Sterling Highway
Milepost 45 to 60
ADOT&PF Project 53014

2014 Traffic Study Update

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NOTICE TO USERS

This report is intended to document the methodologies, findings, and conclusions of a Traffic Study Update completed for HDR Alaska, Inc. Changes frequently occur during the evolution of the design process. Persons who may rely on the information contained in this document should consult with HDR Alaska, Inc. for the most current design decisions.

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1.0 INTRODUCTION

This report updates the analyses and results of the *Sterling Highway Traffic Analysis Study* completed by HDR Alaska, Inc. in 2006 (HDR Study). The purpose of this traffic study is to evaluate intersection and road segment alternatives in support of the Sterling Highway Milepost 45 to 60 Environmental Impact Statement for the Alaska Department of Transportation and Public Facilities (ADOT&PF).

This study primarily focuses on estimating future traffic demand and evaluating the performance of intersections and highway segments related to the proposed alternatives. The analysis presented in this report incorporates the most recently available Average Annual Daily Traffic (AADT) count data. The construction year and design year have been updated to 2023 and 2043 respectively.

1.1 PREVIOUS WORK

1.1.1 STUDIES

This study builds on work presented in:

- *Sterling Highway Traffic Summary Report*, HDR Alaska, October 2006.
- *Sterling Highway Preliminary Engineering Memorandum*, R&M Consultants, Inc., March 2006.
- *Sterling Highway Alaska Origin-Destination Study,* Transformation Systems, Inc., September 2001.

These studies established methodologies and assumptions used in this analysis.

1.1.2 ALTERNATIVES

The four alternatives analyzed in this study were identified in the *Sterling Highway Preliminary Engineering Memorandum*. These alternatives include:

- No-Build Alternative
- Juneau Creek Alternative
    - Including North bypass of the Sterling Highway
        - Variants 1, 2, and 3
- G-South Alternative
    - Including North bypass of the Sterling Highway
- Cooper Creek Alternative
    - Including South bypass of the Sterling Highway
- Juneau Creek Alternative without Schooner Bend Bridge
    - Including North bypass of the Sterling Highway, with Schooner Bend Bridge closed.

Figures showing these alternatives are included as Appendix A.

2.0 EXISTING CONDITIONS

The portion of the Sterling Highway (CDS Route 110000) evaluated in this study is located between Quartz Creek Road and the east terminus of Skilak Lake Road in the vicinity of Cooper Landing. The highway in this area is currently a two-lane highway classified as a Rural Principal Arterial - Interstate (FC 1). It is characterized by tight curves, narrow lanes, areas without shoulders, and varying speed limits.

2.1 TRAFFIC VOLUMES

The most basic measure of traffic demand on a highway is the number of vehicles on

the roadway. The volume of traffic on a roadway is defined as the average daily traffic (ADT) and/or the average annual daily traffic (AADT). The ADOT&PF records traffic volume counts at various locations by either permanent traffic recorders (PTR) or tube counts. Recorded counts are published as AADTs for individual links by ADOT&PF in the Annual Traffic Volume Report (ATVR). This link data provides a basis for estimating future traffic demand.

Historic traffic volume data from the PTR located at Cooper Landing was used to determine historic traffic growth and the design hourly volume (DHV). The DHV is that part of the AADT that can be expected to be on the roadway during the highest volume (peak hour) of any given day. The 100th highest hourly volume (100HV) was determined from guidelines provides by the American Association of State Highway and Transportation Officials (AASHTO) and by comparing a range of design hourly volumes from traffic volume data collected on the Sterling Highway.

Based on a review of traffic data collected by the PTR at Cooper Landing, a DHV corresponding to the 100HV was determined to be 0.19 (approximately 20% of the AADT). A DHV of 0.20 was used in this study. Historic traffic volumes and PTR data used in this study can be found in Appendix B. A summary of the 2012 100HV is shown in Table 1.

Table 1. Sterling Highway 2012 Traffic Volumes

Location	Milepost	AADT	100th Highest Hourly Volume (Veh/Hour)
Quartz Creek Road (Segment 6)	41	3033	607
Cooper Creek (Segment 2-5)	50.5	2915	583
Skilak Lake Road (Segment 1)	58	2810	562

2.2 COMPOSITION OF TRAFFIC

2.2.1 DIRECTIONAL DISTRIBUTION

Most highways and roadways allow traffic to travel in two directions. Traffic volumes established by applying the DHV are considered the total volume of traffic in both directions. The directional distribution (DD) is the percent of the traffic volume traveling in either direction. Continuous 24-hour count information collected in 2012 at Cooper Landing was used to calculate the directional distribution for this portion of the Sterling Highway. The evaluation of the data resulted in an average DD of 55/45 (rounded to 60/40). This split is consistent with the AASHTO design recommendation for directional distribution. A DD of 60/40 was used in this study. Supporting data for the DD determination is included in Appendix B.

2.2.2 COMPOSITION OF TRAFFIC

Vehicles of different sizes and weights have different operating characteristics. The FHWA has categorized vehicles into 13 classifications. Vehicle classification counts were performed by ADOT&PF at milepoint 6.143 of the Sterling Highway in 2008. The percent of trucks in the traffic stream are considered vehicles recorded in classes 4 through 13. This is also known as the percentage of commercial vehicles in the vehicle classification data. This study assumed that the percent of recreational vehicles (RV) in

the traffic stream are those recorded in class 4 and 5 and the percent of trucks in the traffic stream are those recorded in classes 6 through 13. Based on the classification counts, approximately 17% of the traffic is considered RVs and 7% is considered trucks. Supporting data used to determine the percent trucks is presented in Appendix B.

3.0 FUTURE TRAFFIC CONDITIONS

3.1 TRAFFIC GROWTH

Estimates of future traffic demand were determined from a review of available historic traffic count data published in the Annual Traffic Volume Report (ATVR) for each year. Growth rates for three time periods were developed – 1992 to 2012 (20 year), 2002 to 2012 (10 year), and 2007 to 2012 (5 year). The three time periods provide long-term, mid-term, and short-term overviews of growth trends. Growth rates for the three time periods were developed by evaluating historical traffic growth and performing a statistical regression analysis (called a linear trend line analysis) of the historical data.

Table 2. Traffic Growth

Segment	Historical Growth			Linear Trend Line Growth		
	5 year	*10 year*	*20 year*	*5 year*	*10 year*	*20 year*
Quartz Creek to Snug Harbor	-4.30%	-0.90%	0.04%	-2.77% R^2 = 0.47	0.36% R^2 = 0.03	1.19% R^2 = 0.43
Snug Harbor to Russian River Campground	-2.86%	0.24%	0.60%	-1.81% R^2 = 0.34	0.23% R^2 = 0.02	1.03% R^2 = 0.43
Russian River Campground to Russian River Ferry Entrance	0.87%	1.88%	0.88%	1.90% R^2 = 0.12	3.73% R^2 = 0.65	1.41% R^2 = 0.35
Russian River Ferry Entrance to Skilak Lake Road (east)	0.06%	-0.19%	1.15%	0.59% R^2 = 0.20	-0.25% R^2 = 0.09	1.01% R^2 = 0.41

Since the project will be applied over a long term, the long-term growth rates were used as the basis of determining the projected growth rate. Based on the low R^2 values computed for the four segments, variations in traffic volumes are random and do not follow a linear pattern of growth. Based on the linear trend line growth the 20 year data contains the largest R^2 values providing the most accurate data available. The average 20 year linear trend line growth rate is 1.16%.

