



Reference: 509051.100

August 8, 2012

Greg Plucker  
Deputy Director for Planning  
806 South Main Street  
Yreka, CA 96097

**Subject: French Creek Road Traffic Analysis  
JH Ranch, Siskiyou County, California**

Dear Mr. Plucker:

This analysis has been prepared to augment the previous SHN Consulting Engineers & Geologists, Inc. (SHN) traffic analysis for French Creek Road in relation to the on-going operations at JH Ranch. It also responds to questions raised by Siskiyou County about traffic and roadway characteristics on French Creek, the county road that accesses JH Ranch.

## **1.0 Scope of Report**

This traffic analysis has been prepared by SHN to collect and analyze roadway information and existing traffic data for French Creek Road. Data was collected and assessed from the intersection of French Creek Road and California Route 3 to approximately 4.7 miles south at the intersection of French Creek Road and Homestead Lane (Figure 1).

## **2.0 Existing Conditions**

The area tributary to French Creek Road is currently developed with a mixture of uses, such as agriculture, timber production on private forest lands, multiple uses on National Forest lands, single-family residential and planned development, and commercial operations at JH Ranch. French Creek Road is open year-round to public uses and provides access to public and private lands along its route. It is one of the routes for public access to the Klamath National Forest and the Marble Mountain Wilderness area.

French Creek Road in this area has characteristics fairly typical of roadways in the vicinity and contains a number of curves and limited shoulder widths in some areas. French Creek Road is paved its entire length from the intersection of State Highway 3 to past the JH Ranch. Roadside ditches are maintained in locations along its length. Siskiyou County has signed various portions of French Creek Road with warning (intersection and curve signs) and regulatory speed signs (speed limits), with a maximum speed posting of 40 miles per hour (mph). Several public and private roads connect to French Creek Road and provide access to other areas in the vicinity.

## 2.1 Existing Traffic Counts

The Highway Capacity Manual indicates that the ideal capacity of any road segment is approximately 1,800 vehicles per hour (vph) per direction. This number is based on free-flow conditions; and it varies due to road conditions, sight distances, intersections, and other site-specific roadway conditions. Additionally, the Circulation Element of the Siskiyou County General Plan identifies roadways in the county that have at least an 18-foot pavement width and are under free-flow conditions as Level of Service (LOS) A. French Creek Road meets these county definitions except in one location where the pavement width is limited to 14-feet due to an existing rock outcrop and utility pole. As such, the county has calculated that the service volume (the volume of traffic that a roadway can accommodate and continue to meet LOS A standards) is 1,408 average daily traffic (ADT), or 169 vph (Siskiyou County Circulation Element, 1988).

SHN conducted volume counts on French Creek Road from May 19 to May 25, 2010, and from July 27 to August 9, 2010 (SHN, 2011). For this analysis, the May 2010 data was considered to be the off-season, or winter traffic volume. Summer traffic data collected in July and August includes traffic generated by JH Ranch during full summer operation. During the period of data collection, JH Ranch had approximately 40 full-time staff, 125 seasonal staff, and 175 guests onsite. Guest arrival and departure times occurred during the analysis period. French Creek Road was also open to the public and provided unimpeded access to National Forest lands and wilderness areas, as well as to other residential, agriculture, and timber lands during both winter and summer data-collection periods.

As shown in Table 1, the combined peak volumes for French Creek Road are well below the service volumes calculated for the roadway (1,408 ADT) based on the County Circulation Element.

<b>Table 1</b> <b>Traffic Volumes for French Creek Road</b> <b>2010</b>							
Volumes (vehicles)							
Season	Average Daily Traffic	Weekday Average Daily Traffic	Weekday Peak Hour, a.m.	Weekday Peak Hour, p.m.	Weekend Average Daily Traffic	Weekend Peak Hour, a.m.	Weekend Peak Hour, p.m.
Winter	225	229	32	52	216	17	23
Summer	439	449	104	76	409	72	56

## 2.2 French Creek Road Characterization

French Creek Road was characterized to provide a better understanding of current road conditions. Characterization included dividing the road into six sections between the intersection of French

Creek Road and California Route 3 and the intersection of French Creek Road with Homestead Lane (Figure 1). Sections were chosen based on the similarity of road characteristics. General section descriptions are as follows:

- Sections 1 and 2: Roadway has wide lanes and shoulders, and mild slopes.
- Section 3: Lanes narrow slightly with varying shoulder widths and more frequent curves.
- Section 4: Short section (0.2 miles) that includes the narrowest road and shoulder widths.
- Section 5: Lane widths, grade, and shoulder widths increase.
- Section 6: Lane and shoulder widths are similar to section 5, but grade increases.

On July 11, 2012, measurements of lane width, grade, and shoulder width were taken within each section at approximately one-quarter-mile increments, or when road characteristics changed noticeably (Table 2). Photos were taken at each measured location and are included in Appendix A.

<b>Table 2</b> <b>French Creek Road Measurements</b> <b>Wednesday, July 11, 2012</b>						
<b>Section</b>	<b>Location</b>	<b>Distance from CA Route 3 (miles)</b>	<b>Road Width (ft)<sup>1</sup></b>	<b>West Shoulder Width (ft)</b>	<b>East Shoulder Width (ft)</b>	<b>Grade (%)</b>
1	1	0.1	24	3	1	2.5
1	2	0.4	24	4	1	2.8
1	3	0.7	22	1	2	1.2
2	0	1.0	25	2	3	2.9
2	1	1.2	22	1	3	0.6
3	0	1.4	22	3	2	1.8
3	1	1.5	23	1	2	1.3
3	2	1.7	23	7	2	4.5
3	3	2.0	22	1	3	1.3
3	4	2.3	23	3	0	0.6
3	5	2.5	25	2	3	2.7
3	6	2.9	24	0	0	0.4
3	7	3.2	20	0	1	1.0
3	8	3.4	20	2	2	1.7
4	0	3.5	21.5	1	2	1.1
4	1	3.6	11.5	1	1	1.8
4	2	3.65	24.5	0	0	NM <sup>1</sup>
5	0	3.7	21	3	1	3.5

5	1	4.0	19	4	1	2.4
5	2	4.2	22	3	1	1.8
6	0	4.3	19	1	2	4.5
6	1	4.55	19.5	4	1	3.7
End		4.7	22	2	<1	7.6
1. ft: feet 2. NM: Not Measured						

### 3.0 Cumulative Traffic Growth

Cumulative traffic growth occurs over time based on population and traffic growth estimates that is from normal population growth, and project related traffic that may be above the background growth estimates. These two values help to estimate cumulative traffic growth over time.

