} Level of Servi $D_R = 5.475 + 0.0$ $D_R = (pc/mi/ln)$ $D_R = (pc/m$ | Actual Actual ice Determ 00734 v R + 13-2) inination 3-11) | Exhibit 13-8 Influence AI Max E Exhibit 13-8 Inination (in | rea Desirable f not F) | | $V_{FO} = V_{F}$ $V_{FO} = V_{F}$ V_{R} Flow En V_{12} Level of $D_{R} = 39$ $LOS = E$ Speed D $D_{S} = 0.4$ $S_{R} = 58$ $S_{0} = 70$ | - V _R terin Serv D _R = 4 0 (pc) (Exhibited (Exhi | Actual 6955 5528 1427 g Diver Actual 1304 /ice Det 1.252 + 0. /mi/ln) bit 13-2) minatio xhibit 13- | Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-8 Exhibit 13-12 Exhibit | 7200 7200 7200 721 | No No No Violation? |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|--|-------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 8-Be | et Off & On 10th St |
| Project Description SW 10th | | | , | | |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 5210 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjustr | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) Base free-flow Speed, BFFS | 70.0 | mph mph | FFS | 70.0 | mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N s S D = v _p / S LOS | x f _{HV} x f _p) 1855 65.0 28.5 D | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| Concretter | | INILO AND | RAMP JUN | | | <u> </u> | | | |
|---|---|--|------------------------------|------------------------|---|--|--|-----------------------|--------------------------------|
| General Info | rmation | | | Site Infor | | 05.115 | | | |
| Analyst Aganay ar Campan | | COM | | eeway/Dir of Ti | | 95 NB | 40th Ot ED 9 1415 | n | |
| Agency or Compan Date Performed | ly AEC | COM | | ınction ırisdiction | 5 | eg 9-On Ramp | 10th St EB & WE | 3 | |
| Analysis Time Peri | od PM | | | nalysis Year | N | lo-Build 2020 | | | |
| Project Description | | et SIMR | | | | | | | |
| nputs | | | | | | | | | |
| Jpstream Adj Ram | n | Freeway Num | ber of Lanes, N | 3 | | | | Downstream | Adi |
| potream raj ram | ۲ | Ramp Numbe | r of Lanes, N | 1 | | | | Ramp | / tuj |
| ✓ Yes 🔲 C | On | Acceleration L | ane Length, L | 1345 | | | | ☐ Yes ☐ | On |
| | \r. | 1 | ane Length L _D | | | | | | |
| □ No ☑ C | JΠ | Freeway Volu | | 5210 | | | | ☑ No □ | Off |
| _{up} = 1370 | ft | Ramp Volume | | 1160 | | | | L _{down} = f | t |
| up 1070 | | 1 | • • | | | | | down | |
| / _u = 1300 | veh/h | 1 | -Flow Speed, S _{FF} | 70.0 | | | | $V_D = V_C$ | eh/h |
| | | | ow Speed, S _{FR} | 50.0 | | | | | |
| Conversion | | der Base | Conditions | ii . | 1 | 1 | i | ſ | |
| (pc/h) | (Veh/hr) | PHF | Terrain | %Truck | %Rv | f_HV | f _p | v = V/PHF x 1 | _{HV} x f _p |
| Freeway | 5210 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | 5566 | |
| Ramp | 1160 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | 1273 | |
| UpStream | 1300 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | 1427 | |
| DownStream | | | | | | | | | |
| | | • | Diverge Areas | | | | | | |
| Estimation o | of v ₁₂ | | | | Estimation | on of v ₁₂ | | | |
| | V ₁₂ = V | _F (P _{FM}) | | | | \/ - | \/ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | \D | |
| - _{EQ} = | .= | | 13-6 or 13-7) | | | v ₁₂ = | $V_R + (V_F - V_F)$ | | |
| P _{FM} = | | | ion (Exhibit 13-6) | 1 | L _{EQ} = | | (Equation 13- | • | |
| | | pc/h | | | P _{FD} = using Equation (Exhibit 13-7) | | | | |
| 12 = | | · - | on 13-14 or 13- | | V ₁₂ = pc/h | | | | |
| V_3 or V_{av34} | 17) | pc/ii (Lquaii | 011 13-14 01 13- | | ${ m V_3}$ or ${ m V_{av34}}$ | | pc/h (Equation ' | | |
| s V ₃ or V _{av34} > 2,7 | | es 🗹 No | | | Is V ₃ or V _{av34} | > 2,700 pc/h? | ☐Yes ☐No | | |
| s V ₃ or V _{av34} > 1.5 | | | | | Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No | | | | |
| Yes,V _{12a} = | | | on 13-16, 13- | | If Yes,V _{12a} = | | | n 13-16, 13-1 | 8, or |
| | 18, o | r 13-19) | | | | | (3-19) | | |
| Capacity Ch | ecks | | | | Capacity | Checks | | | |
| | Actual | C | apacity | LOS F? | | Actual | | pacity | LOS F? |
| | | | | | V_{F} | | Exhibit 13- | 8 | |
| V_{FO} | 6839 | Exhibit 13-8 | | No | $V_{FO} = V_{F}$ - | V_R | Exhibit 13- | 8 | |
| 10 | | | | | V _R | | Exhibit 13 | i- | |
| | <u> </u> | | | | | <u> </u> | 10 | | |
| | ng Merge I | | | 1 10 10 0 | Flow Ent | | erge Influer | | <i>r</i> |
| low Enterir | | | Desirable | Violation? | \/ | Actual | Max Des | irable | /iolation? |
| | Actual | | 4600:All | No | V ₁₂ | | Exhibit 13-8 | | |
| V _{R12} | Actual 4453 | Exhibit 13-8 | · · · · · | | II AVALAT | Service De | eterminatio | • • | |
| V _{R12} Level of Ser | Actual 4453 vice Deter | mination (| | | | | | | |
| V _{R12} Level of Ser D _R = 5.475 | Actual 4453 vice Deter + 0.00734 v _R + | | | | D | _R = 4.252 + (| 0.0086 V ₁₂ - 0 | .009 L _D | |
| V _{R12} Level of Ser D _R = 5.475 | Actual 4453 vice Deter + 0.00734 v _R + | mination (| | | D | _R = 4.252 + (:/mi/ln) | 0.0086 V ₁₂ - 0 | .009 L _D | |
| Level of Ser | Actual 4453 vice Deter + 0.00734 v _R + /mi/ln) | mination (| | | D _R = (pc | | 0.0086 V ₁₂ - 0 | .009 L _D | |
| V_{R12} Level of Ser $D_R = 5.475$ $D_R = 31.2 \text{ (pc/}$.OS = D (Exhib | Actual 4453 vice Deter + 0.00734 v _R + (mi/ln) it 13-2) | mination (| | | D _R = (pc LOS = (Ex | :/mi/ln) | | L _D | |
| V _{R12} Level of Ser D _R = 5.475 D _R = 31.2 (pc/ .OS = D (Exhib | Actual 4453 vice Deter + 0.00734 v _R + (mi/ln) it 13-2) rmination | mination (| | | D _R = (pc LOS = (Ex Speed De | :/mi/ln) khibit 13-2) | | .009 L _D | |
| V_{R12} Level of Ser $D_R = 5.475$ $D_R = 31.2 (pc/200)$ $D_R = 0 (Exhib)$ Speed Deter $M_S = 0.521 (Exhib)$ | Actual 4453 vice Deter + 0.00734 v _R + /mi/ln) it 13-2) rmination xibit 13-11) | mination (. 0.0078 V ₁₂ - 0. | | | $D_R = (pc)$ $D_R = (pc)$ $D_S = (Ex)$ $D_S = (Ex)$ | k/mi/ln) khibit 13-2) e terminati hibit 13-12) | on | .009 L _D | |
| V_{R12} Level of Ser $D_R = 5.475$ $D_R = 31.2 \text{ (pc/}$ $D_R = 0.521 \text{ (Exc.)}$ $D_R = 0.521 \text{ (Exc.)}$ $D_R = 0.521 \text{ (Exc.)}$ | Actual 4453 vice Deter + 0.00734 v _R + /mi/ln) it 13-2) rmination xibit 13-11) n (Exhibit 13-11) | mination (. 0.0078 V ₁₂ - 0.0 | | | $\begin{array}{c} D_{R} = & (pc) \\ D_{R} = & (Ex) \\ LOS = & (Ex) \\ \hline Speed De \\ D_{S} = & (Ex) \\ S_{R} = & mph \end{array}$ | c/mi/ln) chibit 13-2) eterminati hibit 13-12) n (Exhibit 13-12 | on | .009 L _D | |
| V_{R12} Level of Ser $D_R = 5.475$ $D_R = 31.2 \text{ (pc/}$ $D_R = 0.521 \text{ (Exhib}$ | Actual 4453 vice Deter + 0.00734 v _R + /mi/ln) it 13-2) rmination xibit 13-11) | mination (. 0.0078 V ₁₂ - 0.0 | | | $\begin{array}{c} D_{\rm R} = & {\rm ppc} \\ D_{\rm R} = & {\rm (pcc} \\ {\rm LOS} = & {\rm (Exc} \\ \hline \\ Speed \ D_{\rm S} = & {\rm (Exc} \\ S_{\rm R} = & {\rm mpcc} \\ S_{\rm 0} = & {\rm mpcc} \\ \end{array}$ | k/mi/ln) khibit 13-2) e terminati hibit 13-12) | on) | .009 L _D | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|-----------------------------|--|------------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB No-Build | 2020 |
| <u> </u> | th Street SIMR | | - , | | |
| ✓ Oper.(LOS) |) | | Des.(N) | ☐ Plaı | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 6370 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| DDITY - AADT XIXXD | | Venin | Up/Down % | 1111 | |
| Calculate Flow Adjusti | ments | | | | |
| - | 1.00 | | E _R | 1.2 | |
| f _p E _⊤ | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | | |
| · | | | Guio Opeca Aaj ana 110 | | |
| Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) | 3 70.0 | ft ft ramps/mi mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| Base free-flow Speed, BFFS | | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 2269 56.7 40.0 E | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | f _{HV} x f _p) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| Comorrolla | fo o 4: o | RAMPS | S AND RAM | | | RKS | HEET | | | |
|--------------------------------------|----------------------------|--------------------------|-----------------------------|---------------------------|---|------------------|--------------------------|----------------------------|------------------|--------------------------------------|
| General In | ormation | | | Site Infor | | ו טר אים | | | | |
| Analyst Agency or Comp | any AEC | ·OM | | eeway/Dir of Tr nction | avei | I-95 NB | | | | |
| Agency of Comp Date Performed | ally AEC | JOIVI | | risdiction | | | | | | |
| Analysis Time P | eriod PM | | | alysis Year | | No-Build | 1 2020 | | | |
| <u>-</u> | on SW 10th Stre | et SIMR | | | | | | | | |
| nputs | | | | | | | | | | |
| Upstream A | di Ramo | Freeway Numb | er of Lanes, N | 3 | | | | Ī | Downstre | am Adi |
| · | | Ramp Number | of Lanes, N | 1 | | | | | Ramp | am raj |
| ✓ Yes | ☑ On | Acceleration La | ane Length, L _A | | | | | | ☐Yes | ☐ On |
| □No | Off | Deceleration La | ane Length L _D | 220 | | | | | | |
| | | Freeway Volun | ne, V _F | 6370 | | | | | ✓ No | Off |
| L _{up} = | 3085 ft | Ramp Volume, | V _R | 680 | | | | | down = | ft |
| · | | | Flow Speed, S _{FF} | 70.0 | | | | | , | |
| $V_u =$ | 1160 veh/h | Ramp Free-Flo | | 45.0 | | | | | √ _D = | veh/h |
| Conversio | n to pc/h Un | | - 111 | 10.0 | | | | | | |
| | V | | | 0/ 🖚 1 | 0/ D | 7 | | | . – \//DLU | |
| (pc/h) | (Veh/hr) | PHF | Terrain | %Truck | %Rv | | HV | | | F x f _{HV} x f _p |
| Freeway | 6370 | 0.95 | Level | 3 | 0 | 0.9 | 85 | 1.00 | | 806 |
| Ramp | 680 | 0.92 | Level | 2 | 0 | 0.9 | 90 | 1.00 | - | 747 |
| UpStream | 1160 | 0.92 | Level | 2 | 0 | 0.9 | 90 | 1.00 | 1 | 273 |
| DownStream | | | | | | | | | | |
| | | Merge Areas | | | C-4: | : | | verge Areas | | |
| Estimation | or v ₁₂ | | | | Estimati | ion oi | V ₁₂ | | | |
| | $V_{12} = V_{1}$ | = (P _{FM}) | | | | | $V_{12} = Y_{12}$ | $V_R + (V_F - V_R)$ |)P _{FD} | |
| - _{EQ} = | (Equ | ation 13-6 or | 13-7) | | L _{EQ} = | | 745 | 4.65 (Equatio | n 13-12 | or 13-13) |
| P _{FM} = | using | g Equation (E | xhibit 13-6) | | P _{FD} = | | 0.5 | 55 using Equ | ation (Ext | nibit 13-7) |
| / ₁₂ = | pc/h | | , | | V ₁₂ = | | | 3 pc/h | ` | , |
| / ₃ or V _{av34} | • | (Equation 13- | 14 or 13-17) | | V_3 or V_{av34} | | | 3 pc/h (Equa | ition 13-1 | 4 or 13-17) |
| | 2,700 pc/h? ☐ Y € | | , | | | > 2 70 | | | 11.011 10 1 | 1 01 10 17) |
| | 1.5 * V ₁₂ /2 | | | | Is V_3 or $V_{av34} > 2,700$ pc/h? \square Yes \checkmark No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ \square Yes \checkmark No | | | | | |
| 0 4.0. | | es ∟ No (Equation 13- | 16 13-18 or | | no/h /Equation 12 16 12 19 or 12 | | | | | |
| Yes,V _{12a} = | 13-19 | | 10, 10 10, 01 | | If Yes,V _{12a} = | - | 19) | | 10 10, 10 | 7 10, 01 10 |
| Capacity C | hecks | | | | Capacity | y Che | cks | | | |
| | Actual | Ca | pacity | LOS F? | | | Actual | Сар | acity | LOS F? |
| | | | | | V _F | | 6806 | Exhibit 13-8 | 7200 | No |
| V_{FO} | | Exhibit 13-8 | | | $V_{FO} = V_{F}$ | - V _R | 6059 | Exhibit 13-8 | 7200 | No |
| - | | | | | V _R | | 747 | Exhibit 13-10 | 2100 | No |
| low Enter | ring Merge II | nfluence A | rea | <u> </u> | | terin | | ge Influenc | | |
| = 1101 | Actual | |)esirable | Violation? | | | ctual | Max Desirabl | | Violation? |
| V _{R12} | | Exhibit 13-8 | | - | V ₁₂ | _ | 113 | Exhibit 13-8 | 4400:All | No |
| | ervice Deter | | f not F) | | | | | ermination | | |
| | + 0.00734 v _R + | | | | | | | 0086 V ₁₂ - 0.0 | | - / |
| | - · · | 3.0070 12 | | | | | | 12 0.0 | -D | |
| D _R = (pc/mi/ln) | | | | | | 7.6 (pc/ı | • | | | |
| - | bit 13-2) | | | | | - | it 13-2) | | | |
| | ermination | | | | Speed D | | | | | |
| M _S = (Exibit 13-11) | | | | | ď | | hibit 13-1 | • | | |
| S _R = mph (Exhibit 13-11) | | | | | | 9.8 mph | (Exhibit 1 | 3-12) | | |
| S _R = mph (| | | | | | | | | | |
| | - | | | | $S_0 = 70$ |).2 mph | (Exhibit 1 | 3-12) | | |
| $S_0 = mph ($ | - | | | | ľ | - | (Exhibit 1 (Exhibit 1 | • | | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 12-E No-Build | Bet Off & On Hillsboro |
| Project Description SW 10t | h Street SIMR | | | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 5690 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjusti | ments | | | | |
| f _p E _⊤ | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T-1)+P_R(E_R-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD | 3 | ft ramps/mi | f _{LW} f _{LC} TRD Adjustment | | mph mph mph |
| FFS (measured) Base free-flow Speed, BFFS | 70.0 | mph mph | FFS | 70.0 | mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 2026 62.1 32.6 D | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-1 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | REEWAY | WEAVI | NG WOF | RKSHEE | <u>T</u> | | |
|---|---|------------------|--|---|--|--------------------------|----------------------|---------------------------------|-------------------------------|
| General | Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/Com Date Perforr Analysis Tim | ned | AECO! | М | | Freeway/Dir Weaving Seg Analysis Yea | gment Locati | | NB 3-Bet On & (uild 2020 | Off Hillsboro |
| Project Desc | ription SW 10t | h Street SIMF | ₹ | | | | | | |
| Inputs | | | | | 1 | | | | |
| Weaving seg Freeway free | nber of lanes, N ment length, L _e e-flow speed, Fl | S S | - David | 790ft 70 mph | Segment typ Freeway min Freeway max Terrain type | imum speed | | | Freeway 15 2400 Leve |
| Convers | V (veh/h) | PHF | Truck (%) | RV (%) | E _T | E _R | f | fp | v (pc/h) |
| V | 5060 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 5406 |
| V _{FF} V _{RF} | 630 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 692 |
| V _{FR} | 630 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 692 |
| V _{RR} | 0 | 0.95 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 0 |
| V _{NW} | 5406 | 1 | 1 | 1 | <u> </u> | | 1 | V = | 6790 |
| V _W | 1384 | | | | | | | | |
| VR | 0.204 | | | | | | | | |
| Configu | ration Cha | aracteris | tics | | | | | | |
| Minimum ma | aneuver lanes, l | N_{WL} | | 2 lc | Minimum weaving lane changes, $\mathrm{LC}_{\mathrm{MIN}}$ | | | | 1384 lc/h |
| Interchange | density, ID | | | 0.7 int/mi | Weaving lane changes, LC_W | | | | 1595 lc/h |
| Minimum RI | lane changes, | LC_{RF} | | 1 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | 771 lc/h |
| | R lane changes, | 111 | | 1 lc/pc | Total lane ch | nanges, LC _{AL} | L | | 2366 lc/h |
| Minimum RI | R lane changes | LC _{RR} | | lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | 299 |
| Weaving | g Segment | Speed, | Density, I | _evel of | | | | | |
| vicaving acginion new rate, v | | | Weaving intensity factor, W Weaving segment speed, S | | | 0.537 51.7 mph | | | |
| | | | | | Average weaving speed, S_{W} | | | 50.8 mph | |
| • | gment density, l | D | 32 | 2.9 pc/mi/ln | Average non-weaving speed, $S_{\rm NW}$ | | | 51.9 mph | |
| Level of Service, LOS D | | | | Maximum weaving length, L _{MAX} 4575 f | | | | | |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|--|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 14-E No-Build | Bet Off & On Hillsboro |
| Project Description SW 10t | h Street SIMR | | - | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 5690 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjusti | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance Number of Lanes, N | 3 | ft | f _{LW} f _{LC} | | mph mph |
| Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 70.0 | ramps/mi mph mph | TRD Adjustment FFS | 70.0 | mph mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 2026 62.1 32.6 D | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | REEWAY | / WEAV | | | T | | |
|---|---|---|------------|------------|--|-------------------------------|----------------------|------|-----------|
| Genera | l Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/Co Date Perfor Analysis Tir | med | AECO PM | М | | Freeway/Dir of Travel Weaving Segment Location Analysis Year I-95 NB Seg 15-Bet On & Off to Exp No-Build 2020 | | | | |
| Project Des | cription SW 10 | th Street SIMF | ₹ | | ı | | | | |
| Inputs | | | | | 1 | | | | |
| Weaving se | onfiguration Imber of lanes, Igment length, L De-flow speed, F | Segment type Freeway minimum speed, S _{MIN} Freeway maximum capacity, C _{IFL} Terrain type | | | | Freeway 18 2400 Leve | | | |
| Conver | sions to p | c/h Unde | r Base Co | ndition | S | | | | |
| | V (veh/h) | PHF | Truck (%) | RV (%) | Ε _T | E _R | f_{HV} | fp | v (pc/h) |
| V_{FF} | 4665 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 4984 |
| V_{RF} | 575 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 631 |
| V_{FR} | 1025 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1125 |
| V_{RR} | 65 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 71 |
| V _{NW} | 6740 | | | | | | | V = | 6811 |
| V _W | 71 | | | | | | | | |
| VR | 0.010 | | | | | | | | |
| Configu | ıration Ch | aracteris | tics | | | | | | |
| Minimum m | naneuver lanes, | N_{WL} | | 0 lc | Minimum weaving lane changes, LC _{MIN} | | | | 213 lc/h |
| Interchange | e density, ID | | | 0.7 int/mi | Weaving lane changes, LC_W | | | | 568 lc/h |
| Minimum R | F lane changes | , LC_{RF} | | 0 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | 3192 lc/h |
| Minimum F | R lane changes | , LC _{FR} | | 0 lc/pc | Total lane changes, LC _{ALL} | | | | 3760 lc/h |
| Minimum R | R lane changes | s, LC _{RR} | | 3 lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | 2201 |
| Weavin | g Segmen | t Speed, | Density, I | _evel of | Service, | and Cap | oacity | | |
| Weaving se | egment flow rate | e, v | | 6721 veh/h | Weaving inte | • | | | 0.191 |
| | egment capacity | ', C _w | | 6831 veh/h | Weaving segment speed, S | | | | 57.6 mph |
| Weaving Segment Worlding | | | | | Average weaving speed, S _w | | | | 61.2 mph |
| · · · · · · · · · · · · · · · · · · · | | | | | The state of the s | | | | 57.6 mph |
| IFEAE! 0! 96 | I VICE, LOS | | | Е | ıvıaxımum we | eaving length | 1, ∟ _{MAX} | | 5824 ft |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 16-N No-Build | North of Hillsboro |
| Project Description SW 10t | h Street SIMR | | | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5240 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| DDHV = AADTX K X D | | ven/n | Up/Down % | IIII | |
| Calculate Flow Adjusti | ments | | <u> </u> | | |
| | 1.00 | | | 1.2 | |
| f _p E _⊤ | 1.50 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 0.985 | |
| | 1.5 | | 111 | | |
| Speed Inputs | | | Calc Speed Adj and FFS | <u> </u> | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f _{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 1866 64.9 28.8 D | pc/h/ln mph pc/mi/ln | $\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|------------------------------------|--|-------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 1-Be | et Hillsboro & Palmetto |
| <u> </u> | h Street SIMR | | 7 thatyolo 1 oai | 770 Bana | 2020 |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | · · · | | <u> </u> |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 4540 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 4 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjusti | ments | | | | |
| | 1.00 | | | 1.2 | |
| f _p E _⊤ | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 0.980 | |
| | 1.5 | | 111 | | |
| Speed Inputs | | | Calc Speed Adj and FFS | <u> </u> | |
| Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| LOS and Performance | | • | Design (N) | | |
| Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$ LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | · | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | F | REEWAY | ' WEAV | ING WOF | RKSHEE | T | | |
|---|---|--------------------|------------|--|--|--------------------------|----------------------|----------|-------------------------------|
| Genera | l Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/Co Date Perfo Analysis Ti | med | AECO! | Л | | Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 2-Bet On from Exp Analysis Year No-Build 2020 | | | | ı Exp & Off |
| Project Des | cription SW 10t | h Street SIMF | ? | | 1 | | | | |
| Inputs | | | | | | | | | |
| Weaving se | onfiguration umber of lanes, N egment length, L _e ee-flow speed, Fl | 3 | | One-Sided 3 5085ft 70 mph | Segment typ Freeway min Freeway max Terrain type | imum speed | | | Freeway 15 2400 Leve |
| Conver | sions to po | c/h Unde | r Base Co | ndition | S | | | | |
| | V (veh/h) | PHF | Truck (%) | RV (%) | Ε _Τ | E _R | f_{HV} | fp | v (pc/h) |
| V_{FF} | 3440 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 3675 |
| V_{RF} | 1070 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1175 |
| V_{FR} | 1100 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1208 |
| V_RR | 120 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 132 |
| V_{NW} | 3807 | | | | | | | V = | 6190 |
| V _W | 2383 | | | | | | | | |
| VR | 0.385 | | | | | | | | |
| Config | uration Cha | aracteris | tics | | | | | | |
| Minimum n | naneuver lanes, l | N_{WL} | | 2 lc | Minimum weaving lane changes, LC _{MIN} | | | | 0 lc/h |
| - | e density, ID | | | 0.7 int/mi | Weaving lan | e changes, L | $-C_{W}$ | | 371 lc/h |
| Minimum F | RF lane changes, | LC_{RF} | | 0 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | 2538 lc/h |
| | R lane changes, | | | 0 lc/pc | Total lane ch | nanges, LC _{AL} | L | | 2909 lc/h |
| Minimum F | RR lane changes | , LC _{RR} | | lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | 1355 |
| Weavin | g Segment | t Speed, | Density, I | _evel of | Service, | and Cap | oacity | | |
| Weaving s | egment flow rate | , V | (| 6111 veh/h | Weaving inte | • | | | 0.145 |
| | egment capacity, | c_{w} | (| 6142 veh/h | Weaving segment speed, S | | | 61.2 mph | |
| vveaving segment v/c ratio | | | | | Average weaving speed, S _W | | | | 63.0 mph |
| 1 | | | | Average non-weaving speed, S _{NW} | | | 60.1 mph | | |
| Level of Se | ervice, LOS | | | D | Maximum we | eaving length | າ, L _{MAX} | | 6513 ft |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|--|------------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 3-Be No-Build | et Off & On Ramp |
| Project Description SW 10t | th Street SIMR | | | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 4510 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| DDHV = AADTX K X D | | ven/n | Grade % Length Up/Down % | mı | |
| Calculate Flow Adjusti | monte | | ' | | |
| | | | | 4.0 | |
| f _p ⊏ | 1.00 | | E _R | 1.2 | |
| E _T | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 5 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f_{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 1606 68.1 23.6 C | pc/h/ln mph pc/mi/ln | Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N | f _{HV} x f _p) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| Con 5 = 1 1 = | | AIVIPS AIVU | RAMP JUN | | | <u>L I</u> | | | |
|---|--|---|---|------------------------|---|---|---|--|--------------------------------------|
| | formation | | | Site Infor | | 0-0- | | | |
| Analyst | | 50014 | | eeway/Dir of Ti | | 95 SB | 11911 1 149 | | |
| Agency or Comp Date Performed | | ECOM | | ınction ırisdiction | S | seg 4-Merge from | m Hillsboro WB | | |
| Analysis Time P | | М | | nalysis Year | N | lo-Build 2020 | | | |
| | tion SW 10th S | | 7 | in joint i can | | IO Dalla 2020 | | | |
| nputs | | | | | | | | | |
| Jpstream Adj R | Damp. | Freeway Num | ber of Lanes, N | 3 | | | | Downstre | am Adi |
| Jpsilealli Auj K | Kamp | Ramp Numbe | er of Lanes, N | 1 | | | | Ramp | ani Auj |
| ✓ Yes | On | I ' | ane Length, L _A | 950 | | | | | |
| | _ | | Lane Length L _D | 300 | | | | ☐Yes | ☐ On |
| □ No □ | ☑ Off | | | 4510 | | | | ✓ No | Off |
| = 21 | 175 ft | Freeway Volu | | 4510 | | | | L _{down} = | ft |
| _{-up} = 21 | 175 11 | Ramp Volume | • • | 630 | | | | -down | ., |
| / _u = 12 | 220 veh/h | | e-Flow Speed, S _{FF} | 70.0 | | | | V _D = | veh/h |
| | | | low Speed, S _{FR} | 50.0 | | | | | |
| Conversio | on to pc/h L | Inder Base | Conditions | | _ | | | | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | f _{HV} | f _p | v = V/PH | F x f _{HV} x f _p |
| Freeway | 4510 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | | 4819 |
| Ramp | 630 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 692 |
| UpStream | 1220 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 1339 |
| DownStream | 1220 | 0.92 | Level | | 1 0 | 0.330 | 1.00 | | 1000 |
| 30miotroam | I | Merge Areas | | <u> </u> | | <u> </u> | Diverge Areas | · | |
| Estimation | n of V ₁₂ | | | | Estimation | | _ | | |
| | | V _F (P _{FM}) | | | | | | | |
| _ | 12 | I.15 (Equation | 12 6 or 12 7) | | | V ₁₂ = | $V_R + (V_F - V_R)$ | | |
| _{EQ} = | | | • | | L _{EQ} = | | (Equation 13- | -12 or 13- | 13) |
|) _{FM} = ' – | | | tion (Exhibit 13-6) |) | P _{FD} = | | using Equation | n (Exhibit 1 | 3-7) |
| ′ ₁₂ = | | pc/h | on 10 11 or 10 | | V ₁₂ = | | pc/h | | |
| V_3 or V_{av34} | 190 | pc/n (Equati | on 13-14 or 13- | | ${ m V_3}$ or ${ m V_{av34}}$ | | pc/h (Equation 1 | 13-14 or 13- | 17) |
| Is V ₃ or V _{2v34} > | 2,700 pc/h? | Yes ▼No | | | Is V ₃ or V _{av34} | > 2,700 pc/h? | ☐Yes ☐ No | | |
| | 1.5 * V ₁₂ /2 | | | | Is V ₃ or V _{av34} | > 1.5 * V ₁₂ /2 | ☐Yes ☐No | | |
| | | ⊢ pc/h (Equati | on 13-16, 13- | | If Yes,V _{12a} = | | pc/h (Equatio | n 13-16, 1 | 3-18, or |
| Yes,V _{12a} = | | or 13-19) | | | 1 55,1 12a | 1 | 3-19) | | |
| Capacity (| Checks | | | | Capacity | Checks | | | |
| | Actual | (| Capacity | LOS F? | | Actual | | pacity | LOS F? |
| | | | | | V_{F} | | Exhibit 13- | 8 | |
| | | F.,h;h;t 42 0 | | No | $V_{FO} = V_{F}$ - | V _R | Exhibit 13- | 8 | |
| V _{EO} | 5511 | EXHIBIT 13-01 | | | | | Exhibit 13 | - | |
| V_{FO} | 5511 | Exhibit 13-8 | | | \/_ | I | | | |
| | | | | <u> </u> | V _R | | 10 | | |
| | ring Merge | Influence A | | | | | 10 erge Influen | | W. |
| Flow Ente | ering Merge Actual | Influence A | Desirable | Violation? | Flow Ent | ering Dive | 10 erge Influer Max Des | | Violation' |
| Flow Ente | ering Merge Actual 3603 | Influence A Max Exhibit 13-8 | Desirable 4600:All | Violation? | Flow Ent | Actual | rge Influen Max Des Exhibit 13-8 | irable | Violation' |
| Flow Ente | Actual 3603 | Influence A Max Exhibit 13-8 | Desirable 4600:All if not F) | 1 | Flow Ent | Actual | 10 erge Influer Max Des | irable | Violation' |
| V _{R12} Level of S | Actual 3603 | Influence A Max Exhibit 13-8 | Desirable 4600:All if not F) | 1 | Flow Ent | Actual Service De | rge Influen Max Des Exhibit 13-8 | irable n (if no | Violation' |
| V _{R12} Level of S | Actual 3603 | Influence A Max Exhibit 13-8 | Desirable 4600:All if not F) | 1 | Flow Ent | Actual Service De | 10 erge Influer Max Des Exhibit 13-8 eterminatio | irable n (if no | Violation' |
| Flow Enteroverse V_{R12} Level of South $D_R = 5.4$ $D_R = 27.3$ (| Actual 3603 Service Dete | Influence A Max Exhibit 13-8 | Desirable 4600:All if not F) | 1 | Flow Ent | Actual Service De R = 4.252 + 0 | 10 erge Influer Max Des Exhibit 13-8 eterminatio | irable n (if no | Violation |
| V _{R12} Level of S D _R = 27.3 (.OS = C (Ex | Actual 3603 Service Detector 475 + 0.00734 v proceomi/ln) chibit 13-2) | Influence A Max Exhibit 13-8 ermination (+ 0.0078 V ₁₂ - 0. | Desirable 4600:All if not F) | 1 | Flow Enter | Actual Service De R = 4.252 + (c/mi/ln) (hibit 13-2) | Max Des Exhibit 13-8 Eterminatio 0.0086 V ₁₂ - 0 | irable n (if no | Violation' |
| Flow Enteropy V_{R12} Level of S $D_R = 5.4$ $D_R = 27.3$ (D | Actual 3603 Service Dete 475 + 0.00734 v p (pc/mi/ln) khibit 13-2) termination | Influence A Max Exhibit 13-8 ermination (+ 0.0078 V ₁₂ - 0. | Desirable 4600:All if not F) | 1 | Flow Ent | Actual Service De R = 4.252 + (c/mi/ln) Achibit 13-2) Seterminati | Max Des Exhibit 13-8 Eterminatio 0.0086 V ₁₂ - 0 | irable n (if no | Violation |
| Flow Enter V_{R12} Level of Si $D_R = 5.4$ $D_R = 27.3$ ($D_R = 27.3$ (| Actual 3603 Service Detector 475 + 0.00734 v (pc/mi/ln) shibit 13-2) termination 0 (Exibit 13-11) | Influence A Max Exhibit 13-8 Ermination (+ 0.0078 V ₁₂ - 0. | Desirable 4600:All if not F) | 1 | Flow Enternation V ₁₂ Level of S D _R = (pc) LOS = (Ex Speed De D _s = (Ext | Actual Service De R = 4.252 + (c/mi/ln) chibit 13-2) etermination hibit 13-12) | Max Des Exhibit 13-8 Exermination 0.0086 V ₁₂ - 0 | irable n (if no | Violation' |
| Flow Enter V_{R12} Level of S $D_R = 5.4$ $O_R = 27.3$ ($OS = C$ (Ex. Speed Det $M_S = 0.369$ $S_R = 59.7$ r | Actual 3603 Service Dete 475 + 0.00734 v p (pc/mi/ln) khibit 13-2) termination 9 (Exibit 13-11) mph (Exhibit 13- | Influence A Max Exhibit 13-8 Exhibit 13-8 | Desirable 4600:All if not F) | 1 | Flow Enternation V ₁₂ Level of S D _R = (pc LOS = (Ex Speed De S _R = (Exi S _R = mph | Actual Service De R = 4.252 + (c/mi/ln) chibit 13-2) eterminati hibit 13-12) n (Exhibit 13-12 | Max Des Exhibit 13-8 Exerminatio 0.0086 V ₁₂ - 0 | irable n (if no | Violation' |
| Flow Enter V_{R12} Level of Solution $D_R = 5.4$ $OS = C$ (Excepted Determine) $M_S = 0.369$ | Actual 3603 Service Detector 475 + 0.00734 v (pc/mi/ln) shibit 13-2) termination 0 (Exibit 13-11) | Influence A Max Exhibit 13-8 Permination (| Desirable 4600:All if not F) | 1 | Flow Enter V_{12} Level of V_{12} V_{12} V_{12} V_{12} V_{12} V_{12} V_{13} V_{14} V_{15} V_{15 | Actual Service De R = 4.252 + (c/mi/ln) chibit 13-2) etermination hibit 13-12) | Max Des Exhibit 13-8 Exermination 0.0086 V ₁₂ - 0 | irable n (if no | Violation' |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|---|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I95/SB Seg 5-Be Ramps No-Build | et WB On & EB On |
| Project Description SW 10th | h Street SIMR | | , | | |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5140 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % | 0.95 3 0 Level mi | |
| Calculate Flow Adjustn | nents | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) | 3 70.0 | ft ft ramps/mi mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| Base free-flow Speed, BFFS | N # | mph | Desta (AD) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N x) S D = v _p / S LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | REEWAY | WEAV | | | <u> </u> | | |
|---|---|---------------------|------------|------------------------------------|--|--------------------------|---------------------------|------|-------------------------------|
| Genera | l Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/Co Date Perfo Analysis Ti | med | AECO AM | М | | Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 6- Bet Hillsboro & 10th S Analysis Year No-Build 2020 | | | | |
| Project Des | scription SW 10 | th Street SIMF | ₹ | | 1 | | | | |
| Inputs | | | | | | | | | |
| Weaving no Weaving se Freeway fre | onfiguration umber of lanes, egment length, L ee-flow speed, F | s FS | | One-Sided 4 1830ft 70 mph | Segment type Freeway min Freeway max Terrain type | imum speed | | | Freeway 19 2400 Leve |
| Conver | sions to p | c/h Unde | r Base Co | ndition | 5 | | | | |
| | V (veh/h) | PHF | Truck (%) | RV (%) | E _T | E _R | f_{HV} | fp | v (pc/h) |
| V_{FF} | 3960 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 4231 |
| V_{RF} | 740 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 812 |
| V_{FR} | 1180 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1295 |
| V_{RR} | 0 | 0.95 | 0 | 0 | 1.5 | 1.2 | 1.000 | 1.00 | 0 |
| V _{NW} | 4231 | | | | | | | V = | 6338 |
| V_W | 2107 | | | | | | | | |
| VR | 0.332 | | | | | | | | |
| Config | uration Ch | aracteris | tics | | • | | | | |
| Minimum n | naneuver lanes, | N_{WL} | | 2 lc | Minimum we | aving lane c | hanges, LC _{MIN} | ı | 812 lc/h |
| | e density, ID | | | 0.7 int/mi | Weaving lan | e changes, L | $-C_{W}$ | | 1185 lc/h |
| Minimum F | RF lane changes | , LC _{RF} | | 1 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | 1093 lc/h |
| Minimum F | R lane changes | , LC _{FR} | | 0 lc/pc | Total lane ch | nanges, LC _{AL} | L | | 2278 lc/h |
| Minimum F | RR lane changes | s, LC _{RR} | | lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | 542 |
| Weavin | g Segmen | t Speed, | Density, I | _evel of | | - | _ | | |