Based on a review of historic growth characteristics, growth over the next 20 years may likely be similar to what has occurred over the last 10-20 years. In general, growth in the study area was positive in the long term. The average historical growth rate for the past 10 years is approximately 0.26%. The average historical growth rate for the past 20 years is approximately 0.67%.

Considering the 20 year historical growth and 20 year linear trend line growth related to destinations, a compound annual growth rate of 1.0% was determined for use in this study.

3.2 FUTURE TRAFFIC VOLUMES

For purposes of this study, the design year has changed from 2035 to 2043. As such, all future traffic volumes are projected to the year 2043. Future traffic volumes were estimated by applying a compound annual growth rate of 1% to current traffic volumes. Estimated future traffic volumes are summarized in the following table.

Table 3. 2043 Sterling Highway Traffic Volumes

Location	Milepost	AADT	100th Highest Hourly Volume (Veh/Hour)
Quartz Creek Road (Segment 6)	41	4129	826
Cooper Creek (Segments 2-5)	50.5	3969	794
Skilak Lake Road (Segment 1)	58	3826	766

Turning movement volumes published in the 2006 HDR Study provided the basis of turning movement volume estimates. The 2006 HDR Study assumed a growth rate of 3.0%. The turning movement volumes were adjusted in this study to reflect an annual growth rate of 1.0% to the year 2043. Projected future turning movement volumes at each intersection for each alternative can be found in Appendix C.

4.0 2043 LEVEL OF SERVICE ANALYSIS

4.1 INTERSECTION LEVEL OF SERVICE

A level of service analysis was completed for the two-way stop controlled intersections related to each alternative. This analysis identifies how intersections related to the proposed alternatives are anticipated to operate in 2043 under peak traffic conditions.

4.1.1 METHODOLOGY

The methodologies used to analyze the intersections follow procedures established in the 2000 Highway Capacity Manual (HCM), utilizing Highway Capacity Software (HCS+). The two-way stop controlled analysis assumed that all intersections were unsignalized, minor approaches to alternative alignments were stop controlled, and approaches on the new alignments were not stop controlled (i.e. considered free movements). In addition to the HCM analysis, an Intersection Capacity Utilization (ICU) analysis using Trafficware's Synchro traffic analysis software was completed.

The HCM analysis of two-way stop controlled intersections results in a LOS for individual movements. This methodology provides a measure of the delay that motorists may experience. The LOS is based on the calculated delay for those movements that have to stop or yield to through movements. As such, the LOS does not represent the performance of the entire intersection.

The ICU analysis method results in an LOS that represents overall intersection performance. This methodology provides a measure of how much capacity is available to handle traffic fluctuations at a particular intersection. The ICU LOS considers all approach movements but does not predict delay. As such ICU should not be confused with the HCM LOS and delay.

4.1.2 LEVEL OF SERVICE ANALYSIS

The following sections summarize the results of the LOS analysis for individual alternatives. A summary of the LOS results for all alternatives are presented in Tables

10 and 11 at the end of section 4.1. Worksheets used to determine the HCM LOS and the ICU LOS are included in Appendix D and E respectively. The reported HCM LOS and delay indicates the poorest operating movement or approach at that intersection. The ICU indicates the LOS and percent capacity utilization for the entire intersection.

- ***No Build Alternative***

The No Build Alternative maintains the existing lane configurations for all intersections. All intersection movements are expected to operate at an acceptable LOS.

Table 4. 2043 No Build Alternative Intersection LOS

Intersection		Level of Service		Average Control Delay		Critical Lane Movement (HCM)
East/West Street	North/South Street	HCM	ICU	HCM	ICU%	
Sterling Highway	Bean Creek Road	C	A	17.6	39.3	SBLR
Bean Creek Road	Sterling Highway	B	A	12.0	44.5	EBLT
Sterling Highway	Snug Harbor Road	B	A	14.1	38.3	NBLR
Sterling Highway	Kenai River	B	A	12.1	42.4	SBLR
Sterling Highway	Hamilton Place	B	A	10.0	42.1	SBLTR

Based on the ICU analysis, all intersections are anticipated to operate with reserve capacity in 2043.

Analysis worksheets are included as Appendix D and E.

- ***Juneau Creek and G-South Alternatives***

The intersections connecting the new Sterling Highway alignment and the old Sterling Highway alignment for each alternative are expected to operate at acceptable levels of service. All intersection movements are expected to operate at an acceptable LOS.

The Lane Configurations evaluated for this alternative are summarized in Table 5.

Table 5. Juneau Creek, G-South, and Variant Alternatives Intersection Lane Configurations

East/West Approach			North/South Approach		
Street	***EB***	***WB***	***Street***	***NB***	***SB***
Sterling Highway	**T / R**	**T / L**	Old Sterling Highway	**L / R**	
Sterling Highway	**TL**	**TR**	Bean Creek Road		**LR**
Bean Creek Road	**RL**		Sterling Highway	**LT**	**TR**
Sterling Highway	**TR**	**TL**	Snug Harbor Road	**LR**	
Sterling Highway	**TL**	**TR**	Kenai River		**LR**
Sterling Highway	**LTR**	**LTR**	Hamilton Place	**LTR**	**LTR**
Sterling Highway	**TR**	**TL**	Sportsman's Access	**LR**	
Sterling Highway	**T / R**	**T / L**	Old Sterling Highway	**LR**	
Sterling Highway Variant	**T / L**	**T / R**	Old Sterling Highway		**LR**

The Juneau Creek Variants provide alternative intersection configurations to connect the old and new Sterling Highway alignments at the west end of the project. The intersection configuration Variants 1 and 3 loop the old Sterling Highway under the new Sterling Highway and connect with southbound traffic turning onto the New Sterling Highway. Under each variant alternative, the intersection movements are expected to operate at an acceptable LOS.

Table 6. 2043 Juneau Creek, G-South, and Variant Alternatives Intersection LOS

Intersection		Level of Service		Average Control Delay		Critical Lane Movement (HCM)
East/West Street	North/South Street	HCM	ICU	HCM	ICU%	
Sterling Highway	Old Sterling Highway	C	A	16.9	38.3	NBL
Sterling Highway	Bean Creek Road	B	A	10.3	17.9	SBLR
Bean Creek Road	Sterling Highway	A	A	9.4	23.2	EBLT
Sterling Highway	Snug Harbor Road	A	A	9.7	20.7	NBLR
Sterling Highway	Kenai River	A	A	9.5	22.7	SBLR
Sterling Highway	Hamilton Place	A	A	9.0	22.7	SBLTR
Sterling Highway	Sportsman's Access	A		10.0		NBLR
Sterling Highway	Old Sterling Highway	B	A	14.9	30.9	NBLR
Sterling Highway Variant	Old Sterling Highway	B	A	12.9	33.5	SBLR

Based on the ICU analysis, the intersections related to this alternative are expected to operate with reserve capacity.

Analysis worksheets are included as Appendix D and E.

- ***Cooper Creek Alternative***

All Cooper Creek alternative intersection movements are expected to operate at an acceptable LOS.

The Lane Configurations evaluated for this alternative are summarized in Table 7.