#### 3.1 Background Growth

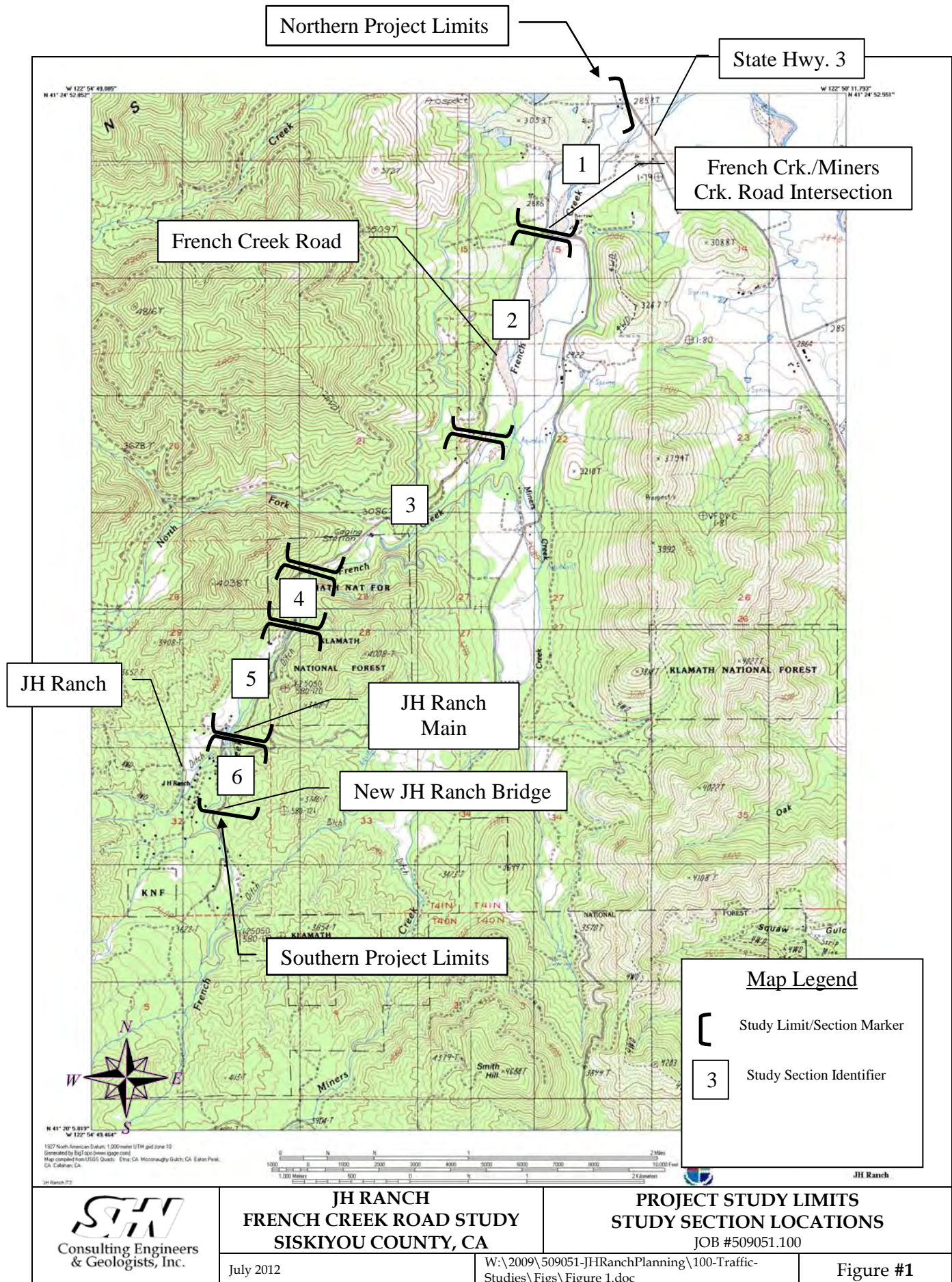
Background growth is general growth in traffic not related to traffic from specific projects (such as JH Ranch). Future traffic levels for this analysis were calculated using two growth rates:

- **2% Growth Rate.** A 2% growth rate was used for area traffic based on historical standards for the industry. Research, especially in California, has shown that this rate overestimates the future potential traffic volumes. This very conservative approach provides the highest potential traffic volumes, based on local growth only.
- **1% Growth Rate.** A 1% growth rate was also used based on California data that shows this to be closer to realistic traffic-related growth projections in the state. This rate is also close to the typical Siskiyou County growth rate over the last several decades.

Table 3 presents current and projected values for ADT and peak hour traffic.

<b>Table 3</b> <b>Current and Projected Average Daily Traffic and Peak Hour Vehicle Count</b> <b>French Creek Road</b>						
Season	2010		2015		2020	
	ADT	Peak Hour	ADT	Peak Hour	ADT	Peak Hour
Winter (2%)	225	52	248	57	270	62
Summer (2%)	439	104	483	114	527	125
Winter (1%)	225	52	236	55	248	57
Summer (1%)	439	104	461	109	483	114





Using county information that indicated that there are 66 undeveloped parcels that could be developed for single-family housing uses, SHN calculated that the build-out of parcels in the next 10 years could potentially be 12 parcels (2% per year development). Using this information and a conservative trip generation value of 10 vehicle trips per day from each parcel, background traffic associated with residential development could increased by as much as 120 vehicles per day.

## 4.0 Roadway Analysis

Roadway analysis was conducted using roadway analysis worksheets from the 2000 Highway Capacity Manual. The worksheets require a set of inputs based on roadway characteristics and traffic volume, from which the allow calculation of the Level of Service (LOS) and other performance measures.

These are the required inputs:

- **Highway class:** French Creek Road is a Class II highway. Class II highways are two lane highways on which motorists do not expect to travel at high speeds (HCM, 2000).
- **Terrain:** Grades on French Creek Road in the analysis area are short and range from 0.4% to 4.5% making an assumption of rolling terrain reasonable.
- **Two-way hourly volume:** The maximum or peak hourly volume was used to provide the most conservative LOS estimate.
- **Directional split:** Traffic was assumed to be split equally between north and southbound lanes.
- **Peak hour factor (PHF):** A peak hour factor is used to estimate a peak hour from average hour data. The peak hour data was used instead of average data so the PHF is 1.
- **Percent trucks and buses:** A conservative value of 2 percent truck and bus traffic was used.
- **Percent recreational vehicles:** Recreational vehicles were assumed to be minimal, and can be accounted for by the conservative percent truck rate. Therefore a value of 0 percent was used.
- **Percent no passing zone:** To be as conservative as possible the roadway was considered to be a no passing zone for 100 percent of its length. This factor has the greatest impact on the LOS when compared to the other input parameters.
- **Access points:** No access points in the project area have a measurable impact on traffic flow.
- **Lane and shoulder width:** Lane and shoulder widths were based on data provided in Table 2. The most representative lane widths were used, except for section 4. The minimum lane width for a two lane road is 9 ft and was used in section 4 due to the single lane location in this segment.
- **Base free flow speed (BFFS):** Base free flow speed of 40 mi/h was used in sections 1 and 2, based on the posted speed limit. A BFFS of 30 mi/h was used in all other sections due to increased grade and reduced sight distances.

A sample worksheet from the 2000 Highway Capacity Manual and calculation sheets are included in Appendix B.