| | egment flow rate | • | (| 6256 veh/h | Weaving inte | • | | | 0.269 |
| | egment capacity | ', C _w | | 7113 veh/h | Weaving seg | | | | 57.1 mph |
| _ | egment v/c ratio | D | 0- | 0.879 | Average wea | | ** | | 58.4 mph |
| _ | egment density, ervice, LOS | ט | 2. | 7.7 pc/mi/ln C | | | | | 56.5 mph |
| Feaci Oi Of | FIVIUE, LUS | | | C | iviaximum we | eaving length | ı, L _{MAX} | | 5934 ft |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|--|-------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 7-Be | et Off & On Ramp |
| Project Description SW 10 | th Street SIMR | | - , | | |
| ✓ Oper.(LOS | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 4700 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| | | | Up/Down % | | |
| Calculate Flow Adjust | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | <u> </u> | |
| Lane Width | | ft | · | | |
| Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design he | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| 73 6 6 6 4 6 1 I E - | | WII O AILD | KAMP JUN | | ORKSHE | EI | | | |
|--|---|---|-------------------------------------|-----------------------------|---|--|--|---|----------------------|
| General Infor | mation | | | Site Infor | | | | | |
| Analyst | | | | eeway/Dir of Tr | | 95 SB | | | |
| Agency or Company | AEC | OM | | inction | S | eg 8-Merge fro | m 10th St | | |
| Date Performed Analysis Time Period | d AM | | | ırisdiction nalysis Year | N | lo-Build 2020 | | | |
| Project Description | | BORO BOULF | | lalysis i cai | IN | IO-Dulla 2020 | | | |
| Inputs | 100711111220 | DOI TO DOULL | 77 (1.05 HVII C | | | | | | |
| • | | Freeway Num | ber of Lanes, N | 3 | | | | Downstra | am Adi |
| Jpstream Adj Ramp | | Ramp Numbe | | 1 | | | | Downstre Ramp | eam Auj |
| ✓ Yes □ On | 1 | | ane Length, L | 1470 | | | | | |
| | | 1 | ane Length L _D | 1470 | | | | ☐Yes | ☐ On |
| ☐ No ✓ Off | f | 1 | | 4700 | | | | ✓ No | Off |
| - _{up} = 2210 | ft | Freeway Volu | | 4700 | | | | L _{down} = | ft |
| _{-up} = 2210 | 11 | Ramp Volume | | 1220 | | | | down | |
| √ _u = 1180 v | /eh/h | | -Flow Speed, S _{FF} | 70.0 | | | | V _D = | veh/h |
| | | | ow Speed, S _{FR} | 50.0 | | | | | |
| Conversion to | . <i>-</i> | der Base (| Conditions | | <u> </u> | | T | 1 | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | f_{HV} | f _p | v = V/PH | $F x f_{HV} x f_{p}$ |
| Freeway | 4700 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | | 5022 |
| Ramp | 1220 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | + | 1339 |
| UpStream | 1180 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | 1 | 1295 |
| DownStream | | | | | | | | | |
| | | Merge Areas | | | | | Diverge Areas | | |
| Estimation of | ^F V ₁₂ | | | | Estimation | on of v ₁₂ | | | |
| | V ₁₂ = V _F | (P _{FM}) | | | | \/ - | : V _R + (V _F - V _F | \D | |
| - _{EQ} = | 2226.93 | (Equation | 13-6 or 13-7) | | \ _ | v ₁₂ – | | | 40) |
| P _{FM} = | | | ion (Exhibit 13-6) | 1 | L _{EQ} = | | (Equation 13 | | • |
| / ₁₂ = | 3101 | | ion (Exhibit to 0) | | P _{FD} = | | using Equation | on (Exhibit 1 | 13-7) |
| | | - | on 13-14 or 13- | | V ₁₂ = | | pc/h | | |
| V_3 or V_{av34} | 17) | pom (Equali | 311 10 11 01 10 | | $\mathrm{V_3}$ or $\mathrm{V_{av34}}$ | | pc/h (Equation | | 17) |
| Is V_3 or $V_{av34} > 2,70$ | 0 pc/h? | s 🗹 No | | | | | ☐Yes ☐ No | | |
| s V ₃ or V _{av34} > 1.5 * | 'V ₁₂ /2 ☑ Ye | s 🗌 No | | | Is V ₃ or V _{av34} | > 1.5 * V ₁₂ /2 | ☐ Yes ☐ No | | |
| 3 av34 | | | on 13-16, 13- | | If Yes,V _{12a} = | , | pc/h (Equatio 13-19) | on 13-16, 1 | 13-18, or |
| | 3101 | | | | | | 10-10) | | |
| Yes,V _{12a} = | 3101 18, or | pc/h (Equation 13-19) | | | 0 | Obsales | - | | |
| Yes,V _{12a} = | 3101 18, or | 13-19) | | 10050 | Capacity | 11" | · | unacit: | 100.50 |
| f Yes,V _{12a} = | 3101 18, or | 13-19) | Capacity | LOS F? | | Checks Actual | | pacity | LOS F? |
| Yes,V _{12a} = Capacity Che | 3101 18, or | 13-19) | | LOS F? | V _F | Actua | Exhibit 13- | -8 | LOS F? |
| Yes,V _{12a} = | 3101 18, or | 13-19) | | LOS F? | | Actua | Exhibit 13- Exhibit 13- | -8 | LOS F? |
| Yes,V _{12a} = Capacity Che | 3101 18, or ecks Actual | 13-19) C | | | V _F | Actua | Exhibit 13- Exhibit 13- Exhibit 13 | -8 | LOS F? |
| Yes,V _{12a} = Capacity Che | 3101 18, or PCKS Actual 6361 | C Exhibit 13-8 | apacity | | V_F $V_{FO} = V_F - V_R$ | Actual V _R | Exhibit 13- Exhibit 13- Exhibit 13 10 | -8 -8 3- | |
| Yes,V _{12a} = Capacity Che | 3101 18, or cks Actual 6361 | Exhibit 13-8 | apacity | No | V_F $V_{FO} = V_F - V_R$ | Actual V _R | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer | 8 8 B- | 3 |
| f Yes,V _{12a} = Capacity Che V _{FO} | 3101 18, or ecks Actual 6361 | Exhibit 13-8 The state of the | Capacity Lirea Desirable | No Violation? | V_{F} $V_{FO} = V_{F} - V_{R}$ Flow Ent | Actual V _R | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des | 8 8 B- | |
| f Yes,V _{12a} = Capacity Che V _{FO} Flow Entering V _{R12} | 3101 18, or ecks Actual 6361 g Merge In Actual 4440 | Exhibit 13-8 Max Exhibit 13-8 | capacity Area Desirable 4600:All | No | $V_{FO} = V_{F} - V_{R}$ Flow Ent | V _R ering Dive | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 | Yiolation? |
| f Yes,V _{12a} = Capacity Che V _{FO} Flow Entering V _{R12} Level of Serve | 3101 18, or ecks Actual 6361 G Merge In Actual 4440 ice Detern | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (| rea Desirable 4600:All | No Violation? | V_{F} $V_{FO} = V_{F} - V_{R}$ Flow Ent | Actual V _R ering Dive Actual Service De | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Erge Influer Max Des Exhibit 13-8 Etermination | 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| Flow Entering V _{R12} Level of Server D _R = 5.475 + | 3101 18, or ecks Actual 6361 G Merge In Actual 4440 ice Detern 0.00734 v _R + 0 | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (| rea Desirable 4600:All | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of S | Actual VR Actual Actual Service Do R = 4.252 + 6 | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| f Yes, V_{12a} = Capacity Che V_{FO} Flow Entering V_{R12} Level of Serve $D_R = 5.475 + 0$ $D_R = 30.3 \text{ (pc/m}$ | 3101 18, or ecks Actual 6361 GMerge In Actual 4440 ice Detern 0.00734 v R + 0 | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (| rea Desirable 4600:All | No Violation? | $V_{FO} = V_{F} - V_{R}$ Flow Enter V_{12} Level of Signature in the property of the proper | Actual Pering Dive Actual Actual Service Decorption R = 4.252 + 6 Actual | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Erge Influer Max Des Exhibit 13-8 Etermination | 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| f Yes, V_{12a} = Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv D_R = 5.475 + D_R = 30.3 (pc/m OS = D (Exhibit | 3101 18, or ecks Actual 6361 G Merge In Actual 4440 ice Detern 0.00734 v _R + 0 ii/ln) 13-2) | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (| rea Desirable 4600:All | No Violation? | $V_{FO} = V_{F} - V_{R}$ $Flow Ent$ V_{12} $Level of S$ $D_{R} = (pc)$ $LOS = (Ex)$ | Actual V _R Pering Dive Actual Service De Emilling Actual | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 | 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| f Yes, V_{12a} = Capacity Che V_{FO} Flow Entering V_{R12} Level of Serve $D_R = 5.475 + D_R = 30.3 \text{ (pc/m}$ $OS = D \text{ (Exhibit)}$ Speed Determ | 3101 18, or ecks Actual 6361 G Merge In Actual 4440 ice Detern 0.00734 v _R + 0 ii/ln) 13-2) | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (| rea Desirable 4600:All | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of S $D_R = (pc)$ $LOS = (Ex)$ Speed De | Actual Pering Diversity Actual Service December Actual Service December Actual Service December Actual | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 | 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| FYes, V_{12a} = Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv D_R = 5.475 + D_R = 30.3 (pc/m .OS = D (Exhibit | 3101 18, or 18, or 1 | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (| rea Desirable 4600:All | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of Signature V_{12} $V_{13} = V_{14}$ $V_{14} = V_{15}$ $V_{15} =$ | Actual V _R Pering Dive Actual Service De Actual Service De Actual Service De Actual Actual | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13-8 Exhibit 13- | 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| Fyes, V_{12a} = Capacity Che V_{FO} Flow Entering V_{R12} Level of Serve $D_R = 5.475 + 0$ $D_R = 30.3 \text{ (pc/m}$ $D_R = 0.505 \text{ (Exit)}$ | 3101 18, or 18, or 1 | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (| rea Desirable 4600:All | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of S $D_R = (pc)$ $D_S = (Ex)$ $D_S = (Ex)$ $D_S = (Ex)$ $D_S = (Ex)$ | Actual VR Actual Service Do R = 4.252 + 0 Activity in the control of the con | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Etermination 0.0086 V ₁₂ - 0 | 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| Fives, $V_{12a} =$ Capacity Che V_{FO} Flow Entering V_{R12} Level of Serve $D_R = 5.475 +$ $D_R = 30.3 \text{ (pc/m}$ $OS = D \text{ (Exhibit)}$ Speed Determ $M_S = 0.505 \text{ (Exit)}$ $S_R = 55.9 \text{ mph}$ | 3101 18, or 18, | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (| rea Desirable 4600:All | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of S $D_R = (pc)$ $LOS = (Ex)$ $D_S = (Ex)$ | Actual V _R Pering Dive Actual Service De Actual Service De Actual Service De Actual Actual | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Etermination 0.0086 V ₁₂ - 0 | 8 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|------------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 9-Be No-Build | et 10th & Exit to Exp |
| Project Description SW 10 | th Street SIMR | | | | |
| ✓ Oper.(LOS |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 5920 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjusti | ments | | | | |
| f _p | 1.00 | | E _R | 1.2 | |
| P E _T | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f_{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | r |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | × f _{HV} × f _p) 2108 60.4 34.9 D | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | f _{HV} x f _p) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| 0 11 - 5 - | | RAMPS | AND RAMI | | | RKS | HEET | | | |
|--|--------------------------|--------------------------|-----------------------------|----------------------|---------------------------------------|--------------------|-------------------|----------------------------|---------------------|-------------|
| General Info | rmation | | | Site Infor | | | | | | |
| Analyst | | | | eeway/Dir of Tr | | I-95 SE | | _ | | |
| Agency or Compar Date Performed | ny AEC | OM | | nction risdiction | | Seg 10 | - Diverge to | Express | | |
| Analysis Time Peri | od AM | | | alysis Year | | No-Rui | ld 2020 | | | |
| Project Description | | et SIMR | 7 11. | aryolo rour | | TTO Bui | 14 2020 | | | |
| nputs | | | | | | | | | | |
| Upstream Adj | Ramp | Freeway Numb | er of Lanes, N | 3 | | | | | Downstrea | am Adi |
| | • | Ramp Number | of Lanes, N | 1 | | | | | Ramp | 7 taj |
| ✓ Yes | ✓ On | Acceleration La | ne Length, L _∆ | | | | | | Yes | ☐ On |
| □No | Off | Deceleration La | ane Length L _n | 300 | | | | | | |
| | | Freeway Volum | ne, V _F | 5920 | | | | | ✓ No | Off |
| L _{up} = | 6000 ft | Ramp Volume, | V _D | 860 | | | | I | - _{down} = | ft |
| • | | | Flow Speed, S _{FF} | 70.0 | | | | Į, | | |
| $V_{u} =$ | 1220 veh/h | Ramp Free-Flo | | 45.0 | | | | | √ _D = | veh/h |
| Conversion | to pc/h Un | | 111 | 10.0 | | | | | | |
| | V | | | 0/ Truck | 0/ Dv | | f | f | , – \//DHE | vf vf |
| (pc/h) | (Veh/hr) | PHF | Terrain | %Truck | %Rv | _ | f _{HV} | | / = V/PHF | <u> </u> |
| Freeway | 5920 | 0.95 | Level | 3 | 0 | _ | 985 | 1.00 | | 25 |
| Ramp | 860 | 0.92 | Level | 2 | 0 | | 990 | 1.00 | | 14 |
| UpStream | 1220 | 0.92 | Level | 2 | 0 | 0. | 990 | 1.00 | 13 | 39 |
| DownStream | | <u> </u> | | | | | | | | |
| Estimation (| of w | Merge Areas | | | Ectimoti | iono | | iverge Areas | | |
| Estimation of | | | | | Estimati | | | | | |
| | $V_{12} = V_{F}$ | - (P _{FM}) | | | | | V ₁₂ = | $V_R + (V_F - V_R)$ |)P _{FD} | |
| - _{EQ} = | (Equ | ation 13-6 or 1 | 3-7) | | L _{EQ} = | | 92 | 51.65 (Equation | on 13-12 o | r 13-13) |
| P _{FM} = | using | Equation (E | khibit 13-6) | | P _{FD} = | | 0.5 | 558 using Equ | ation (Exhi | bit 13-7) |
| ′ ₁₂ = | pc/h | | | | V ₁₂ = | | 39 | 49 pc/h | | |
| / ₃ or V _{av34} | pc/h | (Equation 13- | 14 or 13-17) | | V ₃ or V _{av34} | | 23 | 76 pc/h (Equa | ition 13-14 | or 13-17) |
| Is V ₃ or V _{av34} > 2,7 | | | • | | | , > 2,7 | | Yes ☑ No | | , |
| Is V_3 or $V_{av34} > 1.5$ | | | | | | | | Yes ☑ No | | |
| 0 4.0. | | (Equation 13- | 16, 13-18, or | | | | | c/h (Equation | 13-16, 13- | -18, or 13- |
| Yes,V _{12a} = | 13-19 | | | | If Yes,V _{12a} = | | 19 | | | |
| Capacity Ch | | T . | | 1 | Capacity | y Ch | | 1 . | | 1 |
| | Actual | Ca | pacity | LOS F? | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | | Actual | | acity | LOS F? |
| | | | | | V _F | | 6325 | Exhibit 13-8 | 7200 | No |
| V_{FO} | | Exhibit 13-8 | | | $V_{FO} = V_{F}$ | - V _R | 5381 | Exhibit 13-8 | 7200 | No |
| | | | | | V_R | | 944 | Exhibit 13-10 | 2100 | No |
| low Enterin | ng Merge li | nfluence Ai | rea | | Flow En | terin | g Diver | ge Influenc | e Area | |
| | Actual | Max D | esirable | Violation? | | | Actual | Max Desirabl | е | Violation? |
| V_{R12} | | Exhibit 13-8 | | | V ₁₂ | | 3949 | Exhibit 13-8 | 4400:All | No |
| Level of Ser | vice Deter | mination (it | f not F) | | Level of | Ser | vice De | termination | (if not | F) |
| $D_R = 5.475 + 0$ | 0.00734 v _R + | 0.0078 V ₁₂ - | 0.00627 L _A | | I | D _R = 4 | 1.252 + 0. | 0086 V ₁₂ - 0.0 | 009 L _D | |
|) _R = (pc/mi/ | ln) | | | | D _R = 37 | '.2 (pc | /mi/ln) | | | |
| .OS = (Exhibi | t 13-2) | | | | | | oit 13-2) | | | |
| Speed Deter | • | | | | Speed D | • | | n | | |
| | | | | | | | xhibit 13- | | | |
| $M_{\rm S} = $ (Exibit | - | | | | - | | | - | | |
| | khibit 13-11) | | | | | - | (Exhibit | • | | |
| | khibit 13-11) | | | | ľ | - | (Exhibit | • | | |
| S = mph (E) | khibit 13-13) | | | | S = 63 | 3.2 mph | (Exhibit | 13-13) | | |
| | | | | | | | | | | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|--|------------------------------------|--|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 11-E No-Build | Bet Off Exp Off Sample |
| Project Description SW 10t | h Street SIMR | | | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 5060 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjusti | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | <u> </u> | |
| · | | | Guio opoda 7 taj una 111 | | |
| Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| LOS and Performance | Massuras | • | Design (N) | | |
| Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$ LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base free | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| 0 | . | RAMPS | S AND RAMI | | | RKS | HEET | | | |
|-------------------------------------|----------------------------------|-----------------|-----------------------------|----------------------|---------------------------------------|---------------------|-----------------|---|------------------|------------------------------------|
| General In | Tormation | | | Site Infor | | | | | | |
| Analyst | | 2014 | | eeway/Dir of Tr | | I-95 SE | | 0 | | |
| Agency or Comp Date Performed | any AEC | OM | | nction risdiction | | Seg 12 | - Diverge to | Sample Rd | | |
| Analysis Time P | eriod AM | | | alysis Year | | No-Bui | ld 2020 | | | |
| | on SW 10th Stre | et SIMR | 7 11. | aryono i oar | | I TO Dai | 10 2020 | | | |
| nputs | | | | | | | | | | |
| Upstream A | .di Ramp | Freeway Numb | er of Lanes, N | 3 | | | | | Downstrea | am Adi |
| · | | Ramp Number | of Lanes, N | 1 | | | | | Ramp | |
| ✓ Yes | On | Acceleration La | ne Length, L _A | | | | | | Yes | ☐ On |
| □No | ✓ Off | Deceleration La | ane Length L _D | 250 | | | | | ✓ No | Off |
| | | Freeway Volun | ne, V _F | 5060 | | | | | | |
| L _{up} = | 2000 ft | Ramp Volume, | V_R | 880 | | | | Į. | _down = | ft |
| \ | | Freeway Free- | Flow Speed, S _{FF} | 70.0 | | | | ļ | V _D = | veh/h |
| $V_u =$ | 860 veh/h | Ramp Free-Flo | w Speed, S _{FR} | 45.0 | | | | | v D – | veii/ii |
| Conversio | n to pc/h Un | der Base C | Conditions | | | | | | | |
| (pc/h) | V () () () () | PHF | Terrain | %Truck | %Rv | | f _{HV} | f _p | / = V/PHF | x f _{HV} x f _p |
| Freeway | (Veh/hr) 5060 | 0.95 | Level | 3 | 0 | _ | 985 | 1.00 | | 06 |
| Ramp | 880 | 0.93 | Level | 2 | 0 | | 990 | 1.00 | | 66 66 |
| UpStream | 860 | 0.92 | Level | 2 | 0 | | 990 | 1.00 | | 14 |
| DownStream | 800 | 0.92 | Level | | U | 1 0. | 990 | 1.00 | 3' | +4 |
| Jownoucum | | Merge Areas | | | | | Di | iverge Areas | | |
| Stimation | of v ₁₂ | | | | Estimati | on o | | | | |
| | V ₁₂ = V ₁ | - (P-14) | | | | | | V _R + (V _F - V _R |)P _{EB} | |
| - _{EQ} = | | ation 13-6 or 1 | 13-7) | | L _{EQ} = | | | Equation 13-12 | |) |
| _ | | g Equation (E | • | | | | • | 80 using Equ | | • |
| P _{FM} = / – | • | Lquation (L | KIIIDIL 13-0) | | P _{FD} = | | | | alion (Exili | DIL 13-7) |
| / ₁₂ = | pc/h | /F !: 40 | 44 40 47) | | V ₁₂ = | | | 43 pc/h | | |
| / ₃ or V _{av34} | | (Equation 13- | 14 or 13-17) | | V ₃ or V _{av34} | . 0.7 | | 63 pc/h (Equa | ation 13-14 | l or 13-17) |
| | 2,700 pc/h? ☐ Y€ | | | | | | | Yes ✓ No | | |
| Is V_3 or V_{av34} > | 1.5 * V ₁₂ /2 | | 10 10 10 | | Is V ₃ or V _{av3} | ₃₄ > 1.5 | | Yes ✓ No | | |
| Yes,V _{12a} = | pc/h 13-19 | (Equation 13- | 16, 13-18, or | | If Yes,V _{12a} = | | ро 19 | c/h (Equation | 13-16, 13 | -18, or 13- |
| Capacity C | | , | | | Capacity | y Ch | | , | | |
| • | Actual | Ca | pacity | LOS F? | | | Actual | Car | acity | LOS F? |
| | | | | | V _F | | 5406 | Exhibit 13-8 | 7200 | No |
| V_{FO} | | Exhibit 13-8 | | | $V_{FO} = V_{F}$ | - V _R | 4440 | Exhibit 13-8 | 7200 | No |
| . 0 | | | | | V _R | - 1 | 966 | Exhibit 13-10 | - | No |
| low Enter | ring Merge II | nfluence A | rea | <u> </u> | | terin | | ge Influenc | | 1 |
| .ov Lines | Actual | | esirable | Violation? | | - I | Actual | Max Desirabl | | Violation? |
| V _{R12} | | Exhibit 13-8 | - 3 | | V ₁₂ | _ | 3543 | Exhibit 13-8 | 4400:All | No |
| | ervice Deter | | f not F) | | | | | ermination | | |
| | + 0.00734 v _R + | | | | | | | 0086 V ₁₂ - 0.0 | | • / |
|) _R = (pc/m | 7.7 | -12 | | | | • • | /mi/ln) | 12 0.0 | - D | |
| ** | bit 13-2) | | | | | | oit 13-2) | | | |
| ` | ermination | | | | Speed D | - | | n | | |
| | | | | | | | | | | |
| | it 13-11) | | | | ľ | - | xhibit 13- | • | | |
| | Exhibit 13-11) | | | | | - | (Exhibit 1 | • | | |
| $S_0 = mph ($ | Exhibit 13-11) | | | | ľ | | (Exhibit 1 | 13-12) | | |
| | | | | | | | | | | |
| | Exhibit 13-13) | | | | S = 63 | .2 mph | (Exhibit 1 | 13-13) | | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|---|--|----------------------------|---|------------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 13-L No-Build | Bet Off & On Ramps |
| Project Description SW 10 | th Street SIMR | | | | |
| ✓ Oper.(LOS |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 4180 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjust | ments | | · · · · · · · · · · · · · · · · · · · | | |
| - | 1.00 | | E _R | 1.2 | |
| f _p E _T | 1.5 | | $F_{\text{HV}} = 1/[1+P_{\text{T}}(E_{\text{T}} - 1) + P_{\text{R}}(E_{\text{R}} - 1)]$ | 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f_{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | 3 | mph | | | · |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 1489 69.0 21.6 C | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | f _{HV} x f _p) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h | S - Speed D - Density FFS - Free-flow BFFS - Base free | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | REEWAY | WEAV | NG WOR | RKSHEE | T | | |
|---|--|-----------------|-----------|--------------------------|--|----------------|---------------------------|------|-------------------------------|
| Genera | I Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/Co Date Perfoi Analysis Tii | med | AECON AM | И | | Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 14- Bet Sample & Copa Analysis Year No-Build 2020 | | | | |
| Project Des | scription SW 10t | h Street SIMF | ? | | | | | | |
| Inputs | | | | | _ | | | | |
| Weaving no Weaving se Freeway fre | onfiguration umber of lanes, N egment length, L ee-flow speed, Fl | S S | | 1650ft 70 mph | Segment typ Freeway min Freeway max Terrain type | imum speed | | | Freeway 19 2400 Leve |
| Conver | sions to po | 1 | 1 | 1 | 1 | | 1 , | 2 | (n a /h) |
| \ / | V (veh/h) | PHF | Truck (%) | RV (%) | E _T | E _R | f _{HV} | fp | v (pc/h) |
| V _{FF} | 3575 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 3820 |
| V_{RF} | 1790 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1965 |
| V _{FR} | 605 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 664 |
| V_{RR} | 0 | 0.95 | 0 | 0 | 1.5 | 1.2 | 1.000 | 1.00 | 0 |
| V _{NW} | 3820 | | | | | | | V = | 6449 |
| V _W | 2629 | | | | | | | | |
| VR Configu | 0.408 | | tion. | | | | | | |
| | uration Cha | | ucs | | Minimum | ovina lana a | hangaa I C | | le/h |
| | naneuver lanes, l | N _{WL} | | 2 lc | | - | hanges, LC _{MIN} | l | lc/h |
| _ | e density, ID RF lane changes, | ıc | | | Weaving lan | _ | ** | | lc/h |
| | R lane changes, | 14 | | · | Non-weaving | | •••• | | lc/h |
| | RR lane changes, | 111 | | | Total lane ch | | = | | lc/h |
| | | | Donoity I | | Non-weaving | | | | 551 |
| | g Segment | | | | Weaving inte | | | | |
| _ | egment flow rate egment capacity, | | | 6367 veh/h 5800 veh/h | Weaving seg | • | | | mph |
| | egment v/c ratio | W | , | 1.098 | Average wea | aving speed, | S_W | | mph |
| _ | egment density, | D | | pc/mi/ln | | | | | mph |
| Level of Se | ervice, LOS | | | F | | | | | 6767 f |
| Notes | | | | | <u> </u> | | | | |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|--|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 1-Be No-Build | et Hillsboro & Palmetto |
| Project Description SW 10 | th Street SIMR | | - | | |
| ✓ Oper.(LOS |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 4990 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 4 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjust | monte | | | | |
| | | | | | |
| f _p ⊏ | 1.00 | | E _R | 1.2 | |
| E _T | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.980 | |
| Speed Inputs | | | Calc Speed Adj and FFS | <u> </u> | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f_{LC} | | mph |
| Total Ramp Density, TRD | 70.0 | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 1786 66.0 27.1 D | pc/h/ln mph pc/mi/ln | $\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base fre | - | E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | FREEWAY | WEAV | NG WOR | RKSHEE | T | | |
|---|---|------------------|------------|------------------------------------|--|--------------------------|---------------------------|------|-------------------------------|
| Genera | I Informatio | n | | | Site Info | rmation | | | |
| Analyst Agency/Co Date Perfo Analysis Ti | rmed | AECO PM | M | | Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 2-Bet On from Exp & Off Analysis Year No-Build 2020 | | | | |
| | scription I-95 AT | HILLSBORC | BOULEVARD | IMR | • | | | | |
| Inputs | | | | | <u> </u> | | | | |
| Weaving n Weaving se Freeway fr | onfiguration umber of lanes, N egment length, L _s ee-flow speed, FF | | r Base Co | Two-Sided 3 5085ft 70 mph | Segment typo Freeway min Freeway man Terrain type | imum speed | | | Freeway 18 2400 Leve |
| OOIIVEI | V (veh/h) | PHF | Truck (%) | RV (%) | E _T | E _R | f_{HV} | fp | v (pc/h) |
| V _{FF} | 4055 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 4332 |
| V _{RF} | 1105 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1213 |
| V _{FR} | 935 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1026 |
| V _{RR} | 125 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 137 |
| V _{NW} | 6571 | | <u> </u> | | | | 1 | V = | 6708 |
| V _W | 137 | | | | | | | | _ |
| VR | 0.020 | | | | | | | | |
| Config | uration Cha | racteris | tics | | • | | | | |
| Minimum r | naneuver lanes, N | I_{WL} | | 0 lc | Minimum we | aving lane c | hanges, LC _{MIN} | | 411 lc/h |
| _ | e density, ID | | | 0.7 int/mi | Weaving lan | e changes, L | $-C_W$ | | 782 lc/h |
| | RF lane changes, | IN | | 0 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | 3154 lc/h |
| Minimum F | R lane changes, | LC_FR | | 0 lc/pc | Total lane ch | nanges, LC _{AL} | L | | 3936 lc/h |
| Minimum F | RR lane changes, | LC _{RR} | | 3 lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | 2339 |
| Weavir | ig Segment | Speed, | Density, I | _evel of | Service, | and Cap | oacity | | |
| _ | egment flow rate, egment capacity, | | | 6622 veh/h 6904 veh/h | Weaving inte | gment speed | , S | | 0.185 56.4 mph |
| _ | egment v/c ratio | | | 0.959 | Average wea | | ** | | 61.4 mph |
| - | egment density, D |) | 39 | 9.6 pc/mi/ln | Average non | | | | 56.3 mph |
| Level of Se | ervice, LOS | | | Е | Maximum we | eaving length | n, L _{MAX} | | 5916 ft |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|---|---|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 3-Be No-Build | et Off & On Ramp 2020 |
| Project Description SW 10 | th Street SIMR | | | | |
| ✓ Oper.(LOS |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5160 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| DDIIV - AADI XIXXD | | Venni | Up/Down % | 1111 | |
| Calculate Flow Adjust | ments | | | | |
| - | 1.00 | | E _R | 1.2 | |
| f _p E _T | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | ıı | f _{LC} | | mph |
| Total Ramp Density, TRD | ŭ | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | i e | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h | S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| Canarallata | | WIF 5 AND | RAMP JUN | | | <u> </u> | | | |
|--|--|--|---|------------------------|---|--|--|---|--------------------------------------|
| General Infor | mation | | | Site Infor | | | | | |
| Analyst | | .014 | | eeway/Dir of Tr | | 95 SB | 11911 1 1495 | | |
| Agency or Company Date Performed | AEC | UM | | ınction ırisdiction | S | seg 4-Merge from | m Hillsboro WB | | |
| Analysis Time Period | d PM | | | nalysis Year | N | lo-Build 2020 | | | |
| Project Description | | et SIMR | 7 | , | | IO Dalla 2020 | | | |
| Inputs | | | | | | | | | |
| Jpstream Adj Ramp | | Freeway Num | ber of Lanes, N | 3 | | | | Downstre | am Adi |
| Jpstream Auj Kamp | | Ramp Number | r of Lanes, N | 1 | | | | Ramp | am Auj |
| ✓ Yes □ Or | ı | | ane Length, L | 950 | | | | | |
| | | 1 | ane Length L _D | 300 | | | | ☐Yes | ☐ On |
| ☐ No ☑ Of | f | 1 | | E160 | | | | ✓ No | Off |
| _{up} = 2175 | f4 | Freeway Volur | | 5160 | | | | L _{down} = | ft |
| _{-up} = 2175 | IL | Ramp Volume | • • | 790 | | | | -down | |
| √ _u = 1060 √ | veh/h | | -Flow Speed, S _{FF} | 70.0 | | | | V _D = | veh/h |
| | | | ow Speed, S _{FR} | 50.0 | | | | | |
| Conversion to | o pc/h Un | der Base (| Conditions | | | | | | |
| (pc/h) | (\/ob/br\ | PHF | Terrain | %Truck | %Rv | f _{HV} | f _p | v = V/PH | F x f _{HV} x f _p |
| Freeway | (Veh/hr) 5160 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | | 5513 |
| Ramp | 790 | 0.93 | Level | 2 | 0 | 0.990 | 1.00 | | 867 |
| UpStream | 1060 | 0.92 | | 2 | 0 | 0.990 | 1.00 | | 1164 |
| DownStream | 1000 | 0.92 | Level | | 0 | 0.990 | 1.00 | | 1104 |
| 30WHOti Calli | | Merge Areas | | | 1 | | Diverge Areas | | |
| Stimation of | | | | | Estimation | | | | |
| | V ₁₂ = V _F | (D) | | | 1 | | | | |
| _ | | | 40.0 40.7) | | | V ₁₂ = | $V_R + (V_F - V_F)$ | P _{FD} | |
| -EQ = | | | 13-6 or 13-7) | | L _{EQ} = | | (Equation 13- | -12 or 13- | 13) |
|) _{FM} = | | | ion (Exhibit 13-6) | | P _{FD} = | | using Equation | n (Exhibit 1 | 13-7) |
| / ₁₂ = | 3330 | = | | | V ₁₂ = | | pc/h | | |
| V_3 or V_{av34} | | pc/h (Equation | on 13-14 or 13- | | V ₃ or V _{av34} | | pc/h (Equation ' | 13-14 or 13- | 17) |
| ls V ₃ or V _{av34} > 2,70 | 17) | a Ma | | | | > 2,700 pc/h? | ☐Yes ☐ No | | , |
| | | | | | | | ☐Yes ☐No | | |
| Is V_3 or $V_{av34} > 1.5$ | | | an 12 16 12 | | | 12 | pc/h (Equatio | | 13-18, or |
| Yes,V _{12a} = | | pc/ii (⊑qualic 13-19) | on 13-16, 13- | | If Yes,V _{12a} = | 1 | 3-19) | | · |
| 124 | 18. or | 10-101 | | | | | | | |
| | | 13-19) | | | Capacity | Checks | | | |
| · | | | apacity | LOS F? | Capacity | Checks Actual | Ca | pacity | LOS F? |
| | ecks | | apacity | LOS F? | Capacity V _F | Tr. | Ca Exhibit 13- | | LOS F? |
| Capacity Che | Actual | C | apacity | | V _F | Actual | Exhibit 13- | 8 | LOS F? |
| · | ecks | | apacity | LOS F? | V_F $V_{FO} = V_F$ | Actual | Exhibit 13- Exhibit 13- | 8 | LOS F? |
| Capacity Che | Actual | C | apacity | | V _F | Actual | Exhibit 13- | 8 | LOS F? |
| Capacity Che | Actual 6380 | C Exhibit 13-8 | | | V_F $V_{FO} = V_F - V_R$ | Actual V _R | Exhibit 13- Exhibit 13- Exhibit 13 10 | 8 8 - | |
| Capacity Che | Actual 6380 | Exhibit 13-8 | | | V_F $V_{FO} = V_F - V_R$ | Actual V _R | Exhibit 13- Exhibit 13- Exhibit 13 | 8 8 | |
| V _{FO} | Actual 6380 G Merge In | Exhibit 13-8 | rea | No | V_F $V_{FO} = V_F - V_R$ | Actual V _R ering Dive | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer | 8 8 | 7 |
| V _{FO} | Actual 6380 G Merge In Actual 4197 | Exhibit 13-8 Max I Exhibit 13-8 | rea Desirable 4600:All | No Violation? | $V_{FO} = V_{F} - V_{R}$ Flow Ent | Actual V _R ering Dive | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Violation |
| V _{FO} Flow Entering V _{R12} Level of Serv | Actual 6380 General Merge In Actual 4197 Actice Determination | Exhibit 13-8 Influence A Max I Exhibit 13-8 Influence (i | I rea Desirable 4600:All if not F) | No Violation? | $V_{FO} = V_{F-}$ V_{R} Flow Ent | Actual V _R ering Dive Actual Service De | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Violation |
| V _{FO} Flow Entering V _{R12} Level of Serv D _R = 5.475 + | Actual 6380 G Merge Ir Actual 4197 ice Deterr 0.00734 v R + | Exhibit 13-8 Max I Exhibit 13-8 | I rea Desirable 4600:All if not F) | No Violation? | $V_{FO} = V_{F} - V_{R}$ Flow Enter V_{12} Level of S | Actual V _R ering Dive Actual Service De R = 4.252 + 0 | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Violation |
| Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = 31.9 \text{ (pc/m}$ | Actual 6380 G Merge Ir Actual 4197 fice Deterr 0.00734 v R + | Exhibit 13-8 Influence A Max I Exhibit 13-8 Influence (i | I rea Desirable 4600:All if not F) | No Violation? | $V_{FO} = V_{F} - V_{R}$ Flow Enter V_{12} Level of Signature in the property of the proper | Actual V _R ering Dive Actual Service De R = 4.252 + (c/mi/ln) | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Violation |
| Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = 31.9 \text{ (pc/m}$ $D_R = 0.08 = 0 \text{ (Exhibit)}$ | Actual 6380 G Merge Ir Actual 4197 Fice Deterr 0.00734 v R + hi/ln) 13-2) | Exhibit 13-8 Influence A Max I Exhibit 13-8 Influence (i | I rea Desirable 4600:All if not F) | No Violation? | $V_{FO} = V_{F} - V_{R}$ Flow Ent. V_{12} Level of Signature $V_{R} = V_{R} - V_{R}$ | Actual V _R Pering Dive Actual Service De R = 4.252 + (c/mi/ln) (chibit 13-2) | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Violation |
| Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $O_R = 31.9 \text{ (pc/m}$ $O_R = 0 \text{ (Exhibit)}$ Speed Determ | Actual 6380 G Merge Ir Actual 4197 Fice Deterr 0.00734 v R + hi/ln) 13-2) | Exhibit 13-8 Influence A Max I Exhibit 13-8 Influence (i | I rea Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of S $D_R = (pc)$ $LOS = (Ex)$ Speed De | Actual V _R ering Dive Actual Service De R = 4.252 + (c/mi/ln) chibit 13-2) eterminati | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Violation |
| Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = 31.9 \text{ (pc/m}$ $D_R = 0.08 = 0 \text{ (Exhibit)}$ | Actual 6380 G Merge Ir Actual 4197 Fice Deterrition 13-2) mination | Exhibit 13-8 Influence A Max I Exhibit 13-8 Influence (i | I rea Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of Signature V_{12} $V_{13} = V_{14}$ $V_{14} = V_{15}$ $V_{15} =$ | Actual V _R Pering Dive Actual Service De Actual Service De Actual Service De Actual | Exhibit 13- Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Violation |
| Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $O_R = 31.9 \text{ (pc/m}$ $O_R = 0.485 \text{ (Exister)}$ $O_R = 0.485 \text{ (Exister)}$ | Actual 6380 G Merge Ir Actual 4197 Fice Deterrition 13-2) mination | Exhibit 13-8 Influence A Max I Exhibit 13-8 Influence (i | I rea Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of S $D_R = (pc)$ $D_S = (Ex)$ $D_S = (Ex)$ $D_S = (Ex)$ $D_S = (Ex)$ | Actual V _R ering Dive Actual Service De R = 4.252 + (c/mi/ln) chibit 13-2) eterminati | Exhibit 13- Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Violation |
| Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0.08 = 0.485$ (Existing Englands) $D_R = 0.485$ (Existing Englands) $D_R = 0.485$ (Existing Englands) | Actual 6380 G Merge Ir Actual 4197 Fice Deterr 0.00734 v R + ni/ln) 13-2) mination bit 13-11) | Exhibit 13-8 Influence A Max I Exhibit 13-8 Influence (i | I rea Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of S $D_R = (pc)$ $D_R = (Ex)$ Speed De $D_S = (Ex)$ $D_S = (Ex)$ $D_S = (Ex)$ $D_S = (Ex)$ | Actual V _R Pering Dive Actual Service De Actual Service De Actual Service De Actual | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Violation |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|---|---|--|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | Highway/Direction of Trav From/To Jurisdiction Analysis Year | | I-95 SB Seg 5-Be Ramps No-Build | et WB On & EB On |
| Project Description SW 10th | Street SIMR | | · | | |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5950 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % | 0.95 3 0 Level mi | |
| Calculate Flow Adjustm | nents | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) | 3 70.0 | ft ft ramps/mi mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| Base free-flow Speed, BFFS | | mph | | | |
| Degrational (LOS) v _p = (V or DDHV) / (PHF x N x S) D = v _p / S LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S) D = v _p / S Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | REEWAY | WEAV | NG WOR | KKSHEE | l | | |
|---|---|---------------------|------------|------------------------------------|---|--------------------------|---------------------------|------|-------------------------------|
| Genera | l Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/Co Date Perfo Analysis Ti | rmed | AECO PM | М | | Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 6- Bet Hillsboro & 10th St Analysis Year No-Build 2020 | | | | |
| Project Des | scription SW 10 | th Street SIMF | ₹ | | 1 | | | | |
| Inputs | | | | | 1 | | | | |
| Weaving no Weaving se Freeway fro | onfiguration umber of lanes, egment length, L ee-flow speed, F | s FS | | One-Sided 4 1830ft 70 mph | Segment type Freeway min Freeway max Terrain type | imum speed | | | Freeway 19 2400 Leve |
| Conver | sions to p | c/h Unde | r Base Co | ndition | S | | | | |
| | V (veh/h) | PHF | Truck (%) | RV (%) | Ε _Τ | E _R | f_{HV} | fp | v (pc/h) |
| V_{FF} | 4700 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 5022 |
| V_{RF} | 710 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 779 |
| V_{FR} | 1250 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1372 |
| V_{RR} | 0 | 0.95 | 0 | 0 | 1.5 | 1.2 | 1.000 | 1.00 | 0 |
| V _{NW} | 5022 | | | | | | | V = | 7173 |
| V_W | 2151 | | | | | | | | |
| VR | 0.300 | | | | | | | | |
| Config | uration Ch | aracteris | tics | | 1 | | | | |
| Minimum r | naneuver lanes, | N_{WL} | | 2 lc | Minimum we | aving lane c | hanges, LC _{MIN} | l | 779 lc/h |
| | e density, ID | | | 0.7 int/mi | Weaving lan | e changes, L | $-C_{W}$ | | 1152 lc/h |
| Minimum F | RF lane changes | , LC _{RF} | | 1 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | 1256 lc/h |
| Minimum F | R lane changes | , LC _{FR} | | 0 lc/pc | Total lane ch | nanges, LC _{AL} | L | | 2408 lc/h |
| Minimum F | RR lane changes | s, LC _{RR} | | lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | 643 |
| Weavin | ıg Segmen | t Speed, | Density, I | _evel of | · | | | | |
| U | egment flow rate | • | | 7078 veh/h | Weaving inte | • | | | 0.281 |
| | egment capacity | ', C _w | | 7885 veh/h | A | | | | 56.4 mph |
| _ | egment v/c ratio | D | 0.4 | 0.898 | | | | | 57.9 mph |
| _ | egment density, ervice, LOS | ט | 3 | 1.8 pc/mi/ln D | 1,111 | | | | 55.8 mph |
| Feaci Oi O | FIVIOE, LUS | | | U | ıvıaxımum we | eaving length | ı, L _{MAX} | | 5583 ft |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 7-Be No-Build | et Off & On Ramp |
| Project Description SW 10 | th Street SIMR | | - | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5410 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| DDITV - AADT X K X D | | ven/m | Up/Down % | 1111 | |
| Calculate Flow Adjust | ments | | · | | |
| | 1.00 | | | 1.2 | |
| f _p E _⊤ | 1.50 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 0.985 | |
| | 1.5 | | 111 | | |
| Speed Inputs | | | Calc Speed Adj and FFS | • | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 1927 63.9 30.2 D | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design he | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | WIPS AND | RAMP JUN | | | El | | | |
|---|---|------------------------------|------------------------------|------------------------|--|---|----------------------------|--|------------------------------------|
| General Info | rmation | | | Site Infor | | | | | |
| Analyst | ÷. | | | eeway/Dir of Ti | | 95 SB | 100 5: | | |
| Agency or Compan Date Performed | y AEC | COM | | ınction ırisdiction | S | eg 8-Merge fro | m 10th St | | |
| Analysis Time Perio | od PM | | | nalysis Year | N | o-Build 2020 | | | |
| Project Description | | et SIMR | 7 | iaiyaia . cai | | o Balla 2020 | | | |
| nputs | | | | | | | | | |
| Jpstream Adj Ram | n | Freeway Num | ber of Lanes, N | 3 | | | | Downstrea | am Adi |
| pstream Auj Nam | ب | Ramp Numbe | r of Lanes, N | 1 | | | | Ramp | aiii Auj |
| ✓ Yes 🔲 C |)n | • | ane Length, L | 1470 | | | | | |
| | | | ane Length L _D | 1410 | | | | ☐Yes | ☐ On |
| □ No ☑ C | rff | | | E410 | | | | ✓ No | Off |
| = 2210 | ft | Freeway Volu | ' | 5410 | | | | L _{down} = | ft |
| _{-up} = 2210 | IL | Ramp Volume | | 1220 | | | | -down | ., |
| / _u = 1250 | veh/h | | -Flow Speed, S _{FF} | 70.0 | | | | V _D = | veh/h |
| | | | ow Speed, S _{FR} | 50.0 | | | | | |
| Conversion | | der Base | Conditions | T- | · · · · · · · · · · · · · · · · · · · | T. | T. | r | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | f_HV | f _p | v = V/PHF | x f _{HV} x f _p |
| Freeway | 5410 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | 5 | 780 |
| Ramp | 1220 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 339 |
| UpStream | 1250 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 372 |
| DownStream | 1200 | 10.02 | 20101 | | | 0.000 | 1.00 | <u> </u> | 012 |
| | | Merge Areas | | | | | Diverge Areas | | |
| Estimation o | of v ₁₂ | | | | Estimation | on of v ₁₂ | | | |
| | V ₁₂ = V _F | | | | | \/ | N . (N . N | \D | |
| - _{EQ} = | | | 13-6 or 13-7) | | 1 | v ₁₂ = | $V_R + (V_F - V_R)$ | | |
| P _{FM} = | | | ion (Exhibit 13-6) | 1 | L _{EQ} = | | (Equation 13- | | • |
| | 3510 | | IOTI (EXTIIDIC 10-0) | | P _{FD} = | | using Equation | on (Exhibit 13 | 3-7) |
| / ₁₂ = | | | on 13-14 or 13- | | V ₁₂ = | | pc/h | | |
| V_3 or V_{av34} | 17) | pc/ii (Equation | 011 13-14 01 13- | | V_3 or V_{av34} | | pc/h (Equation 1 | | 7) |
| Is V ₃ or V _{av34} > 2,7 | | es 🗹 No | | | Is V ₃ or V _{av34} | > 2,700 pc/h? | □Yes □No | | |
| s V ₃ or V _{av34} > 1.5 | | | | | Is V ₃ or V _{av34} | > 1.5 * V ₁₂ /2 | □Yes □No | | |
| Yes,V _{12a} = | | | on 13-16, 13- | | If Yes,V _{12a} = | | pc/h (Equatio | n 13-16, 13 | 3-18, or |
| | 18, oı | r 13-19) | | | | | 13-19) | | |
| Capacity Ch | ecks | | | | Capacity | Checks | | | |
| | Actual | C | apacity | LOS F? | | Actual | | pacity | LOS F? |
| | | | | | V_{F} | | Exhibit 13- | 8 | |
| V_{FO} | 7119 | Exhibit 13-8 | | No | $V_{FO} = V_{F}$ - | V_R | Exhibit 13- | 8 | |
| 10 | | | | | V _R | | Exhibit 13 | - | |
| | <u> </u> | | | | | <u> </u> | 10 | | |
| | _ | | | \ \f\:-1-60 | Flow Ent | | erge Influer | | \ /: - - 4: (|
| low Enterir | Actual | <u> </u> | Desirable | Violation? | \ <u>\</u> | Actual | Max Des | Irable | Violation? |
| | 40.40 | Exhibit 13-8 | 4600:All | Yes | V ₁₂ | 2 / 2 | Exhibit 13-8 | /: c 1 | |
| V _{R12} | 4849 | | IT NOT F) | | | | eterminatio | _ | <i>F)</i> |
| V _{R12} Level of Ser | vice Deter | | | | 1 11 | _R = 4.252 + (| 0.0086 V ₁₂ - 0 | .009 L _D | |
| V _{R12} Level of Ser D _R = 5.475 | vice Deter + 0.00734 v _R + | 0.0078 V ₁₂ - 0.0 | | | | | | | |
| V _{R12} Level of Ser D _R = 5.475 | vice Deter + 0.00734 v _R + | | | | | /mi/ln) | | | |
| V _{R12} Level of Ser D _R = 5.475 D _R = 33.5 (pc/ | vice Deter + 0.00734 v _R + mi/ln) | | | | $D_R = (pc)$ | | | | |
| Level of Ser $D_R = 5.475$ $D_R = 33.5 (pc/$ | + 0.00734 v _R + mi/ln) it 13-2) | | | | D _R = (pc. LOS = (Ex | /mi/ln) | on | | |
| V_{R12} Level of Ser $D_R = 5.475$ $D_R = 33.5 (pc/OS = D (Exhib)$ Speed Deter | vice Detern + 0.00734 v _R + mi/ln) it 13-2) | | | | D _R = (pc LOS = (Ex Speed De | /mi/ln) thibit 13-2) | on | | |
| V_{R12} Level of Ser $D_R = 5.475$ $D_R = 33.5 (pc/COS) = D (Exhibition (E$ | vice Detern + 0.00734 v _R + mi/ln) it 13-2) rmination xibit 13-11) | 0.0078 V ₁₂ - 0.0 | | | $D_R = (pc)$ $LOS = (Ex)$ $Speed De$ $D_S = (Ex)$ | /mi/ln) chibit 13-2) e terminati | | | |
| V_{R12} Level of Ser $D_R = 5.475$ $D_R = 33.5 \text{ (pc/}$ $D_R = 0.672 \text{ (Ex)}$ | vice Detern + 0.00734 v _R + mi/ln) it 13-2) rmination xibit 13-11) n (Exhibit 13-11) | 0.0078 V ₁₂ - 0.0 | | | D_R = (pc. LOS = (Ex. Speed De D_S = (Ex. S_R = mph | /mi/ln) thibit 13-2) eterminati hibit 13-12) n (Exhibit 13-12 |) | | |
| V_{R12} Level of Ser $D_R = 5.475$ $D_R = 33.5 \text{ (pc/}$ $D_R = 0.672 \text{ (Exhibition of the points)}$ | vice Detern + 0.00734 v _R + mi/ln) it 13-2) rmination xibit 13-11) | 0.0078 V ₁₂ - 0.0 | | | D_R = (pc. LOS = (Ex Speed De D _S = (Ext S _R = mpt S ₀ = mpt S ₀ = (pc. LOS = 100 Mpc. S ₀ = mpt S ₀ = (pc. LOS = 100 Mpc. S ₀ = mpt S ₀ = (pc. LOS = 100 Mpc. S ₀ = mpt S ₀ = (pc. LOS = 100 Mpc. S | /mi/ln) thibit 13-2) eterminati hibit 13-12) |)) | | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|---|---|----------------------------|---|------------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 9-Be No-Build | et 10th & Exit to Exp 2020 |
| Project Description SW 10 | | | | | |
| ✓ Oper.(LOS |) | | Des.(N) | ∐Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K | 6630 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R | 0.95 3 0 | |
| Peak-Hr Direction Prop, D DDHV = AADT x K x D | | veh/h | General Terrain: Grade % Length Up/Down % | Level mi | |
| Calculate Flow Adjust | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | i e | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 2361 54.4 43.4 E | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | f _{HV} x f _p) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h | S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | RAMP | S AND RAM | P JUNCTI | ONS WO | ORKS | HEET | | | | |
|--|---|--|---|----------------------------|---|-------------------------------|--------------|---------------------------------------|---------------------|--------------------|--|
| General Info | rmation | | | Site Infor | mation | | | | | | |
| Analyst | | | Fr | eeway/Dir of Tr | Travel I-95 SB | | | | | | |
| Agency or Company | y AEC | OM | | nction | | Seg 10 | - Diverge to | Express | | | |
| Date Performed Analysis Time Perio | od PM | | | risdiction nalysis Year | | No-Build 2040 | | | | | |
| Project Description | | t SIMR | Al | iaiysis reai | | INO-DUI | u 2040 | | | | |
| Inputs | OVV TOUT OU CC | CONVINC | | | | | | | | | |
| | 5 | Freeway Num | ber of Lanes, N | 3 | | | | | Б (| A 1' | |
| Upstream Adj f | Kamp | Ramp Numbe | | 1 | | | | | Downstrea Ramp | ım Aaj | |
| ✓ Yes | √ On | l ' | ane Length, L _Δ | ' | | | | | - | | |
| | | | ane Length L _n | 300 | | | | | ☐ Yes | On | |
| □ No [| Off | Freeway Volume | - 5 | 6630 | | ✓ No | Off | | | | |
| L _{up} = 6 | 000 ft | Ramp Volume | • | 720 | | | | | L _{down} = | ft | |
| ир | | | ·, v _R -Flow Speed, S _{FF} | N | | | | | | | |
| V _u = 1: | 220 veh/h | - | ow Speed, S _{FR} | | | | | | $V_D =$ | veh/h | |
| Comunatan | 40 mg/lg 11m | | . 111 | 45.0 | | | | | | | |
| Conversion | to pc/n Uno | der Base (| Conditions | 1 | 1 | _ | | | | | |
| (pc/h) | (Veh/hr) | PHF | Terrain | %Truck | %Rv | | f_{HV} | f_p | v = V/PHF | $x f_{HV} x f_{p}$ | |
| Freeway | 6630 | 0.95 | Level | 3 | 0 | 0. | 985 | 1.00 | 70 | 84 | |
| Ramp | 720 | 0.92 | Level | 2 | 0 | 0. | 990 | 1.00 | 79 | 90 | |
| UpStream | 1220 | 0.92 | Level | 2 | 0 | 0. | 990 | 1.00 | 13 | 39 | |
| DownStream | | <u> </u> | | | | | | | | | |
| Estimation o | | Merge Areas | | | Estima | tion o | | verge Areas | | | |
| LStillation o | | | | | LSuma | lion o | | | | | |
| | $V_{12} = V_{F}$ | | | | | | | $V_R + (V_F - V_F)$ | | | |
| L _{EQ} = | | ation 13-6 or | • | | L _{EQ} = | | | 00.18 (Equati | | • | |
| P _{FM} = | - | Equation (E | Exhibit 13-6) | | P _{FD} = | | | 47 using Equ | uation (Exhi | bit 13-7) | |
| V ₁₂ = | pc/h | | | | V ₁₂ = | | | 30 pc/h | | | |
| V ₃ or V _{av34} | | | -14 or 13-17) | | V ₃ or V _{av34} | | | 54 pc/h (Equa | ation 13-14 | or 13-17) | |
| Is V_3 or $V_{av34} > 2.7$ | | | | | | | | Yes No | | | |
| Is V ₃ or V _{av34} > 1.5 | | | 10 10 10 | | Is V ₃ or V _a | _{v34} > 1.5 | | Yes ☑ No | | | |
| If Yes,V _{12a} = | pc/n (13-19 | | -16, 13-18, or | | If Yes,V _{12a} | = | | 34 pc/h (Equa 13-19) | ation 13-16 | 5, 13-18, | |
| Capacity Ch | | / | | | Capaci | tv Ch | | 10 10) | | | |
| | Actual | С | apacity | LOS F? | | | Actual | Ca | pacity | LOS F? | |
| | | | • | | V _F | | 7084 | Exhibit 13-8 | 7200 | No | |
| V_{FO} | | Exhibit 13-8 | | | V _{FO} = V | _F - V _R | 6294 | Exhibit 13-8 | 7200 | No | |
| 10 | | | | | V_{R} | | 790 | Exhibit 13-1 | 0 2100 | No | |
| Flow Enterin | a Merae Ir | lluence Δ | rea | | | | | ge Influen | | | |
| ou Lineilli | Actual | | Desirable | Violation? | , , , , , , , , , , , , , , , , , , , | | Actual | Max Desirab | | Violation? | |
| V _{R12} | | Exhibit 13-8 | | | V ₁₂ | | 230 | Exhibit 13-8 | 4400:All | No | |
| Level of Serv | rice Deterr | nination (i | if not F) | <u> </u> | | f Serv | ice Det | erminatio | n (if not | | |
| $D_R = 5.475 + 0$ | | ` | | | | | | 0086 V ₁₂ - 0.0 | _ • | , | |
| D _R = (pc/mi/lı | • | 12 | ^ | | D _R = 4 | 1.1 (pc | | 12 | D | | |
| LOS = (Exhibit | • | | | | 1 | ٠. | oit 13-2) | | | | |
| Speed Deter | | | | | | | minatio | | | | |
| | | | | | ' | | xhibit 13- | | | | |
| M _S = (Exibit 1 | ·- | | | | | | (Exhibit 1 | • | | | |
| | hibit 13-11) | | | | | | (Exhibit 1 | - | | | |
| | hibit 13-11) hibit 13-13) | | | | 1 - | | (Exhibit 1 | - | | | |
| right © 2016 Universi | • | | | | 0 - 0 | - | | · · · · · · · · · · · · · · · · · · · | Generated: 5/ | | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 11-E No-Build | Bet Off Exp Off Sample |
| Project Description SW 10t | h Street SIMR | | | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 5910 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjusti | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f _{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | 70.0 | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | RAMP | S AND RAM | | | ORKS | HEET | | | |
|--|----------------------------------|--------------------------|-----------------------------|----------------------|-------------------------------------|------------------|------------------------------|---|-------------------------|--------------------------------------|
| General Info | rmation | | | Site Infor | | | | | | |
| Analyst | | | | eeway/Dir of Tr | avel | I-95 SE | | | | |
| Agency or Compan | y AEC | OM . | | nction risdiction | | Seg 12 | ?- Diverge to | Sample Rd | | |
| Date Performed Analysis Time Perio | od PM | | | alysis Year | | No-Rui | ld 2020 | | | |
| Project Description | | et SIMR | 741 | alysis real | | 140-Dui | 10 2020 | | | |
| Inputs | | | | | | | | | | |
| Upstream Adj | Ramp | Freeway Num | per of Lanes, N | 3 | | | | | Downstre | am Adi |
| | • | Ramp Number | of Lanes, N | 1 | | | | | Ramp | , |
| ✓ Yes | □On | Acceleration L | ane Length, L _A | | | | | | Yes | ☐ On |
| □No | ✓ Off | Deceleration L | ane Length L _D | 250 | | | | | ✓ No | Off |
| | | Freeway Volur | • | 5910 | | | | | | |
| $L_{up} = 2$ | 2000 ft | Ramp Volume | 11 | 1110 | | | | l' | down = | ft |
| V _u = 7 | '20 veh/h | · · | Flow Speed, S _{FF} | 70.0 | | | | Į, | √ _D = | veh/h |
| | | Ramp Free-Flo | 111 | 45.0 | | | | | <i>D</i> | |
| Conversion | | der Base (| Conditions | | | | | | | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | | f_{HV} | f _p | / = V/PHI | F x f _{HV} x f _p |
| Freeway | 5910 | 0.95 | Level | 3 | 0 | 0. | .985 | 1.00 | 6 | 314 |
| Ramp | 1110 | 0.92 | Level | 2 | 0 | _ | 990 | 1.00 | | 219 |
| UpStream | 720 | 0.92 | Level | 2 | 0 | 0. | .990 | 1.00 | - | 790 |
| DownStream | | | | | | | | | | |
| | | Merge Areas | | | ļ | | | iverge Areas | | |
| Estimation o | of v ₁₂ | | | | Estima | tion c | of v ₁₂ | | | |
| | V ₁₂ = V _F | (P _{FM}) | | | | | V ₁₂ = | V _R + (V _F - V _R |)P _{FD} | |
| _ _{EQ} = | (Equ | ation 13-6 or | 13-7) | | L _{EQ} = | | (E | quation 13-12 | or 13-1 | 3) |
| P _{FM} = | | Equation (E | • | | P _{FD} = | | • | 46 using Equ | | • |
| / ₁₂ = | pc/h | (| , | | V ₁₂ = | | | 01 pc/h | (| |
| V_3 or V_{av34} | • | (Equation 13- | 14 or 13-17) | | V ₃ or V _{av34} | | | 13 pc/h (Equa | ition 13 ₋ 1 | 4 or 13-17) |
| Is V ₃ or V _{av34} > 2,7 | - | | 110110117 | | | | | Yes ☑ No | 1011 10-1 | + 01 10-17 <i>)</i> |
| Is V_3 or $V_{av34} > 2,7$ | | | | | | | | Yes ☑ No | | |
| | | | 16, 13-18, or | | | | | tes will no c/h (Equation | 13-16 13 | 3-18 or 13- |
| f Yes,V _{12a} = | 13-19 | | | | If Yes,V _{12a} | | 19 | | 10 10, 10 | 7 10, 01 10 |
| Capacity Ch | | | | | Capaci | ty Ch | 1 | | | |
| | Actual | C | apacity | LOS F? | ļ ,, | | Actual | | acity | LOS F? |
| | | | | | V _F | | 6314 | Exhibit 13-8 | 7200 | No |
| V_{FO} | | Exhibit 13-8 | | | $V_{FO} = V$ | | 5095 | Exhibit 13-8 | 7200 | No |
| | | | | | V _R | ₹ | 1219 | Exhibit 13-10 | 2100 | No |
| Flow Enterin | | nfluence A | rea | | Flow E | nterin | g Diver | ge Influenc | | |
| | Actual | 1 | Desirable | Violation? | | | Actual | Max Desirabl | | Violation? |
| V _{R12} | | Exhibit 13-8 | | | V ₁₂ | | 4001 | Exhibit 13-8 | 4400:All | No |
| Level of Ser | | | | | Level o | | | ermination | | <i>F</i>) |
| $D_R = 5.475 + 0$ | 0.00734 v _R + | 0.0078 V ₁₂ - | 0.00627 L _A | | | $D_R = 4$ | 1.252 + 0. | 0086 V ₁₂ - 0.0 | 09 L _D | |
| O _R = (pc/mi/l | n) | | | | $D_R = 3$ | 38.1 (pc | /mi/ln) | | | |
| 00 (E.J.:1-:1-: | t 13-2) | | | | LOS = E | <u>E (E</u> xhil | bit 13-2) | | | |
| .05 = (Exhibit | mination | | | | Speed | Deter | minatio | n | | |
| • | | | | $D_s = 0$ |).408 (E | xhibit 13- | 12) | | | |
| Speed Deter | 13-11) | | | | | | | | | |
| Speed Deter | | | | | $S_R = 5$ | 58.6 mph | (Exhibit | 13-12) | | |
| Speed Deter $M_S = (Exibit \cdot S_R = mph (Exibit \cdot S_R - mph (Exib$ | chibit 13-11) | | | | 1 | - | n (Exhibit ´ n (Exhibit ´ | • | | |
| Speed Deter $M_S = (Exibit \cdot S_R = mph (Exibit \cdot S_0 = mph (Exib$ | | | | | $S_0 = 7$ | 72.4 mph | • | 13-12) | | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|--|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 13-E No-Build | Bet Off & On Ramps |
| Project Description SW 10ti | h Street SIMR | | | | |
| ✓ Oper.(LOS) | | 1 | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K | 4800 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R | 0.95 3 0 | |
| Peak-Hr Direction Prop, D DDHV = AADT x K x D | | veh/h | General Terrain: Grade % Length Up/Down % | Level mi | |
| Calculate Flow Adjustr | nents | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | • |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS | x f _{HV} x f _p) 1709 67.0 25.5 C | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base fre | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | FREEWAY | WEAV | NG WOR | RKSHEE | T | | |
|---|---|--------------------|------------|------------------------------------|---|--------------------------|---------------------------|----------|------------------------------|
| Gener | al Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/C Date Perfo Analysis T | | AECO PM | M | | Freeway/Dir of Travel Weaving Segment Location Analysis Year I-95 SB Seg 14- Bet Sample & Copans No-Build 2020 | | | | |
| | escription SW 10t | h Street SIMI | ₹ | | | | | | |
| Inputs | | | | | 1 | | | | |
| Weaving r Weaving s Freeway f | configuration number of lanes, N segment length, L ree-flow speed, F | s FS | w Page Co | One-Sided 4 1650ft 70 mph | Segment type Freeway min Freeway max Terrain type | imum speed | | | Freewa 19 2400 Leve |
| Conve | V (veh/h) | PHF | Truck (%) | RV (%) | E _T | E _R | f_{HV} | fp | v (pc/h) |
| V _{FF} | 4170 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 4455 |
| V _{RF} | 1420 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1559 |
| V _{FR} | 630 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 692 |
| V _{RR} | 0 | 0.95 | 0 | 0 | 1.5 | 1.2 | 1.000 | 1.00 | 0 |
| V _{NW} | 4455 | | <u> </u> | <u> </u> | | | | V = | 6706 |
| V _W | 2251 | | | | | | | <u>I</u> | |
| VR | 0.336 | | | | | | | | |
| Config | uration Cha | aracteris | tics | | | | | | |
| Minimum | maneuver lanes, | N _{WL} | | 2 lc | Minimum we | aving lane c | hanges, LC _{MIN} | I | 2251 lc/h |
| Interchan | ge density, ID | | | 0.7 int/mi | Weaving lan | e changes, l | _C _w | | 2602 lc/h |
| Minimum | RF lane changes, | LC_RF | | 1 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | 1042 lc/h |
| Minimum | FR lane changes, | LC_FR | | 1 lc/pc | Total lane ch | nanges, LC _{AL} | L | | 3644 lc/h |
| Minimum | RR lane changes | , LC _{RR} | | lc/pc | Non-weaving | g vehicle ind | ex, I _{NW} | | 515 |
| Weavi | ng Segmen | t Speed, | Density, I | _evel of | Service, | and Ca | oacity | | |
| Weaving | segment flow rate | , V | | 6618 veh/h | Weaving inte | | | | 0.422 |
| Weaving | segment capacity | , c _w | | 7044 veh/h | Weaving seg | ' | | | 48.1 mph |
| _ | segment v/c ratio | _ | _ | 0.939 | | | | | 53.7 mph |
| _ | segment density, | ט | 34 | 1.8 pc/mi/ln | | | | | 45.7 mph |
| Level of S | Service, LOS | | | D | Maximum we | eaving length | າ, L _{MAX} | | 5970 ft |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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| | | | FREEWAY | WEAV | | | | | |
|---|---|--------------------|------------|------------------------------------|---|--------------------------|---------------------------|----------|-------------------------------|
| Gener | al Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/C Date Perfo Analysis T | | AECO AM | M | | Freeway/Dir of Travel Weaving Segment Location Analysis Year I-95 NB Seg 1-Bet Copans & Sample No-Build 2040 | | | | |
| | escription SW 10t | h Street SIMI | 7 | | • | | | | |
| Inputs | | | | | 1 | | | | |
| Weaving i Weaving s Freeway f | configuration number of lanes, N segment length, L, ree-flow speed, Fl | s FS | r Paga Ca | One-Sided 4 1820ft 70 mph | Segment typo Freeway min Freeway max Terrain type | imum speed | | | Freeway 19 2400 Leve |
| Conve | V (veh/h) | PHF | Truck (%) | RV (%) | E _T | E _R | f_{HV} | fp | v (pc/h) |
| V _{FF} | 4755 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 5080 |
| V _{RF} | 405 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 445 |
| V _{FR} | 970 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1065 |
| V _{RR} | 0 | 0.95 | 0 | 0 | 1.5 | 1.2 | 1.000 | 1.00 | 0 |
| V _{NW} | 5080 | | 1 | | | | • | V = | 6590 |
| V _W | 1510 | | | | | | | <u> </u> | <u> </u> |
| VR | 0.229 | | | | | | | | |
| Config | uration Cha | aracteris | tics | | _ | | | | |
| Minimum | maneuver lanes, | N_{WL} | | 2 lc | Minimum we | aving lane c | hanges, LC _{MIN} | I | 1510 lc/h |
| | ge density, ID | | | 0.7 int/mi | Weaving lan | e changes, l | $-C_{W}$ | | 1882 lc/h |
| | RF lane changes, | IM | | 1 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | 1263 lc/h |
| | FR lane changes, | 111 | | 1 lc/pc | Total lane ch | nanges, LC _{AL} | L | | 3145 lc/h |
| Minimum | RR lane changes | , LC _{RR} | | lc/pc | Non-weaving | g vehicle ind | ex, I _{NW} | | 647 |
| Weavi | ng Segmen | t Speed, | Density, I | _evel of | · | | | | |
| Weaving | segment flow rate | , V | | 6500 veh/h | Weaving inte | • | | | 0.348 |
| | segment capacity | , c _w | | 8548 veh/h | Weaving seg | | | | 52.2 mph |
| _ | segment v/c ratio | D | 0. | 0.760 | Average wea | | ** | | 55.8 mph |
| _ | segment density, Service, LOS | ט | 3 | 1.6 pc/mi/ln D | Average non-weaving speed, S_{NW} Maximum weaving length, L_{MAX} | | | | 51.2 mph |
| Notes | Del VICE, LOS | | | U | iviaximum we | eaving length | I, L _{MAX} | | 4836 fl |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|------------------------------------|---|---|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 2-Be Sample No-Build | et Off & On from |
| Project Description SW 10th | Street SIMR | | · | | |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5160 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % | 0.95 3 0 Level mi | |
| Calculate Flow Adjustn | nents | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| | Manageman | Прп | Decima (NI) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | WIF 5 AND | KAMP JUN | | ORKSHE | EI | | | |
|--|--|--|---|------------------------|--|--|--|--|--------------------------------------|
| General Infor | mation | | | Site Infor | | | | | |
| Analyst | . = | | | eeway/Dir of Tr | | 95 NB | | | |
| Agency or Company Date Performed | AEC | OM | | Inction Irisdiction | S | eg 3-On Ramp | from Sample | | |
| Analysis Time Period | d AM | | | nalysis Year | N | o-Build 2040 | | | |
| Project Description | | et SIMR | <i>.</i> | , | | o Balla 2010 | | | |
| nputs | | | | | | | | | |
| | | Freeway Num | ber of Lanes, N | 3 | | | | Doumotre | oom Adi |
| Jpstream Adj Ramp | | Ramp Number | • | 1 | | | | Downstre Ramp | eam Auj |
| ☐ Yes ☐ Or | ı | 1 | ane Length, L _A | 500 | | | | | |
| | | | ane Length L _D | 300 | | | | ✓ Yes | ✓ On |
| ✓ No ☐ Of | f | | - 5 | E460 | | | | ☐ No | Off |
| m = ft | | Freeway Volui | | 5160 | | | | L _{down} = | 1950 ft |
| _{up} = ft | | Ramp Volume | | 1460 | | | | down | 1550 11 |
| / _u = veh/h | 1 | 1 | -Flow Speed, S _{FF} | 70.0 | | | | V _D = | 920 veh/h |
| u | ' | Ramp Free-Flo | ow Speed, S _{FR} | 50.0 | | | | | |
| Conversion to | o pc/h Un | der Base (| Conditions | | | | | | |
| (pc/h) | (\/oh/hr) | PHF | Terrain | %Truck | %Rv | f_HV | f _p | v = V/PH | F x f _{HV} x f _p |
| Freeway | (Veh/hr) 5160 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | | 5513 |
| Ramp | 1460 | 0.93 | | 2 | 0 | 0.985 | 1.00 | | 1603 |
| JpStream | 1400 | 0.92 | Level | | U | 0.990 | 1.00 | | 1003 |
| DownStream | 920 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 1010 |
| 20mica cam | | Merge Areas | 20101 | | Ů | | Diverge Areas | | 1010 |
| stimation of | | | | | Estimation | | | | |
| | V ₁₂ = V _F | (D) | | | | ·- | | | |
| _ | 12 . | | .40.7) | | | V ₁₂ = | $V_R + (V_F - V_F)$ | P _{FD} | |
| EQ = | | ation 13-6 or | • | | L _{EQ} = | | (Equation 13- | -12 or 13- | 13) |
| ' _{FM} = | | | ion (Exhibit 13-6) | | P _{FD} = | | using Equation | n (Exhibit | 13-7) |
| ′ ₁₂ = | 3261 | • | | | V ₁₂ = | | pc/h | | |
| V_3 or V_{av34} | | pc/h (Equation | on 13-14 or 13- | | V ₃ or V _{av34} | | pc/h (Equation ' | 13-14 or 13- | 17) |
| Is V ₃ or V _{av34} > 2,70 | 17) | a ZNa | | | | > 2,700 pc/h? | ☐Yes ☐ No | | , |
| | | | | | | | ☐Yes ☐No | | |
| s V_3 or $V_{av34} > 1.5$ | | | n 12 16 12 | | | 12 | pc/h (Equatio | | 13-18, or |
| Yes,V _{12a} = | | 13-19) | on 13-16, 13- | | If Yes,V _{12a} = | 1 | 3-19) | · | • |
| Capacity Che | | 10 10) | | | Capacity | Checks | | | |
| apacity cire | | | | | Jourgaoity | | | | LOS F? |
| Sapacity Cite | Actual | С | apacity | LOS F? | Capacity | Actual | Ca | pacity | LUSI |
| Sapacity Che | Actual | C | apacity | LOS F? | V _F | Actual | Ca Exhibit 13- | | LOST? |
| | | | apacity | | V _F | | Exhibit 13- | 8 | LOST? |
| V _{FO} | Actual 7116 | Exhibit 13-8 | apacity | LOS F? | V_F $V_{FO} = V_F$ | | Exhibit 13- Exhibit 13- | 8 | LOST? |
| | | | apacity | | V _F | | Exhibit 13- | 8 | LOST? |
| V _{FO} | 7116 | Exhibit 13-8 | | | V_F $V_{FO} = V_F - V_R$ | V _R | Exhibit 13- Exhibit 13- Exhibit 13 | 8 8 - | |
| V _{FO} | 7116 | Exhibit 13-8 | | | V_F $V_{FO} = V_F - V_R$ | V _R | Exhibit 13- Exhibit 13- Exhibit 13 10 | 8 8 | |
| V _{FO} Flow Entering | 7116 g Merge In | Exhibit 13-8 | rea | No | V_F $V_{FO} = V_F - V_R$ | V _R | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer | 8 8 | 9 |
| V _{FO} Flow Entering V _{R12} | 7116 g Merge In Actual 4864 | Exhibit 13-8 Influence A Max I Exhibit 13-8 | rea Desirable 4600:All | No Violation? | V_{F} $V_{FO} = V_{F} - V_{R}$ Flow Ento | V _R ering Dive | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| V _{FO} Flow Entering V _{R12} Level of Serv | 7116 g Merge In Actual 4864 ice Determ | Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i | rea Desirable 4600:All if not F) | No Violation? | V_{F} $V_{FO} = V_{F} - V_{R}$ Flow Enter V_{12} Level of S | V _R ering Dive | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| V _{FO} Flow Entering V _{R12} Level of Serv D _R = 5.475 + | 7116 g Merge In Actual 4864 fice Determ 0.00734 v _R + 0 | Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i | rea Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S | ering Dive Actual Service De | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| V_{FO} Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = 39.5 \text{ (pc/m}$ | 7116 7116 G Merge In Actual 4864 ice Detern 0.00734 v _R + 0 | Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i | rea Desirable 4600:All if not F) | No Violation? | $V_{FO} = V_{F} - V_{R}$ Flow Enter V_{12} Level of S $D_{R} = (pc.$ | ering Dive Actual Service De R = 4.252 + 0 | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| V_{FO} Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = 39.5 \text{ (pc/m}$ $D_R = 6.475 + 0$ $D_R = 6.475 $ | 7116 g Merge In Actual 4864 ice Detern 0.00734 v _R + 0 ni/ln) 13-2) | Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i | rea Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S $D_R = (pc)$ LOS = (Ex | ering Dive Actual Service De R = 4.252 + (/mi/ln) chibit 13-2) | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| V_{FO} Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = 39.5 (pc/m)$ $D_R = 6.475 + 0$ $D_R = 10.475 + 0$ | 7116 g Merge In Actual 4864 ice Detern 0.00734 v _R + 0 ni/ln) 13-2) | Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i | rea Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of S $D_R = (pc)$ $LOS = (Ex)$ Speed De | ering Diverage Actual Service December 24.252 + (colored in the colored in the c | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| V_{FO} Flow Entering V_{R12} Evel of Serv $D_R = 5.475 + 0$ $O_R = 39.5 \text{ (pc/m}$ $OS = E \text{ (Exhibit)}$ Speed Determ | 7116 Actual 4864 | Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i | rea Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S $D_R = (pc)$ $LOS = (Ex)$ Speed De $D_S = (Ex)$ | ering Dive Actual Service De R = 4.252 + 0 /mi/ln) chibit 13-2) eterminati hibit 13-12) | Exhibit 13- Exhibit 13-8 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| V_{FO} Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0.08 = 0.475 + 0.08 = 0.485$ | 7116 Actual 4864 | Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i | rea Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S $D_R = (pc. LOS = (Ext. Speed Dec. Sp$ | ering Diverage Actual Service De Results 13-2) Setermination (Exhibit 13-12) Actual | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |
| V_{FO} Flow Entering V_{R12} Evel of Serv $D_R = 5.475 + 0$ $D_R = 39.5 \text{ (pc/m}$ $D_R = 39.5 \text{ (pc/m}$ $D_R = 0.776 \text{ (Exi}$ | 7116 Actual 4864 4864 O.00734 v R + (0.01/1n) 13-2) Mination bit 13-11) | Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i | rea Desirable 4600:All if not F) | No Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S $D_R = (pc. LOS = (Ex. Speed De. SR = mph. S$ | ering Dive Actual Service De R = 4.252 + 0 /mi/ln) chibit 13-2) eterminati hibit 13-12) | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13 | 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | Yiolation? |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|--|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 4-Be Exp No-Build | et On from Sample & |
| Project Description SW 10th | Street SIMR | | | | |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 6620 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % | 0.95 3 0 Level mi | |
| Calculate Flow Adjustn | nents | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) | 3 70.0 | ft ramps/mi mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| Base free-flow Speed, BFFS | | mph | | | • |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS | (f _{HV} x f _p) 2358 54.4 43.3 E | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | WIPS AND | RAMP JUN | | | <u>El</u> | | | |
|--|---|-----------------------------|------------------------------|-----------------------------|--|---|----------------------------|---------------------|--------------------------------------|
| General Infor | mation | | | Site Infor | | | | | |
| Analyst | | | | eeway/Dir of Ti | | 95 NB | | | |
| Agency or Company | AEC | OM | | inction | S | eg 5-On from E | хр | | |
| Date Performed Analysis Time Period | d AM | | | ırisdiction nalysis Year | N I | o-Build 2040 | | | |
| Project Description | | t SIMR | Al | iaiysis i eai | IV | 0-Build 2040 | | | |
| Inputs | 377 1011 31166 | ST OHVITY | | | | | | | |
| - | | Freeway Num | ber of Lanes, N | 3 | | | | | A 11 |
| Upstream Adj Ramp | | Ramp Numbe | • | 1 | | | | Downstre Ramp | am Adj |
| ☐ Yes ☐ Or | 1 | · ' | | • | | | | | _ |
| | | | ane Length, L _A | 600 | | | | ✓ Yes | On |
| ☑ No ☐ Of | f | | Lane Length L _D | | | | | ☐ No | ✓ Off |
| - 4 | | Freeway Volu | | 6620 | | | | _ | 5545 ft |
| _{rup} = ft | | Ramp Volume | | 920 | | | | L _{down} = | 55 4 5 II |
| $V_{u} = veh/h$ | | Freeway Free | -Flow Speed, S _{FF} | 70.0 | | | | V _D = | 1320 veh/h |
| 'u VCII/II | l | Ramp Free-F | ow Speed, S _{FR} | 50.0 | | | | D | |
| Conversion to | o pc/h Un | der Base | Conditions | | | | - | | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | f_HV | fp | v = V/PH | F x f _{HV} x f _p |
| Freeway | 6620 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | 1 | 7073 |
| Ramp | 920 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | + | 1010 |
| UpStream | 320 | 0.52 | Level | | | 0.550 | 1.00 | | 1010 |
| DownStream | 1320 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 1449 |
| | | Merge Areas | | | | | Diverge Areas | | - |
| Estimation of | | | | | Estimatio | | _ | | |
| | V ₁₂ = V _F | (P) | | | | ·- | | | |
| = | .2 . | | 13-6 or 13-7) | | | V ₁₂ = | $V_R + (V_F - V_F)$ | ` | |
| - _{EQ} = | | | · · | | L _{EQ} = | | (Equation 13- | -12 or 13- | 13) |
| P _{FM} = | | | tion (Exhibit 13-6) |) | P _{FD} = | | using Equation | on (Exhibit 1 | 3-7) |
| / ₁₂ = | 4367 | • | 10.1110 | | V ₁₂ = | | pc/h | | |
| V_3 or V_{av34} | 2706 17) | pc/n (Equati | on 13-14 or 13- | | V_3 or V_{av34} | | pc/h (Equation ' | 13-14 or 13- | 17) |
| Is V ₃ or V _{av34} > 2,70 | | s \square No | | | Is V ₃ or V _{av34} | > 2,700 pc/h? | □Yes □ No | | |
| Is V ₃ or V _{av34} > 1.5 | | | | | Is V ₃ or V _{av34} | > 1.5 * V ₁₂ /2 | □Yes □No | | |
| | | | on 13-16, 13- | | If Yes,V _{12a} = | | pc/h (Equatio | | 3-18, or |
| Yes,V _{12a} = | | 13-19) | 011 10 10, 10 | | 11 103, V _{12a} | 1 | 13-19) | | |
| Capacity Che | cks | | | | Capacity | Checks | | | |
| | Actual | | Capacity | LOS F? | | Actual | Ca | pacity | LOS F? |
| | | | | | V_{F} | | Exhibit 13- | .8 | |
| V_{FO} | 8083 | Exhibit 13-8 | | Yes | $V_{FO} = V_{F}$ - | V_R | Exhibit 13- | .8 | |
| - FO | | Extribit 10 0 | | | | | Exhibit 13 | 3- | |
| | | | | | V _R | | 10 | | |
| Flow Entering | | | | T | Flow Enter | _ | erge Influer | | W. |
| | Actual | 1 1 | Desirable | Violation? | | Actual | Max Des | irable | Violation? |
| | 5907 | Exhibit 13-8 | 4600:AII | Yes | V ₁₂ | | Exhibit 13-8 | | |
| V _{R12} | | nination (| | | | | eterminatio | | t F) |
| Level of Serv | | | ^^^^ | | D _I | _R = 4.252 + 0 | 0.0086 V ₁₂ - 0 | .009 L _D | |
| Level of Serv | o.00734 v _R + 0 | 0.0078 V ₁₂ - 0. | 00627 L _A | | | | | | |
| Level of Serv D _R = 5.475 + | 0.00734 v _R + 0 | 0.0078 V ₁₂ - 0. | 00627 L _A | | $D_R = (pc)$ | /mi/ln) | | | |
| Level of Serv $D_R = 5.475 + 47.3 \text{ (pc/m}$ | 0.00734 v _R + (ii/ln) | 0.0078 V ₁₂ - 0. | 00627 L _A | | | /mi/ln) :hibit 13-2) | | | |
| Level of Serv $D_R = 5.475 + 20$ $D_R = 47.3 \text{ (pc/m}$ | 0.00734 v _R + (ni/ln) 13-2) | 0.0078 V ₁₂ - 0. | 00627 L _A | | LOS = (Ex | | on | | |
| Level of Serv $D_R = 5.475 + 47.3 \text{ (pc/m}$ $D_R = 47.3 \text{ (pc/m}$ $D_R = F \text{ (Exhibit)}$ | 0.00734 v _R + (ni/ln) 13-2) nination | 0.0078 V ₁₂ - 0. | 00627 L _A | | LOS = (Ex | hibit 13-2) e terminati | on | | |
| Level of Serv $D_R = 5.475 + 4$ $D_R = 47.3 \text{ (pc/m}$ $D_R = 47.3$ | 0.00734 v _R + (ni/ln) 13-2) mination bit 13-11) | 0.0078 V ₁₂ - 0. | 00627 L _A | | LOS = $(Ex$ Speed De $D_s = (Ext)$ | chibit 13-2) ceterminati nibit 13-12) | | | |
| Level of Serv $D_R = 5.475 + 47.3 \text{ (pc/m}$ $D_R = 47.3 \text{ (pc/m}$ $D_R = 47.3 \text{ (pc/m}$ $D_R = 1.695 \text{ (Exi}$ $D_R = 47.3 \text{ (pc/m}$ $D_R =$ | 0.00734 v _R + (ii/ln) 13-2) mination bit 13-11) (Exhibit 13-11) | 0.0078 V ₁₂ - 0. | 00627 L _A | | LOS = (Ex Speed De D_s = (Exh S_R = mph | chibit 13-2) ceterminati hibit 13-12) n (Exhibit 13-12 |) | | |
| $D_{R} = 5.475 + 0.000$ $D_{R} = 5.475 + 0.000$ $D_{R} = 47.3 \text{ (pc/m}$ $D_{R} = 47.3 (pc/m$ | 0.00734 v _R + (ni/ln) 13-2) mination bit 13-11) | 0.0078 V ₁₂ - 0. | 00627 L _A | | $\begin{array}{llllllllllllllllllllllllllllllllllll$ | chibit 13-2) ceterminati nibit 13-12) |)) | | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|---|---|----------------------------|---|------------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 6-Be No-Build | et Exp On & Off to 10th |
| Project Description SW 10 | th Street SIMR | | | | |
| ✓ Oper.(LOS |) | <u> </u> | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 7540 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level | |
| DDHV = AADTX K X D | | ven/n | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjust | monte | | - F | | |
| • | | | | 1.0 | |
| f _p | 1.00 | | E _R | 1.2 | |
| E _T | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | <u> </u> | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f_{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | 3 | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | × f _{HV} × f _p) 2685 44.4 60.4 F | pc/h/ln mph pc/mi/ln | Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N | f _{HV} x f _p) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | RAMP | S AND RAM | P JUNCTI | ONS WO | RKS | HEET | | | |
|---|--------------------------------|--|-------------------------------|-----------------|--|----------------------|------------|---|---------------------|------------------------------------|
| General Info | rmation | | | Site Infor | mation | | | | | |
| Analyst | | | Fr | eeway/Dir of Tr | avel | I-95 NB | 3 | | | |
| Agency or Compar | ıy AEC | OM | | ınction | | Seg 7-0 | Off Ramp t | o 10th St | | |
| Date Performed | | | | ırisdiction | | N. D. I | 1.0040 | | | |
| Analysis Time Peri Project Description | | 4 CIMD | Ar | nalysis Year | | No-Buil | a 2040 | | | |
| Inputs | SW TOUT SUE | EL SIIVIK | | | | | | | | |
| • | | Freeway Num | nber of Lanes, N | 3 | | | | | | |
| Upstream Adj | Ramp | Ramp Numbe | | | | | | | Downstrea | ım Adj |
| □Yes | On | | | 1 | | | | | Ramp | |
| | | | Lane Length, L _A | | | | | | Yes | ✓ On |
| ✓ No | Off | | Lane Length L _D | 250 | | | | | □No | Off |
| | | Freeway Volu | • | 7540 | | | | | ı – | 1270 ft |
| L _{up} = | ft | Ramp Volume | 11 | 1320 | | | | | L _{down} = | 1370 ft |
| V,, = | veh/h | Freeway Free | e-Flow Speed, S _{FF} | 70.0 | | | | | V _D = | 1660 veh/h |
| v u | VGII/II | Ramp Free-F | low Speed, S _{FR} | 45.0 | | | | | D | |
| Conversion | to pc/h Un | der Base | Conditions | | | | | - | | |
| (pc/h) | V () () | PHF | Terrain | %Truck | %Rv | | f_{HV} | fp | v = V/PHF | x f _{uv} x f _n |
| , | (Veh/hr) | | | | | _ | | r | | ı- |
| Freeway | 7540 | 0.95 | Level | 3 | 0 | _ | 985 | 1.00 | 80 | |
| Ramp UpStream | 1320 | 0.92 | Level | 2 | 0 | 0.9 | 990 | 1.00 | 14 | 49 |
| DownStream | 1660 | 0.92 | Level | 2 | 0 | 0 | 990 | 1.00 | 18 | 22 |
| Downoucum | | Merge Areas | LCVCI | 2 | <u> </u> | 0., | | Diverge Areas | 10 | <u></u> |
| Estimation o | | g. | | | Estimat | ion o | | J | | |
| | | /D \ | | | | | | · \/ + (\/ \/ | \D | |
| | $V_{12} = V_F$ | | 10 =) | | _ | | | V _R + (V _F - V _F | | ` |
| L _{EQ} = | | ation 13-6 or | • | | L _{EQ} = | | • | Equation 13-1 | | |
| P _{FM} = | ū | Equation (| Exhibit 13-6) | | P _{FD} = | | | 492 using Eqւ | lation (Exhi | bit 13-7) |
| V ₁₂ = | pc/h | | | | V ₁₂ = | | | 699 pc/h | | |
| V ₃ or V _{av34} | | | 3-14 or 13-17) | | V_3 or V_{av34} | | | 357 pc/h (Equa | ation 13-14 | or 13-17) |
| Is V_3 or $V_{av34} > 2.7$ | | | | | | | | ✓ Yes □ No | | |
| Is V_3 or $V_{av34} > 1.5$ | | | | | Is V ₃ or V _{av} | _{/34} > 1.5 | | ☐Yes ☑No | | |
| If Yes,V _{12a} = | | | 3-16, 13-18, or | | If Yes,V _{12a} = | = | | 356 pc/h (Equa | ation 13-16 | 5, 13-18, |
| Capacity Ch | 13-19 |) | | | | | | r 13-19) | | |
| Сараспу Сп | Actual | 1 6 | Capacity | LOS F? | Capacit | y Circ | Actual | Co | pacity | LOS F? |
| | Actual | | Japacity | LOST | V _F | \dashv | 8056 | Exhibit 13-8 | | Yes |
| ., | | E-1:1:140 0 | | | <u> </u> | | | | | + |
| V_{FO} | | Exhibit 13-8 | | | $V_{FO} = V_{F}$ | - v _R | 6607 | Exhibit 13-8 | + | No |
| | | | | | V _R | | 1449 | Exhibit 13-10 | | No |
| Flow Enterir | | | | | Flow En | | | rge Influen | | |
| | Actual | i ı | Desirable | Violation? | | | Actual | Max Desirab | | Violation? |
| V _{R12} | | Exhibit 13-8 | | | V ₁₂ | | 1699 | Exhibit 13-8 | 4400:All | Yes |
| Level of Ser | | <u>, </u> | | | + | | | terminatio | • | F) |
| $D_R = 5.475 + 0$ | 0.00734 v _R + | 0.0078 V ₁₂ · | - 0.00627 L _A | | | $D_R = 4$ | .252 + 0 | .0086 V ₁₂ - 0.0 | 009 L _D | |
| $D_R = (pc/mi/l)$ | n) | | | | $D_R = 48$ | 8.1 (pc/ | /mi/ln) | | | |
| LOS = (Exhibi | t 13-2) | | | | LOS = F | (Exhib | oit 13-2) | | | |
| Speed Deter | mination | | | | Speed L | Deter | minatio | on | | |
| $M_S = (Exibit)$ | | | | | ' | | xhibit 13 | | | |
| - | • | | | | | | | • | | |
| | (hibit 13-11) | | | | S_R = 58.0 mph (Exhibit 13-12) S_0 = 70.2 mph (Exhibit 13-12) | | | | | |
| | (hibit 13-11) (hibit 13-13) | | | | 1 - | | • | • | | |
| 1 (| • | Noble 5 | | | Ţ, | | (Exhibit | | 2 | 100/00/10 |
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| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|--|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 8-Be No-Build | et Off & On 10th St |
| Project Description SW 10t | th Street SIMR | | | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 6220 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| | | | Up/Down % | | |
| Calculate Flow Adjusti | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T-1)+P_R(E_R-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$ LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base free | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| Canaval Inf | | INILO AND | RAMP JUN | | | <u> </u> | | | |
|---|--|------------------------------|-----------------------------|------------------------|-------------------------------------|------------------------------------|----------------------------|---------------------|--------------------------------------|
| General Info | mation | | _ | Site Infor | | 05.115 | | | |
| Analyst | | 2014 | | reeway/Dir of Tr | | 95 NB | 0.50 | | |
| Agency or Company Date Performed | / AEC | JUIVI | | unction urisdiction | S | eg -Un Ramp 1 | 0th St EB & WB | | |
| Analysis Time Perio | d AM | | | nalysis Year | N | o-Build 2040 | | | |
| Project Description | | et SIMR | | , | .,, | o Bana 2010 | | | |
| nputs | | | | | | | | | |
| Jpstream Adj Ramp | | Freeway Num | per of Lanes, N | 3 | | | | Downstre | am Adi |
| opstream Auj Kamp |) | Ramp Number | of Lanes, N | 1 | | | | Ramp | ani Auj |
| ☑ Yes ☐ O | n | 1 ' | ane Length, L _A | 1345 | | | | | |
| | | | ane Length L _D | 1040 | | | | □Yes | ☐ On |
| ☐ No ☑ Of | if | | | 6220 | | | | ✓ No | Off |
| - _{up} = 1370 | ft | Freeway Volu | | 6220 | | | | L _{down} = | ft |
| _{up} = 1370 | π | Ramp Volume | | 1660 | | | | -down | |
| / _u = 1320 | veh/h | • | Flow Speed, S _{FF} | 70.0 | | | | V _D = | veh/h |
| u 1020 | | Ramp Free-Fl | ow Speed, S _{FR} | 50.0 | | | | | |
| Conversion t | o pc/h Un | der Base (| Conditions | | | | | | |
| (pc/h) | (\/oh/hr\ | PHF | Terrain | %Truck | %Rv | f_HV | fp | v = V/PH | F x f _{HV} x f _p |
| Freeway | (Veh/hr) 6220 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | | 6646 |
| Ramp | 1660 | 0.93 | Level | 2 | 0 | 0.985 | 1.00 | | 1822 |
| UpStream | 1320 | 0.92 | | 2 | 0 | 0.990 | 1.00 | | 1449 |
| DownStream | 1320 | 0.92 | Level | 2 | U | 0.990 | 1.00 | | 1449 |
| 30WIIOti Cairi | | Merge Areas | | | | | Diverge Areas | | |
| stimation o | f v ₄₂ | germous | | | Estimation | | | | |
| | V ₁₂ = V _F | / D \ | | | | ·- | | | |
| _ | | | 10.0 10.7 | | | V ₁₂ = | $V_R + (V_F - V_R)$ | P _{FD} | |
| - _{EQ} = | | | 13-6 or 13-7) | | L _{EQ} = | | (Equation 13- | 12 or 13- | 13) |
| FM = | | | on (Exhibit 13-6) |) | P _{FD} = | | using Equation | n (Exhibit 1 | 3-7) |
| ′ ₁₂ = | 3563 | ·= | | | V ₁₂ = | | pc/h | | |
| ′ ₃ or V _{av34} | | pc/h (Equation | on 13-14 or 13- | | V ₃ or V _{av34} | | pc/h (Equation 1 | 13-14 or 13- | 17) |
| Is V ₃ or V _{av34} > 2,70 | 17) | na 🗆 Nia | | | | > 2,700 pc/h? | ☐Yes ☐ No | | , |
| | | | | | | | ☐Yes ☐No | | |
| Is V ₃ or V _{av34} > 1.5 | | | n 12 16 12 | | | 12 | pc/h (Equatio | n 13-16, 1 | 3-18, or |
| Yes,V _{12a} = | | pc/h (Equatio · 13-19) |)II 13-10, 13- | | If Yes,V _{12a} = | 1 | 13-19) | | , |
| Capacity Che | | 10 10) | | | Capacity | Checks | | | |
| , , | Actual | С | apacity | LOS F? | 1 | Actual | Ca | pacity | LOS F? |
| | T | | | | V _F | | Exhibit 13- | | |
| \/ | 0460 | Evhibit 42 0 | | Var | $V_{FO} = V_F -$ | VD | Exhibit 13- | 8 | 1 |
| V_{FO} | 8468 | Exhibit 13-8 | | Yes | | K | Exhibit 13 | | |
| | 1 | | | | V_R | | 10 | | |
| low Enterin | g Merge II | nfluence A | rea | | Flow Ent | ering Dive | erge Influer | ce Area | ? |
| | Actual | | Desirable | Violation? | | Actual | Max Des | | Violation' |
| V _{R12} | 5768 | Exhibit 13-8 | 4600:All | Yes | V ₁₂ | | Exhibit 13-8 | | |
| Level of Serv | vice Deter | mination (i | f not F) | | Level of | Service De | eterminatio | n (if no | t F) |
| | | 0.0078 V ₁₂ - 0.0 | | | 1 | | 0.0086 V ₁₂ - 0 | _ | |
| | | 12 | A | | L | /mi/ln) | 12 | Б | |
| •• | • | | | | | · · | | | |
| O _R = 41.2 (pc/n | 13-2) | | | | <u> </u> | thibit 13-2) E terminati | | | |
| $D_R = 41.2 \text{ (pc/n)}$ $D_R = F \text{ (Exhibit)}$ | | Speed Determination | | | | | on | | |
| O _R = 41.2 (pc/n OS = F (Exhibit Speed Deteri | | | | | m3 - /= 1 | hibit 13-12) | | | |
| O _R = 41.2 (pc/n OS = F (Exhibit Speed Deterr | | | | | 1 " | , | | | |
| O_R = 41.2 (pc/n OS = F (Exhibit) Speed Determined M_S = 1.434 (Exhibit) | mination | | | | | n (Exhibit 13-12) |) | | |
| $R_{\rm R}$ = 41.2 (pc/n OS = F (Exhibit Speed Determant $R_{\rm R}$ = 1.434 (Exhibit 29.8 mph | mination ibit 13-11) | | | | S _R = mph | , | • | | |
| $_{\rm R}$ = 41.2 (pc/n OS = F (Exhibit Speed Deteri $_{\rm S}$ = 1.434 (Ex $_{\rm R}$ = 29.8 mph $_{\rm O}$ = 61.1 mph | mination ibit 13-11) (Exhibit 13-11) | | | | $S_R = mpt$ $S_0 = mpt$ | n (Exhibit 13-12 |) | | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|--|-----------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed | AECOM | | Highway/Direction of Travel From/To Jurisdiction | I-95 NB Seg 10- | Bet 10th St & Hillsboro |
| Analysis Time Period | AM | | Analysis Year | No-Build | 1 2040 |
| Project Description SW 10th | | | | | |
| ✓ Oper.(LOS) |) | | Des.(N) | Pla | anning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K | 7880 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R | 0.95 3 0 | |
| Peak-Hr Direction Prop, D DDHV = AADT x K x D | | veh/h | General Terrain: Grade % Length Up/Down % | Level mi | |
| Calculate Flow Adjustr | ments | | | | |
| f _p | 1.00 | | E _R | 1.2 | |
| E _T | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f_{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | · |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N : S D = v _p / S | x f _{HV} x f _p) 2806 40.1 70.0 | pc/h/ln mph pc/mi/ln | Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S | $f_{HV} \times f_p$) | pc/h/ln mph |
| LOS | F | рс/пі/пі | D = v _p / S Required Number of Lanes, N | | pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | RAMP | S AND RAM | P JUNCTI | ONS WO | RKS | HEET | | | | | |
|--|----------------------------------|--------------------------|-------------------------------|-----------------|-------------------------------------|----------------------|---|---|---------------------|---------------------------------------|--|--|
| General Info | rmation | | | Site Infor | mation | | | | | | | |
| Analyst | | | Fr | eeway/Dir of Tr | avel | I-95 NB | | | | | | |
| Agency or Company | / AEC | OM | | nction | | Seg 11 | -Off Ramp | Hillsboro EB | | | | |
| Date Performed | d 0.00 | | | risdiction | | Na Duil | 4 0040 | | | | | |
| Analysis Time Perio Project Description | | at SIMR | AI | nalysis Year | | No-Buil | d 2040 | | | | | |
| Inputs | OW TOUT OUG | St OliviiX | | | | | | | | | | |
| - | 2000 | Freeway Num | nber of Lanes, N | 3 | | | | | Downstra | ····································· | | |
| Upstream Adj F | Kamp | Ramp Numbe | | 1 | | | | | Downstrea Ramp | am Auj | | |
| ✓ Yes | ✓ On | · | _ane Length, L _Δ | ' | | | | | • | | | |
| | _ | | Lane Length L _n | 220 | | | | | ☐ Yes | ☐ On | | |
| □No | Off | | - 5 | | | | | | ✓ No | Off | | |
| l = 20 | 085 ft | Freeway Volu | • | 7880 | | | | | L. = | ft | | |
| L _{up} = 30 | J00 II | Ramp Volume | | 800 | | | | | L _{down} = | | | |
| V,, = 16 | 660 veh/h | - | e-Flow Speed, S _{FF} | 70.0 | | | | , | V _D = | veh/h | | |
| | | | low Speed, S _{FR} | 45.0 | | | | | | | | |
| Conversion t | T - | der Base | Conditions | | ı | | | | | | | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | | f _{HV} | f _p | v = V/PHF | $x f_{HV} x f_{p}$ | | |
| Freeway | 7880 | 0.95 | Level | 3 | 0 | 0.9 | 985 | 1.00 | 84 | 19 | | |
| Ramp | 800 | 0.92 | Level | 2 | 0 | | 990 | 1.00 | 8 | | | |
| UpStream | 1660 | 0.92 | Level | 2 | 0 | 0.9 | 990 | 1.00 | 18 | 22 | | |
| DownStream | | | | | | | | | | | | |
| | | Merge Areas | | | | | | iverge Areas | | | | |
| Estimation o | f v ₁₂ | | | | Estimat | ion o | f v ₁₂ | | | | | |
| | V ₁₂ = V _F | (P _{FM}) | | | | | V ₁₂ = | V _R + (V _F - V _R | P _{FD} | | | |
| L _{EQ} = | (Equa | ation 13-6 or | 13-7) | | L _{EQ} = | | 92 | 06.25 (Equation | on 13-12 o | r 13-13) | | |
| P _{FM} = | using | Equation (| Exhibit 13-6) | | P _{FD} = | | 0.5 | 509 using Equ | iation (Exhi | bit 13-7) | | |
| V ₁₂ = | pc/h | | | | V ₁₂ = | | 47 | 17 pc/h | | | | |
| V ₃ or V _{av34} | pc/h (| Equation 13 | -14 or 13-17) | | V ₃ or V _{av34} | | 37 | 02 pc/h (Equa | ation 13-14 | or 13-17) | | |
| Is V_3 or $V_{av34} > 2,70$ | | • | , | | | ₃₄ > 2,70 | | Yes □No | | , | | |
| Is V_3 or $V_{av34} > 1.5$ | | | | | | | | Yes □ No | | | | |
| | | | -16, 13-18, or | | | | | 19 pc/h (Equa | ation 13-16 | 5, 13-18, | | |
| If Yes,V _{12a} = | 13-19) | | | | If Yes,V _{12a} = | _ | | 13-19) | | | | |
| Capacity Che | | 7 | | | Capacit | y Che | ecks | | | | | |
| | Actual | | Capacity | LOS F? | | | Actual | - | pacity | LOS F? | | |
| | | | | | V _F | | 8419 | Exhibit 13-8 | | Yes | | |
| V _{FO} | | Exhibit 13-8 | | | $V_{FO} = V_{F}$ | - V _R | 7541 | Exhibit 13-8 | 7200 | Yes | | |
| | | | | | V_R | | 878 | Exhibit 13-10 | 2100 | No | | |
| Flow Enterin | g Merge In | fluence A | \rea | | Flow En | terin | g Diver | ge Influenc | ce Area | | | |
| | Actual | Max | Desirable | Violation? | | P | Actual | Max Desirab | le | Violation? | | |
| V_{R12} | | Exhibit 13-8 | | | V ₁₂ | 4 | 717 | Exhibit 13-8 | 4400:All | Yes | | |
| Level of Serv | vice Detern | nination (| if not F) | | Level of | f Serv | vice De | terminatior | n (if not | F) | | |
| $D_R = 5.475 + 0$ | .00734 v _R + | 0.0078 V ₁₂ · | - 0.00627 L _A | | | $D_R = 4$ | .252 + 0. | 0086 V ₁₂ - 0.0 | 009 L _D | | | |
| D _R = (pc/mi/lr | ٦) | | | | $D_R = 51$ | 1.5 (pc/ | mi/ln) | | | | | |
| LOS = (Exhibit | 13-2) | | | | LOS = F | (Exhib | it 13-2) | | | | | |
| Speed Deteri | <u> </u> | | | | Speed L | | | n | | | | |
| | | | | | | | xhibit 13- | | | | | |
| | | | | | | | $D_s = 0.377$ (Exhibit 13-12) $S_R = 59.4$ mph (Exhibit 13-12) | | | | | |
| | • | | | | S_0 = 70.2 mph (Exhibit 13-12) | | | | | | | |
| • | hibit 13-11) hibit 13-13) | | | | * | • | (Exhibit | - | | | | |
| right © 2016 Universi | • | Dighte Doorsed | | | HCS2010 TM | | • | · · · · · · · · · · · · · · · · · · · | Congreted: C | /22/2019 11:4 | | |
| | IV OLEIODOA AILE | CULIES RESERVED | | | UCC20101V | Varaiar | S 6 00 | (| renetated. 2 | 2212UT9 TT | | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|--|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 12-E No-Build | Bet Off & On Hillsboro |
| Project Description SW 10t | th Street SIMR | | - | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 7080 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjusti | ments | | | | |
| f _p E _⊤ | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T-1)+P_R(E_R-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | <u> </u> | | |
| Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| · | | Прп | | | |
| Coperational (LOS) v _p = (V or DDHV) / (PHF x N S) D = v _p / S LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S) D = v _p / S Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | REEWAY | WEAVI | NG WOR | RKSHEE | T | | |
|---|---|--------------------|------------|-------------------|--|--------------------------|---------------------------|------|-----------------------------|
| Genera | l Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/Co Date Perfo Analysis Ti | rmed | AECO! | И | | Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 13-Bet On & Off Hillsboro Analysis Year No-Build 2040 | | | | |
| Project Des | scription SW 10t | h Street SIMF | ? | | <u> </u> | | | | |
| Inputs | | | | | 1 | | | | |
| Weaving no Weaving se Freeway fro | onfiguration umber of lanes, Negment length, Leee-flow speed, Fl | S S | - David | 790ft 70 mph | Segment type Freeway min Freeway max Terrain type | imum speed | | | Freewa 1 2400 Leve |
| Conver | V (veh/h) | PHF | Truck (%) | RV (%) | E _T | Е | f f | fp | v (pc/h) |
| \/ | 6430 | 0.95 | 3 | 0 | 1.5 | E _R | f _{HV} 0.985 | 1.00 | 6870 |
| V _{FF} | 660 | 0.93 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 725 |
| V _{RF} | 650 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 714 |
| V _{FR} V _{RR} | 0 | 0.95 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 0 |
| V _{NW} | 6870 | 0.00 | | | 1.0 | | 0.000 | V = | 8309 |
| V _W | 1439 | | | | | | | | 1 |
| VR | 0.173 | | | | | | | | , |
| Config | uration Cha | aracteris | tics | | | | | | |
| Minimum r | naneuver lanes, l | N _{WL} | | 2 lc | Minimum we | aving lane c | hanges, LC _{MIN} | I | 1439 lc/h |
| Interchang | e density, ID | | | 0.7 int/mi | Weaving lan | e changes, L | .C _w | | 1650 lc/h |
| Minimum F | RF lane changes, | LC_RF | | 1 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | 1073 lc/h |
| Minimum F | R lane changes, | LC_FR | | 1 lc/pc | Total lane ch | nanges, LC _{AL} | L | | 2723 lc/h |
| Minimum F | RR lane changes | , LC _{RR} | | lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | 380 |
| Weavir | ig Segment | t Speed, | Density, I | _evel of | Service, | and Cap | oacity | | |
| Weaving segment flow rate, v 8193 veh/h Weaving segment capacity, c _w 8410 veh/h | | | | | Weaving inte | gment speed | , S | | 0.600 49.6 mph |
| • | egment v/c ratio | D | 4. | 0.974 | | | | | 49.4 mph |
| | egment density, lervice, LOS | ט | 4′ | I.9 pc/mi/ln E | | | | | • |
| Notes | JI VIOG, LOO | | | Б | iviaximum we | eaving lengtr | I, L _{MAX} | | 4264 fl |

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a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|---|---|----------------------------|--|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 14-E No-Build | Bet Off & On Hillsboro |
| | th Street SIMR | | , | | |
| ✓ Oper.(LOS |) |] | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 7090 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| DDITY /VIDTXIXD | | VCIIII | Up/Down % | 1111 | |
| Calculate Flow Adjust | ments | | | | |
| f _p | 1.00 | | E _R | 1.2 | |
| E _T | 1.5 | | $f_{HV} = 1/[1 + P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | <u> </u> | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f_{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | × f _{HV} × f _p) 2525 49.6 50.9 F | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | F | REEWAY | WEAV | NG WOR | KSHEE | T | | |
|---|---|---------------|------------|--------------------------|--|-------------------------|---------------------------|---------------------------------|--------------------------------|
| Genera | I Information | | | | Site Info | | | | |
| Analyst Agency/Co Date Perfo Analysis Ti | rmed | AECON AM | Л | | Freeway/Dir Weaving Seg Analysis Yea | ment Locati | | IB 5-Bet On & 0 uild 2040 | Off to Exp |
| Project De | scription SW 10th | n Street SIMR | 1 | | l | | | | |
| Inputs | | | | | 1 | | | | |
| Weaving n Weaving se Freeway fr | onfiguration umber of lanes, N egment length, L _s ee-flow speed, FF | s FS | | 4665ft 70 mph | Segment type Freeway min Freeway max Terrain type | imum speed | | | Freeway 15 2400 Level |
| Convei | rsions to po | | 1 | 1 | T T | | | 1 , | 1 (11) |
| | V (veh/h) | PHF | Truck (%) | RV (%) | E _T | E _R | f _{HV} | fp | v (pc/h) |
| V _{FF} | 5525 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 5903 |
| V_{RF} | 635 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 697 |
| V_{FR} | 1565 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1718 |
| V_RR | 175 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 192 |
| V_{NW} | 8318 | | | | | | | V = | 8510 |
| V_{W} | 192 | | | | | | | | |
| VR | 0.023 | | | | | | | | |
| Config | uration Cha | aracterist | ics | | 1 | | | | |
| Minimum r | maneuver lanes, I | N_{WL} | | 0 lc | Minimum we | aving lane c | hanges, LC _{MIN} | | lc/h |
| _ | je density, ID | | | 0.7 int/mi | Weaving land | e changes, L | $-C_{W}$ | | lc/h |
| Minimum F | RF lane changes, | LC_{RF} | | 0 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | lc/h |
| | FR lane changes, | 111 | | 0 lc/pc | Total lane ch | anges, LC _{AL} | L | | lc/h |
| Minimum F | RR lane changes, | LC_{RR} | | 3 lc/pc | Non-weaving | y vehicle inde | ex, I _{NW} | | |
| Weavir | ng Segment | Speed, | Density, I | _evel of | Service, | and Cap | oacity | | |
| | segment flow rate, segment capacity, | | | 8398 veh/h 6807 veh/h | Weaving inte | ment speed | , S | | mph |
| | segment v/c ratio | _ | | 1.234 | Average wea | | ** | | mph |
| | egment density, I |) | | • | Average non | | | | mph |
| | ervice, LOS | | | F | Maximum we | eaving length | ı, L _{MAX} | | 5936 ft |
| Notes | | | | | | | | | |

<sup>a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".</sup>

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| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|------------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 16-N No-Build | North of Hillsboro |
| Project Description SW 10t | th STreet SIMR | | | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 6160 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 4 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjustr | ments | | | | |
| f _p | 1.00 | | E _R | 1.2 | |
| E _T | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.980 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 2205 58.3 37.8 <i>E</i> | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | f _{HV} x f _p) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | REEWAY | WEAV | NG WOR | RKSHEE | l | | |
|---|---|------------------|------------|------------------------------------|--|--------------------------|---------------------------|--------------------------------|-------------------------------|
| General | Information | on | | | Site Info | rmation | | | |
| Analyst Agency/Con Date Perfori Analysis Tin | med | AECON PM | Л | | Freeway/Dir Weaving Seg Analysis Yea | gment Locati | | IB -Bet Copans uild 2040 | & Sample |
| Project Des | cription SW 10tl | h Street SIMF | } | | | | | | |
| Inputs | | | | | • | | | | |
| Weaving se | nfiguration mber of lanes, N gment length, L _s e-flow speed, Ff | S | | One-Sided 4 1820ft 70 mph | Segment type Freeway min Freeway max Terrain type | imum speed | | | Freeway 19 2400 Leve |
| Conver | sions to po | /h Unde | r Base Co | ndition | S | | | | |
| | V (veh/h) | PHF | Truck (%) | RV (%) | Ε _Τ | ER | f_{HV} | fp | v (pc/h) |
| V_{FF} | 4770 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 5096 |
| V_{RF} | 480 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 527 |
| V_{FR} | 1810 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1987 |
| V_{RR} | 0 | 0.95 | 0 | 0 | 1.5 | 1.2 | 1.000 | 1.00 | 0 |
| V_{NW} | 5096 | | | | | | | V = | 7610 |
| V_W | 2514 | | | | | | | | |
| VR | 0.330 | | | | | | | | |
| Configu | ration Cha | aracteris | tics | | T | | | | |
| Minimum m | aneuver lanes, I | N _{WL} | | 2 lc | Minimum we | aving lane c | hanges, LC _{MIN} | | lc/h |
| Interchange | • | | | 0.7 int/mi | Weaving lan | e changes, L | $-C_{W}$ | | lc/h |
| | F lane changes, | IM | | 1 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | lc/h |
| | R lane changes, | 111 | | 1 lc/pc | Total lane ch | nanges, LC _{AL} | L | | lc/h |
| Minimum R | R lane changes, | LC _{RR} | | lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | |
| Weavin | g Segment | Speed, | Density, I | _evel of | Service, | and Cap | oacity | | |
| Weaving se | gment flow rate gment capacity, gment v/c ratio | | | 7511 veh/h 7158 veh/h 1.049 | Weaving into Weaving seg Average wea | gment speed | , S | | mph mph |
| | gment density, I | D | | pc/mi/ln | Average non | n-weaving sp | eed, S _{NW} | | mph |
| Level of Se | rvice, LOS | | | F | Maximum we | eaving length | ı, L _{max} | | 5912 ft |

Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
 For volumes that exceed the weaving segment capacity, the level of service is "F".