Table 7. Cooper Creek Alternative Intersection Lane Configurations

East/West Approach			North/South Approach		
Street	***EB***	***WB***	***Street***	***NB***	***SB***
Bean Creek Road	**L / R**		Sterling Highway	**LT**	**TR**
Snug Harbor Road	**LT / R**	**LT / R**	Sterling Highway	**L / T / R**	**L / T / R**
Sterling Highway	**TL**	**TR**	Kenai River		**LR**
Sterling Highway	**LTR**	**LTR**	Hamilton Place	**LTR**	**LTR**
Sterling Highway	**T / L**	**T / R**	Old Sterling Highway		**LR**

Table 8. 2043 Cooper Creek Alternative Intersection LOS

Intersection		Level of Service		Average Control Delay		Critical Lane Movement (HCM)
East/West Street	North/South Street	HCM	ICU	HCM	ICU%	
Bean Creek Road	New Sterling Highway	C	A	18.0	43.3	EBL
Sterling Highway	Snug Harbor Road	C	A	23.7	40.6	EBLT
Sterling Highway	Kenai River	A	A	9.5	22.7	SBLR
Sterling Highway	Hamilton Place	A	A	9.0	22.7	SBLTR
Sterling Highway	Old Sterling Highway	B	A	12.9	33.5	SBLR

Based on the ICU analysis, the intersections related to this alternative are expected to operate with reserve capacity.

Analysis worksheets are included as Appendix D and E.

- ***Juneau Creek Alternative without Schooner Bend Bridge***

The intersections connecting the new Sterling Highway alignment and the old Sterling Highway alignment are anticipated to operate at acceptable levels of service. All intersection movements all are anticipated to operate at LOS C or better. The lane configurations evaluated for this alternative is the same as the Juneau Creek Alternative summarized in Table 5.

Table 9. 2043 Juneau Creek Alternative Without Bridge Intersection LOS

Intersection		Level of Service		Average Control Delay		Critical Lane Movement (HCM)
East/West Street	North/South Street	HCM	ICU	HCM	ICU%	
Sterling Highway	Old Sterling Highway	C	A	20.0	38.8	NBL
Sterling Highway	Bean Creek Road	B	A	11.5	20.2	SBLR
Bean Creek Road	Sterling Highway	B	A	10.5	19.3	EBLT
Sterling Highway	Snug Harbor Road	A	A	9.5	29.0	NBLR
Sterling Highway	Kenai River	B	A	10.5	18.4	SBLR
Sterling Highway	Hamilton Place	B	A	10.2	23.2	SBLTR
Sterling Highway	Old Sterling Highway	B	A	14.7	35.5	NBLR

Based on the ICU analysis, all intersections are anticipated to operate with reserve capacity in 2043.

Analysis worksheets are included as Appendix D and E.

Table 10. Unsignalized Intersection Analysis Results (1% Growth Rate)

	2043	No-Build		Juneau Creek		G-South		Cooper Creek		Juneau Creek Without Bridge	
Intersection	**Approach**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
East Connection to Existing Highway	WBL	-	-	8.8	A	8.8	A	-	-	9.3	A
	NBR	-	-	13.5	B	13.5	B	-	-	13.4	B
	NBL	-	-	16.9	C	16.9	C	-	-	20.0	C
Bean Creek Road - North	EBLT	8.0	A	7.6	A	7.6	A	-	-	7.9	A
	SBLR	17.6	C	10.3	B	10.3	B	-	-	11.5	B
Bean Creek Road - South	EBLT	12.0	B	9.4	A	9.4	A	-	-	10.5	B
	NBLR	8.0	A	7.6	A	7.6	A	-	-	7.8	A
Bean Creek Road - Combined	EBL	-	-	-	-	-	-	18.0	C	-	-
	EBR	-	-	-	-	-	-	10.2	B	-	-
	NBL	-	-	-	-	-	-	8.1	A	-	-
Snug Harbor Road	WBLT	9.0	A	7.7	A	7.7	A	-	-	7.8	A
	NBLR	14.1	B	9.7	A	9.7	A	-	-	9.5	A
Snug Harbor Road & East Connection to Existing Highway	EBLT	8.0	A	-	-	-	-	23.7	C	-	-
	EBR	-	-	-	-	-	-	9.6	A	-	-
	WBLT	-	-	-	-	-	-	15.7	C	-	-
	WBR	-	-	-	-	-	-	11.1	B	-	-
	NBL	-	-	-	-	-	-	7.9	A	-	-
	SBL	-	-	-	-	-	-	8.4	A	-	-
Kenai River Boat Launch	EBLT	8.1	A	7.6	A	7.6	A	7.6	A	7.8	A
	SBLR	12.1	B	9.5	A	9.5	A	9.5	A	10.5	B
Hamilton's Place	EBLTR	8.1	A	7.7	A	7.7	A	7.7	A	7.7	A
	WBLTR	8.9	A	7.8	A	7.8	A	7.8	A	7.6	A
	NBLTR	-	-	-	-	-	-	-	-	-	-
	SBLTR	10.0	B	9.0	A	9.0	A	9	A	10.2	B
West Connection to Existing Highway	WBL	-	-	8.9	A	8.9	A	-	-	9.0	A
	NBLR	-	-	14.9	B	14.9	B	-	-	14.7	B
West Connection to Existing Highway	EBL	-	-	-	-	-	-	8.3	A	-	-
	SBLR	-	-	-	-	-	-	12.9	B	-	-

							L - Left	R - Right
LOS:	A	B	C	D	E	F	LT - Left/Thru	LR - Left/Right
Approach Delay (s):	0-10	10-15	15-25	25-35	35-50	50+	LTR - Left/Thru/Right	TR - Thur/Right

Table 11. Unsignalized Intersection Analysis Results Variants (1% Growth Rate)

2043		No-Build		Juneau Creek Variant 1		Juneau Creek Variant 2		Juneau Creek Variant 3		Juneau Creek	
Intersection	**Approach**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
East Connection to Existing Highway	WBL	-	-	8.8	A	8.8	A	8.8	A	8.8	A
	NBR	-	-	13.5	B	13.5	B	13.5	B	13.5	B
	NBL	-	-	16.9	C	16.9	C	16.9	C	16.9	C
Bean Creek Road - North	EBLT	8.0	A	7.6	A	7.6	A	7.6	A	7.6	A
	SBLR	17.6	C	10.3	B	10.3	B	10.3	B	10.3	B
Bean Creek Road - South	EBLT	12.0	B	9.4	A	9.4	A	9.4	A	9.4	A
	NBLR	8.0	A	7.6	A	7.6	A	7.6	A	7.6	A
Bean Creek Road - Combined	EBL	-	-	-	-	-	-	-	-	-	-
	EBR	-	-	-	-	-	-	-	-	-	-
	NBL	-	-	-	-	-	-	-	-	-	-
Snug Harbor Road	WBLT	9.0	A	7.7	A	7.7	A	7.7	A	7.7	A
	NBLR	14.1	B	9.7	A	9.7	A	9.7	A	9.7	A
	EBL	8.0	A	-	-	-	-	-	-	-	-
Snug Harbor Road & East Connection to Existing Highway No East & West Bound Left Turns	EBT	-	-	-	-	-	-	-	-	-	-
	EBR	-	-	-	-	-	-	-	-	-	-
	WBT	-	-	-	-	-	-	-	-	-	-
	WBR	-	-	-	-	-	-	-	-	-	-
	NBL	-	-	-	-	-	-	-	-	-	-
	SBL	-	-	-	-	-	-	-	-	-	-
Kenai River Boat Launch	EBLT	8.1	A	7.6	A	7.6	A	7.6	A	7.6	A
	SBLR	12.1	B	9.5	A	9.5	A	9.5	A	9.5	A
Hamilton's Place	EBLTR	8.1	A	7.7	A	7.7	A	7.7	A	7.7	A
	WBLTR	8.9	A	7.8	A	7.8	A	7.8	A	7.8	A
	NBLTR	-	-	-	-	-	-	-	-	-	-
	SBLTR	10.0	B	9.0	A	9.0	A	9.0	A	9.0	A
Sportsman's Access	WBL	-	-	-	-	7.9	A	-	-	-	-
	NBLR	-	-	-	-	10.0	A	-	-	-	-
West Connection to Existing Highway	WBL	-	-	-	-	8.9	A	-	-	8.9	A
	NBLR	-	-	-	-	14.9	B	-	-	14.9	B
West Connection to Existing Highway	EBL	-	-	8.3	A	-	-	8.3	A	-	-
	SBLR	-	-	12.9	B	-	-	12.9	B	-	-