#### 4.1 Section Capacity and Level of Service

Under the conservative assumptions listed above, all sections meet LOS A criteria, with both current and projected peak hour traffic volumes. The peak hour volumes (PHV) required for the roadway to be classified as LOS B or LOS C were calculated using the calculation sheets provided in Appendix B. Peak hour traffic volumes of 143 vph and 365 vph would be required to reduce the roadway to LOS B and LOS C, respectively. It should be noted that LOS calculations are designed for two lane roads, and they may not adequately address the single-lane location on French Creek Road that is approximately 3.6 miles south of California Route 3. However, French Creek Road exhibits conditions that meet the two lane criteria for virtually all of the roadway evaluated.

Volume-to-capacity ratios were calculated under current and projected conditions using both 1% and 2% percent growth rates (Table 4).

#### 4.2 Project Related Traffic

The level of service and capacity calculations summarized in Table 4 indicates that French Creek Road has capacity to support additional project traffic. Specifically, the 2020 future year projection is for 125 vph during the peak hour which leaves approximately 240 vehicles of reserve capacity.

The previous report approximated 75% of the summer volume increase was associated with JH Ranch, which is 39 vehicles during the peak hour. Comparing this volume to the reserve capacity, the traffic from JH Ranch programs, participants could increase approximately six-fold (600%) before the level of service would drop below the county standard of LOS C.

<b>Table 4</b> <b>Current and Projected Volume to Capacity Ratio</b> <b>French Creek Road</b>			
Season	2010	2015	2020
Winter (2%)	0.021	0.024	0.026
Summer (2%)	0.043	0.047	0.052
Winter (1%)	0.021	0.023	0.024
Summer (1%)	0.043	0.045	0.047

#### 5.0 Conclusions and Recommendations

Based on the review of the information above and discussions about LOS conditions (current and potential future) for French Creek Road, our conclusions from our earlier studies have not changed.

The Circulation Element of the Siskiyou County General Plan identifies roadways in the county that have at least an 18-foot pavement width and are under free-flow conditions as LOS A. French Creek Road meets these county definitions except in one location where the road narrows to a single lane. As such, the county has calculated that the service volume (the traffic that a roadway can accommodate and continue to meet LOS A standards) is 1,408 ADT, or 169 vehicles per hour (Siskiyou County Circulation Element, 1988). Even at 2% growth, the projected ADT in 2020 is 527

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vehicles, which is less than 40% of the county's calculated service volume. The projected PHV in 2020, based on a growth rate of 2%, is 125 vehicles, would meet the County's LOS A criteria.

Based on the 2000 Highway Capacity Manual, a PHV of 365 vph would be required before the roadway could be categorized as LOS C. At 2% annual growth, it will take approximately 125 years for French Creek Road to reach this PHV during the summer. It would take approximately 300 years at 2% growth to reach LOS C during the rest of the year.

The reserve capacity of French Creek Road in 2020 for a 2% growth rate could accommodate an additional 240 vehicles during the peak hour before reaching the threshold for mitigation. JH Ranch currently accounts for approximately 39 vehicles during the peak hour; thus, JH Ranch programs could increase approximately 600% before reaching LOS C standards for the future year.

In conclusion, JH Ranch does not trigger mitigation thresholds from its programs on French Creek Road. Please call me at 707-441-8855 if you have any questions or concerns.

Sincerely,

**SHN Consulting Engineers & Geologists, Inc.**



Brian A. Freeman, P.E., T.E.  
Senior Civil Engineer

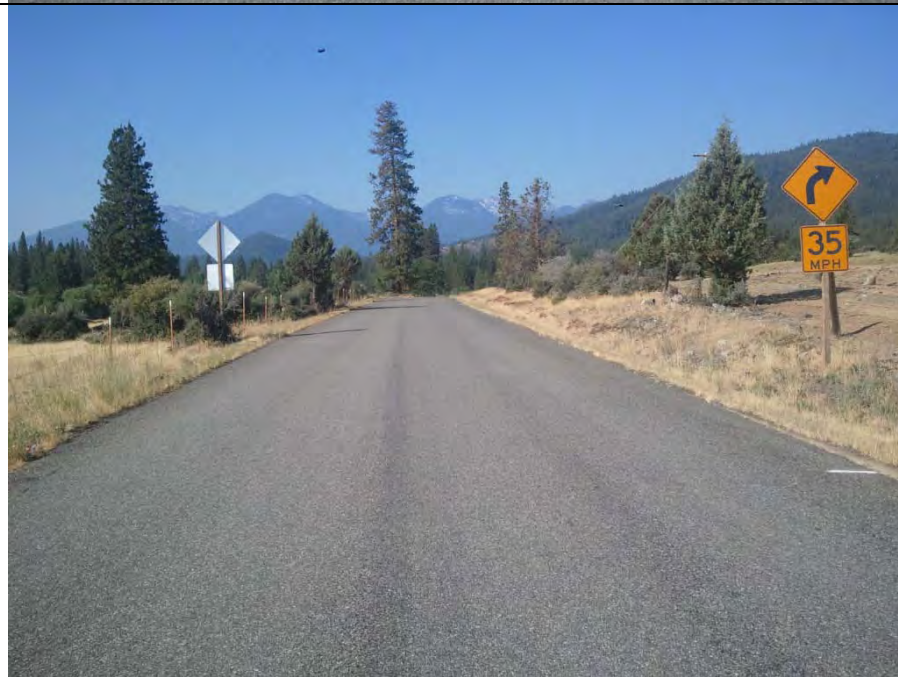
BAF:bgh:lms  
Appendix A: Photographs  
Appendix B: Roadway Analysis Forms





**Figure A-1**

Section 1, Location 1.  
Road width is 24 feet,  
with east and west  
shoulder widths of 1 and  
3 feet, respectively.  
Grade is 2.5%.

**Figure A-2**

Section 1, Location 2.  
Road width is 24 feet,  
with east and west  
shoulder widths of 1 and  
4 feet, respectively.  
Grade is 2.8%.

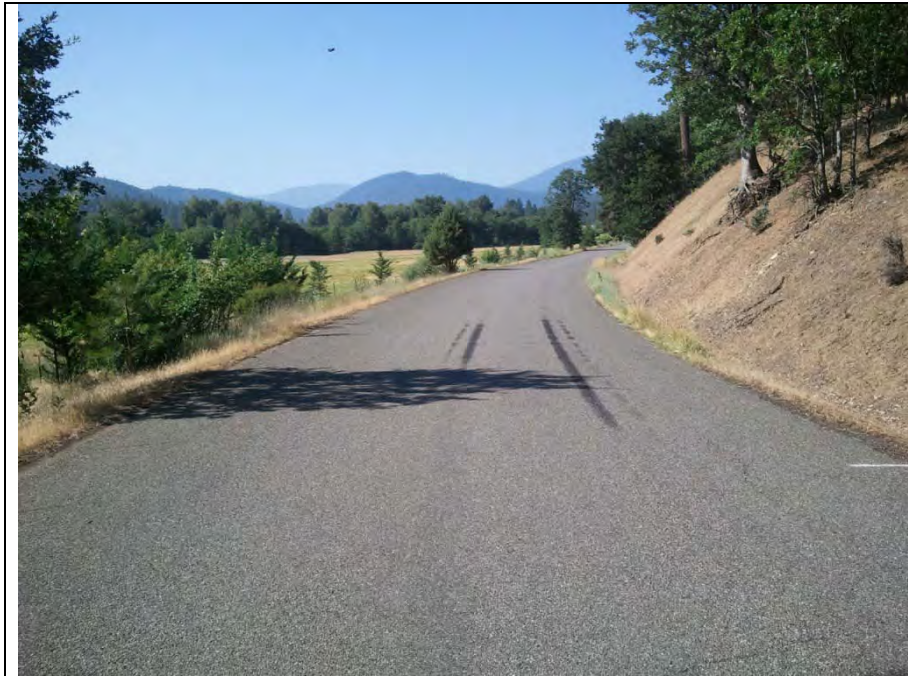
**Figure A-3**

Section 1, Location 3.  
Road width is 22 feet,  
with east and west  
shoulder widths of 2 feet  
and 1 foot, respectively.  
Grade is 1.2%.