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|------------------------------------|---|---|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 2-Be Sample No-Build | et Off & On from 2040 |
| Project Description SW 10th | h Street SIMR | | • | | |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5250 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % | 0.95 3 0 Level mi | |
| Calculate Flow Adjustn | nents | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| · | Magaziraa | Прп | Decign (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N | f _{HV} x f _p) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | MPS AND | RAMP JUN | | | E I | | | |
|--|--|----------------|------------------------------|-----------------|--|---|----------------------------|---|--------------------------------------|
| General Infor | mation | | | Site Infor | | | | | |
| Analyst | | | | eeway/Dir of Tr | | 95 NB | | | |
| Agency or Company | AEC | OM | | ınction | S | eg 3-On Ramp | from Sample | | |
| Date Performed | J DM | | | ırisdiction | N | - D.:!!-! 0040 | | | |
| Analysis Time Period Project Description | | + CIMD | AI | nalysis Year | N | o-Build 2040 | | | |
| Inputs | SW TOUT SHEE | SINIK | | | | | | | |
| - | | Freeway Num | ber of Lanes, N | 3 | | | | | |
| Upstream Adj Ramp | | 1 1 | • | 1 | | | | Downstre | am Adj |
| ☐ Yes ☐ Or | 1 | Ramp Numbe | | • | | | | Ramp | |
| | ļ. | 1 | ane Length, L _A | 500 | | | | Yes | ✓ On |
| ☑ No ☐ Of | f | 1 | _ane Length L _D | | | | | □No | Off |
| | | Freeway Volu | ' | 5250 | | | | | |
| _{-up} = ft | | Ramp Volume | e, V _R | 1150 | | | | L _{down} = | 1950 ft |
| / | | Freeway Free | -Flow Speed, S _{FF} | 70.0 | | | | V _D = | 770 veh/h |
| / _u = veh/h | I | Ramp Free-Fl | ow Speed, S _{FR} | 50.0 | | | | V _D – | 770 Veii/ii |
| Conversion to | o pc/h Un | der Base | Conditions | | | | | | |
| (pc/h) | V | PHF | Terrain | %Truck | %Rv | f_{HV} | f _p | v = V/PH | F x f _{HV} x f _p |
| . , | (Veh/hr) | | | | | | ı' | | r |
| Freeway | 5250 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | | 5609 |
| Ramp | 1150 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 1262 |
| UpStream DownStream | 770 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 845 |
| DownStream | | Merge Areas | Level | | U | | Diverge Areas | | 043 |
| Estimation of | | Merge Areas | | | Estimation | | Diverge Aleas | | |
| | | (D) | | | | 11 01 112 | | | |
| | $V_{12} = V_{F}$ | | | | | V ₁₂ = | $V_R + (V_F - V_R)$ |)P _{FD} | |
| - _{EQ} = | (Equ | ation 13-6 or | r 13-7) | | L _{EQ} = | | (Equation 13- | 12 or 13- | 13) |
| P _{FM} = | 0.591 | using Equat | tion (Exhibit 13-6) |) | P _{FD} = | | using Equation | | · · |
| ′ ₁₂ = | 3318 | pc/h | | | V ₁₂ = | | pc/h | (=::::::::::::::::::::::::::::::::::::: | - '/ |
| / ₃ or V _{av34} | 2291 | pc/h (Equati | on 13-14 or 13- | | V ₃ or V _{av34} | | pc/h (Equation 1 | 3 1/1 or 13 | 17\ |
| | 17) | | | | | > 0.700 na/h0 l | | 3-14-01-13- | 17) |
| Is V_3 or $V_{av34} > 2,70$ | | | | | | | ☐Yes ☐ No | | |
| Is V_3 or $V_{av34} > 1.5$ ' | ·V ₁₂ /2 | s 🗌 No | | | is v ₃ or v _{av34} | | Yes No | - 10 10 1 | 2.10 |
| Yes,V _{12a} = | | | on 13-16, 13- | | If Yes,V _{12a} = | | pc/h (Equatio 3-19) | 11 13-10, 1 | 3-10, 01 |
| Capacity Che | | 13-19) | | | Capacity | | , | | |
| apacity Cite | Actual | | apacity | LOS F? | Capacity | Actual | Car | pacity | LOS F? |
| | , totaai | † Ť | | 2001: | V _F | , totali | Exhibit 13- | | 2001: |
| | | | | | | \/ | | | _ |
| V_{FO} | 6871 | Exhibit 13-8 | | No | $V_{FO} = V_{F}$ - | VR . | Exhibit 13- | | |
| | | | | | V_R | | Exhibit 13 | - | |
| low Entering | n Merae Ir | fluence A | rea | | Flow Ent | erina Dive | rge Influen | ce Area | , |
| 1011 2111011119 | Actual | | Desirable | Violation? | 7 1011 2110 | Actual | Max Desi | | Violation? |
| V _{R12} | 4580 | Exhibit 13-8 | 4600:All | No | V ₁₂ | | Exhibit 13-8 | | |
| | | | | | | Service De | eterminatio | n (if no | † F) |
| | | • | | | 1 | | 0.0086 V ₁₂ - 0 | | , |
| Level of Serv | $0.007.54 \text{ V} = \pm 1$ | 3.0070 112 0.0 | 2002: L _A | | | · - | 7.0000 V ₁₂ 0 | .000 L D | |
| D _R = 5.475 + | • | | | | | /mi/ln) | | | |
| Level of Serv $D_R = 5.475 + 20$ $D_R = 37.5 \text{ (pc/m}$ | ni/ln) | | | | | hibit 13-2) | | | |
| Level of Serv $D_R = 5.475 + 20$ $D_R = 37.5 \text{ (pc/m}$ $D_R = E \text{ (Exhibit)}$ | ni/ln) 13-2) | | | | - | | | | |
| Level of Serv $D_R = 5.475 + 20$ $D_R = 37.5 \text{ (pc/m}$ | ni/ln) 13-2) | | | | Speed De | eterminati | on | | |
| Level of Serv $D_R = 5.475 + 20$ $D_R = 37.5 \text{ (pc/m}$ $D_R = 6 \text{ (Exhibit)}$ Speed Determ | ni/ln) 13-2) mination | | | | Speed De | | on | | |
| Level of Serv $D_R = 5.475 + 20$ $D_R = 37.5 \text{ (pc/m}$ $D_R = 37.$ | ni/ln) 13-2) nination bit 13-11) | | | | Speed De | eterminati | | | |
| $\begin{array}{c} \textbf{Level of Serv} \\ \textbf{D}_{R} = 5.475 + \\ \textbf{D}_{R} = 37.5 \text{ (pc/m} \\ \textbf{OS} = \text{E (Exhibit} \\ \textbf{Speed Detern} \\ \textbf{M}_{S} = 0.651 \text{ (Exilographics)} \\ \textbf{E}_{R} = 51.8 \text{ mph} \text{ (in the properties)} \end{array}$ | ni/ln) 13-2) mination bit 13-11) (Exhibit 13-11) | | | | Speed De $D_s = (Exh S_R = mph$ | etermination hibit 13-12) |) | | |
| $D_{\rm R} = 5.475 + 0.000$ $D_{\rm R} = 37.5 \text{ (pc/m}$ $D_{\rm R} = 37.5 \text{ (pc/m}$ $D_{\rm R} = 37.5 \text{ (pc/m}$ $D_{\rm R} = 0.651 \text{ (Exilibit)}$ | ni/ln) 13-2) nination bit 13-11) | | | | $\begin{array}{ccc} \textbf{Speed De} \\ \textbf{D}_{\text{S}} = & (\text{Ext} \\ \textbf{S}_{\text{R}} = & \text{mph} \\ \textbf{S}_{0} = & \text{mph} \end{array}$ | etermination hibit 13-12) hi (Exhibit 13-12 |) | | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|--|--|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 4-Be Exp No-Build | et On from Sample & |
| Project Description SW 10th | n Street SIMR | | · | | |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 6400 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % | 0.95 3 0 Level mi | |
| Calculate Flow Adjustn | nents | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ft ramps/mi mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| | | mph | Decima (Al) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S) D = v _p / S Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| <u> </u> | | MPS AND | RAMP JUN | | | E I | | | |
|--|--|-----------------------------------|------------------------------|------------------------|---|--|--|--|--------------------------------------|
| General Infor | rmation | | | Site Infor | | | | | |
| Analyst | | | | eeway/Dir of Ti | | 95 NB | | | |
| Agency or Company Date Performed | AEC | OM | | inction irisdiction | S | eg 5-On from E | exp | | |
| Analysis Time Period | d PM | | | nalysis Year | N | o-Build 2040 | | | |
| Project Description | | t SIMR | 7.0 | laryolo roai | IN | O-Dulla 2040 | | | |
| Inputs | 011 1041 041 0 | | | | | | | | |
| - | | Freeway Num | ber of Lanes, N | 3 | | | | D | A al: |
| Upstream Adj Ramp | 1 | Ramp Numbe | • | 1 | | | | Downstre Ramp | am Aaj |
| ☐ Yes ☐ Or | n | 1 ' | ane Length, L _A | 600 | | | | | _ |
| | | 1 | ** | 000 | | | | ✓ Yes | On |
| ☑ No ☐ Of | ff | 1 | ane Length L _D | 0.400 | | | | ☐ No | ✓ Off |
| - tt | | Freeway Volu | | 6400 | | | | . = | 5545 ft |
| _{-up} = ft | | Ramp Volume | | 770 | | | | L _{down} = | JJ 4 J II |
| $V_{u} = veh/h$ | า | 1 | -Flow Speed, S _{FF} | 70.0 | | | | V _D = | 1590 veh/h |
| - u • • • • • • • • • • • • • • • • • • | • | Ramp Free-Fl | ow Speed, S _{FR} | 50.0 | | | | | |
| Conversion t | o pc/h Un | der Base | Conditions | | | | | | |
| (pc/h) | () (ab/br) | PHF | Terrain | %Truck | %Rv | f_HV | fp | v = V/PH | F x f _{HV} x f _p |
| Freeway | (Veh/hr) 6400 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | | 6838 |
| Ramp | 770 | 0.93 | Level | 2 | 0 | 0.990 | 1.00 | | 845 |
| UpStream | 110 | 0.32 | Level | | 0 | 0.990 | 1.00 | | 040 |
| DownStream | 1590 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 1746 |
| | | Merge Areas | | | | | Diverge Areas | | |
| Estimation of | | | | | Estimation | | | | |
| | V ₁₂ = V _F | (P) | | | | ·- | | | |
| = | | | n 13-6 or 13-7) | | | V ₁₂ = | $V_R + (V_F - V_R)$ | | |
| -EQ = D - | | | • | | L _{EQ} = | | (Equation 13- | ·12 or 13- | 13) |
| P _{FM} = | | | ion (Exhibit 13-6) | | P _{FD} = | | using Equation | n (Exhibit 1 | 3-7) |
| / ₁₂ = | 4318 | • | 10.1110 | | V ₁₂ = | | pc/h | | |
| / ₃ or V _{av34} | 2520 17) | pc/h (Equation | on 13-14 or 13- | | V_3 or V_{av34} | | pc/h (Equation 1 | 13-14 or 13- | 17) |
| Is V ₃ or V _{av34} > 2,70 | | s VNo | | | Is V ₃ or V _{av34} | > 2,700 pc/h? | □Yes □ No | | |
| Is V ₃ or V _{av34} > 1.5 | | | | | Is V ₃ or V _{av34} | > 1.5 * V ₁₂ /2 | □Yes □No | | |
| | | | on 13-16, 13- | | If Yes,V _{12a} = | | pc/h (Equatio | n 13-16, 1 | 3-18, or |
| Yes,V _{12a} = | | 13-19) | 011 10-10, 10- | | 11 163, V _{12a} – | 1 | 13-19) | | |
| Capacity Che | ecks | | | | Capacity | Checks | | | |
| | Actual | C | apacity | LOS F? | | Actual | Ca | pacity | LOS F? |
| | | | | | V_{F} | | Exhibit 13- | 8 | |
| V_{FO} | 7683 | Exhibit 13-8 | | Yes | $V_{FO} = V_{F}$ - | V_R | Exhibit 13- | 8 | |
| - FO | 1000 | EXHIBIT 10 0 | | 100 | | - 1 | Exhibit 13 | - | |
| | | | | | V _R | | 10 | | |
| | | ifluence A | | | Flow Enter | ering Dive | erge Influer | | W. |
| Flow Entering | g Merge In | | | | | Actual | Max Des | irable | Violation? |
| | Actual | Max | Desirable | Violation? | | Actual | | | |
| Flow Entering | Actual 5681 | Max Exhibit 13-8 | 4600:All | Violation? Yes | V ₁₂ | | Exhibit 13-8 | | |
| | Actual 5681 | Max Exhibit 13-8 | 4600:All | | | | | n (if not | ! F) |
| V _{R12} Level of Serv | Actual 5681 | Max Exhibit 13-8 mination (| 4600:All if not F) | | Level of | Service De | Exhibit 13-8 | | ! : F) |
| V _{R12} Level of Serv D _R = 5.475 + | Actual 5681 *ice Detern 0.00734 v R + 0 | Max Exhibit 13-8 mination (| 4600:All if not F) | | Level of S | Service De | Exhibit 13-8 eterminatio | | ! ! F) |
| V_{R12} Level of Serv $D_R = 5.475 + 45.6 \text{ (pc/m}$ | Actual 5681 Fice Determination of the control of t | Max Exhibit 13-8 mination (| 4600:All if not F) | | Level of S D D C D C C C C C C C C C | Service D R = 4.252 + 0 | Exhibit 13-8 eterminatio | | ! ! F) |
| V_{R12} Level of Serv $D_R = 5.475 + C_R = 45.6 \text{ (pc/m}$ LOS = F (Exhibit | Actual 5681 **Ice Detern** • 0.00734 v _R + (ni/ln) 13-2) | Max Exhibit 13-8 mination (| 4600:All if not F) | | Level of S D _R = (pc. LOS = (Ex | Service Do _R = 4.252 + (/mi/ln) chibit 13-2) | Exhibit 13-8 eterminatio 0.0086 V ₁₂ - 0 | | ! <i>F</i>) |
| V_{R12} Level of Serv $D_R = 5.475 + 45.6 \text{ (pc/m}$ $D_S = F \text{ (Exhibit)}$ Speed Determ | Actual 5681 **Ice Detern** - 0.00734 v _R + (ni/ln) 13-2) **mination** | Max Exhibit 13-8 mination (| 4600:All if not F) | | Level of S D D R = (pc. LOS = (Ex Speed De | Service Do _R = 4.252 + (/mi/ln) thibit 13-2) | Exhibit 13-8 eterminatio 0.0086 V ₁₂ - 0 | | ! ! F) |
| V_{R12} Level of Serv $D_R = 5.475 + 45.6 \text{ (pc/m}$ $LOS = F \text{ (Exhibit)}$ Speed Determ $M_S = 1.405 \text{ (Exhibit)}$ | Actual 5681 rice Determ 0.00734 v _R + (ni/ln) 13-2) mination ibit 13-11) | Max Exhibit 13-8 mination (| 4600:All if not F) | | D _R = (pc. LOS = (Ex. Speed De | Service Do _R = 4.252 + (/mi/ln) thibit 13-2) eterminati nibit 13-12) | Exhibit 13-8 eterminatio 0.0086 V ₁₂ - 0 | | ! <i>F</i>) |
| V_{R12} Level of Serv $D_R = 5.475 + 45.6 \text{ (pc/m}$ $DS = F \text{ (Exhibit)}$ Speed Deterr $M_S = 1.405 \text{ (Exion)}$ $D_R = 30.7 \text{ mph}$ | Actual 5681 ice Determ 0.00734 v _R + (ni/ln) 13-2) mination ibit 13-11) (Exhibit 13-11) | Max Exhibit 13-8 mination (| 4600:All if not F) | | $\begin{array}{ccc} \textbf{Level of S} \\ & & \text{D}_{\text{I}} \\ \text{D}_{\text{R}} = & \text{(pc. LOS} = & \text{(Exx} \\ \textbf{Speed De} \\ \text{D}_{\text{S}} = & \text{(Ext)} \\ \text{S}_{\text{R}} = & \text{mph} \end{array}$ | Service Do R = 4.252 + (/mi/ln) thibit 13-2) eterminati hibit 13-12) n (Exhibit 13-12 | Exhibit 13-8 Exermination 0.0086 V ₁₂ - 0 on | | ! <i>F</i>) |
| V_{R12} Level of Serv $D_R = 5.475 + 45.6 \text{ (pc/m}$ $OS = F \text{ (Exhibit)}$ Speed Deterr $M_S = 1.405 \text{ (Exist)}$ $S_R = 30.7 \text{ mph}$ $S_0 = 64.6 \text{ mph}$ | Actual 5681 rice Determ 0.00734 v _R + (ni/ln) 13-2) mination ibit 13-11) | Max Exhibit 13-8 mination (| 4600:All if not F) | | $\begin{array}{c} \textbf{Level of S} \\ \textbf{D}_{R} = & (\text{pc.} \\ \textbf{LOS} = & (\text{Ex.} \\ \textbf{Speed De} \\ \textbf{D}_{S} = & (\text{Ex.} \\ \textbf{S}_{R} = & \text{mph} \\ \textbf{S}_{0} = & \text{mph} \end{array}$ | Service Do _R = 4.252 + (/mi/ln) thibit 13-2) eterminati nibit 13-12) | Exhibit 13-8 eterminatio 0.0086 V ₁₂ - 0 on | | ! <i>F</i>) |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|---|--|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 6-Be No-Build | et Exp On & Off to 10th |
| Project Description SW 10 | th Street SIMR | | | | |
| ✓ Oper.(LOS |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 7170 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjust | ments | | | | |
| f _p E _⊤ | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T-1)+P_R(E_R-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | <u> </u> | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD | 3 | ft ramps/mi | f _{LW} f _{LC} TRD Adjustment | | mph mph mph |
| FFS (measured) Base free-flow Speed, BFFS | 70.0 | mph mph | FFS | 70.0 | mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 2554 48.7 52.4 F | pc/h/ln mph pc/mi/ln | Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N | · | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h | S - Speed D - Density FFS - Free-flow BFFS - Base free | - | E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-1 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | RAMP | S AND RAM | P JUNCTI | ONS WO | RKS | HEET | | | |
|-------------------------------------|--------------------------------|--------------------------|-------------------------------|-----------------|---|---------------------|------------|-----------------------------|---------------------|-------------|
| General Info | rmation | | | Site Infor | mation | | | | | |
| Analyst | | | Fr | eeway/Dir of Tr | avel | I-95 NB | | | | |
| Agency or Compar | ny AEC | OM | | ınction | | Seg 7-0 | Off Ramp t | o 10th St | | |
| Date Performed | | | | ırisdiction | | | 10040 | | | |
| Analysis Time Peri | | 4 CMID | Ar | nalysis Year | | No-Buil | d 2040 | | | |
| Project Description Inputs | SW TULII SLIEE | EL SIVIIR | | | | | | | | |
| • | | Freeway Num | nber of Lanes, N | 3 | | | | | | |
| Upstream Adj | Ramp | , | | | | | | | Downstrea | am Adj |
| □Yes | On | Ramp Numbe | | 1 | | | | | Ramp | |
| | | | _ane Length, L _A | | | | | | Yes | ✓ On |
| ✓ No | Off | | Lane Length L _D | 250 | | | | | □No | Off |
| | | Freeway Volu | • | 7170 | | | | | | |
| L _{up} = | ft | Ramp Volume | e, V _R | 1590 | | | | | L _{down} = | 130 ft |
| V,, = | veh/h | Freeway Free | e-Flow Speed, S _{FF} | 70.0 | | | | | V _D = | 1320 veh/h |
| v _u – | venin | Ramp Free-F | low Speed, S _{FR} | 45.0 | | | | | - D | 1020 VCII/I |
| Conversion | to pc/h Un | der Base | Conditions | | | | | | | |
| (pc/h) | V | PHF | Terrain | %Truck | %Rv | | f_HV | fp | v = V/PHF | x funz x f |
| | (Veh/hr) | | | | | _ | | г | | г |
| Freeway | 7170 | 0.95 | Level | 3 | 0 | _ | 985 | 1.00 | 76 | |
| Ramp | 1590 | 0.92 | Level | 2 | 0 | 0.9 | 990 | 1.00 | 1/ | 46 |
| UpStream DownStream | 1320 | 0.92 | Level | 2 | 0 | 0.0 | 990 | 1.00 | 1.1 | 49 |
| DownStream | | Merge Areas | Level | | U | 0.8 | | Diverge Areas | 14 | 43 |
| Estimation o | | morgo / modo | | | Estimat | ion o | | 7170190711000 | | |
| | | /D) | | | | | | | \D | |
| | $V_{12} = V_{F}$ | | | | | | | $V_R + (V_F - V_F)$ | | |
| L _{EQ} = | | ation 13-6 or | * | | L _{EQ} = | | | Equation 13-1 | | • |
| P _{FM} = | ū | Equation (I | Exhibit 13-6) | | P _{FD} = | | | 488 using Equ | uation (Exhi | bit 13-7) |
| V ₁₂ = | pc/h | | | | V ₁₂ = | | | 333 pc/h | | |
| V ₃ or V _{av34} | | | -14 or 13-17) | | V_3 or V_{av34} | | |)28 pc/h (Equa | ation 13-14 | f or 13-17) |
| Is V_3 or $V_{av34} > 2.7$ | | | | | | | | ✓ Yes □ No | | |
| Is V_3 or $V_{av34} > 1.5$ | | | | | Is V ₃ or V _{av} | ₃₄ > 1.5 | | ☐Yes ☑No | | |
| If Yes,V _{12a} = | | | -16, 13-18, or | | If Yes,V _{12a} = | = | | 961 pc/h (Equa | ation 13-16 | 5, 13-18, |
| Capacity Ch | 13-19 |) | | | | | | r 13-19) | | |
| Сараспу Сп | Actual | 1 0 | Capacity | LOS F? | Capacit | y Che | Actual | Co | pacity | LOS F? |
| | Actual | | apacity | LOST | V _F | | 7661 | Exhibit 13-8 | | Yes |
| ., | | E-rp:p:r 40 0 | | | | 1/ | | | | _ |
| V_{FO} | | Exhibit 13-8 | | | $V_{FO} = V_{F}$ | : - v _R | 5915 | Exhibit 13-8 | + | No |
| | | | | | V _R | | 1746 | Exhibit 13-10 | | No |
| Flow Enterir | | | | | Flow En | | | rge Influen | | |
| | Actual | T r | Desirable | Violation? | | | ctual | Max Desirab | | Violation? |
| V _{R12} | | Exhibit 13-8 | | | V ₁₂ | | 633 | Exhibit 13-8 | 4400:All | Yes |
| Level of Ser | | | | | + | | | terminatio | • | F) |
| $D_R = 5.475 + 0$ | 0.00734 v _R + | 0.0078 V ₁₂ - | - 0.00627 L _A | | | $D_R = 4$ | .252 + 0 | .0086 V ₁₂ - 0.0 | 009 L _D | |
| $D_R = (pc/mi/l)$ | ln) | | | | $D_R = 44$ | 4.7 (pc/ | mi/ln) | | | |
| LOS = (Exhibi | t 13-2) | | | | LOS = F | (Exhib | it 13-2) | | | |
| Speed Deter | rmination | | | | Speed L | Deteri | minatio | n | | |
| $M_S = (Exibit)$ | | | | | ' | | khibit 13- | | | |
| - | • | | | | | • | (Exhibit | • | | |
| | (hibit 13-11) | | | | | • | (Exhibit | • | | |
| • | (hibit 13-11) (hibit 13-13) | | | | 1 - | • | - | • | | |
| 1 (| • | Yolds B | | | , , , , , , , , , , , , , , , , , , , | | (Exhibit | | 2 | 10010010 11 |
| right © 2016 Univers | sity ot Florida, All F | kıqnıs Reserved | | | HCS2010 TM | Version | 16.90 | (| Generated: 5/ | ZZ/ZU19 10: |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 8-Be No-Build | et Off & On 10th St 2040 |
| Project Description SW 10t | th Street SIMR | | | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5580 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| DDITV - AADT X K X D | | Venin | Up/Down % | 1111 | |
| Calculate Flow Adjusti | ments | | · | | |
| | 1.00 | | E _R | 1.2 | |
| f _p E _⊤ | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | 7.0 | | Calc Speed Adj and FFS | | |
| · | | | Caic Speed Auj and FFS |) | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f _{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | 70.0 | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 1987 62.8 31.6 D | pc/h/ln mph pc/mi/ln | $\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | III O AIID | RAMP JUN | | | <u> </u> | | | |
|--|--|---|---|------------------------|--|--|--|---|--------------------------------------|
| General Infor | mation | | | Site Infor | | | | | |
| Analyst | | 014 | | eeway/Dir of Tr | | 95 NB | 400 00 55 000 | 5 | |
| Agency or Company Date Performed | AEC | UIVI | | ınction ırisdiction | S | eg 9-On Ramp | 10th St EB & WE | 3 | |
| Analysis Time Period | d PM | | | nalysis Year | N | lo-Build 2040 | | | |
| Project Description | | et SIMR | | | | o Balla 2010 | | | |
| nputs | | | | | | | | | |
| Jpstream Adj Ramp | | Freeway Num | ber of Lanes, N | 3 | | | | Downstre | am Adi |
| pstream Auj Ramp | | Ramp Number | r of Lanes, N | 1 | | | | Ramp | ani Auj |
| ✓ Yes 🗌 Or | ı | 1 | ane Length, L _A | 1345 | | | | | |
| | | | _ane Length L _D | 10-10 | | | | ☐Yes | ☐ On |
| ☐ No ☑ Of | f | | | EE00 | | | | ✓ No | Off |
| nin = 1370 | f | Freeway Volu | | 5580 | | | | L _{down} = | ft |
| _{up} = 1370 | IL | Ramp Volume | | 1320 | | | | -down | |
| / _u = 1590 \ | veh/h | • | -Flow Speed, S _{FF} | 70.0 | | | | V _D = | veh/h |
| u .000 . | | Ramp Free-Fl | ow Speed, S _{FR} | 50.0 | | | | ر ا | |
| Conversion to | o pc/h Un | der Base (| Conditions | | | | | | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | f_HV | f _p | v = V/PH | F x f _{HV} x f _D |
| Freeway | 5580 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | | 5962 |
| Ramp | 1320 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | + | 1449 |
| UpStream | 1590 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 1746 |
| DownStream | 1390 | 0.92 | Level | | U | 0.550 | 1.00 | | 1740 |
| 20Miloti daini | | Merge Areas | | | | | Diverge Areas | | |
| Stimation of | F V ₁₂ | | | | Estimation | | | | |
| | V ₁₂ = V _F | (P) | | | 1 | ·- | | | |
| _ | .2 . | | 40.0 40.7) | | | V ₁₂ = | $V_R + (V_F - V_F)$ | R)P _{FD} | |
| - _{EQ} = | | · · | 13-6 or 13-7) | | L _{EQ} = | | (Equation 13- | -12 or 13- | 13) |
| P _{FM} = | | | tion (Exhibit 13-6) | | P _{FD} = | | using Equation | on (Exhibit 1 | 13-7) |
| ′ ₁₂ = | 3281 | - | | | V ₁₂ = | | pc/h | | |
| / ₃ or V _{av34} | 2681 17) | pc/h (Equation | on 13-14 or 13- | | V_3 or V_{av34} | | pc/h (Equation | 13-14 or 13- | 17) |
| Is V ₃ or V _{av34} > 2,70 | | o Wo | | | | > 2,700 pc/h? [| ☐Yes ☐ No | | |
| ls V ₃ or V _{av34} > 1.5 ' | | | | | | | Yes No | | |
| 3 V3 OI V _{av34} - 1.0 | v ₁₂ /2 <u>□ 1 e</u> | | on 13-16, 13- | | | | pc/h (Equation | | 13-18, or |
| | | | JII 13-10, 13- | | If Yes,V _{12a} = | 1 | 3-19) | | |
| | 3406 | | | | | | | | |
| Yes,V _{12a} = | 3406 18, or | 13-19) | | | Capacity | Checks | | | |
| f Yes,V _{12a} = Capacity Che | 3406 18, or | 13-19) | Capacity | LOS F? | Capacity | Checks Actual | Ca | pacity | LOS F? |
| f Yes,V _{12a} = | 3406 18, or | 13-19) | apacity | LOS F? | Capacity V _F | ıı . | Ca Exhibit 13- | | LOS F? |
| fYes,V _{12a} = Capacity Che | 3406 18, or ecks Actual | 13-19) C | apacity | | V _F | Actual | | 8 | LOS F? |
| Yes,V _{12a} = | 3406 18, or | 13-19) | apacity | LOS F? | V_F $V_{FO} = V_F$ | Actual | Exhibit 13- Exhibit 13- | 8 | LOS F? |
| Yes,V _{12a} = Capacity Che | 3406 18, or ecks Actual | 13-19) C | apacity | | V _F | Actual | Exhibit 13- | 8 | LOS F? |
| Yes,V _{12a} = Capacity Che | 3406 18, or PCKS Actual 7411 | C Exhibit 13-8 | | | V_F $V_{FO} = V_F - V_R$ | Actual V _R | Exhibit 13- Exhibit 13- Exhibit 13 | 8 8 | |
| fYes,V _{12a} = Capacity Che V _{FO} | 3406 18, or PCKS Actual 7411 | Exhibit 13-8 | | | V_F $V_{FO} = V_F - V_R$ | Actual V _R | Exhibit 13- Exhibit 13- Exhibit 13 | 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 | |
| f Yes,V _{12a} = Capacity Che V _{FO} | 3406 18, or Pcks Actual 7411 | Exhibit 13-8 | Irea | Yes | V_F $V_{FO} = V_F - V_R$ | Actual V _R ering Dive | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer | 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 | 3 |
| FYes,V _{12a} = Capacity Che V _{FO} Flow Entering | 3406 18, or ecks Actual 7411 g Merge In Actual 4855 | Exhibit 13-8 Max Exhibit 13-8 | A rea Desirable 4600:All | Yes Violation? | $V_{FO} = V_{F} - V_{R}$ Flow Ento | Actual V _R ering Dive Actual | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des | 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 | Yiolation? |
| V _{FO} Flow Entering V _{R12} Level of Serv | 3406 18, or ecks Actual 7411 g Merge In Actual 4855 | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (i | A rea Desirable 4600:All if not F) | Yes Violation? | V_{F} $V_{FO} = V_{F} - V_{R}$ Flow Enter V_{12} Level of S | Actual V _R ering Dive Actual Service De | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Erge Influer Max Des Exhibit 13-8 | 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | Yiolation? |
| V _{FO} Flow Entering V _{R12} Level of Serv D _R = 5.475 + | 3406 18, or ecks Actual 7411 g Merge In Actual 4855 fice Detern 0.00734 v R + 0 | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (i | A rea Desirable 4600:All if not F) | Yes Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S | Actual V _R ering Dive Actual Service De R = 4.252 + 0 | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | Yiolation? |
| f Yes, V_{12a} = Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = 34.2$ (pc/m | 3406 18, or ecks Actual 7411 7411 g Merge In Actual 4855 fice Determ 0.00734 v R + 0 | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (i | A rea Desirable 4600:All if not F) | Yes Violation? | $V_{FO} = V_{F} - V_{R}$ Flow Enter V_{12} Level of S $D_{R} = (pc)$ | Actual V _R ering Dive Actual Service December 1988 Actual | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Erge Influer Max Des Exhibit 13-8 | 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | Yiolation? |
| f Yes, V_{12a} = Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv D_R = 5.475 + D_R = 34.2 (pc/m .OS = F (Exhibit | 3406 18, or ecks Actual 7411 7411 G Merge In Actual 4855 Fice Detern 0.00734 v _R + 0 ni/ln) 13-2) | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (i | A rea Desirable 4600:All if not F) | Yes Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S $D_R = D_R$ LOS = (Ex | Actual V _R ering Dive Actual Service De R = 4.252 + 0 /mi/ln) khibit 13-2) | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 | 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | Yiolation? |
| V_{FO} Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $C_R = 34.2 \text{ (pc/m}$ $C_R = 5.475 + 0$ $C_R = 34.2 \text{ (pc/m}$ $C_R = 6.475 + 0$ $C_R =$ | 3406 18, or ecks Actual 7411 g Merge In Actual 4855 fice Detern 0.00734 v R + (ni/ln) 13-2) mination | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (i | A rea Desirable 4600:All if not F) | Yes Violation? | V_F $V_{FO} = V_F - V_R$ Flow Enter V_{12} Level of S $D_R = (pc)$ $LOS = (Ex)$ Speed De | Actual VR ering Dive Actual Service De R = 4.252 + 0 //mi/ln) chibit 13-2) | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 | 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | Yiolation |
| FYes, V_{12a} = Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv D_R = 5.475 + D_R = 34.2 (pc/m D_R = 5.475 + D_R = 0.687 (Exil | 3406 18, or ecks Actual 7411 7411 GMerge In Actual 4855 Fice Detern 0.00734 v R + 0 hi/ln) 13-2) mination bit 13-11) | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (i | A rea Desirable 4600:All if not F) | Yes Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S $D_R = (pc)$ $LOS = (Ex)$ Speed De $D_S = (Ex)$ | Actual V _R ering Dive Actual Service De R = 4.252 + 0 r/mi/ln) chibit 13-2) etermination hibit 13-12) | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13-8 Exhibit 13- | 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | Yiolation? |
| FYes, V_{12a} = Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv D_R = 5.475 + D_R = 34.2 (pc/m D_R = 5.475 + D_R = 0.687 (Exil | 3406 18, or ecks Actual 7411 g Merge In Actual 4855 fice Detern 0.00734 v R + (ni/ln) 13-2) mination | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (i | A rea Desirable 4600:All if not F) | Yes Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S $D_R = (pc$ $LOS = (Ext)$ $Speed De$ $D_S = (Ext)$ $S_R = mpt$ | Actual VR ering Dive Actual Service De R = 4.252 + (c/mi/ln) chibit 13-2) etermination hibit 13-12) n (Exhibit 13-12) | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | Yiolation? |
| Fives, $V_{12a} =$ Capacity Che V_{FO} Flow Entering V_{R12} Level of Serv $D_R = 5.475 +$ $0_R = 34.2 \text{ (pc/m}$ $0S = F \text{ (Exhibit)}$ Speed Determ $M_S = 0.687 \text{ (Exilos)}$ $S_R = 50.8 \text{ mph}$ | 3406 18, or ecks Actual 7411 7411 GMerge In Actual 4855 Fice Detern 0.00734 v R + 0 hi/ln) 13-2) mination bit 13-11) | Exhibit 13-8 Max Exhibit 13-8 Exhibit 13-8 mination (i | A rea Desirable 4600:All if not F) | Yes Violation? | V_F $V_{FO} = V_F - V_R$ Flow Ento V_{12} Level of S $D_R = (pc$ $LOS = (Extended S)$ $D_S = (Extended S)$ $D_S = (Extended S)$ $D_S = (Extended S)$ | Actual V _R ering Dive Actual Service De R = 4.252 + 0 r/mi/ln) chibit 13-2) etermination hibit 13-12) | Exhibit 13- Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 8 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 | Yiolation? |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|--|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 10-L No-Build | Bet 10th St & Hillsboro |
| Project Description SW 10t | h Street SIMR | | | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 6900 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjustr | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | _ | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | 70.0 | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 2457 51.7 47.6 F | pc/h/ln mph pc/mi/ln | Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | RAMP | S AND RAM | P JUNCTI | ONS WO | RKS | HEET | | | |
|--|----------------------------------|--------------------------|------------------------------|-----------------|--|--------------------|-------------------|---|---------------------|--------------------|
| General Info | rmation | | | Site Infor | mation | | | | | |
| Analyst | | | Fr | eeway/Dir of Tr | | I-95 NB | | | | |
| Agency or Company | y AEC | MC | | inction | | Seg 11 | -Off Ramp I | Hillsboro EB | | |
| Date Performed | .d DM | | | risdiction | No-Build 2040 | | | | | |
| Analysis Time Perio Project Description | | t SIMR | AI | nalysis Year | | NO-Bull | d 2040 | | | |
| Inputs | OW TOUT OUG | t Oliviix | | | | | | | | |
| • | | Freeway Num | ber of Lanes, N | 3 | | | | | <u> </u> | A 11 |
| Upstream Adj F | Ramp | Ramp Numbe | | 1 | | | | | Downstrea Ramp | am Adj |
| ✓Yes | ✓ On | • | ane Length, L _A | ı | | | | | · | _ |
| | | | ,, | 000 | | | | | ☐ Yes | On |
