TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information

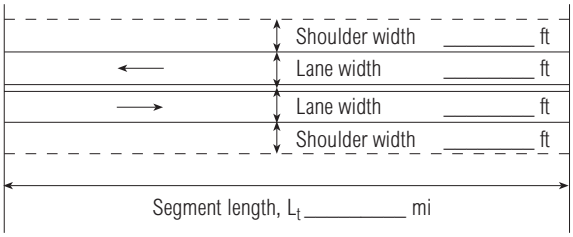
Analyst _____
Agency or Company _____
Date Performed _____
Analysis Time Period _____

Site Information

Highway _____
From/To _____
Jurisdiction _____
Analysis Year _____

❑ Operational (LOS) ❑ Design (v_p) ❑ Planning (LOS) ❑ Planning (v_p)

Input Data



❑ Class I highway ❑ Class II highway
Terrain ❑ Level ❑ Rolling
Two-way hourly volume _____ veh/h
Directional split _____ /_____
Peak-hour factor, PHF _____
% Trucks and buses, P_T _____ %
% Recreational vehicles, P_R _____ %
% No-passing zone _____ %
Access points/mi _____/mi

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	
Heavy-vehicle adjustment factor, f_{HV} $f_{HV} = \frac{1}{1 + P_T(E_T - 1) + P_R(E_R - 1)}$	
Two-way flow rate,[1] v_p (pc/h) $v_p = \frac{V}{PHF * f_G * f_{HV}}$	
v_p * highest directional split proportion[2] (pc/h)	
Free-Flow Speed from Field Measurement	Estimated Free-Flow Speed
Field measured speed, S_{FM} _____mi/h Observed volume, V_f _____veh/h Free-flow speed, FFS _____mi/h $FFS = S_{FM} + 0.00776\left(\frac{V_f}{f_{HV}}\right)$	Base free-flow speed, BFFS _____mi/h Adj. for lane width and shoulder width, f_{LS} (Exhibit 20-5) _____mi/h Adj. for access points, f_A (Exhibit 20-6) _____mi/h Free-flow speed, FFS _____mi/h $FFS = BFFS - f_{LS} - f_A$
Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	
Average travel speed, ATS (mi/h) $ATS = FFS - 0.00776v_p - f_{np}$	

Percent Time-Spent-Following

Grade adjustment factor, f_G (Exhibit 20-8)	
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	
Heavy-vehicle adjustment factor, f_{HV} $f_{HV} = \frac{1}{1 + P_T(E_T - 1) + P_R(E_R - 1)}$	
Two-way flow rate,[1] v_p (pc/h) $v_p = \frac{V}{PHF * f_G * f_{HV}}$	
v_p * highest directional split proportion[2] (pc/h)	
Base percent time-spent-following, BPTSF (%) $BPTSF = 100(1 - e^{-0.000879v_p})$	
Adj. for directional distribution and no-passing zone, $f_{d/np}$ (%) (Exhibit 20-12)	
Percent time-spent-following, PTSF (%) $PTSF = BPTSF + f_{d/np}$	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	
Volume to capacity ratio, v/c $v/c = \frac{v_p}{3{,}200}$	
Peak 15-min vehicle-miles of travel, VMT_{15} (veh-mi) $VMT_{15} = 0.25L_t\left(\frac{V}{PHF}\right)$	
Peak-hour vehicle-miles of travel, VMT_{60} (veh-mi) $VMT_{60} = V * L_t$	
Peak 15-min total travel time, TT_{15} (veh-h) $TT_{15} = \frac{VMT_{15}}{ATS}$	

Notes

1. If $v_p \geq 3{,}200$ pc/h, terminate analysis—the LOS is F.
2. If highest directional split $v_p \geq 1{,}700$ pc/h, terminate analysis—the LOS is F.