**Figure A-4**

Section 2, Location 0.  
Road width is 25 feet,  
with east and west  
shoulder widths of 3 and  
2 feet, respectively.  
Grade is 2.9%.



**Figure A-5**

Section 2, Location 1.  
Road width is 22 feet,  
with east and west  
shoulder widths of 3 feet  
and 1 foot, respectively.  
Grade is 0.6%.

**Figure A-6**

Section 3, Location 0.  
Road width is 22 feet,  
with east and west  
shoulder widths of 2 and  
3 feet, respectively.  
Grade is 1.8%.





**Figure A-7**  
Section 3, Location 1.  
Road width is 23 feet,  
with east and west  
shoulder widths of 2 feet  
and 1 foot, respectively.  
Grade is 1.3%.



**Figure A-8**  
Section 3, Location 2.  
Road width is 23 feet,  
with east and west  
shoulder widths of 2 and  
7 feet, respectively.  
Grade is 4.5%.



**Figure A-9**

Section 3, Location 3.  
Road width is 22 feet,  
with east and west  
shoulder widths of 3 feet  
and 1 foot, respectively.  
Grade is 1.3%.

**Figure A-10**

Section 3, Location 4.  
Road width is 23 feet,  
with east and west  
shoulder widths of 0 and  
3 feet, respectively.  
Grade is 0.6%.





**Figure A-11**  
Section 3, Location 5.  
Road width is 25 feet,  
with east and west  
shoulder widths of 3 feet  
and 2 feet, respectively.  
Grade is 2.7%.



**Figure A-12**  
Section 3, Location 7.  
Road width is 20 feet,  
with east and west  
shoulder widths of 1 and  
0 feet, respectively.  
Grade is 1.0%.

**Figure A-13**

Section 3, Location 8.  
Road width is 20 feet,  
with east and west  
shoulder widths of 2 feet.  
Grade is 1.7%.

**Figure A-14**

Section 4, Location 0.  
Road width is 21.5 feet,  
with east and west  
shoulder widths of 2 feet  
and 1 foot, respectively.  
Grade is 1.1%.



**Figure A-15**

Section 4, Location 1.  
Road width is 11.5 feet,  
with east and west  
shoulder widths of 1  
foot. Grade is 1.8%.

**Figure A-16**

Section 5, Location 0.  
Road width is 21 feet,  
with east and west  
shoulder widths of 1 foot  
and 3 feet, respectively.  
Grade is 3.5%.





**Figure A-17**  
Section 5, Location 1.  
Road width is 19 feet,  
with east and west  
shoulder widths of 1 and  
4 feet, respectively.  
Grade is 2.4%.



**Figure A-18**  
Section 5, Location 2.  
Road width is 22 feet,  
with east and west  
shoulder widths of 1 foot  
and 3 feet, respectively.  
Grade is 1.8%.



**Figure A-19**

Section 6, Location 0.  
Road width is 19 feet,  
with east and west  
shoulder widths of 2 feet  
and 1 foot, respectively.  
Grade is 4.5%.

**Figure A-20**

Section 6, Location 1.  
Road width is 19.5 feet,  
with east and west  
shoulder widths of 1 foot  
and 4 feet, respectively.  
Grade is 3.7%.



**Figure A-21**  
End Section at  
intersection of French  
Creek Road and  
Homestead Lane.  
Road width is 22 feet,  
with east and west  
shoulder widths of less  
than 1 foot and 2 feet,  
respectively. Grade is  
7.6%.





## Two-Way Two Lane Highway Segment Worksheet\*

Section	1
Time Period	Winter 2020
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	62
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	2
Segment Length (Lt)	1

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.026
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	15.5
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	62
Peak 15-min total travel time (TT15) (veh-h)	0.49

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	89.9
vp*highest directional proportion (pc/h)	45.0
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.6

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	81.8
vp*highest directional proportion (pc/h)	40.9
Base percent time spent following (BPTSF)	6.94
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.74

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	2
Time Period	Winter 2020
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	62
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.026
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	6.2
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	24.8
Peak 15-min total travel time (TT15) (veh-h)	0.20

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	89.9
vp*highest directional proportion (pc/h)	45.0
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.6

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	81.8
vp*highest directional proportion (pc/h)	40.9
Base percent time spent following (BPTSF)	6.94
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.74

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	3
Time Period	Winter 2020
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	62
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	0
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.026
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	31
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	124
Peak 15-min total travel time (TT15) (veh-h)	1.51

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	89.9
vp*highest directional proportion (pc/h)	45.0
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.5

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	81.8
vp*highest directional proportion (pc/h)	40.9
Base percent time spent following (BPTSF)	6.94
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.74

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	4
Time Period	Winter 2020
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	62
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	9
Lane width (ft)	9
Shoulder width (ft)	1
Segment Length (Lt)	0.2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.026
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	3.1
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	12.4
Peak 15-min total travel time (TT15) (veh-h)	0.16

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	89.9
vp*highest directional proportion (pc/h)	45.0
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	6.4
Adjustment for access points (fA)	0
Free flow speed (FFS)	23.6
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	19.4

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	81.8
vp*highest directional proportion (pc/h)	40.9
Base percent time spent following (BPTSF)	6.94
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.74

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	5
Time Period	Winter 2020
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	62
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.6

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.026
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	9.3
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	37.2
Peak 15-min total travel time (TT15) (veh-h)	0.45

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	89.9
vp*highest directional proportion (pc/h)	45.0
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.5

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	81.8
vp*highest directional proportion (pc/h)	40.9
Base percent time spent following (BPTSF)	6.94
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.74

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000



## Two-Way Two Lane Highway Segment Worksheet\*

Section	6
Time Period	Winter 2020
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	62
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.026
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	6.2
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	24.8
Peak 15-min total travel time (TT15) (veh-h)	0.30

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	89.9
vp*highest directional proportion (pc/h)	45.0
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.5

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	81.8
vp*highest directional proportion (pc/h)	40.9
Base percent time spent following (BPTSF)	6.94
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.74

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	1
Time Period	Winter 2020
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	57
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	2
Segment Length (Lt)	1

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.024
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	14.25
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	57
Peak 15-min total travel time (TT15) (veh-h)	0.45