| □ No [| Off | | ane Length L _D | 220 | | | | | ✓ No | Off |
| 1 = 30 | 085 ft | Freeway Volu | | 6900 | | | | | L _{down} = | ft |
| L _{up} = 30 | 000 II | Ramp Volume | | 750 | | | | | _down | ., |
| V = 1: | 320 veh/h | • | -Flow Speed, S _{FF} | 70.0 | | | | | V _D = | veh/h |
| | | | ow Speed, S _{FR} | 45.0 | | | | | | |
| Conversion | | der Base | Conditions | , | | | | | | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | | f _{HV} | f _p | v = V/PHF | $x f_{HV} x f_{p}$ |
| Freeway | 6900 | 0.95 | 0.95 Level 3 | | | 0.9 | 985 | 1.00 | 73 | 72 |
| Ramp | 750 | 0.92 | Level | 2 | 0 | | 990 | 1.00 | | 23 |
| UpStream | 1320 | 0.92 | Level | 2 | 0 | | 990 | 1.00 | 14 | 49 |
| DownStream | | | | | | | | | | |
| | | Merge Areas | | | | | | iverge Areas | | |
| Estimation o | f v ₁₂ | | | | Estimat | ion o | f v ₁₂ | | | |
| | V ₁₂ = V _F | (P _{FM}) | | | | | V ₁₂ = | V _R + (V _F - V _F | P _{FD} | |
| L _{EQ} = | (Equa | ition 13-6 or | 13-7) | | L _{EQ} = | | 814 | 40.08 (Equation | on 13-12 o | r 13-13) |
| P _{FM} = | using | Equation (I | Exhibit 13-6) | | P _{FD} = 0.538 using Equation (Exhibit 13-7) | | | | | |
| V ₁₂ = | pc/h | . , | , | | V ₁₂ = 4345 pc/h | | | | | |
| V ₃ or V _{av34} | • | Equation 13 | -14 or 13-17) | | V_3 or V_{av34} 3027 pc/h (Equation 13-14 or 13-17) | | | | | |
| Is V_3 or $V_{av34} > 2.7$ | | | , | | Is V_3 or $V_{av34} > 2,700$ pc/h? \checkmark Yes \square No | | | | | |
| Is V ₃ or V _{av34} > 1.5 | | | | | Is V_3 or $V_{av34} > 1.5 * V_{19}/2$ Yes \checkmark No | | | | | |
| | | | -16, 13-18, or | | 4070 m = //s //F === 40 40 40 40 | | | | | |
| If Yes,V _{12a} = | 13-19) | | | | or 13-19) | | | | | |
| Capacity Ch | | | | | Capacit | y Che | ecks | - | | |
| | Actual | | apacity | LOS F? | | | Actual | - | pacity | LOS F? |
| | | | | | V_{F} | | 7372 | Exhibit 13-8 | 7200 | Yes |
| V_{FO} | | Exhibit 13-8 | | | $V_{FO} = V_{F}$ | - V _R | 6549 | Exhibit 13-8 | 7200 | No |
| | | | | | V_R | | 823 | Exhibit 13-10 | 2100 | No |
| Flow Enterin | g Merge In | fluence A | rea | - | Flow En | terin | g Diver | ge Influen | ce Area | * |
| | Actual | | Desirable | Violation? | | | Actual | Max Desirab | | Violation? |
| V _{R12} | | Exhibit 13-8 | | | V ₁₂ | 4 | 345 | Exhibit 13-8 | 4400:AII | No |
| Level of Serv | | Level of | f Serv | rice Det | erminatio | n (if not | F) | | | |
| $D_R = 5.475 + 0$ | .00734 v _R + | 0.0078 V ₁₂ - | · 0.00627 L _A | | | D _R = 4 | .252 + 0. | 0086 V ₁₂ - 0.0 | 009 L _D | |
| D _R = (pc/mi/lr | า) | | | | $D_R = 42$ | 2.5 (pc/ | mi/ln) | | | |
| LOS = (Exhibit | 13-2) | | | | LOS = F | (Exhib | oit 13-2) | | | |
| Speed Deter | Speed L | | | n | | | | | | |
| $M_S = (Exibit 1)$ | | † ' | | xhibit 13- | | | | | | |
| | • | | | | | - | (Exhibit 1 | • | | |
| | hibit 13-11) | | | | | • | (Exhibit 1 | • | | |
| • | hibit 13-11) hibit 13-13) | | | | | - | (Exhibit 1 | - | | |
| vright © 2016 Universi | • | lighto Description | | | HCS2010 TM | | • | • | Concerts to 5 | 22/2019 11:4 |
| OUT (C) ZUTh Liniversi | IV OT HIORIDA All H | MANAGARIA PITTE | | | 1100001011// | 11. | | (| -anarated: 5 | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|---|---|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 12-E No-Build | Bet Off & On Hillsboro |
| Project Description SW 10 | th Street SIMR | | - , | | |
| ✓ Oper.(LOS | |] | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 6150 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjust | mante | | | | |
| | | | | 4.0 | |
| f _p □ | 1.00 1.5 | | E _R | 1.2 0.985 | |
| E _T | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | | |
| Speed Inputs | | | Calc Speed Adj and FFS | <u> </u> | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f _{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | i | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 2190 58.6 37.4 E | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h | S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume | - | E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | REEWAY | WEAV | NG WOR | RKSHEE | l | | |
|--|---|---------------------|------------|-----------------------------------|---|--------------------------|---------------------------|------|-------------------------------|
| Genera | l Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/Co Date Perfol Analysis Ti | rmed | AECO PM | М | | Freeway/Dir of Travel Weaving Segment Location Analysis Year I-95 NB Seg 13-Bet On & Off Hillsboro No-Build 2040 | | | | |
| Project Des | scription SW 10 | th Street SIMF | ₹ | | l . | | | | |
| Inputs | | | | | | | | | |
| Weaving no Weaving se Freeway fre | onfiguration umber of lanes, l egment length, L ee-flow speed, F | rs FS | | One-Sided 4 790ft 70 mph | Segment type Freeway min Freeway max Terrain type | imum speed | | | Freeway 15 2400 Leve |
| Conver | sions to p | c/h Unde | r Base Co | ndition | S | | | | |
| | V (veh/h) | PHF | Truck (%) | RV (%) | Ε _Τ | E _R | f_{HV} | fp | v (pc/h) |
| V_{FF} | 5460 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 5834 |
| V_{RF} | 730 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 801 |
| V_{FR} | 690 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 758 |
| V_{RR} | 0 | 0.95 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 0 |
| V_{NW} | 5834 | | | | | | | V = | 7393 |
| V_W | 1559 | | | | | | | | |
| VR | 0.211 | | | | | | | | |
| Config | uration Ch | aracteris | tics | | 1 | | | | |
| Minimum n | naneuver lanes, | N_{WL} | | 2 lc | Minimum we | aving lane c | hanges, LC _{MIN} | l | 1559 lc/h |
| Ŭ | e density, ID | | | 0.7 int/mi | Weaving lan | e changes, L | $-C_{W}$ | | 1770 lc/h |
| Minimum F | RF lane changes | , LC _{RF} | | 1 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | 860 lc/h |
| | R lane changes | 111 | | 1 lc/pc | Total lane ch | nanges, LC _{AL} | L | | 2630 lc/h |
| Minimum F | RR lane changes | s, LC _{RR} | | lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | 323 |
| Weavin | g Segmen | t Speed, | Density, I | _evel of | · | | | | |
| Ŭ | egment flow rate | • | | 7291 veh/h | Weaving inte | • | | | 0.584 |
| | egment capacity | ** | | 8296 veh/h | Weaving seg | | | | 49.9 mph |
| _ | egment v/c ratio | | 0- | 0.879 | | | | | 49.7 mph |
| | egment density, ervice, LOS | ט | 3. | 7.1 pc/mi/ln E | J J J J J J J J J J J J J J J J J J J | | | | 49.9 mph |
| Feaci Oi Of | FIVIUE, LUS | | | | ıvıaxımum we | eaving length | ı, L _{MAX} | | 4648 ft |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 14-E No-Build | Bet Off & On Hillsboro |
| | h Street SIMR | | - | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 6190 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjusti | ments | | | | |
| f _p E _⊤ | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T-1)+P_R(E_R-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) | 3 70.0 | ft ramps/mi mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| Base free-flow Speed, BFFS | | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 2205 58.3 37.8 <i>E</i> | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-1 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | REEWAY | WEAV | | | I | | | |
|--|--|------------------|------------|------------------------------------|--|--------------------------|---------------------------|----------------------------------|-------------------------------|--|
| Genera | l Information | on | | | Site Information | | | | | |
| Analyst Agency/Cor Date Perfor Analysis Tir | med | AECON PM | И | | Freeway/Dir Weaving Seg Analysis Yea | gment Locati | | NB 5-Bet On & 0 uild 2040 | Off to Exp | |
| Project Des | cription SW 10tl | h Street SIMF | ? | | <u> </u> | | | | | |
| Inputs | | | | | | | | | | |
| Weaving se | nfiguration Imber of lanes, N Igment length, L _e Pe-flow speed, Ff | S | | Two-Sided 3 4665ft 70 mph | Segment typo Freeway min Freeway max Terrain type | imum speed | | | Freeway 19 2400 Leve | |
| Conver | sions to po | /h Unde | r Base Co | ndition | S | | | | | |
| | V (veh/h) | PHF | Truck (%) | RV (%) | Ε _T | ER | f_{HV} | fp | v (pc/h) | |
| V_{FF} | 5040 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 5385 | |
| V_{RF} | 610 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 670 | |
| V_{FR} | 1150 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1263 | |
| V_{RR} | 130 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 143 | |
| V _{NW} | 7318 | | | | | | | V = | 7461 | |
| V_W | 143 | | | | | | | | | |
| VR | 0.019 | | | | | | | | | |
| Configu | ration Cha | aracteris | tics | | T | | | | | |
| Minimum m | naneuver lanes, l | N_{WL} | | 0 lc | Minimum we | aving lane c | hanges, LC _{MIN} | I | lc/h | |
| ŭ | e density, ID | | | 0.7 int/mi | Weaving lan | e changes, L | .C _w | | lc/h | |
| | F lane changes, | IM | | 0 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | lc/h | |
| | R lane changes, | 111 | | 0 lc/pc | Total lane ch | nanges, LC _{AL} | L | | lc/h | |
| Minimum R | R lane changes, | LC _{RR} | | 3 lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | | |
| Weavin | g Segment | Speed, | Density, I | _evel of | Service, | and Cap | oacity | | | |
| Weaving se | egment flow rate egment capacity, egment v/c ratio | | | 7360 veh/h 6813 veh/h 1.080 | Weaving inte Weaving seg Average wea | gment speed | , S | | mph mph | |
| | egment density, I | D | | pc/mi/ln | Average non | ı-weaving sp | eed, S _{NW} | | mph | |
| Level of Se | rvice, LOS | | | F | Maximum we | eaving length | ı, L _{MAY} | | 5905 ft | |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|------------------------------|---|---|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period Project Description SW 10t | AECOM 6/26/2017 PM h Street SIMR | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 NB Seg 16-N FDOT D No-Build | |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5650 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % | 0.95 3 0 Level mi | |
| Onla lata Ela Adil ata | | | Ορ/D0wii % | | |
| Calculate Flow Adjustr | | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$ LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|---|--|----------------------------|---|-----------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 1-Be | et Hillsboro & Palmetto |
| Project Description SW 10 | | | Analysis i cal | NO-Balla | 2040 |
| ✓ Oper.(LOS | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | , | | 300.(11) | | g Data |
| Volume, V AADT Peak-Hr Prop. of AADT, K | 4870 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R | 0.95 3 0 | |
| Peak-Hr Direction Prop, D DDHV = AADT x K x D | | veh/h | General Terrain: Grade % Length Up/Down % | Level mi | |
| Calculate Flow Adjust | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f_{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) Base free-flow Speed, BFFS | 70.0 S | mph mph | FFS | 70.0 | mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 1734 66.7 26.0 D | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h | S - Speed D - Density FFS - Free-flow BFFS - Base free | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | REEWAY | WEAV | NG WOR | RKSHEE | T | | |
|---|--|--------------------|--------------|------------------|---|--------------------------|---------------------------|---------------------------------|-------------------------------|
| General | Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/Comp Date Perform Analysis Time | ed | AECO! | И | | Freeway/Dir Weaving Seg Analysis Yea | gment Location | | B 2-Bet On from uild 2040 | Exp & Off |
| Project Descr | iption SW 10t | h Street SIMF | ? | | | | | | |
| Inputs | | | | | 1 | | | | |
| Weaving segi Freeway free | nber of lanes, N ment length, L _s -flow speed, Fl | S FS | - David | 5085ft 70 mph | Segment type Freeway min Freeway max Terrain type | imum speed | | | Freeway 15 2400 Leve |
| Convers | V (veh/h) | PHF | r Base Co | RV (%) | E _T | E _R | f | fp | v (pc/h) |
| / | 3585 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 3830 |
| V _{FF} V _{RF} | 1265 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1389 |
| V _{FR} | 1285 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1411 |
| V _{RR} | 145 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 159 |
| V _{NW} | 6630 | | 1 | <u> </u> | | | | V = | 6789 |
| V _W | 159 | | | | | | | | |
| VR | 0.023 | | | | | | | | |
| Configur | ration Cha | aracteris | tics | | | | | | |
| Minimum ma | neuver lanes, l | N_WL | | 0 lc | Minimum we | aving lane c | hanges, LC _{MIN} | l | 477 lc/h |
| Interchange of | • | | | 0.7 int/mi | Weaving lan | e changes, L | .C _w | | 848 lc/h |
| Minimum RF | lane changes, | LC_{RF} | | 0 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | 3167 lc/h |
| Minimum FR | lane changes, | LC_FR | | 0 lc/pc | Total lane ch | nanges, LC _{AL} | L | | 4015 lc/h |
| Minimum RR | lane changes | , LC _{RR} | | 3 lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | 2360 |
| Weaving | Segment | t Speed, | Density, l | _evel of | Service, | and Cap | oacity | | |
| Weaving segment flow rate, v 6704 veh/h Weaving segment capacity, c _w 6899 veh/h | | | | | Weaving inte | • | | | 0.188 55.8 mph |
| | ment v/c ratio | Average wea | aving speed, | S_W | | 61.3 mph | | | |
| | ment density, l | D | 40 |).5 pc/mi/ln | Average weaving speed, S _w 61 Average non-weaving speed, S _{NW} 55 | | | | 55.7 mph |
| Level of Serv | rice, LOS | | | Е | Maximum weaving length, L _{MAX} 5944 ft | | | | |
| Notes | | | | | | | | | |

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a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 3-Be No-Build | et Off & On Ramp |
| Project Description SW 10t | h Street SIMR | | | | |
| ✓ Oper.(LOS) | 1 | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K | 4850 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R | 0.95 3 0 | |
| Peak-Hr Direction Prop, D DDHV = AADT x K x D | | veh/h | General Terrain: Grade % Length Up/Down % | Level mi | |
| Calculate Flow Adjustr | nents | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | 7 0.0 | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$ LOS | x f _{HV} x f _p) 1727 66.8 25.9 C | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| Canaval lafa | | INILO HIND | RAMP JUN | | | <u> </u> | | | |
|--|---|------------------------------|-----------------------------|--|-------------------------------------|--------------------------------------|----------------------------|---------------------|--------------------------------------|
| General Infor | mation | | _ | Site Infor | | | | | |
| Analyst | | | | eeway/Dir of Ti | | 95 SB | | | |
| Agency or Company Date Performed | , AEC | OM | | Inction Iriodiation | S | eg 4-Merge fro | m Hillsboro WB | | |
| Date Performed Analysis Time Period | d AM | | | ırisdiction nalysis Year | N | o-Build 2040 | | | |
| Project Description | | et SIMR | 7.0 | laryolo roai | IN. | O-Dulla 2040 | | | |
| nputs | 011 1041 040 | or omm t | | | | | | | |
| • | | Freeway Numb | per of Lanes, N | 3 | | | | D | A al: |
| Jpstream Adj Ramp | | Ramp Number | | 1 | | | | Downstre Ramp | am Adj |
| ✓ Yes ☐ Or | า | 1 | ane Length, L _A | 950 | | | | | _ |
| | | 1 | ,, | 930 | | | | □Yes | ☐ On |
| ☐ No 🗹 Of | f | Deceleration L | | 4050 | | | | ✓ No | Off |
| - 0475 | rı. | Freeway Volur | | 4850 | | | | . = | ft |
| _{rup} = 2175 | π | Ramp Volume | | 750 | | | | L _{down} = | |
| √ _u = 1430 √ | veh/h | Freeway Free- | Flow Speed, S _{FF} | 70.0 | | | | V _D = | veh/h |
| 'u 1430 ' | VE11/11 | Ramp Free-Flo | ow Speed, S _{FR} | 50.0 | | | | | |
| Conversion t | o pc/h Un | der Base (| Conditions | | | | | | |
| (pc/h) | V | PHF | Terrain | %Truck | %Rv | f _{HV} | fp | v = V/PH | F x f _{HV} x f _p |
| . , | (Veh/hr) | 0.95 | | 3 | 0 | 0.985 | 1.00 | | <u> </u> |
| Freeway | 4850 | + | Level | | · · | | 1 | | 5182 |
| Ramp UpStream | 750 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 823 |
| DownStream | 1430 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | - | 1570 |
| Jownstream | | Merge Areas | | | | | Diverge Areas | | |
| Stimation of | f V ₄₀ | | | | Estimation | | | | |
| | | / D \ | | | | 12 | | | |
| | $V_{12} = V_{F}$ | | | | | V ₁₂ = | $V_R + (V_F - V_F)$ | P _{FD} | |
| - _{EQ} = | | | 13-6 or 13-7) | | L _{EQ} = | | (Equation 13- | -12 or 13- | 13) |
| P _{FM} = | | | on (Exhibit 13-6) | | P _{FD} = | | using Equation | n (Exhibit 1 | 3-7) |
| ′ ₁₂ = | 3130 | = | | | V ₁₂ = | | pc/h | | |
| V_3 or V_{av34} | | pc/h (Equation | n 13-14 or 13- | • | V ₃ or V _{av34} | | pc/h (Equation ' | 13-14 or 13- | 17) |
| Is V ₃ or V _{av34} > 2,70 | 17) | . ZN. | | | | > 2.700 pc/h? | ∵ ` ` · □Yes □ No | | , |
| | | | | | | | □Yes □No | | |
| s V_3 or $V_{av34} > 1.5$ | | | - 40 40 40 | | | 112 | pc/h (Equatio | n 13-16. 1 | 3-18. or |
| Yes,V _{12a} = | | pc/h (Equatio 13-19) | on 13-16, 13- | | If Yes,V _{12a} = | 1 | 13-19) | , | , - |
| Capacity Che | | 10 10) | | | Capacity | Checks | | | |
| | Actual | C | apacity | LOS F? | | Actual | Ca | pacity | LOS F? |
| | | | | | V _F | | Exhibit 13- | 1 | |
| W | 6005 | Evk:h:: 40.0 | | N.a | $V_{FO} = V_F$ - | Vp | Exhibit 13- | | |
| V_{FO} | 6005 | Exhibit 13-8 | | No | | K | Exhibit 13 | | |
| | | | | | V_R | | 10 | | |
| low Entering | g Merge li | nfluence A | rea | | Flow Ent | ering Dive | erge Influer | ice Area | ? |
| | Actual | | Desirable | Violation? | | Actual | Max Des | | Violation ⁴ |
| V _{R12} | 3953 | Exhibit 13-8 | 4600:All | No | V ₁₂ | | Exhibit 13-8 | | |
| evel of Serv | ice Deter | mination (i | f not F) | | Level of S | Service D | eterminatio | n (if no | : F) |
| | | 0.0078 V ₁₂ - 0.0 | | | 1 | | 0.0086 V ₁₂ - 0 | _ | , |
| O _R = 30.0 (pc/m | • | 12 | A | | L | /mi/ln) | 112 | _D | |
| | • | | | | | · · | | | |
| | • | | | | <u> </u> | thibit 13-2) | · | | |
| .OS = D (Exhibit | nination | | | | + | eterminati | on | | |
| OS = D (Exhibit | IIIIauon | | | | $D_s = (Ext)$ | hibit 13-12) | | | |
| .OS = D (Exhibit | | | | | | | | | |
| OS = D (Exhibit Speed Determine) (Exhibit M _S = 0.429 (Exhibit M _S) (Exhibit Determine) | | | | | | n (Exhibit 13-12 | !) | | |
| OS = D (Exhibit Speed Deterror) $I_S = 0.429$ (Eximple Section 18) $I_R = 58.0$ mph | ibit 13-11) | | | | S _R = mph | n (Exhibit 13-12 n (Exhibit 13-12 | • | | |
| $\begin{array}{ll} \text{OS} = & \text{D (Exhibit)} \\ \textbf{Speed Deterr} \\ \textbf{I}_{\text{S}} = & 0.429 \text{ (Exhibit)} \\ \textbf{R} = & 58.0 \text{ mph} \\ \textbf{0} = & 64.4 \text{ mph} \end{array}$ | ibit 13-11) (Exhibit 13-11) | | | | $S_R = mph$ $S_0 = mph$ | • | 2) | | |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|---|------------------|-----------|--|---|--------------------------------|
| General Information | | | Site Information | | |
| Analyst | | | Highway/Direction of Travel | I-95 SB | |
| Agency or Company | AECOM | | From/To | • | et WB On & EB On |
| Date Performed | | | Jurisdiction | Ramps | |
| Analysis Time Period | AM | | Analysis Year | No-Buila | 1 2040 |
| Project Description SW 10th | h Street SIMR | | | | |
| ✓ Oper.(LOS) | | | Des.(N) | ☐ Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V | 5600 | veh/h | Peak-Hour Factor, PHF | 0.95 | |
| AADT | | veh/day | %Trucks and Buses, P _T | 3 | |
| Peak-Hr Prop. of AADT, K | | | %RVs, P _R | 0 | |
| Peak-Hr Direction Prop, D DDHV = AADT x K x D | | veh/h | General Terrain: Grade % Length | Level mi | |
| | | | Up/Down % | | |
| Calculate Flow Adjustn | nents | | · · · · · · · · · · · · · · · · · · · | | |
| f _p | 1.00 | | E _R | 1.2 | |
| E _T | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | | _ |
| | | | Caic Opeeu Auj and i i i | <u>, </u> | |
| Lane Width | | ft | £ | | |
| Rt-Side Lat. Clearance | | ft | f _{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) | | | Design (N) | | |
| Operational (LOS) | v.f. v.f.) 4004 | | Design LOS | | |
| v _p = (V or DDHV) / (PHF x N > | Р | pc/h/ln | $v_p = (V \text{ or DDHV}) / (PHF x N x)$ | $f_{HV} \times f_{p}$ | pc/h/ln |
| S | 62.7 | mph | s | p | mph |
| $D = v_p / S$ | 31.8 | pc/mi/ln | $D = v_p / S$ | | pc/mi/ln |
| LOS | D | | Required Number of Lanes, N | | • |
| Glossary | | | Factor Location | | |
| N - Number of lanes | S - Speed | | | | |
| V - Hourly volume | D - Density | | E _R - Exhibits 11-10, 11-12 | | f _{LW} - Exhibit 11-8 |
| v _n - Flow rate | FFS - Free-flow | speed | E _T - Exhibits 11-10, 11-11, 11- | -13 | f _{LC} - Exhibit 11-9 |
| LOS - Level of service | BFFS - Base from | - | f _p - Page 11-18 | | TRD - Page 11-1 |
| DDHV - Directional design ho | | opoou | LOS, S, FFS, v _p - Exhibits 11- | 2, 11-3 | |
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| | | | REEWAY | / WEAVI | NG WOR | KSHEE | T | | |
|--|--|----------------------|------------|------------------|---|----------------|---------------------------|------|-------------------------------|
| Genera | l Information | on | | | Site Info | rmation | | | |
| Analyst Agency/Co Date Perfor Analysis Tii | med | AECOI AM | М | | Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 6- Bet Hillsboro & 10th St Analysis Year No-Build 2040 | | | | |
| Project Des | scription SW 10th | n Street SIMF | ₹ | | l | | | | |
| Inputs | | | | | • | | | | |
| Weaving se Freeway fre | umber of lanes, Negment length, Lee-flow speed, FF | S FS | | 1830ft 70 mph | Segment type Freeway min Freeway max Terrain type | imum speed | | | Freeway 15 2400 Leve |
| Conver | sions to po | 1 | | 1 | | | ſ | | (/ -) |
| \ / | V (veh/h) | PHF | Truck (%) | RV (%) | E _T | E _R | f _{HV} | fp | v (pc/h) |
| V _{FF} | 4180 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 4466 |
| V _{RF} | 890 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 977 |
| V _{FR} | 1420 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1559 |
| V _{RR} | 0 | 0.95 | 0 | 0 | 1.5 | 1.2 | 1.000 | 1.00 | 0 7000 |
| V _{NW} | 4466 | | | | | | | V = | 7002 |
| V _W VR | 2536 | | | | | | | | |
| | 0.362 uration Cha | <u>l</u> racteris | tics | | | | | | |
| | naneuver lanes, i | | 1100 | 2 lc | Minimum we | aving lane c | hanges, LC _{MIN} | | lc/h |
| | e density, ID | *WL | | 0.7 int/mi | Weaving land | - | - 14111 | 4 | lc/h |
| | RF lane changes, | LC _{RE} | | | Non-weaving | | •• | | lc/h |
| Minimum F | R lane changes, | LC _{FR} | | 0 lc/pc | Total lane ch | | | | lc/h |
| Minimum F | RR lane changes, | LC _{RR} | | lc/pc | Non-weaving | , | - | | |
| Weavin | g Segment | Speed, | Density, I | | I | | | | |
| Weaving Segment Speed, Density, Level of Weaving segment flow rate, v 6911 veh/lt Weaving segment capacity, c _w 6529 veh/lt | | | | | Weaving intensity factor, W Weaving segment speed, S | | | | mph |
| _ | egment v/c ratio | 2 | | 1.058 | | | | | mph |
| Weaving segment density, D pc/mi/lr Level of Service, LOS F | | | | | · · · · · · · · · · · · · · · · · · · | | | | mph |
| -cvci 0i 06 | JI VIOC, LOO | | | ı | iviaximum We | aving lengtr | I, ∟ _{MAX} | | 6260 ft |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|---|--|------------------------------|---|-------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 7-Be | et Off & On Ramp |
| Project Description SW 10 | | | 7 thatyolo 1 out | TTO Bana | 2010 |
| ✓ Oper.(LOS | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | , | | . , | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5070 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| | | | Up/Down % | | |
| Calculate Flow Adjust | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h | S - Speed D - Density FFS - Free-flow BFFS - Base free | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| 0 | | MPS AND | RAMP JUN | | | | | | |
|---|--|--|---|------------------------|---|---|--|---------------------|--------------------------------------|
| General Info | rmation | | | Site Infor | | | | | |
| Analyst | | | | eeway/Dir of Ti | | 95 SB | 400.5: | | |
| Agency or Company Date Performed | y AEC | ;OM | | inction irisdiction | S | eg 8-Merge fro | m 10th St | | |
| Analysis Time Perio | od AM | | | nalysis Year | N | lo-Build 2040 | | | |
| Project Description | | et SIMR | | , | | o Balla 2010 | | | |
| nputs | | | | | | | | | |
| Jpstream Adj Ramp | <u> </u> | Freeway Num | ber of Lanes, N | 3 | | | | Downstre | am Adi |
| pstieam Auj Kamp | , | Ramp Number | of Lanes, N | 1 | | | | Ramp | ani Auj |
| ✓ Yes 🗌 O | | | | | | | | | |
| | | | ane Length L _D | 1410 | | | | ☐Yes | ☐ On |
| □ No ☑ O | ff | | | 5070 | | | | ✓ No | Off |
| un = 2210 | ft | Freeway Volum | ' | 5070 | | | | L _{down} = | ft |
| _{-up} = 2210 | IL | Ramp Volume | | 1550 | | | | -down | ., |
| V _u = 1420 | veh/h | 1 | -Flow Speed, S _{FF} | 70.0 | | | | V _D = | veh/h |
| | | | ow Speed, S _{FR} | 50.0 | | | | | |
| Conversion | , | der Base (| Conditions | T- | · | 1 | T. | T | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | f_HV | fp | v = V/PH | F x f _{HV} x f _p |
| Freeway | 5070 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | <u> </u> | 5417 |
| Ramp | 1550 | 0.93 | Level | 2 | 0 | 0.990 | 1.00 | | 1702 |
| UpStream | 1420 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 1559 |
| DownStream | 1420 | 0.52 | Level | | | 0.550 | 1.00 | | 1000 |
| 301111011101111 | | Merge Areas | | <u> </u> | | <u> </u> | Diverge Areas | 1 | |
| stimation o | $\overline{f}_{V_{12}}$ | | | | Estimation | | | | |
| | V ₁₂ = V _F | (P) | | | | ·- | | | |
| _ | .2 . | | 13-6 or 13-7) | | | V ₁₂ = | $V_R + (V_F - V_F)$ | | |
| - _{EQ} = | | | · · | | L _{EQ} = | | (Equation 13- | -12 or 13- | 13) |
|) = / = | | | ion (Exhibit 13-6) | | P _{FD} = | | using Equation | on (Exhibit 1 | 3-7) |
| 12 = | 3289 | • | 10.1110 | | V ₁₂ = | | pc/h | | |
| V_3 or V_{av34} | 2128 17) | pc/h (Equation | on 13-14 or 13- | | V_3 or V_{av34} | | pc/h (Equation | 13-14 or 13- | 17) |
| Is V ₃ or V _{av34} > 2,7 | | es VNo | | | Is V ₃ or V _{av34} | > 2,700 pc/h? | □Yes □ No | | |
| Is V ₃ or V _{av34} > 1.5 | | | | | Is V ₃ or V _{av34} | > 1.5 * V ₁₂ /2 | □Yes □No | | |
| | | pc/h (Equatio | on 13-16 13- | | If Yes,V _{12a} = | | pc/h (Equation | | 13-18, or |
| Yes,V _{12a} = | | · 13-19) | 511 10 10, 10 | | 11 100, V 12a | 1 | 13-19) | | |
| Capacity Che | ecks | | | | Capacity | Checks | | | |
| | Actual | C | apacity | LOS F? | | Actual | Ca | pacity | LOS F? |
| | | | | | V_{F} | | Exhibit 13- | 8 | |
| | | | | | | 17 | E 131340 | g l | |
| Vro | 7119 | Exhibit 13-8 | | No | $V_{FO} = V_{F}$ - | v_{R} | Exhibit 13- | ۷ I | |
| V_{FO} | 7119 | Exhibit 13-8 | | No | $V_{FO} = V_{F} - V_{FO}$ | v _R | Exhibit 13- | | |
| | | | | No | V _R | | Exhibit 13 10 |) - | |
| | ig Merge li | nfluence A | | | V _R | ering Dive | Exhibit 13 10 erge Influer | ice Area | W. |
| Flow Enterin | ng Merge II | nfluence A | Desirable | Violation? | V _R | | Exhibit 13 10 erge Influer Max Des | ice Area | Violation |
| Flow Enterin | Actual 4991 | Max I Exhibit 13-8 | Desirable 4600:All | | V _R Flow Ent | ering Dive | Exhibit 13 10 erge Influer Max Des Exhibit 13-8 | irable | Violation? |
| Flow Enterin | Actual 4991 | Max I Exhibit 13-8 | Desirable 4600:All | Violation? | V _R Flow Ent | ering Dive | Exhibit 13 10 erge Influer Max Des | irable | Violation? |
| V _{R12} Level of Serv | Actual 4991 Vice Determine | Max I Exhibit 13-8 | Desirable 4600:All if not F) | Violation? | Flow Ent | ering Dive Actual Service De | Exhibit 13 10 erge Influer Max Des Exhibit 13-8 | irable | Violation? |
| V _{R12} Level of Serv | Actual 4991 Vice Determent + 0.00734 v R + | mfluence A Max [Exhibit 13-8 mination (i | Desirable 4600:All if not F) | Violation? | V _R Flow Ent | ering Dive Actual Service De | Exhibit 13 10 erge Influer Max Des Exhibit 13-8 etermination | irable | Violation? |
| Flow Entering V_{R12} Level of Server $D_{R} = 5.475 + 0$ $D_{R} = 34.4 \text{ (pc/r)}$ | Actual 4991 Vice Determition + 0.00734 v R + mi/ln) | mfluence A Max [Exhibit 13-8 mination (i | Desirable 4600:All if not F) | Violation? | V _R Flow Enter V ₁₂ Level of S D D R = (pc | ering Dive Actual Service De R = 4.252 + 0 | Exhibit 13 10 erge Influer Max Des Exhibit 13-8 etermination | irable | Violation? |
| Flow Enterin V_{R12} Level of Serv $D_R = 5.475 + 0.00$ $D_R = 34.4 \text{ (pc/r}$ $D_R = 0.00 = 0.00 \text{ (Exhibit)}$ | Actual 4991 vice Determinum + 0.00734 v R + mi/ln) t 13-2) | mfluence A Max [Exhibit 13-8 mination (i | Desirable 4600:All if not F) | Violation? | V _R Flow Enter V ₁₂ Level of S D _R = (pc LOS = (Ex | ering Dive Actual Service De R = 4.252 + (/mi/ln) khibit 13-2) | Exhibit 13 10 erge Influer Max Des Exhibit 13-8 etermination 0.0086 V ₁₂ - 0 | irable | Violation' |
| Flow Enterin V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = 34.4 \text{ (pc/r}$ $D_R = 0 \text{ (Exhibit)}$ Speed Determ | Actual 4991 Vice Determinin) t 13-2) Minimation | mfluence A Max [Exhibit 13-8 mination (i | Desirable 4600:All if not F) | Violation? | V _R Flow Enter V ₁₂ Level of S D D C C C Speed De | ering Dive Actual Service De R = 4.252 + (/mi/ln) khibit 13-2) | Exhibit 13 10 erge Influer Max Des Exhibit 13-8 etermination 0.0086 V ₁₂ - 0 | irable | Violation' |
| Flow Enterin V_{R12} Level of Serv $D_R = 5.475 + 0.00$ $D_R = 34.4 \text{ (pc/r}$ $D_R = 0.748 \text{ (Ex. of the context)}$ $D_R = 0.748 \text{ (Ex. of the context)}$ | Actual 4991 Vice Determi/In) t 13-2) mination kibit 13-11) | Max I Exhibit 13-8 mination (i 0.0078 V ₁₂ - 0.0 | Desirable 4600:All if not F) | Violation? | V _R Flow Enter V ₁₂ Level of S D _R = (pc LOS = (Ex Speed De D _s = (Ex | ering Dive Actual Service De R = 4.252 + (c/mi/ln) chibit 13-2) eterminati hibit 13-12) | Exhibit 13 10 erge Influer Max Des Exhibit 13-8 etermination 0.0086 V ₁₂ - 0 | irable | Violation? |