LOS:	A	B	C	D	E	F
Approach Delay (s):	0-10	10-15	15-25	25-35	35-50	50+

L - Left R - Right
LT - Left/Thru LR - Left/Right
LTR - Left/Thru/Right TR - Thur/Right

4.2 ROADWAY SEGMENT ANALYSIS

A level of service analysis was completed for the two lane highway segments related to each alternative. This analysis identifies how the highway segments related to the proposed alternatives are anticipated to operate in 2043 under peak traffic conditions.

4.2.1 METHODOLOGY & ASSUMPTIONS

A two lane highway level of service analysis was completed for each alternative. The analysis evaluated individual segments within the proposed alternative corridor. The methodologies used to analyze the segments follow procedures established in the HCM using HCS+.

Traffic volumes projected for 2043 were used to analyze each segment. Based on the HDR Study, the Juneau Creek, G-South, and Cooper Creek Alternatives assumed that approximately 70 percent of the Sterling Highway traffic is anticipated to use the new alignment and 30 percent is anticipated to continue using the existing corridor. The Juneau Creek Alternative without Schooner Bend Bridge assumed that approximately 80 percent of Sterling Highway traffic is anticipated to use the new alignment and 20 percent is anticipated to continue to use the existing corridor. Additionally, the two-lane highway analysis incorporates climbing and passing lanes for all build alternatives.

4.2.2 LEVEL OF SERVICE ANALYSIS

The following sections summarize the results of the two lane highway LOS analysis for individual alternatives. A summary of the LOS results for all alternatives are presented in Tables 19 and 20 at the end of Section 4.2. Analysis worksheets used to determine the Segment LOS are included as Appendix F.

- ***No Build Alternative***

The No Build Alternative maintains the existing Sterling Highway alignment and lane configurations. As shown in the table below, all segments are anticipated to operate at LOS D in 2043.

Table 12. 2043 No Build Alternative Two Lane Highway LOS

Segment	AADT	100th Highest Hourly Volume (veh/hour)	LOS (EB/WB)
1	3826	766	D/D
2, 3, 4, & 5	3969	794	D/D
6	4129	826	D/D

- ***Juneau Creek Alternative***

The Juneau Creek alternative consists of a two lane highway with climbing and passing lanes. Passing lanes are provided in each direction of Segment 1. Climbing lanes are provided in the eastbound direction for Segment 2. In the westbound direction, climbing lanes are provided on Segments 3, 4, 5 and 6. Each segment of the Juneau Creek alternative is expected to operate at acceptable level of service in 2043.

Table 13. 2043 Juneau Creek Alternative Two Lane Highway LOS

Segment	AADT	100th Highest Hourly Volume (veh/hour)	LOS (EB/WB)
1	3830	766	D/C
2	2779	556	C/C
3			C/C
4			C/B
5			C/B
6	4130	826	D/C

The Juneau Creek Variants incorporate alternate routes along segment 2. For all variants, Segment 2 is expected to operate at LOS C in both eastbound and westbound lanes.

- ***G-South Alternative***

The G-South alternative consists of a two lane highway with climbing and passing lanes. Passing lanes are provided in each direction of Segments 1 and 2. Climbing lanes are provided in the eastbound direction for Segments 3 and 4. In the westbound direction, climbing lanes are provided on Segments 5 and 6. Each segment of the Juneau Creek alternative is expected to operate at acceptable level of service in 2043.

Table 14. 2043 G South Alternative Two Lane Highway LOS

Segment	AADT	100th Highest Hourly Volume (veh/hour)	LOS (EB/WB)
1	3830	766	D/C
2	3970	794	D/C
3, 4, & 5	2779	556	C/B
6	4130	826	D/C

- ***Cooper Creek Alternative***

The Cooper Creek alternative consists of a two lane highway with climbing and passing lanes. Passing lanes are provided in each direction of Segments 1 and 2. Climbing lanes are provided in the eastbound direction for Segments 3 and 6. In the westbound direction, climbing lanes are provided on Segments 4 and 6. Each segment of the Juneau Creek alternative is expected to operate at acceptable level of service in 2043.

Table 15. 2043 Cooper Creek Alternative Two Lane Highway LOS

Segment	AADT	100th Highest Hourly Volume (veh/hour)	LOS (EB/WB)
1	3830	766	D/C
2	3970	794	D/C
3 & 4	2779	556	C/C
5	3970	794	D/C
6	4130	826	D/C

- ***Juneau Creek Alternative without Schooner Bend Bridge***

This Juneau Creek alternative consists of a two lane highway with climbing and passing lanes. Passing lanes are provided in each direction of Segment 1 and in the eastbound direction of Segment 4. Climbing lanes are provided in the eastbound direction for Segment 2. In the westbound direction, climbing lanes are provided on Segments 3, 4,

5 and 6. Each segment of the Juneau Creek alternative is expected to operate at acceptable level of service in 2043.

Table 16. 2043 Juneau Creek Without Bridge Alternative Two Lane Highway LOS

Segment	AADT	100th Highest Hourly Volume (veh/hour)	LOS (EB/WB)
1	3830	766	D/C
2	3176	635	B/C
3			C/C
4			C/B
5			C/B
6	4130	826	D/C

- ***Existing Sterling Highway***

Each alternative assumes that a portion of the traffic will continue using the existing Sterling Highway alignment. Based on the assumed distribution of traffic for the Juneau Creek, G-South, and Cooper Creek alternatives the existing Sterling Highway is expected to operate at acceptable level of service in 2043.

Table 17. 2043 Old Sterling Highway Two Lane Highway LOS

Segment	AADT	100th Highest Hourly Volume (veh/hour)	LOS (EB/WB)
1*	3830	766	D/C
2, 3, 4, & 5	1191	238	C/A
6*	4130	826	D/C

*Segment with the same layout as the respective alternative analysis.

Based on the assumed distribution of traffic for the Juneau Creek without Schooner Bend Bridge the existing Sterling Highway is expected to operate at acceptable level of service in 2043.

Table 18. 2043 Juneau Creek Without Bridge Alternative Two Lane Highway LOS (20%) – no bridge

Segment	AADT	100th Highest Hourly Volume (veh/hour)	LOS (EB/WB)
1*	3830	766	D/C
2	794	159	A/A
3			C/A
4			C/A
5			C/A
6*	4130	826	D/C

*Segment with the same layout as the respective alternative analysis.

4.2.3 SEGMENT 6 PASSING LANE

As shown in the tables above, the eastbound direction of Segment 6 operates at a LOS D for all the build alternatives. The eastbound direction of Segment 6 borders on LOS E. Including a passing lane in the eastbound direction of Segment 6 could provide a more desirable level of service. Since passing and climbing lanes are provided on the adjacent segments, the addition of a passing lane may not provide a substantial benefit to the project. An evaluation of the impacts (environmental, cost, etc.) related to a passing lane should be completed.