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	82.7
vp*highest directional proportion (pc/h)	41.3
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.7

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	75.2
vp*highest directional proportion (pc/h)	37.6
Base percent time spent following (BPTSF)	6.40
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.20

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	2
Time Period	Winter 2020
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	57
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses (P <sub>t</sub> )	2%
% Recreational Vehicles (P <sub>R</sub> )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.024
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	5.7
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	22.8
Peak 15-min total travel time (TT15) (veh-h)	0.18

Average Travel Speed	
Grade Adjustment Factor (f <sub>G</sub> )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	82.7
vp*highest directional proportion (pc/h)	41.3
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (f <sub>LS</sub> )	4.2
Adjustment for access points (f <sub>A</sub> )	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (f <sub>np</sub> ) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.7

Percent Time Spent Following	
Grade Adjustment Factor (f <sub>G</sub> )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	75.2
vp*highest directional proportion (pc/h)	37.6
Base percent time spent following (BPTSF)	6.40
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.20

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	3
Time Period	Winter 2020
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	57
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses (P <sub>t</sub> )	2%
% Recreational Vehicles (P <sub>R</sub> )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	0
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.024
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	28.5
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	114
Peak 15-min total travel time (TT15) (veh-h)	1.39

Average Travel Speed	
Grade Adjustment Factor (f <sub>G</sub> )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	82.7
vp*highest directional proportion (pc/h)	41.3
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (f <sub>LS</sub> )	5.3
Adjustment for access points (f <sub>A</sub> )	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (f <sub>np</sub> ) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.6

Percent Time Spent Following	
Grade Adjustment Factor (f <sub>G</sub> )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	75.2
vp*highest directional proportion (pc/h)	37.6
Base percent time spent following (BPTSF)	6.40
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.20

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	4
Time Period	Winter 2020
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	57
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	9
Lane width (ft)	9
Shoulder width (ft)	1
Segment Length (Lt)	0.2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.024
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	2.85
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	11.4
Peak 15-min total travel time (TT15) (veh-h)	0.15

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	82.7
vp*highest directional proportion (pc/h)	41.3
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	6.4
Adjustment for access points (fA)	0
Free flow speed (FFS)	23.6
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	19.5

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	75.2
vp*highest directional proportion (pc/h)	37.6
Base percent time spent following (BPTSF)	6.40
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.20

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	5
Time Period	Winter 2020
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	57
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.6

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.024
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	8.55
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	34.2
Peak 15-min total travel time (TT15) (veh-h)	0.42

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	82.7
vp*highest directional proportion (pc/h)	41.3
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.6

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	75.2
vp*highest directional proportion (pc/h)	37.6
Base percent time spent following (BPTSF)	6.40
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.20

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000



## Two-Way Two Lane Highway Segment Worksheet\*

Section	6
Time Period	Winter 2020
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	57
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.024
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	5.7
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	22.8
Peak 15-min total travel time (TT15) (veh-h)	0.28

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	82.7
vp*highest directional proportion (pc/h)	41.3
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.6

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	75.2
vp*highest directional proportion (pc/h)	37.6
Base percent time spent following (BPTSF)	6.40
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.20

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	1
Time Period	Winter 2015
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	57
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	2
Segment Length (Lt)	1

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.024
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	14.25
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	57
Peak 15-min total travel time (TT15) (veh-h)	0.45

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	82.7
vp*highest directional proportion (pc/h)	41.3
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.7

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	75.2
vp*highest directional proportion (pc/h)	37.6
Base percent time spent following (BPTSF)	6.40
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.20

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	2
Time Period	Winter 2015
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	57
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.024
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	5.7
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	22.8
Peak 15-min total travel time (TT15) (veh-h)	0.18

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	82.7
vp*highest directional proportion (pc/h)	41.3
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.7

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	75.2
vp*highest directional proportion (pc/h)	37.6
Base percent time spent following (BPTSF)	6.40
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.20

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	3
Time Period	Winter 2015
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	57
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	0
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.024
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	28.5
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	114
Peak 15-min total travel time (TT15) (veh-h)	1.39

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	82.7
vp*highest directional proportion (pc/h)	41.3
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.6

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	75.2
vp*highest directional proportion (pc/h)	37.6
Base percent time spent following (BPTSF)	6.40
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.20

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	4
Time Period	Winter 2015
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	57
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	9
Lane width (ft)	9
Shoulder width (ft)	1
Segment Length (Lt)	0.2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.024
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	2.85
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	11.4
Peak 15-min total travel time (TT15) (veh-h)	0.15

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	82.7
vp*highest directional proportion (pc/h)	41.3
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	6.4
Adjustment for access points (fA)	0
Free flow speed (FFS)	23.6
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	19.5

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	75.2
vp*highest directional proportion (pc/h)	37.6
Base percent time spent following (BPTSF)	6.40
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.20

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	5
Time Period	Winter 2015
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	57
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.6

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.024
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	8.55
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	34.2
Peak 15-min total travel time (TT15) (veh-h)	0.42

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	82.7
vp*highest directional proportion (pc/h)	41.3
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.6

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	75.2
vp*highest directional proportion (pc/h)	37.6
Base percent time spent following (BPTSF)	6.40
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.20

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	6
Time Period	Winter 2015
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	57
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.024
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	5.7
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	22.8
Peak 15-min total travel time (TT15) (veh-h)	0.28

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	82.7
vp*highest directional proportion (pc/h)	41.3
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.6

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	75.2
vp*highest directional proportion (pc/h)	37.6
Base percent time spent following (BPTSF)	6.40
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	28.20

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	1
Time Period	Winter 2015
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	55
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	2
Segment Length (Lt)	1

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.023
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	13.75
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	55
Peak 15-min total travel time (TT15) (veh-h)	0.43

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	79.8
vp*highest directional proportion (pc/h)	39.9
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.7

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	72.6
vp*highest directional proportion (pc/h)	36.3
Base percent time spent following (BPTSF)	6.18
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	27.98

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000



## Two-Way Two Lane Highway Segment Worksheet\*

Section	2
Time Period	Winter 2015
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	55
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.023
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	5.5
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	22
Peak 15-min total travel time (TT15) (veh-h)	0.17

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	79.8
vp*highest directional proportion (pc/h)	39.9
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.7

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	72.6
vp*highest directional proportion (pc/h)	36.3
Base percent time spent following (BPTSF)	6.18
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	27.98

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	3
Time Period	Winter 2015
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	55
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses (P <sub>t</sub> )	2%
% Recreational Vehicles (P <sub>R</sub> )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	0
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.023
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	27.5
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	110
Peak 15-min total travel time (TT15) (veh-h)	1.34

Average Travel Speed	
Grade Adjustment Factor (f <sub>G</sub> )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	79.8
vp*highest directional proportion (pc/h)	39.9
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (f <sub>LS</sub> )	5.3
Adjustment for access points (f <sub>A</sub> )	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (f <sub>np</sub> ) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.6