| Flow Entering V_{R12} Level of Serve $D_R = 5.475 + 34.4 \text{ (pc/r}$ $OS = D \text{ (Exhibit)}$ Speed Determination of the serve of | Actual 4991 Vice Determination (ibit 13-11) (Exhibit 13-11) | Max I Exhibit 13-8 mination (i 0.0078 V ₁₂ - 0.0 | Desirable 4600:All if not F) | Violation? | V _R Flow Enter V ₁₂ Level of S D D _R = (pc LOS = (Ex Speed De S _R = mph | ering Dive Actual Service De R = 4.252 + (/mi/ln) chibit 13-2) eterminati hibit 13-12) n (Exhibit 13-12 | Exhibit 13 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 O.0086 V ₁₂ - 0 | irable | Violation |
| Flow Enterin V_{R12} Evel of Serv $D_R = 5.475 + 34.4 \text{ (pc/r}$ $OS = D \text{ (Exhibit)}$ Speed Determine $M_S = 0.748 \text{ (Exhibit)}$ $M_R = 49.1 \text{ mph}$ $M_S = 64.1 \text{ mph}$ | Actual 4991 Vice Determi/In) t 13-2) mination kibit 13-11) | Max I Exhibit 13-8 mination (i 0.0078 V ₁₂ - 0.0 | Desirable 4600:All if not F) | Violation? | $\begin{array}{c c} V_R \\ \hline Flow Ent \\ V_{12} \\ \hline Level of S \\ \hline D_R = & (pc \\ LOS = & (Ex \\ \hline Speed De \\ S_R = & mpt \\ S_0 = & mpt \\ \end{array}$ | ering Dive Actual Service De R = 4.252 + (c/mi/ln) chibit 13-2) eterminati hibit 13-12) | Exhibit 13 10 Erge Influer Max Des Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 O.0086 V ₁₂ - 0 | irable | Violation? |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|---|--|----------------------------|--|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 9-Be No-Build | et 10th & Exit to Exp |
| Project Description SW 10 | th Street SIMR | | | | |
| ✓ Oper.(LOS |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 6620 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjust | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T-1)+P_R(E_R-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | <u> </u> | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times NS)$ $D = v_p / S$ LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N | · | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h | S - Speed D - Density FFS - Free-flow BFFS - Base free | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | RAMP | S AND RAM | P JUNCTI | ONS WO | RKS | HEET | | | |
|--|----------------------------------|--------------------|-------------------------------|-----------------|-------------------------------------|---------------------|-------------------|---|---------------------|------------------------------------|
| General Info | rmation | | | Site Infor | mation | | | | | |
| Analyst | | | Fr | eeway/Dir of Tr | avel | I-95 SB | | | | |
| Agency or Compan | y AEC | OM | | ınction | | Seg 10 | - Diverge to | Express | | |
| Date Performed | | | | ırisdiction | | N D " | 1.0040 | | | |
| Analysis Time Perion Project Description | | + CIMD | Ar | nalysis Year | | No-Buil | d 2040 | | | |
| Inputs | SW TOUT SHEE | EL SIIVIN | | | | | | | | |
| • | _ | Freeway Num | nber of Lanes, N | 3 | | | | | | |
| Upstream Adj | Ramp | Ramp Numbe | | 1 | | | | | Downstrea Ramp | am Adj |
| ✓Yes | ☑ On | | | ļ | | | | | • | _ |
| | | | Lane Length, L _A | 200 | | | | | ☐ Yes | On |
| ☐ No | Off | | Lane Length L _D | 300 | | | | | ✓ No | Off |
| | 2000 ft | Freeway Volu | | 6620 | | | | | l = | ft |
| L _{up} = 6 | 6000 ft | Ramp Volume | | 950 | | | | | L _{down} = | |
| V = 1 | 550 veh/h | | e-Flow Speed, S _{FF} | 70.0 | | | | | V _D = | veh/h |
| u . | 701111 | Ramp Free-F | low Speed, S _{FR} | 45.0 | | | | | | |
| Conversion | | der Base | Conditions | | | | | | | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | | f_HV | f _p | v = V/PHF | x f _{HV} x f _p |
| Freeway | 6620 | 0.95 | Level | 3 | 0 | 0.9 | 985 | 1.00 | 70 | 73 |
| Ramp | 950 | 0.92 | Level | 2 | 0 | | 990 | 1.00 | | 43 |
| UpStream | 1550 | 0.92 | Level | 2 | 0 | | 990 | 1.00 | | 02 |
| DownStream | 1000 | 1 | | | | | | | | <u></u> |
| | | Merge Areas | | | | | | iverge Areas | | |
| Estimation o | of v ₁₂ | | | | Estimat | ion o | f v ₁₂ | | | |
| | V ₁₂ = V _F | (P _{EM}) | | | | | V ₁₂ = | V _R + (V _F - V _R |)P _{FD} | |
| L _{EQ} = | .= . | ation 13-6 or | 13-7) | | L _{EQ} = | | 11 | 022.53 (Equat | ion 13-12 | or 13-13) |
| P _{FM} = | • • | Equation (| • | | P _{FD} = | | | i35 using Equ | | • |
| V ₁₂ = | pc/h | , , | , | | V ₁₂ = | | | 70 pc/h | ` | , |
| V ₃ or V _{av34} | • | Fouation 13 | -14 or 13-17) | | V ₃ or V _{av34} | | | 03 pc/h (Equa | ation 13-14 | or 13-17) |
| Is V ₃ or V _{av34} > 2,7 | - | | | | | ₂₄ > 2,7 | | Yes □ No | | , , , |
| Is V ₃ or V _{av34} > 1.5 | | | | | | | | Yes ☑ No | | |
| | | | -16, 13-18, or | | | | | 73 pc/h (Equa | ation 13-16 | S. 13-18. |
| If Yes,V _{12a} = | 13-19 | | ,,, | | If Yes,V _{12a} = | = | | 13-19) | 20011 10 10 | ,, 10 10, |
| Capacity Ch | ecks | | | | Capacit | y Che | ecks | | | |
| | Actual | | Capacity | LOS F? | | | Actual | Cap | pacity | LOS F? |
| | | | | | V_{F} | | 7073 | Exhibit 13-8 | 7200 | No |
| V_{FO} | | Exhibit 13-8 | | | $V_{FO} = V_{F}$ | - V _R | 6030 | Exhibit 13-8 | 7200 | No |
| | | | | | V_R | | 1043 | Exhibit 13-10 | 2100 | No |
| Flow Enterin | na Merae Ir | fluence A | \rea | ' | Flow Er | terin | a Diver | ge Influenc | ce Area | |
| | Actual | | Desirable | Violation? | | | Actual | Max Desirab | | Violation? |
| V_{R12} | | Exhibit 13-8 | | | V ₁₂ | 4 | 270 | Exhibit 13-8 | 4400:All | No |
| Level of Ser | vice Deterr | nination (| if not F) | • | Level of | f Serv | rice De | ermination | if not | . F) |
| D _R = 5.475 + 0 | | | | | | D _R = 4 | .252 + 0. | 0086 V ₁₂ - 0.0 | 009 L _D | • |
| D _R = (pc/mi/l | * * | | , | | | 1.0 (pc/ | | | 5 | |
| LOS = (Exhibit | - | | | | '` | | oit 13-2) | | | |
| Speed Deter | <u> </u> | | | | Speed L | | | n | | |
| • | | | | | ' | | xhibit 13- | | | |
| $M_S = (Exibit)$ | • | | | | | • | (Exhibit | • | | |
| | thibit 13-11) | | | | I '' | - | • | • | | |
| | thibit 13-11) | | | | | • | (Exhibit | • | | |
| . , | thibit 13-13) | | | | 1 | • | (Exhibit | • | | |
| riaht © 2016 Univers | ity of Florida All F | Rights Reserved | | | HCS2010TM | Varaio | 6.00 | (| Generated: 5 | 22/2019 12:3 |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|------------------------------------|---|--|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 11-E Samples No-Build | |
| Project Description SW 10th | Street SIMR | | <u> </u> | | |
| ✓ Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5670 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % | 0.95 3 0 Level mi | |
| Calculate Flow Adjustn | nents | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| LOS and Performance | Mogeuros | | Design (N) | | |
| Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | • | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| 0 | 4" | RAMPS | AND RAM | | | RKS | HEET | | | |
|--|--|---------------------------------------|-----------------------------|----------------------|--|---|--|--|------------------------------------|--------------------|
| General Infor | rmation | | | Site Infor | | | | | | |
| Analyst | . 450 | OM | | eeway/Dir of Tr | | I-95 SE | | Canada Dal | | |
| Agency or Company Date Performed | / AEC | ОМ | | nction risdiction | ; | Seg 12 | - Diverge to | Sample Rd | | |
| Analysis Time Perio | d AM | | | alysis Year | i | No-Bui | ld 2040 | | | |
| Project Description | | et SIMR | | , | | | | | | |
| Inputs | | | | | | | | | | |
| Upstream Adj F | Ramp | Freeway Numb | er of Lanes, N | 3 | | | | | Downstrea | am Adi |
| | • | Ramp Number | of Lanes, N | 1 | | | | | Ramp | / tug |
| ✓Yes | On | Acceleration La | ne Length, L∧ | | | | | | Yes | On |
| □Na [| 404 | Deceleration La | ,, | 250 | | | | | | |
| □ No | ✓ Off | Freeway Volum | - 0 | 5670 | | | | | ✓ No | Off |
| L _{up} = 20 | 000 ft | Ramp Volume, | | 1050 | | | | Į | L _{down} = | ft |
| up — | | | 11 | 70.0 | | | | | down | |
| V _u = 95 | 50 veh/h | | Flow Speed, S _{FF} | | | | | [| $V_D =$ | veh/h |
| | | Ramp Free-Flo | - 111 | 45.0 | | | | | | |
| Conversion t | | der Base C | onditions | 1 | 1 | | | ı | | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | | f_{HV} | f _p | v = V/PHF | $x f_{HV} x f_{p}$ |
| Freeway | 5670 | 0.95 | Level | 3 | 0 | 0 | 985 | 1.00 | 60 |)58 |
| Ramp | 1050 | 0.92 | Level | 2 | 0 | _ | 990 | 1.00 | | 53 |
| UpStream | 950 | 0.92 | Level | 2 | 0 | | 990 | 1.00 | | 143 |
| DownStream | | 1 1 | 2010. | | | + ** | | | | |
| | | Merge Areas | | | | | | verge Areas | | |
| Estimation o | f v ₁₂ | | | | Estimati | on o | f v ₁₂ | | | |
| | V ₁₂ = V _F | (P _{ru}) | | | | | V ₄₀ = ' | V _R + (V _F - V _R | .)P _{-D} | |
| = | | ation 13-6 or 1 | 3-7) | | = | | | quation 13-1 | – |) |
| - _{EQ} = P = | | Equation (E) | • | | L _{EQ} = P = | | • | - | | • |
| P _{FM} = | - | Equation (E) | KIIIDIL 13-0) | | P _{FD} = | | | 56 using Equ | iation (Exil | DIL 13-7) |
| / ₁₂ = | pc/h | /F (' 40 · | 4.4 40.47) | | V ₁₂ = | | | 78 pc/h | | |
| V_3 or V_{av34} | • | (Equation 13- | 14 or 13-17) | | V ₃ or V _{av34} | | | 30 pc/h (Equa | ation 13-1 | 4 or 13-17) |
| Is V_3 or $V_{av34} > 2,70$ | | | | | 0 4.0 | | | Yes V No | | |
| Is V_3 or $V_{av34} > 1.5$ | | | | | Is V ₃ or V _{av3} | ₃₄ > 1.5 | | Yes ☑ No | | |
| f Yes,V _{12a} = | pc/h (13-19 | (Equation 13- | 16, 13-18, or | | If Yes,V _{12a} = | | pc 19 | :/h (Equation | 13-16, 13 | -18, or 13- |
| Capacity Che | |) | | | Capacity | v Ch | | <i>)</i> | | |
| | Actual | Ca | pacity | LOS F? | | | Actual | Car | pacity | LOS F? |
| | | | | | V _F | | 6058 | Exhibit 13-8 | | No |
| \/ | | Exhibit 13-8 | | | $V_{FO} = V_{F}$ | - V. | 4905 | Exhibit 13-8 | + | No |
| V | | EXHIBIT 10-0 | | | V _{FO} V _R | *R | 1153 | Exhibit 13-10 | _ | _ |
| V_{FO} | | | | 1 | I VR | - 1 | 1100 | EXHIBIT 19-10 | | No |
| | | | | <u> </u> | | 4 | Di | I £1 | - A | |
| | T | | | \/iolotion? | Flow En | | - - | ge Influend | | \/iolotion? |
| Flow Enterin | g Merge In | Max D | rea esirable | Violation? | | / | Actual | Max Desirab | le | Violation? |
| Flow Enterin | Actual | Max D Exhibit 13-8 | esirable | Violation? | V ₁₂ | 3 | Actual 3878 | Max Desirab Exhibit 13-8 | le 4400:All | No |
| Flow Enterin V _{R12} Level of Serv | Actual vice Deterr | Max D Exhibit 13-8 mination (if | esirable f not F) | Violation? | V ₁₂ Level of | Serv | Actual 3878 /ice Det | Max Desirab Exhibit 13-8 ermination | le 4400:All n (if not | No |
| Flow Entering V_{R12} Level of Server $D_R = 5.475 + 0$ | Actual vice Deterr | Max D Exhibit 13-8 mination (if | esirable f not F) | Violation? | V ₁₂ Level of | Serv | Actual 3878 /ice Det | Max Desirab Exhibit 13-8 | le 4400:All n (if not | No |
| Flow Entering V_{R12} Level of Server $D_R = 5.475 + 0$ | Actual rice Deterr .00734 v _R + | Max D Exhibit 13-8 mination (if | esirable f not F) | Violation? | V ₁₂ Level of | | Actual 3878 /ice Det | Max Desirab Exhibit 13-8 ermination | le 4400:All n (if not | No |
| Flow Entering V_{R12} Level of Serve $D_{R} = 5.475 + 0$ $D_{R} = (pc/mi/lr)$ | Actual vice Deterr .00734 v _R + | Max D Exhibit 13-8 mination (if | esirable f not F) | Violation? | V ₁₂ Level of D _R = 37 | $Serv$ $O_{R} = 4$ 0.0 (pc.) | Actual 3878 /ice Det 1.252 + 0.0 | Max Desirab Exhibit 13-8 ermination | le 4400:All n (if not | No |
| Flow Entering V_{R12} Level of Serve $D_{R} = 5.475 + 0$ $D_{R} = (pc/mi/lr = 0.00)$ $D_{R} = (Exhibit)$ | Actual vice Deterr .00734 v _R + | Max D Exhibit 13-8 mination (if | esirable f not F) | Violation? | V ₁₂ Level of D _R = 37 | $Serv$ $D_R = 4$ 0 (pc.) $Serv$ | Actual 8878 //ice Det 1.252 + 0.0 //mi/ln) bit 13-2) | Max Desirable Exhibit 13-8 ermination 0086 V ₁₂ - 0.0 | le 4400:All n (if not | No |
| Flow Entering V_{R12} Level of Serve $D_{R} = 5.475 + 0$ $D_{R} = (pc/mi/lr)$ $LOS = (Exhibit)$ Speed Determination | Actual vice Deterr .00734 v _R + n) 13-2) mination | Max D Exhibit 13-8 mination (if | esirable f not F) | Violation? | V ₁₂ Level of D _R = 37 LOS = E Speed D | Serv D _R = 4 1.0 (pc. (Exhib | Actual 8878 //ice Det 1.252 + 0.0 //mi/ln) bit 13-2) | Max Desirable Exhibit 13-8 ermination 0086 V ₁₂ - 0.0 | le 4400:All n (if not | No |
| Flow Entering V_{R12} Level of Serve $D_R = 5.475 + 0$ $D_R = (pc/mi/lr$ $LOS = (Exhibit)$ Speed Determine $M_S = (Exibit)$ | Actual vice Deterr .00734 v _R + 1) 13-2) mination 3-11) | Max D Exhibit 13-8 mination (if | esirable f not F) | Violation? | V ₁₂ Level of D _R = 37 LOS = E 6 Speed D D _s = 0.4 | Service (Exhibit 402 (E | Actual 8878 // 100 Det 1.252 + 0.0 // 100 Det 1.252 + 0.0 // 100 Det 1.252 | Max Desirable Exhibit 13-8 ermination 0086 V ₁₂ - 0.0 | le 4400:All n (if not | No |
| Flow Entering V_{R12} Level of Serve $D_R = 5.475 + 0$ $D_R = (pc/mi/lr$ $LOS = (Exhibit)$ Speed Determine $M_S = (Exibit)$ $M_S = (Exibit)$ $M_S = (Exibit)$ | Actual vice Deterr .00734 v _R + n) 13-2) mination 3-11) nibit 13-11) | Max D Exhibit 13-8 mination (if | esirable f not F) | Violation? | V_{12} Level of $D_R = 37$ $LOS = E$ Speed D $D_S = 0.4$ $S_R = 58$ | Serv D _R = 4 0.0 (pc, (Exhib) 00 (Exhib) 00 (Exhib) 00 (Exhib) 00 (Exhib) 00 (Exhib) 00 (Exhib) 00 (Exhib) | Actual 8878 //ice Det 9.252 + 0.0 //mi/ln) oit 13-2) //mi/libit 13-1 (Exhibit 1 | Max Desirable Exhibit 13-8 ermination 0086 V ₁₂ - 0.0 n 12) 3-12) | le 4400:All n (if not | No |
| Flow Entering V_{R12} Level of Serve $D_R = 5.475 + 0$ $D_R = (pc/mi/lr$ $LOS = (Exhibit)$ Speed Determing $M_S = (Exibit)$ | Actual vice Deterr .00734 v _R + 1) 13-2) mination 3-11) | Max D Exhibit 13-8 mination (if | esirable f not F) | Violation? | V_{12} Level of $D_R = 37$ $LOS = E_0$ Speed D $D_s = 0.4$ $S_R = 58$ $S_0 = 72$ | Serv D _R = 4 7.0 (pc. (Exhibit 402 (E 8.8 mph | Actual 8878 // 100 Det 1.252 + 0.0 // 100 Det 1.252 + 0.0 // 100 Det 1.252 | Max Desirable Exhibit 13-8 ermination 0086 V ₁₂ - 0.0 12) 3-12) 3-12) | le 4400:All n (if not | No |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|---|---|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM AM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 13-E No-Build | Bet Off & On Ramps |
| Project Description SW 10 | th Street SIMR | | | | |
| ✓ Oper.(LOS | () | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 4620 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADTXKXD | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjust | ments | | <u> </u> | | |
| - | 1.00 | | | 1.2 | |
| f _p E _T | 1.50 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 0.985 | |
| Speed Inputs | 1.0 | | Calc Speed Adj and FFS | | |
| • | | | Caic Speed Auj and 11 C | <u> </u> | |
| Lane Width | | ft | | | b |
| Rt-Side Lat. Clearance | • | ft | f _{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | 70.0 | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 1645 67.7 24.3 C | pc/h/ln mph pc/mi/ln | $\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | REEWAY | WEAV | NG WOR | KKSHEE | l | | |
|---|--|----------------|------------|------------------|--|----------------|---------------------------|------------|-------------------------------|
| General | Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/Con Date Perfori Analysis Tin | med | AECOI AM | М | | Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 14- Bet Sample & Copans Analysis Year No-Build 2040 | | | | le & Copans |
| Project Des | cription SW 10t | h Street SIMF | ₹ | | l | | | | |
| Inputs | | | | | | | | | |
| Weaving se Freeway fre | mber of lanes, N gment length, L _o e-flow speed, Fl | s S | | 1650ft 70 mph | Segment type Freeway min Freeway max Terrain type | imum speed | | | Freeway 15 2400 Leve |
| Convers | sions to po | 1 | | 1 | | F | | | (= = / =) |
| \ | V (veh/h) | PHF | Truck (%) | RV (%) | E _T | E _R | f _{HV} | fp | v (pc/h) |
| V _{FF} | 3915 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 4183 |
| V _{RF} | 1970 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 2163 |
| V _{FR} | 705 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 774 |
| V_{RR} | 0 | 0.95 | 0 | 0 | 1.5 | 1.2 | 1.000 | 1.00 | 0 |
| V _{NW} | 4183 | | | | | | | V = | 7120 |
| V _W | 2937 | | | | | | | | |
| VR | 0.412 | | 4* | | | | | | |
| | ration Cha | | tics | | I. e | | | | |
| | aneuver lanes, | N_{WL} | | 2 lc | | - | hanges, LC _{MIN} | I | lc/h |
| | e density, ID | | | 0.7 int/mi | Weaving lan | | •• | | lc/h |
| | F lane changes, | T U | | | Non-weaving | | | | lc/h |
| | R lane changes, | 111 | | 1 lc/pc | Total lane ch | , | | | lc/h |
| | R lane changes | | | | Non-weaving | | | | 603 |
| Weaving | g Segment | t Speed, | Density, I | _evel of | T . | | | | |
| • | gment flow rate | • | | 7029 veh/h | Weaving inte | • | | | mah |
| | gment capacity, | C _w | | 5732 veh/h | A | | | mph mph | |
| • | gment v/c ratio | n | | 1.226 | | | | • | |
| Level of Se | egment density, l | ט | | pc/mi/ln F | , inv | | | | mph |
| Feater or Se | I VIOO, LOO | | | Г | ıvıaxırnum we | eaving length | ı, ∟ _{MAX} | | 6822 ft |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|---|---|----------------------------|--|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 1-Be No-Build | et Hillsboro & Palmetto |
| Project Description SW 10 | th Street SIMR | | , | | |
| ✓ Oper.(LOS | 5) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5150 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| DURV - AAUTXKXU | | venin | Up/Down % | IIII | |
| Calculate Flow Adjust | ments | | · | | |
| | 1.00 | | E _R | 1.2 | |
| f _p E _T | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | | |
| · | | # | от ороси и и дини и и | | |
| Lane Width Rt-Side Lat. Clearance | | ft ft | f _{LW} | | mph |
| Number of Lanes, N | 3 | п | f _{LC} | | mph |
| Total Ramp Density, TRD | J | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | 3 | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | REEWAY | WEAV | NG WOR | KKSHEE | <u> </u> | | |
|---|--|--------------------|------------|------------------|---|--------------------------|---------------------------|------|-------------------------------|
| Genera | l Informati | on | | | Site Info | rmation | | | |
| Analyst Agency/Cor Date Perfor Analysis Tir | med | AECO PM | М | | Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 2-Bet On from Exp & Of No-Build 2040 | | | | |
| Project Des | cription SW 10t | h Street SIMF | ₹ | | l | | | | |
| Inputs | | | | | 1 | | | | |
| Weaving se Freeway fre | mber of lanes, N gment length, L e-flow speed, F | s FS | | 5085ft 70 mph | Segment type Freeway min Freeway max Terrain type | imum speed | | | Freeway 18 2400 Leve |
| Conver | sions to po | 1 | | 1 | | | Ι | Ι. | (") |
| | V (veh/h) | PHF | Truck (%) | RV (%) | Ε _Τ | ER | f_{HV} | fp | v (pc/h) |
| V_{FF} | 4010 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 4284 |
| V_{RF} | 1460 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1603 |
| V_{FR} | 1140 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1252 |
| V_{RR} | 130 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 143 |
| V_{NW} | 7139 | | | | | | | V = | 7282 |
| V_W | 143 | | | | | | | | |
| VR | 0.020 | | | | | | | | |
| Configu | ration Cha | aracteris | tics | | 1 | | | | |
| Minimum m | aneuver lanes, | N_{WL} | | 0 lc | | - | hanges, LC _{MIN} | 1 | lc/h |
| J | e density, ID | | | 0.7 int/mi | Weaving lan | e changes, L | $-C_W$ | | lc/h |
| Minimum R | F lane changes, | LC_RF | | 0 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | lc/h |
| Minimum F | R lane changes, | , LC _{FR} | | 0 lc/pc | Total lane ch | nanges, LC _{AL} | L | | lc/h |
| Minimum R | R lane changes | , LC _{RR} | | 3 lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | |
| Weavin | g Segmen | t Speed, | Density, I | _evel of | Service, | and Cap | oacity | | |
| Weaving segment flow rate, v 7189 veh/ Weaving segment capacity, c _w 6907 veh/ | | | | | Weaving segment speed, S | | | | mph |
| • | egment v/c ratio | Б | | 1.041 | Average wea | | ** | | mph |
| • | egment density, | ט | | pc/mi/ln | Average non | | | | mph |
| u evelot Se | rvice, LOS | | | F | Maximum weaving length, L _{MAX} 5909 f | | | | |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|------------------------------------|--|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 3-Be No-Build | et Off & On Ramp 2040 |
| Project Description SW 10 | | | | | |
| ✓ Oper.(LOS |) | | Des.(N) | Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5470 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| DETTO TOTALLA | | VC11/11 | Up/Down % | 1111 | |
| Calculate Flow Adjust | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 1.2 0.985 | |
| Speed Inputs | - | | Calc Speed Adj and FFS | | |
| • | | | Guio opoda 7 taj una 111 | | |
| Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF x N S)$ $D = v_p / S$ LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h | S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| Compress 1 1:: 5 | | MPS AND | KAIVIP JUIN | | | <u> </u> | | | |
|--|---|--|--|------------------------|--|---|--|-------------------------------|--------------------------------------|
| General Info | rmation | | | Site Infor | | 0-0- | | | |
| Analyst | | 0011 | | eeway/Dir of Ti | | 95 SB | 11911 1475 | | |
| Agency or Compar Date Performed | ıy AEC | COM | | ınction ırisdiction | S | eg 4-Merge tro | m Hillsboro WB | | |
| Analysis Time Peri | iod PM | | | nalysis Year | N | lo-Build 2040 | | | |
| Project Description | | | | , | | | | | |
| Inputs | | | | | | | | | |
| Jpstream Adj Ram | an. | Freeway Num | ber of Lanes, N | 3 | | | | Downstre | nam Adi |
| Jpstream Auj Ran | ıþ | Ramp Number | | 1 | | | | Ramp | eam Auj |
| ✓ Yes 🔲 🤇 | Эn | 1 1 | ane Length, L _A | 950 | | | | | |
| | | | ane Length L _D | 300 | | | | ☐Yes | ☐ On |
| □ No ✓ (| Off | | - 5 | E470 | | | | ✓ No | Off |
| - _{up} = 2175 | f# | Freeway Volui | | 5470 | | | | L _{down} = | ft |
| _{-up} = 2175 | IL | Ramp Volume | • • | 890 | | | | -down | |
| √ _u = 1270 | veh/h | 1 | Flow Speed, S _{FF} | 70.0 | | | | V _D = | veh/h |
| | | | ow Speed, S _{FR} | 50.0 | | | | | |
| Conversion | to pc/h Ur | ider Base (| Conditions | | | | | | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | f _{HV} | fp | v = V/PH | F x f _{HV} x f _p |
| Freeway | 5470 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | | 5844 |
| Ramp | 890 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 977 |
| UpStream | 1270 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | | 1394 |
| DownStream | 1270 | 0.92 | Level | | 1 0 | 0.990 | 1.00 | | 1334 |
| - Jown Caroani | | Merge Areas | | <u> </u> | | <u> </u> | Diverge Areas | | |
| Estimation | of v ₁₂ | | | | Estimation | | • | | |
| | | (P _{FM}) | | | | | | | |
| _ | | | 40.0 40.7) | | | V ₁₂ = | : V _R + (V _F - V _R | P _{FD} | |
| -EQ = | | 49 (Equation | · · | | L _{EQ} = | | (Equation 13- | 12 or 13- | 13) |
|) _{FM} = | | | ion (Exhibit 13-6) | | P _{FD} = | | using Equation | n (Exhibit 1 | 13-7) |
| ′ ₁₂ = | 3530 | = | | | V ₁₂ = | | pc/h | | |
| / ₃ or V _{av34} | | pc/h (Equation | on 13-14 or 13- | | V ₃ or V _{av34} | | pc/h (Equation 1 | 13-14 or 13- | 17) |
| Is V ₃ or V _{av34} > 2, | 17) | os 🗸 No | | | | > 2,700 pc/h? | ☐Yes ☐ No | | |
| Is V_3 or $V_{av34} > 1.5$ | | | | | | | Yes No | | |
| | | es ⊟ No pc/h (Equatio | n 12 16 12 | | | 12 | pc/h (Equatio | n 13-16, 1 | 13-18, or |
| Yes,V _{12a} = | | r 13-19) | JII 13-10, 13- | | If Yes,V _{12a} = | • | 13-19) | | |
| Capacity Ch | | | | | Capacity | Checks | | | |
| | Actual | С | apacity | LOS F? | | Actua | I Ca | pacity | LOS F? |
| | | | | | | li e | | 8 | |
| | | | | | V_{F} | | Exhibit 13- | ٠ı | |
| V | | Evhihit 13-8 | | No | | V _D | Exhibit 13- | | |
| V _{FO} | 6821 | Exhibit 13-8 | | No | $V_{FO} = V_F$ - | V _R | Exhibit 13- | 8 | |
| V _{FO} | | Exhibit 13-8 | | No | | V _R | | 8 | |
| | 6821 | | rea | No | $V_{FO} = V_{F} - V_{R}$ | | Exhibit 13- | 8 | a |
| | 6821 | nfluence A | rea Desirable | No Violation? | $V_{FO} = V_{F} - V_{R}$ | | Exhibit 13- Exhibit 13 10 | 8 - nce Area | a Violation |
| Flow Enterii | 6821 ng Merge I | nfluence A | | | $V_{FO} = V_{F} - V_{R}$ | ering Dive | Exhibit 13- Exhibit 13 10 erge Influer | 8 - nce Area | W. |
| | 6821 ng Merge I Actual 4507 | Influence A Max I Exhibit 13-8 | Desirable 4600:All | Violation? | $V_{FO} = V_F - V_R$ Flow Ent | ering Dive | Exhibit 13- Exhibit 13- 10 Erge Influer Max Des | 8 - Ince Area irable | Violation |
| Flow Enterion V _{R12} Level of Ser | 6821 ng Merge I Actual 4507 vice Deter | Max I Exhibit 13-8 | Desirable 4600:All f not F) | Violation? | $V_{FO} = V_F - V_R$ Flow Ent | ering Dive Actual Service De | Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Eterminatio | 8 | Violation |
| V _{R12} Level of Ser | 6821 Merge I Actual 4507 Vice Deter + 0.00734 v _R + | Influence A Max I Exhibit 13-8 | Desirable 4600:All f not F) | Violation? | $V_{FO} = V_F - V_R$ Flow Ent V_{12} Level of V_{12} | Actual Service Do R = 4.252 + 6 | Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 | 8 | Violation |
| Flow Entering V_{R12} Level of Ser $D_R = 5.475$ $D_R = 34.2 \text{ (pc.)}$ | 6821 Merge I Actual 4507 Vice Deter 5 + 0.00734 v _R + | Max I Exhibit 13-8 | Desirable 4600:All f not F) | Violation? | $V_{FO} = V_F - V_R$ Flow Ent V_{12} Level of V_{12} V_{13} V_{14} V_{15} $V_{$ | Actual Service Decomposition (Actual) | Exhibit 13- Exhibit 13- 10 Erge Influer Max Des Exhibit 13-8 Eterminatio | 8 | Violation |
| Flow Entering V_{R12} Level of Ser $D_R = 5.475$ $D_R = 34.2 \text{ (pc. OS} = D \text{ (Exhibit)}$ | 6821 Merge I Actual 4507 Vice Deter 5 + 0.00734 v R + e/mi/ln) bit 13-2) | Max I Exhibit 13-8 | Desirable 4600:All f not F) | Violation? | $V_{FO} = V_F - V_R$ Flow Ent V_{12} Level of S $D_R = (pc)$ $D_R = (pc)$ $D_R = (pc)$ | Actual Service Do R = 4.252 + 6 Simi/In) Actual | Exhibit 13- Exhibit 13- Erge Influer Max Des Exhibit 13-8 Eterminatio 0.0086 V ₁₂ - 0 | 8 | Violation |
| Flow Entering V_{R12} Level of Ser $D_R = 5.475$ $D_R = 34.2 \text{ (pc. LOS} = D \text{ (Exhibit)}$ Speed Determine V_{R12} | 6821 Merge I. Actual 4507 Vice Deter 5 + 0.00734 v _R + c/mi/ln) oit 13-2) rmination | Max I Exhibit 13-8 | Desirable 4600:All f not F) | Violation? | $V_{FO} = V_F - V_R$ Flow Ent V_{12} Level of V_{12} $V_{13} = V_{14}$ $V_{14} = V_{15}$ $V_{15} $ | Actual Service Delay R = 4.252 + 6 Actival | Exhibit 13- Exhibit 13- Erge Influer Max Des Exhibit 13-8 Eterminatio 0.0086 V ₁₂ - 0 | 8 | Violation |
| Flow Entering V_{R12} Level of Ser $D_R = 5.475$ $D_R = 34.2 \text{ (pc. } .0S = D \text{ (Exhibit)}$ Speed Determine $M_S = 0.580 \text{ (Exhibit)}$ | 6821 Merge I Actual 4507 Vice Deter 5 + 0.00734 v _R + c/mi/ln) bit 13-2) rmination Exibit 13-11) | Exhibit 13-8 Transfer of the control of the contro | Desirable 4600:All f not F) | Violation? | $V_{FO} = V_F - V_R$ Flow Ent V_{12} Level of S $D_R = (pc)$ $LOS = (Ex)$ Speed De $D_S = (Ex)$ | Actual Service Do R = 4.252 + 6 Sc/mi/ln) Achibit 13-2) Eterminati Actual | Exhibit 13- Exhibit 13- Expe Influer Max Des Exhibit 13-8 Extermination 0.0086 V ₁₂ - 0 | 8 | Violation |
| Flow Entering V_{R12} Level of Ser $D_R = 5.475$ $D_R = 34.2 \text{ (pc)}$ $D_R = 0.580 (Exhibited in the second of the second$ | 6821 Merge I. Actual 4507 Vice Deter 5 + 0.00734 v _R + c/mi/ln) oit 13-2) rmination | Exhibit 13-8 Transfer of the control of the contro | Desirable 4600:All f not F) | Violation? | $V_{FO} = V_F - V_R$ Flow Ent V_{12} Level of V_{12} $V_{13} = V_{14}$ $V_{14} = V_{15}$ $V_{15} $ | Actual Service Do R = 4.252 + 6 Activity in the service of the | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Max Des Exhibit 13-8 Ex | 8 | Violation |
| Flow Entering V_{R12} Level of Ser $D_R = 5.475$ $O_R = 34.2 \text{ (pc.)}$ $OS = D \text{ (Exhibition of Expeed Determine)}$ $OS = 0.580 \text{ (Exhibition of Expeed Determine)}$ $OS = 0.580 \text{ (Exhibition of Expeed Determine)}$ | 6821 Merge I Actual 4507 Vice Deter 5 + 0.00734 v _R + c/mi/ln) bit 13-2) rmination Exibit 13-11) | Max Exhibit 13-8 | Desirable 4600:All f not F) | Violation? | $V_{FO} = V_F - V_R$ Flow Ent V_{12} Level of V_{12} $V_{13} = V_{14}$ $V_{14} = V_{15}$ $V_{15} $ | Actual Service Do R = 4.252 + 6 Sc/mi/ln) Achibit 13-2) Eterminati Actual | Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Exhibit 13- Max Des Exhibit 13-8 Ex | 8 | Violation |

| General Information | | | Site Information | | |
|--|------------------|--------------|--|-----------------------|--------------------------------|
| Analyst | | | Highway/Direction of Travel | I-95 SB | - 4 14/0 0 - 4 50 0 - |
| Agency or Company | AECOM | | From/To | Seg 5-Be Ramps | et WB On & EB On |
| Date Performed | | | Jurisdiction | • | |
| Analysis Time Period | PM | | Analysis Year | No-Build | 2040 |
| Project Description SW 10th | Street SIMR | | | | |
| ✓ Oper.(LOS) | | | Des.(N) | ∐ Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V | 6360 | veh/h | Peak-Hour Factor, PHF | 0.95 | |
| AADT | | veh/day | %Trucks and Buses, P _T | 3 | |
| Peak-Hr Prop. of AADT, K | | | %RVs, P _R General Terrain: | 0 Level | |
| Peak-Hr Direction Prop, D DDHV = AADT x K x D | | veh/h | General Ferrain: Grade % Length | Levei mi | |
| | | | Up/Down % | •••• | |
| Calculate Flow Adjustn | nents | | · · · · · · · · · · · · · · · · · · · | | |
| f _p | 1.00 | | E _R | 1.2 | |
| E _T | 1.5 | | $f_{HV} = 1/[1 + P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | | |
| Lane Width | | ft | Caro opoda 7 taj ana 1 1 t | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | п | f _{LC} | | mph |