4.2.4 DIRECTIONAL IMPACT SUMMARY

A Directional Impact analysis was completed to determine the percent of LOS for each Alternative. This summary shows the impact of each alternative's segments in relation to the entire alignment length. The Impact Summary emphasizes the percentage of roadway at LOS D or worse and LOS E or worse. The Directional Impact Summary is presented in Table 21.

Table 19. Two-Lane Highway Analysis Results (1% Growth Rate)

		2012 Existing			2043 No-Build			Juneau Creek			G-South			Cooper Creek			Juneau Creek Without Bridge		
Segment	**Direction**	**ATS**	**PTSF**	**LOS**	**ATS**	**PTSF**	**LOS**	**ATS**	**PTSF**	**LOS**	**ATS**	**PTSF**	**LOS**	**ATS**	**PTSF**	**LOS**	**ATS**	**PTSF**	**LOS**
1	EB	46.0	60.6	C	44.6	66.4	D	49.2	66.4	D	49.2	66.4	D	49.2	66.4	D	49.2	66.4	D
	WB	46.1	48.6	C	44.9	55.9	D	49.4	55.9	C	49.4	55.9	C	49.4	55.9	C	49.4	55.9	C
2	EB	44.0	70.4	D	42.9	73.0	D	48.0	45.1	C	49.0	66.1	D	49.0	66.1	D	50.1	49.7	B
	WB	44.6	55.7	D	43.5	61.5	D	49.0	35.5	C	49.2	56.3	C	49.1	57.3	C	48.2	39.0	C
3	EB	44.0	70.4	D	42.9	73.0	D	48.0	45.1	C	52.0	50.3	C	48.0	45.1	C	47.8	49.6	C
	WB	44.6	55.7	D	43.5	61.5	D	49.0	35.5	C	50.7	41.2	B	49.0	35.5	C	48.7	37.9	C
4	EB	44.0	70.4	D	42.9	73.0	D	50.5	55.4	C	52.0	60.6	C	48.0	45.1	C	50.0	59.0	C
	WB	44.6	55.7	D	43.5	61.5	D	50.7	45.0	B	52.0	48.7	B	49.0	35.5	C	50.2	47.5	B
5	EB	44.0	70.4	D	42.9	73.0	D	50.5	60.6	C	52.0	55.4	C	47.0	73.0	D	50.0	63.2	C
	WB	44.6	55.7	D	43.5	61.5	D	50.7	45.0	B	52.0	45.0	B	48.0	61.5	C	50.2	47.5	B
6	EB	43.9	70.1	D	42.7	74.3	D	48.0	71.5	D	50.0	71.5	D	48.6	68.2	D	48.0	71.5	D
	WB	44.4	56.2	D	43.3	62.2	D	49.0	54.5	C	50.0	54.5	C	49.0	54.5	C	49.0	54.5	C
2E	EB							n/a	55.1	C							n/a	23.5	A
	WB							n/a	39.4	A							n/a	16.4	A
3E	EB							n/a	55.1	C	n/a	55.1	C	n/a	55.1	C	n/a	55.1	C
	WB							n/a	39.3	A	n/a	39.3	A	n/a	39.3	A	n/a	39.3	A
4E	EB							n/a	55.1	C	n/a	55.1	C	n/a	55.1	C	n/a	55.1	C
	WB							n/a	39.3	A	n/a	39.3	A	n/a	39.3	A	n/a	39.3	A
5E	EB							n/a	55.1	C	n/a	55.1	C				n/a	55.1	C
	WB							n/a	39.3	A	n/a	39.3	A				n/a	39.3	A

LOS (Class 1 Highway):	**A**	**B**	**C**	**D**	**E**	**F**
ATS (Average Travel Speed):	>55	50-55	45-50	40-45	<40	**
PTSF (Percent Time Spent Following):	<35	35-50	50-65	65-80	>80	**

EB: Eastbound Traffic
WB: Westbound Traffic

**Exceeds Capacity (2-Lane Capacity = 1,700 passenger cars per hour)
Per Highway Capacity Manual
Average Travel Speed criteria for NHS Interstate Rural is 45 MPH.

Table 20. Two-Lane Highway Analysis Results Variants (1% Growth Rate)

		2012 Existing			2043 No-Build			Juneau Creek Variant 1			Juneau Creek Variant 2			Juneau Creek Variant 3			Juneau Creek		
Segment	**Direction**	**ATS**	**PTSF**	**LOS**	**ATS**	**PTSF**	**LOS**	**ATS**	**PTSF**	**LOS**	**ATS**	**PTSF**	**LOS**	**ATS**	**PTSF**	**LOS**	**ATS**	**PTSF**	**LOS**
1	EB	46.0	60.6	C	44.6	66.4	D	49.2	66.4	D	49.2	66.4	D	49.2	66.4	D	49.2	66.4	D
	WB	46.1	48.6	C	44.9	55.9	D	49.4	55.9	C	49.4	55.9	C	49.4	55.9	C	49.4	55.9	C
2	EB	44.0	70.4	D	42.9	73.0	D	47.3	52.1	C	47.9	51.4	C	47.3	52.1	C	48.0	45.1	C
	WB	44.6	55.7	D	43.5	61.5	D	47.5	40.2	C	47.5	40.2	C	47.5	40.2	C	49.0	35.5	C
3	EB	44.0	70.4	D	42.9	73.0	D	48.0	45.1	C	48.0	45.1	C	48.0	45.1	C	48.0	45.1	C
	WB	44.6	55.7	D	43.5	61.5	D	49.0	35.5	C	49.0	35.5	C	49.0	35.5	C	49.0	35.5	C
4	EB	44.0	70.4	D	42.9	73.0	D	50.5	55.4	C	50.5	55.4	C	50.5	55.4	C	50.5	55.4	C
	WB	44.6	55.7	D	43.5	61.5	D	50.7	45.0	B	50.7	45.0	B	50.7	45.0	B	50.7	45.0	B
5	EB	44.0	70.4	D	42.9	73.0	D	50.5	60.6	C	50.5	60.6	C	50.5	60.6	C	50.5	60.6	C
	WB	44.6	55.7	D	43.5	61.5	D	50.7	45.0	B	50.7	45.0	B	50.7	45.0	B	50.7	45.0	B
6	EB	43.9	70.1	D	42.7	74.3	D	48.0	71.5	D	48.0	71.5	D	48.0	71.5	D	48.0	71.5	D
	WB	44.4	56.2	D	43.3	62.2	D	49.0	54.5	C	49.0	54.5	C	49.0	54.5	C	49.0	54.5	C
2E	EB							n/a	55.1	C	n/a	55.1	C	n/a	55.1	C	n/a	55.1	C
	WB							n/a	39.4	A	n/a	39.4	A	n/a	39.4	A	n/a	39.4	A
3E	EB							n/a	55.1	C	n/a	55.1	C	n/a	55.1	C	n/a	55.1	C
	WB							n/a	39.3	A	n/a	39.3	A	n/a	39.3	A	n/a	39.3	A
4E	EB							n/a	55.1	C	n/a	55.1	C	n/a	55.1	C	n/a	55.1	C
	WB							n/a	39.3	A	n/a	39.3	A	n/a	39.3	A	n/a	39.3	A
5E	EB							n/a	55.1	C	n/a	55.1	C	n/a	55.1	C	n/a	55.1	C
	WB							n/a	39.3	A	n/a	39.3	A	n/a	39.3	A	n/a	39.3	A

LOS (Class 1 Highway):	**A**	**B**	**C**	**D**	**E**	**F**
ATS (Average Travel Speed):	>55	50-55	45-50	40-45	<40	**
PTSF (Percent Time Spent Following):	<35	35-50	50-65	65-80	>80	**

EB: Eastbound Traffic
WB: Westbound Traffic

**Exceeds Capacity (2-Lane Capacity = 1,700 passenger cars per hour)
Per Highway Capacity Manual
Average Travel Speed criteria for NHS Interstate Rural is 45 MPH.