Percent Time Spent Following	
Grade Adjustment Factor (f <sub>G</sub> )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	72.6
vp*highest directional proportion (pc/h)	36.3
Base percent time spent following (BPTSF)	6.18
Adjustment for directional distribution and no passing zones (f <sub>d/np</sub> )	21.8
Percent Time Spent Following (PTSF)	27.98

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	4
Time Period	Winter 2015
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	55
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	9
Lane width (ft)	9
Shoulder width (ft)	1
Segment Length (Lt)	0.2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.023
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	2.75
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	11
Peak 15-min total travel time (TT15) (veh-h)	0.14

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	79.8
vp*highest directional proportion (pc/h)	39.9
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	6.4
Adjustment for access points (fA)	0
Free flow speed (FFS)	23.6
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	19.5

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	72.6
vp*highest directional proportion (pc/h)	36.3
Base percent time spent following (BPTSF)	6.18
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	27.98

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	5
Time Period	Winter 2015
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	55
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.6

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.023
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	8.25
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	33
Peak 15-min total travel time (TT15) (veh-h)	0.40

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	79.8
vp*highest directional proportion (pc/h)	39.9
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.6

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	72.6
vp*highest directional proportion (pc/h)	36.3
Base percent time spent following (BPTSF)	6.18
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	27.98

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	6
Time Period	Winter 2015
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	55
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.023
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	5.5
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	22
Peak 15-min total travel time (TT15) (veh-h)	0.27

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	79.8
vp*highest directional proportion (pc/h)	39.9
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.6

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	72.6
vp*highest directional proportion (pc/h)	36.3
Base percent time spent following (BPTSF)	6.18
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	27.98

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	1
Time Period	Winter 2010
Projected Growth Rate	NA

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	52
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	2
Segment Length (Lt)	1

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.021
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	13
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	52
Peak 15-min total travel time (TT15) (veh-h)	0.41

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	75.4
vp*highest directional proportion (pc/h)	37.7
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.7

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	68.6
vp*highest directional proportion (pc/h)	34.3
Base percent time spent following (BPTSF)	5.85
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	27.65

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	2
Time Period	Winter 2010
Projected Growth Rate	NA

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	52
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.021
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	5.2
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	20.8
Peak 15-min total travel time (TT15) (veh-h)	0.16

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	75.4
vp*highest directional proportion (pc/h)	37.7
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.7

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	68.6
vp*highest directional proportion (pc/h)	34.3
Base percent time spent following (BPTSF)	5.85
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	27.65

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	3
Time Period	Winter 2010
Projected Growth Rate	NA

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	52
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	0
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.021
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	26
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	104
Peak 15-min total travel time (TT15) (veh-h)	1.26

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	75.4
vp*highest directional proportion (pc/h)	37.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.6

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	68.6
vp*highest directional proportion (pc/h)	34.3
Base percent time spent following (BPTSF)	5.85
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	27.65

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000



## Two-Way Two Lane Highway Segment Worksheet\*

Section	4
Time Period	Winter 2010
Projected Growth Rate	NA

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	52
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	9
Lane width (ft)	9
Shoulder width (ft)	1
Segment Length (Lt)	0.2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.021
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	2.6
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	10.4
Peak 15-min total travel time (TT15) (veh-h)	0.13

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	75.4
vp*highest directional proportion (pc/h)	37.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	6.4
Adjustment for access points (fA)	0
Free flow speed (FFS)	23.6
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	19.5

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	68.6
vp*highest directional proportion (pc/h)	34.3
Base percent time spent following (BPTSF)	5.85
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	27.65

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	5
Time Period	Winter 2010
Projected Growth Rate	NA

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	52
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.6

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.021
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	7.8
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	31.2
Peak 15-min total travel time (TT15) (veh-h)	0.38

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	75.4
vp*highest directional proportion (pc/h)	37.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.6

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	68.6
vp*highest directional proportion (pc/h)	34.3
Base percent time spent following (BPTSF)	5.85
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	27.65

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	6
Time Period	Winter 2010
Projected Growth Rate	NA

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	52
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.021
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	5.2
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	20.8
Peak 15-min total travel time (TT15) (veh-h)	0.25

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	75.4
vp*highest directional proportion (pc/h)	37.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.6

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	68.6
vp*highest directional proportion (pc/h)	34.3
Base percent time spent following (BPTSF)	5.85
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	27.65

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	1
Time Period	Summer 2020
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	125
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses (P <sub>t</sub> )	2%
% Recreational Vehicles (P <sub>R</sub> )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	2
Segment Length (Lt)	1

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.052
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	31.25
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	125
Peak 15-min total travel time (TT15) (veh-h)	1.01

Average Travel Speed	
Grade Adjustment Factor (f <sub>G</sub> )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	181.3
vp*highest directional proportion (pc/h)	90.7
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (f <sub>LS</sub> )	4.2
Adjustment for access points (f <sub>A</sub> )	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (f <sub>np</sub> ) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	30.9

Percent Time Spent Following	
Grade Adjustment Factor (f <sub>G</sub> )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	164.9
vp*highest directional proportion (pc/h)	82.5
Base percent time spent following (BPTSF)	13.50
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	35.30

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000



## Two-Way Two Lane Highway Segment Worksheet\*

Section	2
Time Period	Summer 2020
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	125
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.052
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	12.5
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	50
Peak 15-min total travel time (TT15) (veh-h)	0.40

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	181.3
vp*highest directional proportion (pc/h)	90.7
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	30.9

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	164.9
vp*highest directional proportion (pc/h)	82.5
Base percent time spent following (BPTSF)	13.50
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	35.30

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	3
Time Period	Summer 2020
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	125
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	0
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.052
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	62.5
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	250
Peak 15-min total travel time (TT15) (veh-h)	3.16

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	181.3
vp*highest directional proportion (pc/h)	90.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	19.8

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	164.9
vp*highest directional proportion (pc/h)	82.5
Base percent time spent following (BPTSF)	13.50
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	35.30

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	4
Time Period	Summer 2020
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	125
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	9
Lane width (ft)	9
Shoulder width (ft)	1
Segment Length (Lt)	0.2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.052
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	6.25
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	25
Peak 15-min total travel time (TT15) (veh-h)	0.33

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	181.3
vp*highest directional proportion (pc/h)	90.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	6.4
Adjustment for access points (fA)	0
Free flow speed (FFS)	23.6
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	18.7

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	164.9
vp*highest directional proportion (pc/h)	82.5
Base percent time spent following (BPTSF)	13.50
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	35.30

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	5
Time Period	Summer 2020
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	125
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses (P <sub>t</sub> )	2%
% Recreational Vehicles (P <sub>R</sub> )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.6

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.052
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	18.75
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	75
Peak 15-min total travel time (TT15) (veh-h)	0.95

Average Travel Speed	
Grade Adjustment Factor (f <sub>G</sub> )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	181.3
vp*highest directional proportion (pc/h)	90.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (f <sub>LS</sub> )	5.3
Adjustment for access points (f <sub>A</sub> )	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (f <sub>np</sub> ) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	19.8

Percent Time Spent Following	
Grade Adjustment Factor (f <sub>G</sub> )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	164.9
vp*highest directional proportion (pc/h)	82.5
Base percent time spent following (BPTSF)	13.50
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	35.30