| Total Ramp Density, TRD | 3 | romno/mi | TRD Adjustment | | • |
| • | 70.0 | ramps/mi | | 70.0 | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) | | | Design (N) | | |
| Operational (LOS) | (f | | Design LOS | | |
| $v_p = (V \text{ or DDHV}) / (PHF x N)$ | r | pc/h/ln | $v_p = (V \text{ or DDHV}) / (PHF x N x)$ | $f_{HV} \times f_{p}$ | pc/h/ln |
| S | 56.8 | mph | s | | mph |
| $D = v_p / S$ | 39.8 | pc/mi/ln | $D = v_p / S$ | | pc/mi/ln |
| LOS | Ε | | Required Number of Lanes, N | | • |
| Glossary | | | Factor Location | | |
| N - Number of lanes | S - Speed | | | | |
| V - Hourly volume | D - Density | | E _R - Exhibits 11-10, 11-12 | | f _{LW} - Exhibit 11-8 |
| v _n - Flow rate | FFS - Free-flow | sneed | E _T - Exhibits 11-10, 11-11, 11- | 13 | f _{LC} - Exhibit 11-9 |
| V _p - Flow rate LOS - Level of service | BFFS - Base from | - | f _p - Page 11-18 | | TRD - Page 11-1 |
| | | ze-now speed | LOS, S, FFS, v _p - Exhibits 11-2 | 2, 11-3 | |
| DDHV - Directional design ho | ui voiullie | | <u>'</u> | | |

| | | | REEWAY | WEAV | NG WOR | RKSHEE | | | |
|--|---|------------------|------------|------------------------------------|--|--------------------------|---------------------------|------------------------------------|-------------------------------|
| Genera | Information | on | | | Site Info | rmation | | | |
| Analyst Agency/Cor Date Perfor Analysis Tin | med | AECON PM | Л | | Freeway/Dir Weaving Seg Analysis Yea | gment Locati | | SB S- Bet Hillsbor uild 2040 | o & 10th St |
| Project Des | cription SW 10tl | h Street SIMF | } | | 1 | | | | |
| Inputs | | | | | | | | | |
| Weaving se | nfiguration mber of lanes, N gment length, L _ç e-flow speed, Ff | S | | One-Sided 4 1830ft 70 mph | Segment typo Freeway min Freeway max Terrain type | imum speed | | | Freeway 19 2400 Leve |
| Conver | sions to po | /h Unde | r Base Co | ndition | S | | | | |
| | V (veh/h) | PHF | Truck (%) | RV (%) | Ε _Τ | ER | f_{HV} | fp | v (pc/h) |
| V_{FF} | 4860 | 0.95 | 3 | 0 | 1.5 | 1.2 | 0.985 | 1.00 | 5193 |
| V_{RF} | 830 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 911 |
| V_{FR} | 1500 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1647 |
| V_RR | 0 | 0.95 | 0 | 0 | 1.5 | 1.2 | 1.000 | 1.00 | 0 |
| V_{NW} | 5193 | | | | | | | V = | 7751 |
| V_W | 2558 | | | | | | | | |
| VR | 0.330 | | | | | | | | |
| Configu | ration Cha | aracterist | tics | | T | | | | |
| Minimum m | aneuver lanes, I | N_{WL} | | 2 lc | Minimum we | aving lane c | hanges, LC _{MIN} | I | lc/h |
| Interchange | • | | | 0.7 int/mi | Weaving lan | e changes, L | .C _w | | lc/h |
| | F lane changes, | IN | | 1 lc/pc | Non-weaving | g lane chang | es, LC _{NW} | | lc/h |
| | R lane changes, | 111 | | 0 lc/pc | Total lane ch | nanges, LC _{AL} | L | | lc/h |
| Minimum R | R lane changes, | LC _{RR} | | lc/pc | Non-weaving | g vehicle inde | ex, I _{NW} | | |
| Weavin | g Segment | Speed, | Density, I | _evel of | Ĭ . | | | | |
| Weaving se | gment flow rate gment capacity, gment v/c ratio | | | 7649 veh/h 7165 veh/h 1.067 | Weaving into Weaving seg Average wea | gment speed | , S | | mph mph |
| _ | Veaving segment density, D pc/mi | | | | | | | | |
| Level of Se | rvice, LOS | | | F | Maximum weaving length, L _{MAX} 5908 | | | | |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 7-Be No-Build | et Off & On Ramp |
| Project Description SW 10t | th Street SIMR | | - | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 5690 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| | | | Up/Down % | | |
| Calculate Flow Adjusti | ments | | | | |
| f _p E _T | 1.00 1.5 | | E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$ | 1.2 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS | 3 70.0 | ft ramps/mi mph mph | f _{LW} f _{LC} TRD Adjustment FFS | 70.0 | mph mph mph mph |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| <u> </u> | | MINS AND | RAMP JUN | | | | | | |
|---|--|---------------------|------------------------------------|------------------------|--|---|--|---------------------|--------------------|
| General Infor | <u>rmation</u> | | | Site Infor | | | | | |
| Analyst | | | | eeway/Dir of Ti | | 95 SB | 1011 5: | | |
| Agency or Company Date Performed | y AEC | OM | | inction irisdiction | S | eg 8-Merge froi | m 10th St | | |
| Analysis Time Perio | d PM | | | nalysis Year | N | o-Build 2040 | | | |
| Project Description | | et SIMR | 7 | , | | o Build 2010 | | | |
| nputs | | | | | | | | | |
| Jpstream Adj Ramp | , | Freeway Num | ber of Lanes, N | 3 | | | | Downstrea | m Adi |
| pstream Auj Kamp | , | Ramp Numbe | r of Lanes, N | 1 | | | | Ramp | iiii Auj |
| ✓ Yes 🔲 Oı | n | 1 | ane Length, L | 1470 | | | | | |
| | | | ane Length L _D | 1470 | | | | ☐Yes | ☐ On |
| ☐ No ✓ Of | ff | | - 5 | E600 | | | | ✓ No | Off |
| _{up} = 2210 | ft | Freeway Volume | | 5690 | | | | L _{down} = | ft |
| _{up} = 2210 | IL | Ramp Volume | • • | 1560 | | | | _down | |
| V _u = 1500 | veh/h | | -Flow Speed, S _{FF} | 70.0 | | | | V _D = | veh/h |
| | | | ow Speed, S _{FR} | 50.0 | | | | | |
| Conversion t | , | der Base | Conditions | T- | , | T. | | r | |
| (pc/h) | V (Veh/hr) | PHF | Terrain | %Truck | %Rv | f_{HV} | f _p | v = V/PHF | $x f_{HV} x f_{D}$ |
| Freeway | 5690 | 0.95 | Level | 3 | 0 | 0.985 | 1.00 | 6 | 079 |
| Ramp | 1560 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | <u> </u> | 713 |
| UpStream | 1500 | 0.92 | Level | 2 | 0 | 0.990 | 1.00 | t | 647 |
| DownStream | 1000 | 0.02 | 20101 | | | 0.000 | 1.00 | | 517 |
| | | Merge Areas | | | | | Diverge Areas | | |
| Estimation o | fv ₁₂ | | | | Estimation | on of v ₁₂ | | | |
| | V ₁₂ = V _E | (P.,) | | | | | N . 01 N | ,,, | |
| = | | | 13-6 or 13-7) | | | V ₁₂ = | $V_R + (V_F - V_R)$ | | |
| EQ = | | | ion (Exhibit 13-6) | | L _{EQ} = | | (Equation 13- | | • |
| FM = | | | IOIT (EXHIBIT 13-0) | | P _{FD} = | | using Equation | on (Exhibit 13 | -7) |
| ′ ₁₂ = | 3636 | ·= | on 12 14 or 12 | | V ₁₂ = | | pc/h | | |
| V_3 or V_{av34} | 2 44 3 17) | pc/ii (⊏quatio | on 13-14 or 13- | | ${ m V_3}$ or ${ m V_{av34}}$ | | pc/h (Equation 1 | 13-14 or 13-1 | 7) |
| s V ₃ or V _{av34} > 2,70 | | es 🗸 No | | | Is V ₃ or V _{av34} | > 2,700 pc/h? | ☐Yes ☐ No | | |
| Is V_3 or $V_{av34} > 1.5$ | | | | | Is V ₃ or V _{av34} | > 1.5 * V ₁₂ /2 | ☐Yes ☐No | | |
| | | | on 13-16, 13- | | If Yes,V _{12a} = | | pc/h (Equatio | | 3-18, or |
| Yes,V _{12a} = | | 13-19) | | | 12a | 1 | 3-19) | | |
| Capacity Che | ecks | | | | Capacity | Checks | | | |
| | Actual | C | apacity | LOS F? | | Actual | | pacity | LOS F? |
| | | | | | V_{F} | | Exhibit 13- | 8 | |
| | 7792 | Exhibit 13-8 | | Yes | $V_{FO} = V_{F}$ - | V_R | Exhibit 13- | 8 | |
| VEO | | | | | V _R | | Exhibit 13 | - | |
| V_{FO} | | | | <u> </u> | | | 10 | <u> </u> | |
| | <u></u> | | | | 1F1 F4 | ering Dive | rge Influer | | 10111 |
| | | | | 1 | Flow Ent | | | ırable I | Violation? |
| Flow Enterin | Actual | Max | Desirable | Violation? | | Actual | Max Des | | |
| Flow Entering | Actual 5349 | Max Exhibit 13-8 | Desirable 4600:All | Violation? Yes | V ₁₂ | Actual | Exhibit 13-8 | | |
| Flow Entering V _{R12} Level of Serv | Actual 5349 vice Deteri | Max Exhibit 13-8 | Desirable 4600:All if not F) | | V ₁₂ Level of S | Actual Service De | Exhibit 13-8 Eterminatio | n (if not | F) |
| Flow Entering V _{R12} Level of Serv | Actual 5349 | Max Exhibit 13-8 | Desirable 4600:All if not F) | | V ₁₂ Level of S | Actual Service De | Exhibit 13-8 | n (if not | F) |
| V _{R12} Level of Serv D _R = 5.475 + | Actual 5349 /ice Deterion + 0.00734 v R + | Max Exhibit 13-8 | Desirable 4600:All if not F) | | V ₁₂ Level of S | Actual Service De | Exhibit 13-8 Eterminatio | n (if not | F) |
| V _{R12} Level of Serv | Actual 5349 Vice Deteri + 0.00734 v _R + mi/ln) | Max Exhibit 13-8 | Desirable 4600:All if not F) | | V ₁₂ Level of S D D _R = (pc | Actual Service De R = 4.252 + 0 | Exhibit 13-8 Eterminatio | n (if not | F) |
| Flow Entering V_{R12} Level of Serv $D_{R} = 5.475 + 0$ $D_{R} = 37.2 \text{ (pc/n)}$ | Actual 5349 /ice Deterion + 0.00734 v R + mi/ln) 13-2) | Max Exhibit 13-8 | Desirable 4600:All if not F) | | V ₁₂ Level of S D D R = (pc LOS = (Ex | Actual Service De R = 4.252 + (/mi/ln) | Exhibit 13-8 Exerminatio 0.0086 V ₁₂ - 0 | n (if not | F) |
| Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $O_R = 37.2 \text{ (pc/n)}$ $OS = F \text{ (Exhibit)}$ Speed Determ | Actual 5349 vice Determination Actual 7549 Actual 7549 | Max Exhibit 13-8 | Desirable 4600:All if not F) | | V ₁₂ Level of S D D _R = (pc LOS = (Ex | Actual Service De R = 4.252 + (/mi/ln) chibit 13-2) | Exhibit 13-8 Exerminatio 0.0086 V ₁₂ - 0 | n (if not | F) |
| Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $O_R = 37.2 \text{ (pc/m)}$ $O_R = F \text{ (Exhibit)}$ Speed Determant $M_S = 0.995 \text{ (Exhibit)}$ | Actual 5349 vice Determ + 0.00734 v _R + mi/ln) 13-2) mination tibit 13-11) | Max Exhibit 13-8 | Desirable 4600:All if not F) | | V_{12} Level of S $D_R = (pc)$ LOS = (Ex Speed De $D_S = (Ex)$ | Actual Service De R = 4.252 + (/mi/ln) chibit 13-2) etermination nibit 13-12) | Exhibit 13-8 eterminatio 0.0086 V ₁₂ - 0 | n (if not | F) |
| Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 37.2 \text{ (pc/n)}$ $OS = F \text{ (Exhibit)}$ Speed Determing $M_S = 0.995 \text{ (Exhibit)}$ $G_R = 42.2 \text{ mph}$ | Actual 5349 Vice Determite 0.00734 v R + mi/ln) 13-2) mination ibit 13-11) (Exhibit 13-11) | Max Exhibit 13-8 | Desirable 4600:All if not F) | | V_{12} Level of S $D_R = (pc)$ LOS = (Ex Speed De $D_S = (Ex)$ $D_S = (Ex)$ $D_S = (Ex)$ | Actual Service De R = 4.252 + (/mi/ln) thibit 13-2) eterminati nibit 13-12) n (Exhibit 13-12 | Exhibit 13-8 Exermination 0.0086 V ₁₂ - 0 | n (if not | <i>F</i>) |
| Flow Entering V_{R12} Level of Serve $D_R = 5.475 + 37.2 \text{ (pc/m)}$ $OS = F \text{ (Exhibit)}$ Speed Determing $M_S = 0.995 \text{ (Exhibit)}$ $G_R = 42.2 \text{ mph}$ $G_R = 62.6 \text{ mph}$ | Actual 5349 vice Determ + 0.00734 v _R + mi/ln) 13-2) mination tibit 13-11) | Max Exhibit 13-8 | Desirable 4600:All if not F) | | V_{12} Level of S_{12} $D_{R} = (pc)$ LOS = (Ex Speed De $D_{S} = (Ex)$ $S_{R} = (Ex)$ $S_{R} = (Ex)$ $S_{R} = (Ex)$ | Actual Service De R = 4.252 + (/mi/ln) chibit 13-2) etermination nibit 13-12) | Exhibit 13-8 eterminatio 0.0086 V ₁₂ - 0 on | n (if not | F) |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|---------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 9-Be No-Build | et 10th & Exit to Exp |
| Project Description SW 10t | h Street SIMR | | | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | 7250 | veh/h veh/day veh/h | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length | 0.95 3 0 Level mi | |
| DDITV - AADT X K X D | | VEII/II | Up/Down % | 1111 | |
| Calculate Flow Adjusti | ments | | · | | |
| | 1.00 | | E _R | 1.2 | |
| f _p E _⊤ | 1.50 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | 7.0 | | Calc Speed Adj and FFS | | |
| · | | | Calc Speed Auj and 113 | | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | _ | ft | f _{LW} | | mph |
| Number of Lanes, N | 3 | | f _{LC} | | mph |
| Total Ramp Density, TRD | 70.0 | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 2582 47.8 54.0 F | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | RAMP | S AND RAM | P JUNCTI | ONS WO | RKS | HEET | | | |
|------------------------------|----------------------------------|----------------|------------------------------|-----------------|--|------------------|-------------------|---|---------------------|------------------------------------|
| General Info | rmation | 1 2 1111 | <u> </u> | Site Infor | | | | | | |
| Analyst | | | Fr | eeway/Dir of Tr | | I-95 SB | | | | |
| Agency or Compar | ny AECO | OM | | nction | | | - Diverge to | Express | | |
| Date Performed | | | | risdiction | | - | | | | |
| Analysis Time Peri | | | Ar | alysis Year | | No-Buil | d 2040 | | | |
| Project Description | SW 10th Stree | t SIMR | | | | | | | | |
| Inputs | | FN | Jan af Laura N | 2 | | | | | | |
| Upstream Adj | Ramp | | nber of Lanes, N | 3 | | | | | Downstre | am Adj |
| ✓Yes | ☑ On | Ramp Numbe | | 1 | | | | | Ramp | |
| E 103 | E OII | | ane Length, L _A | | | | | | ☐ Yes | On |
| □No | Off | | Lane Length L _D | 300 | | | | | ✓ No | Off |
| | | Freeway Volu | me, V _F | 7250 | | | | | | |
| $L_{up} = \epsilon$ | 6000 ft | Ramp Volume | e, V _R | 770 | | | | | L _{down} = | ft |
| \/ - | 1560 vah/h | Freeway Free | -Flow Speed, S _{FF} | 70.0 | | | | | V _D = | veh/h |
| V _u = | 1560 veh/h | Ramp Free-F | low Speed, S _{FR} | 45.0 | | | | | - Б | VOII/II |
| Conversion | to pc/h Und | der Base | Conditions | | | | | , | | |
| (pc/h) | V (1-1-(1-2) | PHF | Terrain | %Truck | %Rv | | f_HV | f _p | v = V/PHF | x f _{HV} x f _p |
| . , | (Veh/hr) | | | | 0 | | | r | | ı. |
| Freeway Ramp | 7250 770 | 0.95 0.92 | Level Level | 3 2 | 0 | | 985 990 | 1.00 1.00 | | 746 45 |
| UpStream | 1560 | 0.92 | Level | 2 | 0 | | 990 | 1.00 | | 713 |
| DownStream | 1300 | 0.92 | Levei | | U | 0.3 | 990 | 1.00 | 1 | 13 |
| <u> </u> | <u> </u> | Merge Areas | | <u> </u> | | | | iverge Areas | | |
| Estimation of | of v ₁₂ | | | | Estimat | ion o | f v ₁₂ | | | |
| | V ₁₂ = V _F | (P) | | | | | | V _R + (V _F - V _R | .)P> | |
| l = | | tion 13-6 or | 13_7) | | = | | | 62.56 (Equation | | or 13_13) |
| L _{EQ} = D - | | Equation (| • | | L _{EQ} = P = | | | 527 using Equ | | - |
| P _{FM} = | J | Equation (| EXHIBIT 13-0) | | P _{FD} = V ₁₂ = | | | 85 pc/h | iation (Exi | ibit 13-7) |
| V ₁₂ = | pc/h | | 44 40 47) | | | | | • | -ti 10 1 | 4 40 47) |
| V_3 or V_{av34} | | | -14 or 13-17) | | V ₃ or V _{av34} | > 0.70 | | 61 pc/h (Equa | ation 13-1 | 4 or 13-17) |
| Is V_3 or $V_{av34} > 2$, | | | | | | | | Yes No | | |
| Is V_3 or $V_{av34} > 1.5$ | | | -16, 13-18, or | | | | | Yes ☑ No | -ti 10 1 | 0 40 40 |
| f Yes,V _{12a} = | 13-19) | | -10, 13-10, 01 | | If Yes,V _{12a} = | = | | 46 pc/h (Equa 13-19) | ation 13-1 | 0, 13-16, |
| Capacity Ch | ecks | | | | Capacit | y Che | | , | | |
| | Actual | | Capacity | LOS F? | | | Actual | Cap | oacity | LOS F? |
| | | | | | V _F | | 7746 | Exhibit 13-8 | 7200 | Yes |
| V_{FO} | | Exhibit 13-8 | | | $V_{FO} = V_{F}$ | - V _R | 6901 | Exhibit 13-8 | 7200 | No |
| 10 | | | | | V_{R} | - '` | 845 | Exhibit 13-10 | + | No |
| Flow Enterii | na Merae In | fluence / | lroa | | | torin | | ge Influenc | | 110 |
| IOW LINEIN | Actual | | Desirable | Violation? | I IOW LII | | y Dive | Max Desirab | | Violation? |
| V _{R12} | | Exhibit 13-8 | | , | V ₁₂ | + | 485 | Exhibit 13-8 | 4400:All | Yes |
| Level of Ser | vice Detern | | if not F) | | | | | termination | | |
| | 0.00734 v _R + (| | | | | | | .0086 V ₁₂ - 0.0 | • | , |
| O _R = (pc/mi/ | * * | - 12 | - A | | 1 | -к 7.1 (pc/ | | 12 | ט | |
| -OS = (Exhibi | • | | | | 1 '' | | oit 13-2) | | | |
| | • | | | | | | | <u> </u> | | |
| Speed Deter | | | | | Speed E | | | | | |
| $M_S = (Exibit)$ | • | | | | ľ | • | xhibit 13- | - | | |
| | khibit 13-11) | | | | | - | (Exhibit | - | | |
| • | khibit 13-11) | | | | 1 | - | (Exhibit | - | | |
| • • | khibit 13-13) | | | | S = 62 | 2.8 mph | (Exhibit | | | |
| right © 2016 Univers | sity of Florida All R | ights Reserved | | | HCS2010TM | Varciar | 6.00 | (| Generated: 5 | /22/2019 12: |

| General Information | | | Site Information | | |
|--|--|----------------------------|--|-----------------------|--|
| Analyst | | | Highway/Direction of Travel | I-95 SB | |
| Agency or Company | AECOM | | From/To | Seg 11-E Samples | Bet Off Exp Off |
| Date Performed Analysis Time Period | PM | | Jurisdiction Analysis Year | No-Build | |
| Project Description SW 10th | Street SIMR | | | | |
| Oper.(LOS) | | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT | 6480 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T | 0.95 3 | |
| Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D | | veh/h | %RVs, P _R General Terrain: Grade % Length Up/Down % | 0 Level mi | |
| Calculate Flow Adjustn | nents | | <u> </u> | | |
| f _p | 1.00 | | E _R | 1.2 | |
| 'p E _T | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | | |
| • | | | Care Opeca Aaj ana i i | | |
| Lane Width Rt-Side Lat. Clearance | | ft ft | f | | mph |
| Number of Lanes, N | 3 | π | f _{LW} f _{LC} | | mph |
| Total Ramp Density, TRD | 9 | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | 70.0 | Прп |
| LOS and Performance | Moseuroe | · · | Design (N) | | |
| LOS and Periormance | vieasures | | | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS | (f _{HV} x f _p) 2308 55.8 41.4 E | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | $f_{HV} \times f_p$) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base fre | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11- | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

| <u> </u> | C | RAMPS | S AND RAM | | | RKS | HEET | | | |
|---|--|--|-----------------------------|----------------------|---|---|--|--|---|------------------------------------|
| General In | rormation | | | Site Infor | | | | | | |
| Analyst | | | | eeway/Dir of Tr | | I-95 SE | | | | |
| Agency or Comp Date Performed | oany AEC | ЮM | | nction risdiction | ; | Seg 12 | - Diverge to S | Sample Rd | | |
| Analysis Time P | eriod PM | | | alysis Year | ĺ | No-Rui | d 2040 | | | |
| | ion SW 10th Street | et SIMR | 7 11 | lary 515 T Car | | INO-Dui | u 2040 | | | |
| Inputs | | | | | | | | | | |
| Upstream A | di Damp | Freeway Numb | er of Lanes, N | 3 | | | | | Downstre | am Adi |
| opstream A | uj Kamp | Ramp Number | | 1 | | | | | Downstre Ramp | am Auj |
| ✓ Yes | □On | Acceleration La | | • | | | | | | |
| | | | ,, | 250 | | | | | Yes | On |
| ☐ No | ✓ Off | Deceleration La | - 5 | 250 | | | | | ✓ No | Off |
| | 0000 % | Freeway Volun | • | 6480 | | | | l, | _ | ft |
| L _{up} = | 2000 ft | Ramp Volume, | | 1310 | | | | ľ | -down = | 11 |
| V _u = | 770 veh/h | Freeway Free- | Flow Speed, S _{FF} | 70.0 | | | | , | V _D = | veh/h |
| v _u – | 770 Ven/m | Ramp Free-Flo | ow Speed, S _{FR} | 45.0 | | | | | - D | 101211 |
| Conversio | n to pc/h Un | der Base C | Conditions | | | | | | | |
| (pc/h) | V | PHF | Terrain | %Truck | %Rv | | f _{HV} | f _p | / = V/PHF | x f _{HV} x f _p |
| . , | (Veh/hr) | ++ | | | | _ | | · · | | |
| Freeway | 6480 | 0.95 | Level | 3 | 0 | | 985 | 1.00 | | 923 |
| Ramp | 1310 | 0.92 | Level | 2 | 0 | | 990 | 1.00 | | 438 |
| UpStream | 770 | 0.92 | Level | 2 | 0 | 0. | 990 | 1.00 | 8 | 45 |
| DownStream | | Merge Areas | | | | | Div | erge Areas | | |
| Estimation | | Weige Aleas | | | Estimati | ion o | | eige Aleas | | |
| | | | | | LStillati | 011 0 | | | | |
| | $V_{12} = V_{F}$ | _: (P _{FM}) | | | | | | $'_{R}$ + $(V_{F} - V_{R})$ | | |
| - _{EQ} = | (Equa | ation 13-6 or 1 | 13-7) | | L _{EQ} = | | (Ec | uation 13-12 | 2 or 13-13 | 3) |
| P _{FM} = | using | g Equation (E | xhibit 13-6) | | P _{FD} = | | 0.52 | 1 using Equ | ation (Exh | ibit 13-7) |
| / ₁₂ = | pc/h | | | | V ₁₂ = | | 4294 | pc/h | | |
| / ₃ or V _{av34} | pc/h | (Equation 13- | 14 or 13-17) | | V ₃ or V _{av34} | | 2629 | pc/h (Equa | ation 13-1 | 4 or 13-17) |
| | 2,700 pc/h? ☐ Ye | | · | | | , > 2,7 | | Yes ☑ No | | , |
| | 1.5 * V ₁₂ /2 Ye | | | | | | * V ₁₂ /2 | | | |
| | | (Equation 13- | 16, 13-18, or | | | | | h (Equation | 13-16. 13 | -18. or 13- |
| Yes,V _{12a} = | 13-19 | | | | If Yes,V _{12a} = | | 19) | (1 | | |
| Capacity C | hecks | | | | Capacity | y Ch | ecks | | | |
| | Actual | Ca | apacity | LOS F? | | | Actual | Cap | acity | LOS F? |
| | | | | | 1 ,, | - 1 | 6923 | Exhibit 13-8 | 7200 | No |
| | | | | | V _F | I | 0020 | | 1 - 1 - 1 | |
| V _{FO} | | Exhibit 13-8 | | | | - V _R | 5485 | Exhibit 13-8 | 1 | No |
| V_{FO} | | Exhibit 13-8 | | | $V_{FO} = V_{F}$ | - V _R | 5485 | Exhibit 13-8 | 7200 | _ |
| | ring Merge Is | | roa | | $V_{FO} = V_{F}$ V_{R} | | 5485 1438 | Exhibit 13-8 Exhibit 13-10 | 7200 2100 | No No |
| | ring Merge Ir | nfluence A | | Violation? | $V_{FO} = V_{F}$ V_{R} | terin | 5485 1438 g Diverg | Exhibit 13-8 Exhibit 13-10 E Influence | 7200 2100 ce Area | No |
| Flow Enter | ring Merge Ir Actual | nfluence A | rea Desirable | Violation? | $V_{FO} = V_F$ V_R Flow En | terin | 5485 1438 g Diverg Actual | Exhibit 13-8 Exhibit 13-10 E Influence Max Desirable | 7200 2100 ce Area e | No Violation? |
| Flow Enter | Actual | nfluence A | Desirable | Violation? | $V_{FO} = V_F$ V_R Flow En | terin | 5485 1438 g Diverg Actual | Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Max Desirable Exhibit 13-8 | 7200 2100 ce Area e 4400:All | No Violation? |
| Flow Enter V _{R12} Level of Se | Actual ervice Deterr | nfluence A Max D Exhibit 13-8 mination (i | Desirable f not F) | Violation? | $V_{FO} = V_F$ V_R Flow En V_{12} Level of | terin | 5485 1438 g Diverg Actual 1294 vice Dete | Exhibit 13-8 Exhibit 13-10 E Influence Max Desirable Exhibit 13-8 Ermination | 7200 2100 ce Area e 4400:All | No Violation? |
| V _{R12} Level of Se | Actual ervice Detern + 0.00734 v _R + | nfluence A Max D Exhibit 13-8 mination (i | Desirable f not F) | Violation? | $V_{FO} = V_F$ V_R Flow En V_{12} Level of | terin | 5485 1438 g Diverg Actual 1294 rice Dete 1.252 + 0.00 | Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Max Desirable Exhibit 13-8 | 7200 2100 ce Area e 4400:All | No Violation? |
| Flow Enter V_{R12} Level of Set $D_R = 5.475 \cdot 0$ $Q_R = (pc/m)$ | Actual ervice Detern + 0.00734 v _R + | nfluence A Max D Exhibit 13-8 mination (i | Desirable f not F) | Violation? | $V_{FO} = V_F$ V_R Flow En V_{12} Level of | terin | 5485 1438 g Diverg Actual 1294 vice Dete | Exhibit 13-8 Exhibit 13-10 E Influence Max Desirable Exhibit 13-8 Ermination | 7200 2100 ce Area e 4400:All | No Violation? |
| Flow Enter V_{R12} Level of Set $D_{R} = 5.475 + 0$ $D_{R} = (pc/m)$ | Actual ervice Detern + 0.00734 v _R + | nfluence A Max D Exhibit 13-8 mination (i | Desirable f not F) | Violation? | $V_{FO} = V_{F}$ V_{R} Flow En V_{12} Level of $D_{R} = 40$ | terin Serv O _R = 4 1.8 (pc. | 5485 1438 g Diverg Actual 1294 rice Dete 1.252 + 0.00 | Exhibit 13-8 Exhibit 13-10 E Influence Max Desirable Exhibit 13-8 Ermination | 7200 2100 ce Area e 4400:All | No Violation? |
| Flow Enter V_{R12} Level of Set of D _R = 5.475 · O _R = (pc/m) · OS = (Exhi | Actual ervice Deteri + 0.00734 v _R + ni/ln) | nfluence A Max D Exhibit 13-8 mination (i | Desirable f not F) | Violation? | $V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 40$ LOS = E | Service (Exhibit | 5485 1438 g Diverg Actual 1294 vice Dete 1.252 + 0.00 (mi/ln) | Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Max Desirable Exhibit 13-8 Ex | 7200 2100 ce Area e 4400:All | No Violation? |
| Flow Enter V_{R12} Level of Set $D_R = 5.475 \cdot 0$ $D_R = (pc/m)$ $D_R = (Exhinormal Enter Ente$ | Actual ervice Detern + 0.00734 v _R + ni/ln) ibit 13-2) ermination | nfluence A Max D Exhibit 13-8 mination (i | Desirable f not F) | Violation? | $V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 40$ LOS = E Speed D | terin Serv D _R = 4 1.8 (pc. (Exhib | 5485 1438 g Diverg Actual 1294 rice Dete 252 + 0.00 (mi/ln) bit 13-2) | Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Max Desirable Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 | 7200 2100 ce Area e 4400:All | No Violation? |
| Flow Enter V_{R12} Level of Se $D_R = 5.475$ $D_R = (pc/m)$ $D_R = (pc/m)$ $D_R = (Exhi)$ Speed Det | Actual ervice Determent + 0.00734 v _R + ni/ln) ibit 13-2) ermination oit 13-11) | nfluence A Max D Exhibit 13-8 mination (i | Desirable f not F) | Violation? | $V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 40$ LOS = E Speed D $D_S = 0.4$ | terin | 5485 1438 g Diverg Actual 1294 1294 1252 + 0.00 (mi/ln) 13-2) mination xhibit 13-12 | Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Max Desirable Exhibit 13-8 Exhibit 13-10 Exhibit 13-8 E | 7200 2100 ce Area e 4400:All | No Violation? |
| Flow Enter V_{R12} Level of Set $D_R = 5.475 \cdot 0$ $O_R = (pc/m)$ $O_R = (Exhinology)$ | Actual ervice Detern + 0.00734 v _R + ni/ln) ibit 13-2) ermination bit 13-11) Exhibit 13-11) | nfluence A Max D Exhibit 13-8 mination (i | Desirable f not F) | Violation? | $V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 40$ $LOS = E$ Speed D $D_S = 0.4$ $S_R = 58$ | terin Serv Serv | 5485 1438 g Diverg Actual 1294 1294 1252 + 0.00 1/mi/ln) 13-2) 143-2 15485 1438 15485 16485 | Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Max Desirable Exhibit 13-8 Exhibit 13-10 Exhibi | 7200 2100 ce Area e 4400:All | No Violation? |
| Flow Enter V_{R12} Level of Se $D_R = 5.475 \cdot 0$ $OS = (Exhinity)$ Speed Det $M_S = (Exib)$ $M_S = (Exib)$ $M_S = (Exhinity)$ | Actual ervice Determent + 0.00734 v _R + ni/ln) ibit 13-2) ermination oit 13-11) | nfluence A Max D Exhibit 13-8 mination (i | Desirable f not F) | Violation? | $V_{FO} = V_{F}$ V_{R} Flow En V_{12} Level of $D_{R} = 40$ $LOS = E$ Speed D $S_{R} = 58$ $S_{0} = 71$ | terin 2 Serv D _R = 4 1.8 (pc. (Exhib) Deteri 427 (E 1.0 mph 1.3 mph | 5485 1438 g Diverg Actual 1294 1294 1252 + 0.00 (mi/ln) 13-2) mination xhibit 13-12 | Exhibit 13-8 Exhibit 13-10 The Influence Max Desirable Exhibit 13-8 Exhibit 13-10 Ex | 7200 2100 ce Area e 4400:All | No Violation? |

| | BASIC F | REEWAY SE | GMENTS WORKSHEET | | |
|--|---|----------------------------|---|------------------------------------|--|
| General Information | | | Site Information | | |
| Analyst Agency or Company Date Performed Analysis Time Period | AECOM PM | | Highway/Direction of Travel From/To Jurisdiction Analysis Year | I-95 SB Seg 13-E No-Build | Bet Off & On Ramps |
| Project Description SW 10t | th Street SIMR | | | | |
| ✓ Oper.(LOS) |) | | Des.(N) | □Pla | nning Data |
| Flow Inputs | | | | | |
| Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D | 5170 | veh/h veh/day | Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: | 0.95 3 0 Level | |
| DDHV = AADT x K x D | | veh/h | Grade % Length Up/Down % | mi | |
| Calculate Flow Adjusti | ments | | | | |
| f _p | 1.00 | | E _R | 1.2 | |
| Ε _Τ | 1.5 | | $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ | 0.985 | |
| Speed Inputs | | | Calc Speed Adj and FFS | 3 | |
| Lane Width | | ft | | | |
| Rt-Side Lat. Clearance | | ft | f_{LW} | | mph |
| Number of Lanes, N | 3 | | f_{LC} | | mph |
| Total Ramp Density, TRD | | ramps/mi | TRD Adjustment | | mph |
| FFS (measured) | 70.0 | mph | FFS | 70.0 | mph |
| Base free-flow Speed, BFFS | | mph | | | · |
| LOS and Performance | Measures | | Design (N) | | |
| Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS | x f _{HV} x f _p) 1841 65.2 28.2 D | pc/h/ln mph pc/mi/ln | Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N | f _{HV} x f _p) | pc/h/ln mph pc/mi/ln |
| Glossary | | | Factor Location | | |
| N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho | S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume | - | E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2 | | f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11 |

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| | | | FREEWAY | / WEAV | ING WOF | RKSHEE | T | | |
|---|--------------------|-------------|------------------|-------------------|--|----------------|-----------------------|----------|-------------------------------|
| Gener | al Information | | Site Information | | | | | | |
| Analyst Agency/Company AECOM Date Performed Analysis Time Period PM | | | | | Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 14- Bet Sample & Copans Analysis Year No-Build 2040 | | | | |
| Project De | escription SW 10th | Street SIMI | R | | | | | | |
| Inputs | | | | | | | | | |
| Weaving configuration One-Sided Weaving number of lanes, N 4 Weaving segment length, L_s 1650ft Freeway free-flow speed, FFS 70 mph | | | | | Terrain type | | | | Freeway 15 2400 Leve |
| Conve | V (veh/h) | PHF | Truck (%) | RV (%) | E _T | E _R | f | fp | v (pc/h) |
| V | 4430 | 0.95 | 3 | 0 | 1.5 | 1.2 | f _{HV} 0.985 | 1.00 | 4733 |
| V _{FF} V _{RF} | 1580 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 1735 |
| V _{RF} | 740 | 0.92 | 2 | 0 | 1.5 | 1.2 | 0.990 | 1.00 | 812 |
| V _{RR} | 0 | 0.95 | 0 | 0 | 1.5 | 1.2 | 1.000 | 1.00 | 0 |
| V _{NW} | 4733 | | 1 - | | | | 1 1111 | V = | 7280 |
| V _W | 2547 | | | | | | | <u> </u> | |
| VR | 0.350 | | | | | | | | |
| Config | uration Cha | racteris | tics | | | | | | |
| Minimum maneuver lanes, N _{WL} 2 Ic | | | | | Minimum weaving lane changes, LC _{MIN} | | | | lc/h |
| Interchange density, ID 0.7 int/mi | | | | | Weaving lane changes, LC _w | | | | lc/h |
| Minimum RF lane changes, LC _{RF} 1 lc/pc | | | | | Non-weaving lane changes, LC _{NW} | | | | lc/h |
| Minimum FR lane changes, LC _{FR} 1 lc/pc | | | | | Total lane changes, LC _{ALL} | | | | lc/h |
| Minimum RR lane changes, $\mathrm{LC}_{\mathrm{RR}}$ lc/pc | | | | | Non-weaving vehicle index, I _{NW} 65 | | | | 655 |
| Weavi | ng Segment | Speed, | Density, I | _evel of | Service, | and Cap | oacity | | |
| Weaving segment flow rate, v 7185 veh/h Weaving segment capacity, c _w 6758 veh/h | | | | | | | | | mph mph |
| 5 5 | | | | 1.063 pc/mi/ln | Average non-weaving speed, S _{NW} | | | | mph |
| Level of Service, LOS | | | | ρc/m/m F | Maximum weaving length, L _{MAX} | | | | 6125 ft |
| Notes | • | | | | | | ·, -MAX | | - 012010 |

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F". Copyright © 2016 University of Florida, All Rights Reserved

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