Table 21A. Directional Impact Summary

		Existing 2012			2043 No-Build			G-South			Cooper Creek			Juneau Creek Without Bridge			Juneau Creek			Juneau Creek Variant 1			Juneau Creek Variant 2			Juneau Creek Variant 3		
Segment	**Direction**	%	Length	**LOS**	%	Length	**LOS**	%	Length	**LOS**	%	Length	**LOS**	%	Length	**LOS**	%	Length	**LOS**	%	Length	**LOS**	%	Length	**LOS**	%	Length	**LOS**
1	EB	12.0	3	C	12.0	3	D	9.3	2.8	D	10.2	2.8	D	9.8	2.8	D	9.8	2.8	D	10.5	2.8	D	10.9	2.8	D	10.5	2.8	D
	WB	12.0	3	C	12.0	3	D	9.3	2.8	C	10.2	2.8	C	9.8	2.8	C	9.8	2.8	C	10.5	2.8	C	10.9	2.8	C	10.5	2.8	C
2	EB	12.0	3	D	12.0	3	D	14.9	4.5	D	16.4	4.5	D	14.0	4	B	14.0	4	C	11.3	3	C	9.8	2.5	C	11.3	3	C
	WB	12.0	3	D	12.0	3	D	14.9	4.5	C	16.4	4.5	C	14.0	4	C	14.0	4	C	11.3	3	C	9.8	2.5	C	11.3	3	C
3	EB	8.0	2	D	8.0	2	D	3.6	1.1	C	3.6	1	C	10.5	3	C	10.5	3	C	11.3	3	C	11.7	3	C	11.3	3	C
	WB	8.0	2	D	8.0	2	D	3.6	1.1	B	3.6	1	C	10.5	3	C	10.5	3	C	11.3	3	C	11.7	3	C	11.3	3	C
4	EB	6.0	1.5	D	6.0	1.5	D	11.6	3.5	C	7.3	2	C	4.5	1.3	C	4.5	1.3	C	4.9	1.3	C	5.1	1.3	C	4.9	1.3	C
	WB	6.0	1.5	D	6.0	1.5	D	11.6	3.5	B	7.3	2	C	4.5	1.3	B	4.5	1.3	B	4.9	1.3	B	5.1	1.3	B	4.9	1.3	B
5	EB	4.0	1	D	4.0	1	D	4.0	1.2	C	5.1	1.4	D	4.2	1.2	C	4.2	1.2	C	4.5	1.2	C	4.7	1.2	C	4.5	1.2	C
	WB	4.0	1	D	4.0	1	D	4.0	1.2	B	5.1	1.4	C	4.2	1.2	B	4.2	1.2	B	4.5	1.2	B	4.7	1.2	B	4.5	1.2	B
6	EB	8.0	2	D	8.0	2	D	6.6	2	D	7.3	2	D	7.0	2	D	7.0	2	D	7.5	2	D	7.8	2	D	7.5	2	D
	WB	8.0	2	D	8.0	2	D	6.6	2	C	7.3	2	C	7.0	2	C	7.0	2	C	7.5	2	C	7.8	2	C	7.5	2	C
Total	Length	100.0	25		100.0	25		100.0	30.2		100.0	27.4		100.0	28.6		100.0	28.6		100.0	26.6		100.0	25.6		100.0	26.6	

Table 21B. Directional Impact Summary - Peak Direction of Travel

	Existing 2012			2043 No-Build			G-South			Cooper Creek			Juneau Creek Without Bridge			Juneau Creek			Juneau Creek Variant 1			Juneau Creek Variant 2			Juneau Creek Variant 3		
Segment	%	Length	**LOS**	%	Length	**LOS**	%	Length	**LOS**	%	Length	**LOS**	%	Length	**LOS**	%	Length	**LOS**	%	Length	**LOS**	%	Length	**LOS**	%	Length	**LOS**
1	24.0	3	C	24.0	3	D	18.5	2.8	D	20.4	2.8	D	19.6	2.8	D	19.6	2.8	D	21.1	2.8	D	21.9	2.8	D	21.1	2.8	D
2	24.0	3	D	24.0	3	D	29.8	4.5	D	32.8	4.5	D	28.0	4	C	28.0	4	C	22.6	3	C	19.5	2.5	C	22.6	3	C
3	16.0	2	D	16.0	2	D	7.3	1.1	C	7.3	1	C	21.0	3	C	21.0	3	C	22.6	3	C	23.4	3	C	22.6	3	C
4	12.0	1.5	D	12.0	1.5	D	23.2	3.5	C	14.6	2	C	9.1	1.3	C	9.1	1.3	C	9.8	1.3	C	10.2	1.3	C	9.8	1.3	C
5	8.0	1	D	8.0	1	D	7.9	1.2	C	10.2	1.4	D	8.4	1.2	C	8.4	1.2	C	9.0	1.2	C	9.4	1.2	C	9.0	1.2	C
6	16.0	2	D	16.0	2	D	13.2	2	D	14.6	2	D	14.0	2	D	14.0	2	D	15.0	2	D	15.6	2	D	15.0	2	D
Total	100.0	12.5		100.0	12.5		100.0	15.1		100.0	13.7		100.0	14.3		100.0	14.3		100.0	13.3		100.0	12.8		100.0	13.3	

Table 21C. Impact Summary

	Existing 2012	2043 No-Build	G-South	Cooper Creek	Juneau Creek Without Bridge	Juneau Creek	Juneau Creek Variant 1	Juneau Creek Variant 2	Juneau Creek Variant 3
Segment Length (miles)	12.5	12.5	15.1	13.7	14.3	14.3	13.3	12.8	13.3
Percent of Alternative at Level of Service (LOS) D or Worse*	76	100.0	61.6	78.1	33.6	33.6	36.1	37.5	36.1
Percent of Alternative at LOS E or Worse*	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

* Based on peak direction of Travel

Table 21D. Percent Level of Service

	Existing 2012	2043 No-Build	G-South	Cooper Creek	Juneau Creek Without Bridge	Juneau Creek	Juneau Creek Variant 1	Juneau Creek Variant 2	Juneau Creek Variant 3
Total % LOS B*									
Total % LOS C*	24.0		38.4	21.9	66.4	66.4	63.9	62.5	63.9
Total % LOS D*	76.0	100.0	61.6	78.1	33.6	33.6	36.1	37.5	36.1
Total % LOS E*									
Total % LOS F*									