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000



## Two-Way Two Lane Highway Segment Worksheet\*

Section	6
Time Period	Summer 2020
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	125
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.052
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	12.5
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	50
Peak 15-min total travel time (TT15) (veh-h)	0.63

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	181.3
vp*highest directional proportion (pc/h)	90.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	19.8

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	164.9
vp*highest directional proportion (pc/h)	82.5
Base percent time spent following (BPTSF)	13.50
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	35.30

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	1
Time Period	Summer 2020
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	114
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	2
Segment Length (Lt)	1

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.047
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	28.5
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	114
Peak 15-min total travel time (TT15) (veh-h)	0.92

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	165.4
vp*highest directional proportion (pc/h)	82.7
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.0

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	150.4
vp*highest directional proportion (pc/h)	75.2
Base percent time spent following (BPTSF)	12.39
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	34.19

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	2
Time Period	Summer 2020
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	114
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses (P <sub>t</sub> )	2%
% Recreational Vehicles (P <sub>R</sub> )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.047
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	11.4
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	45.6
Peak 15-min total travel time (TT15) (veh-h)	0.37

Average Travel Speed	
Grade Adjustment Factor (f <sub>G</sub> )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	165.4
vp*highest directional proportion (pc/h)	82.7
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (f <sub>LS</sub> )	4.2
Adjustment for access points (f <sub>A</sub> )	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (f <sub>np</sub> ) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.0

Percent Time Spent Following	
Grade Adjustment Factor (f <sub>G</sub> )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	150.4
vp*highest directional proportion (pc/h)	75.2
Base percent time spent following (BPTSF)	12.39
Adjustment for directional distribution and no passing zones (f <sub>d/np</sub> )	21.8
Percent Time Spent Following (PTSF)	34.19

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	3
Time Period	Summer 2020
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	114
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	0
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.047
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	57
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	228
Peak 15-min total travel time (TT15) (veh-h)	2.86

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	165.4
vp*highest directional proportion (pc/h)	82.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	19.9

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	150.4
vp*highest directional proportion (pc/h)	75.2
Base percent time spent following (BPTSF)	12.39
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	34.19

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000



## Two-Way Two Lane Highway Segment Worksheet\*

Section	4
Time Period	Summer 2020
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	114
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	9
Lane width (ft)	9
Shoulder width (ft)	1
Segment Length (Lt)	0.2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.047
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	5.7
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	22.8
Peak 15-min total travel time (TT15) (veh-h)	0.30

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	165.4
vp*highest directional proportion (pc/h)	82.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	6.4
Adjustment for access points (fA)	0
Free flow speed (FFS)	23.6
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	18.8

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	150.4
vp*highest directional proportion (pc/h)	75.2
Base percent time spent following (BPTSF)	12.39
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	34.19

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	5
Time Period	Summer 2020
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	114
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.6

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.047
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	17.1
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	68.4
Peak 15-min total travel time (TT15) (veh-h)	0.86

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	165.4
vp*highest directional proportion (pc/h)	82.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	19.9

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	150.4
vp*highest directional proportion (pc/h)	75.2
Base percent time spent following (BPTSF)	12.39
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	34.19

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	6
Time Period	Summer 2020
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	114
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.047
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	11.4
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	45.6
Peak 15-min total travel time (TT15) (veh-h)	0.57

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	165.4
vp*highest directional proportion (pc/h)	82.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	19.9

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	150.4
vp*highest directional proportion (pc/h)	75.2
Base percent time spent following (BPTSF)	12.39
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	34.19

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	1
Time Period	Summer 2015
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	114
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_T$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	2
Segment Length (Lt)	1

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.047
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	28.5
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	114
Peak 15-min total travel time (TT15) (veh-h)	0.92

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	165.4
vp*highest directional proportion (pc/h)	82.7
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.0

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	150.4
vp*highest directional proportion (pc/h)	75.2
Base percent time spent following (BPTSF)	12.39
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	34.19

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	2
Time Period	Summer 2015
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	114
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses (P <sub>T</sub> )	2%
% Recreational Vehicles (P <sub>R</sub> )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.047
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	11.4
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	45.6
Peak 15-min total travel time (TT15) (veh-h)	0.37

Average Travel Speed	
Grade Adjustment Factor (f <sub>G</sub> )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	165.4
vp*highest directional proportion (pc/h)	82.7
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (f <sub>LS</sub> )	4.2
Adjustment for access points (f <sub>A</sub> )	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (f <sub>np</sub> ) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.0

Percent Time Spent Following	
Grade Adjustment Factor (f <sub>G</sub> )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	150.4
vp*highest directional proportion (pc/h)	75.2
Base percent time spent following (BPTSF)	12.39
Adjustment for directional distribution and no passing zones (f <sub>d/np</sub> )	21.8
Percent Time Spent Following (PTSF)	34.19

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000



## Two-Way Two Lane Highway Segment Worksheet\*

Section	3
Time Period	Summer 2015
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	114
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_T$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	0
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.047
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	57
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	228
Peak 15-min total travel time (TT15) (veh-h)	2.86

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	165.4
vp*highest directional proportion (pc/h)	82.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	19.9

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	150.4
vp*highest directional proportion (pc/h)	75.2
Base percent time spent following (BPTSF)	12.39
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	34.19

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	4
Time Period	Summer 2015
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	114
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_T$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	9
Lane width (ft)	9
Shoulder width (ft)	1
Segment Length (Lt)	0.2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.047
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	5.7
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	22.8
Peak 15-min total travel time (TT15) (veh-h)	0.30

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	165.4
vp*highest directional proportion (pc/h)	82.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	6.4
Adjustment for access points (fA)	0
Free flow speed (FFS)	23.6
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	18.8

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	150.4
vp*highest directional proportion (pc/h)	75.2
Base percent time spent following (BPTSF)	12.39
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	34.19

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	5
Time Period	Summer 2015
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	114
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_T$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.6

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.047
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	17.1
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	68.4
Peak 15-min total travel time (TT15) (veh-h)	0.86

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	165.4
vp*highest directional proportion (pc/h)	82.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	19.9

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	150.4
vp*highest directional proportion (pc/h)	75.2
Base percent time spent following (BPTSF)	12.39
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	34.19

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	6
Time Period	Summer 2015
Projected Growth Rate	2%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	114
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_T$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.047
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	11.4
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	45.6
Peak 15-min total travel time (TT15) (veh-h)	0.57

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	165.4
vp*highest directional proportion (pc/h)	82.7
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	19.9

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	150.4
vp*highest directional proportion (pc/h)	75.2
Base percent time spent following (BPTSF)	12.39
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	34.19

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	1
Time Period	Summer 2015
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	109
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	2
Segment Length (Lt)	1

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.045
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	27.25
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	109
Peak 15-min total travel time (TT15) (veh-h)	0.88

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	158.1
vp*highest directional proportion (pc/h)	79.1
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.1

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	143.8
vp*highest directional proportion (pc/h)	71.9
Base percent time spent following (BPTSF)	11.88
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	33.68