* Based on peak direction of Travel

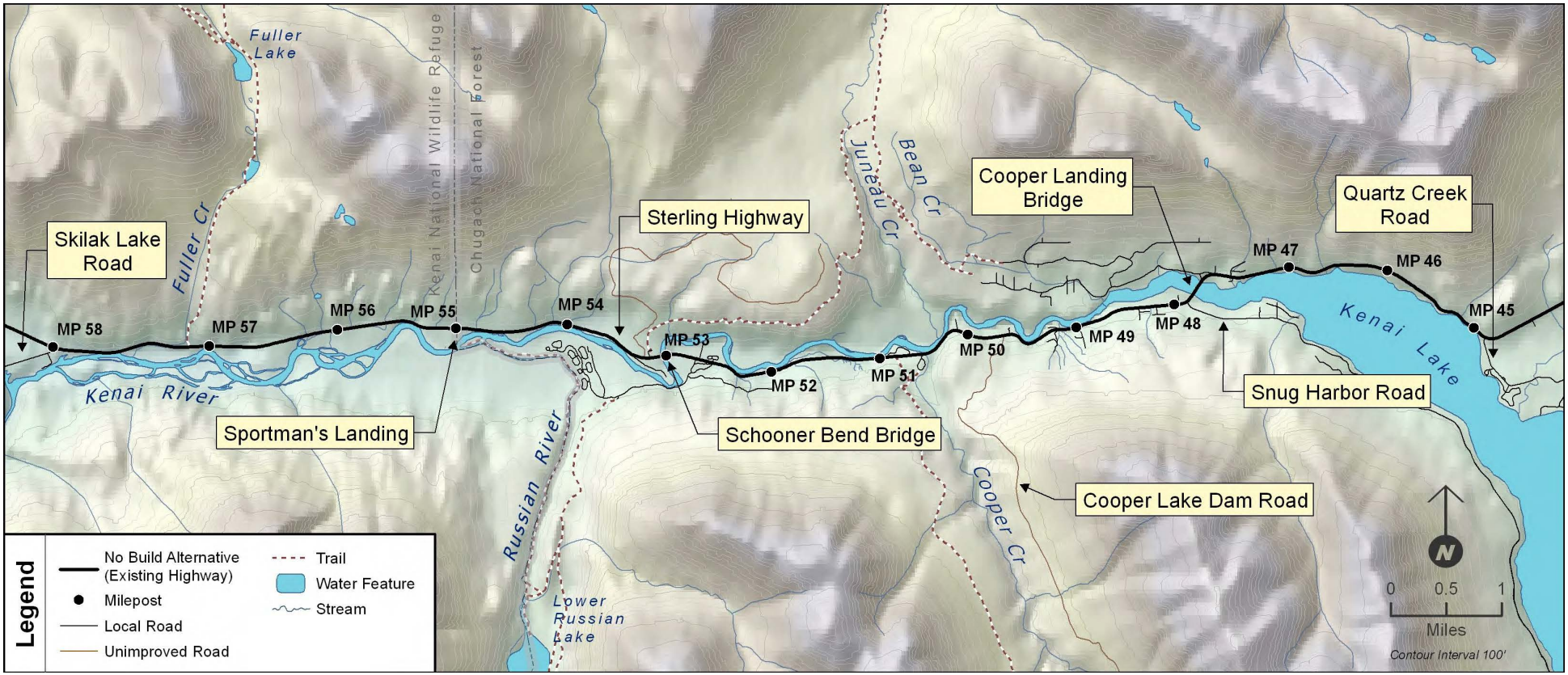
REFERENCES

1. Sterling Highway Traffic Summary Report, HDR Alaska, October 2006.
2. Sterling Highway Preliminary Engineering Memorandum, R&M Consultants, Inc., March 2006.
3. Sterling Highway Alaska Original-Destination Study, Transformation Systems, Inc., September 2001.
4. Transportation Research Board: *Highway Capacity Manual,* 2000.
5. AASHTO-Geometric Design of Highways and Streets, 2001.