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	2
Time Period	Summer 2015
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	109
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.045
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	10.9
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	43.6
Peak 15-min total travel time (TT15) (veh-h)	0.35

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	158.1
vp*highest directional proportion (pc/h)	79.1
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.1

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	143.8
vp*highest directional proportion (pc/h)	71.9
Base percent time spent following (BPTSF)	11.88
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	33.68

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000



## Two-Way Two Lane Highway Segment Worksheet\*

Section	3
Time Period	Summer 2015
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	109
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	0
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.045
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	54.5
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	218
Peak 15-min total travel time (TT15) (veh-h)	2.73

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	158.1
vp*highest directional proportion (pc/h)	79.1
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.0

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	143.8
vp*highest directional proportion (pc/h)	71.9
Base percent time spent following (BPTSF)	11.88
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	33.68

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	4
Time Period	Summer 2015
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	109
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	9
Lane width (ft)	9
Shoulder width (ft)	1
Segment Length (Lt)	0.2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.045
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	5.45
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	21.8
Peak 15-min total travel time (TT15) (veh-h)	0.29

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	158.1
vp*highest directional proportion (pc/h)	79.1
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	6.4
Adjustment for access points (fA)	0
Free flow speed (FFS)	23.6
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	18.9

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	143.8
vp*highest directional proportion (pc/h)	71.9
Base percent time spent following (BPTSF)	11.88
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	33.68

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	5
Time Period	Summer 2015
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	109
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.6

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.045
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	16.35
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	65.4
Peak 15-min total travel time (TT15) (veh-h)	0.82

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	158.1
vp*highest directional proportion (pc/h)	79.1
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.0

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	143.8
vp*highest directional proportion (pc/h)	71.9
Base percent time spent following (BPTSF)	11.88
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	33.68

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	6
Time Period	Summer 2015
Projected Growth Rate	1%

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	109
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.045
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	10.9
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	43.6
Peak 15-min total travel time (TT15) (veh-h)	0.55

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	158.1
vp*highest directional proportion (pc/h)	79.1
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.0

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	143.8
vp*highest directional proportion (pc/h)	71.9
Base percent time spent following (BPTSF)	11.88
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	33.68

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	1
Time Period	Summer 2010
Projected Growth Rate	NA

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	104
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	2
Segment Length (Lt)	1

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.043
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	26
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	104
Peak 15-min total travel time (TT15) (veh-h)	0.84

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	150.9
vp*highest directional proportion (pc/h)	75.4
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.1

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	137.2
vp*highest directional proportion (pc/h)	68.6
Base percent time spent following (BPTSF)	11.36
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	33.16

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	2
Time Period	Summer 2010
Projected Growth Rate	NA

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	104
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	12
Lane width (ft)	12
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.043
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	10.4
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	41.6
Peak 15-min total travel time (TT15) (veh-h)	0.33

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	150.9
vp*highest directional proportion (pc/h)	75.4
Base free flow speed (BFFS)	40
Adjustment for lane and shoulder width (fLS)	4.2
Adjustment for access points (fA)	0
Free flow speed (FFS)	35.8
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	31.1

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	137.2
vp*highest directional proportion (pc/h)	68.6
Base percent time spent following (BPTSF)	11.36
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	33.16

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000



## Two-Way Two Lane Highway Segment Worksheet\*

Section	3
Time Period	Summer 2010
Projected Growth Rate	NA

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	104
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	0
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.043
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	52
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	208
Peak 15-min total travel time (TT15) (veh-h)	2.60

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	150.9
vp*highest directional proportion (pc/h)	75.4
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.0

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	137.2
vp*highest directional proportion (pc/h)	68.6
Base percent time spent following (BPTSF)	11.36
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	33.16

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	4
Time Period	Summer 2010
Projected Growth Rate	NA

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	104
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	9
Lane width (ft)	9
Shoulder width (ft)	1
Segment Length (Lt)	0.2

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.043
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	5.2
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	20.8
Peak 15-min total travel time (TT15) (veh-h)	0.27

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	150.9
vp*highest directional proportion (pc/h)	75.4
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	6.4
Adjustment for access points (fA)	0
Free flow speed (FFS)	23.6
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	18.9

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	137.2
vp*highest directional proportion (pc/h)	68.6
Base percent time spent following (BPTSF)	11.36
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	33.16

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	5
Time Period	Summer 2010
Projected Growth Rate	NA

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	104
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	3
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.6

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.043
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	15.6
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	62.4
Peak 15-min total travel time (TT15) (veh-h)	0.78

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	150.9
vp*highest directional proportion (pc/h)	75.4
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.0

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	137.2
vp*highest directional proportion (pc/h)	68.6
Base percent time spent following (BPTSF)	11.36
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	33.16

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000

## Two-Way Two Lane Highway Segment Worksheet\*

Section	6
Time Period	Summer 2010
Projected Growth Rate	NA

Level of Service Criteria	
LOS	PTSF
A	≤40
B	>40-55
C	>55-70
D	>70-85
E	>85

Input Data	
Highway Class	II
Terrain	Rolling
Two way hourly volume (veh/hour) (V)	104
Highest Directional Split Proportion	0.5
Peak hour factor (PHF)	1
% Trucks and Buses ( $P_t$ )	2%
% Recreational Vehicles ( $P_R$ )	0%
% No passing zone	100%
Access points/mile	0
Shoulder width (ft)	1
Lane width (ft)	10
Lane width (ft)	10
Shoulder width (ft)	1
Segment Length (Lt)	0.4

Level of Service and Other Performance Measures	
Level of Service (LOS)	A
Volume to capacity ratio (v/c)	0.043
Peak 15-min vehicle miles of travel (VMT15) (veh-mi)	10.4
Peak-hour vehicle-miles of travel (VMT60) (veh-mi)	41.6
Peak 15-min total travel time (TT15) (veh-h)	0.52

Average Travel Speed	
Grade Adjustment Factor ( $f_G$ )	0.71
Passenger-car equivalents for trucks (ET)	2.5
Passenger-car equivalents for RVs (ER)	1.1
Heavy vehicle adjustment factor (FHV)	0.971
Two way flow rate (vp) (pc/h)	150.9
vp*highest directional proportion (pc/h)	75.4
Base free flow speed (BFFS)	30
Adjustment for lane and shoulder width (fLS)	5.3
Adjustment for access points (fA)	0
Free flow speed (FFS)	24.7
Adjustment for no-passing zones (fnp) (mi/h)	3.5
Average Travel Speed (ATS) (mi/h)	20.0

Percent Time Spent Following	
Grade Adjustment Factor ( $f_G$ )	0.77
Passenger-car equivalents for trucks (ET)	1.8
Passenger-car equivalents for RVs (ER)	1
Heavy vehicle adjustment factor (FHV)	0.984
Two way flow rate (vp) (pc/h)	137.2
vp*highest directional proportion (pc/h)	68.6
Base percent time spent following (BPTSF)	11.36
Adjustment for directional distribution and no passing zones (fd/np)	21.8
Percent Time Spent Following (PTSF)	33.16

\*Worksheet based on worksheet provided in the Highway Capacity Manual 2000