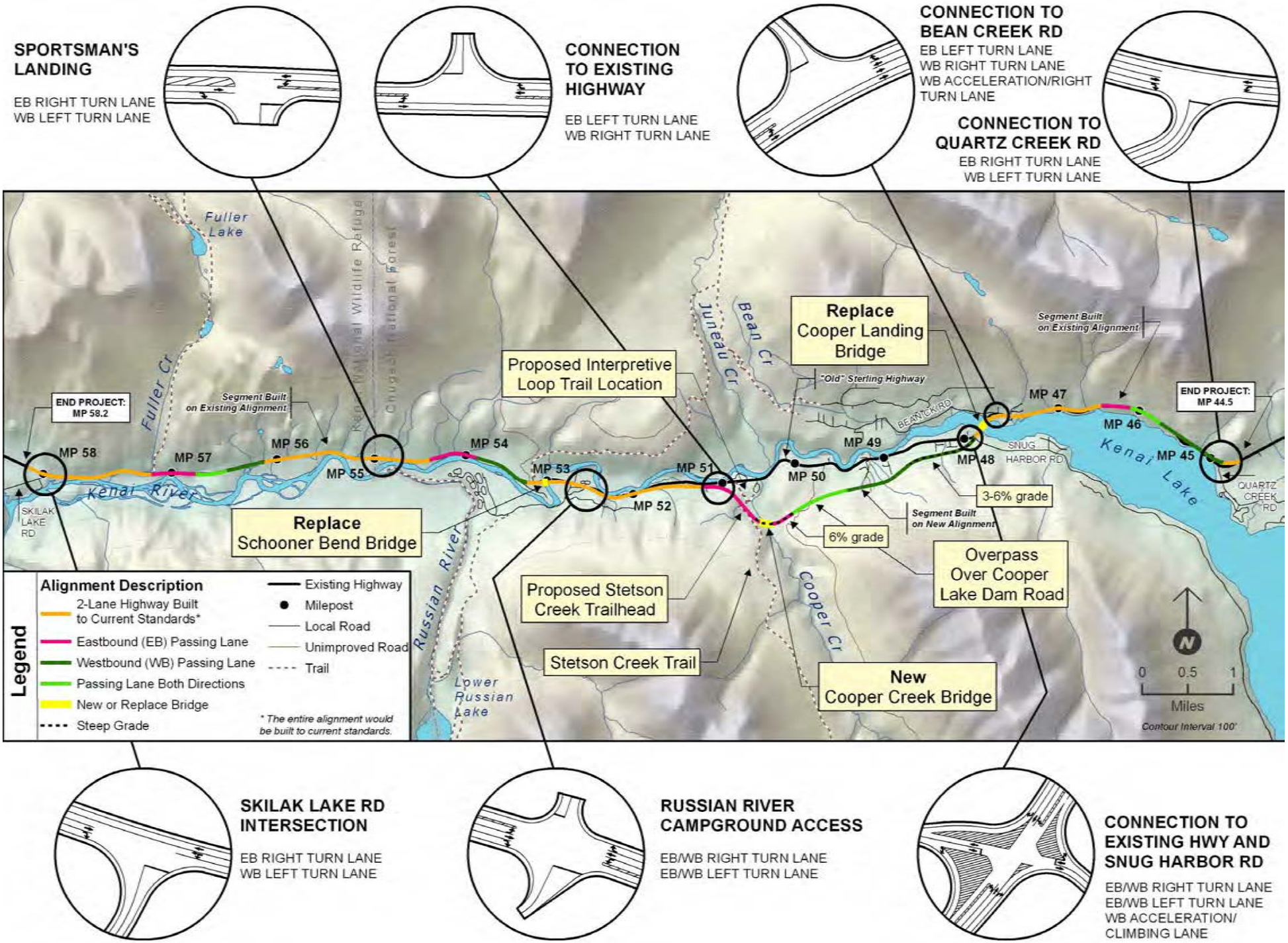
APPENDICES

APPENDIX A

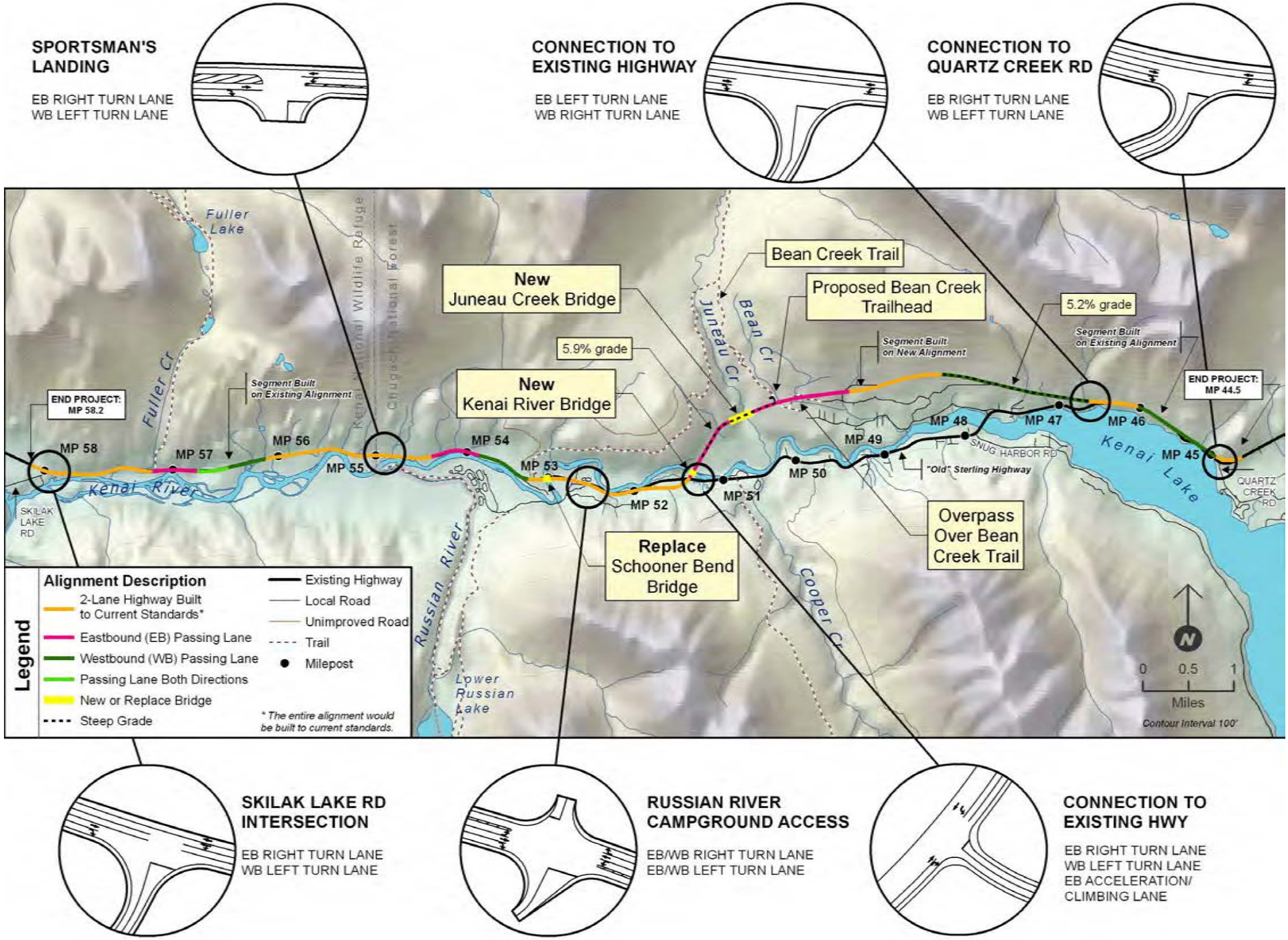
ALTERNATIVE FIGURES



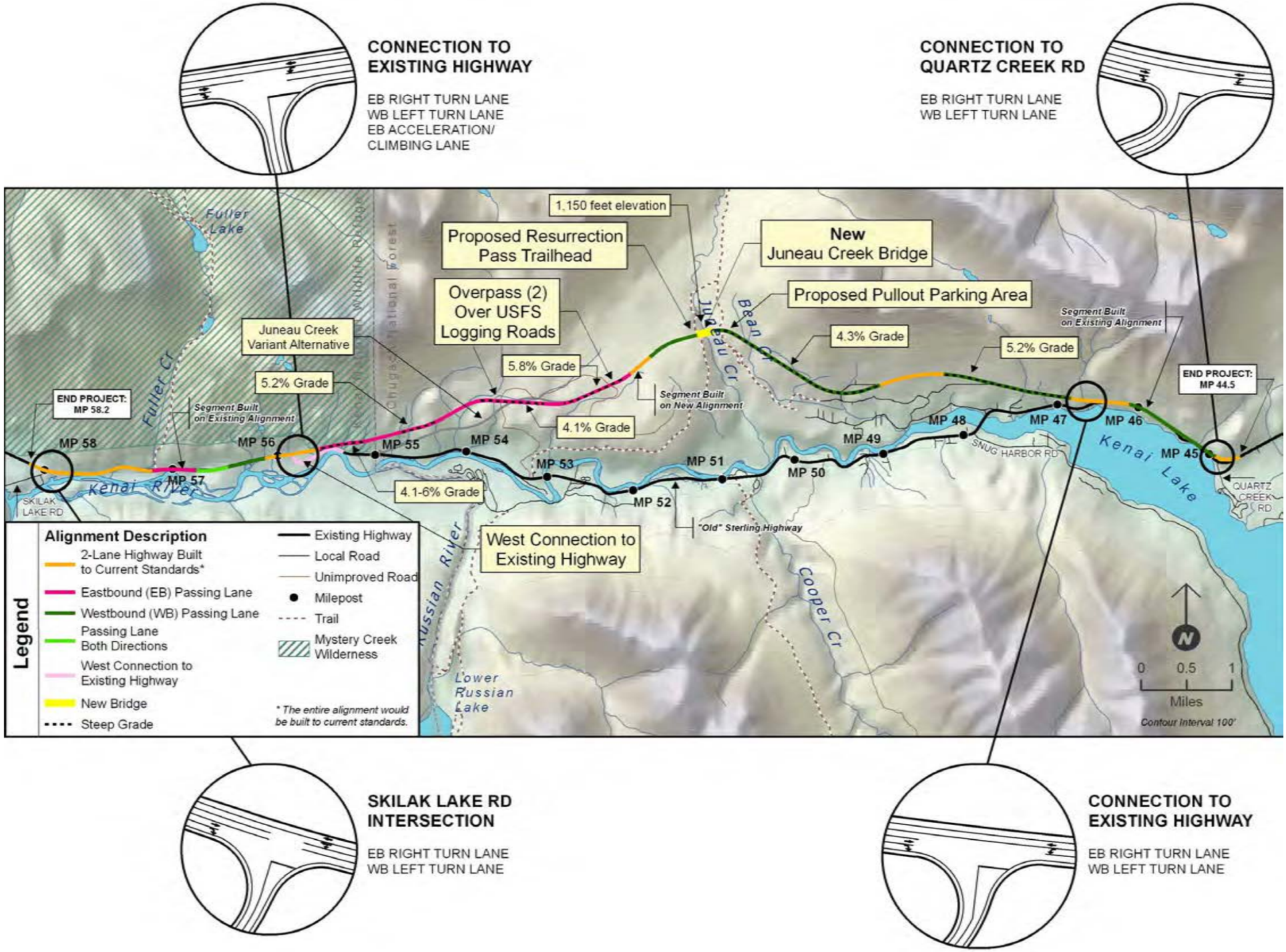
No Build Alternative



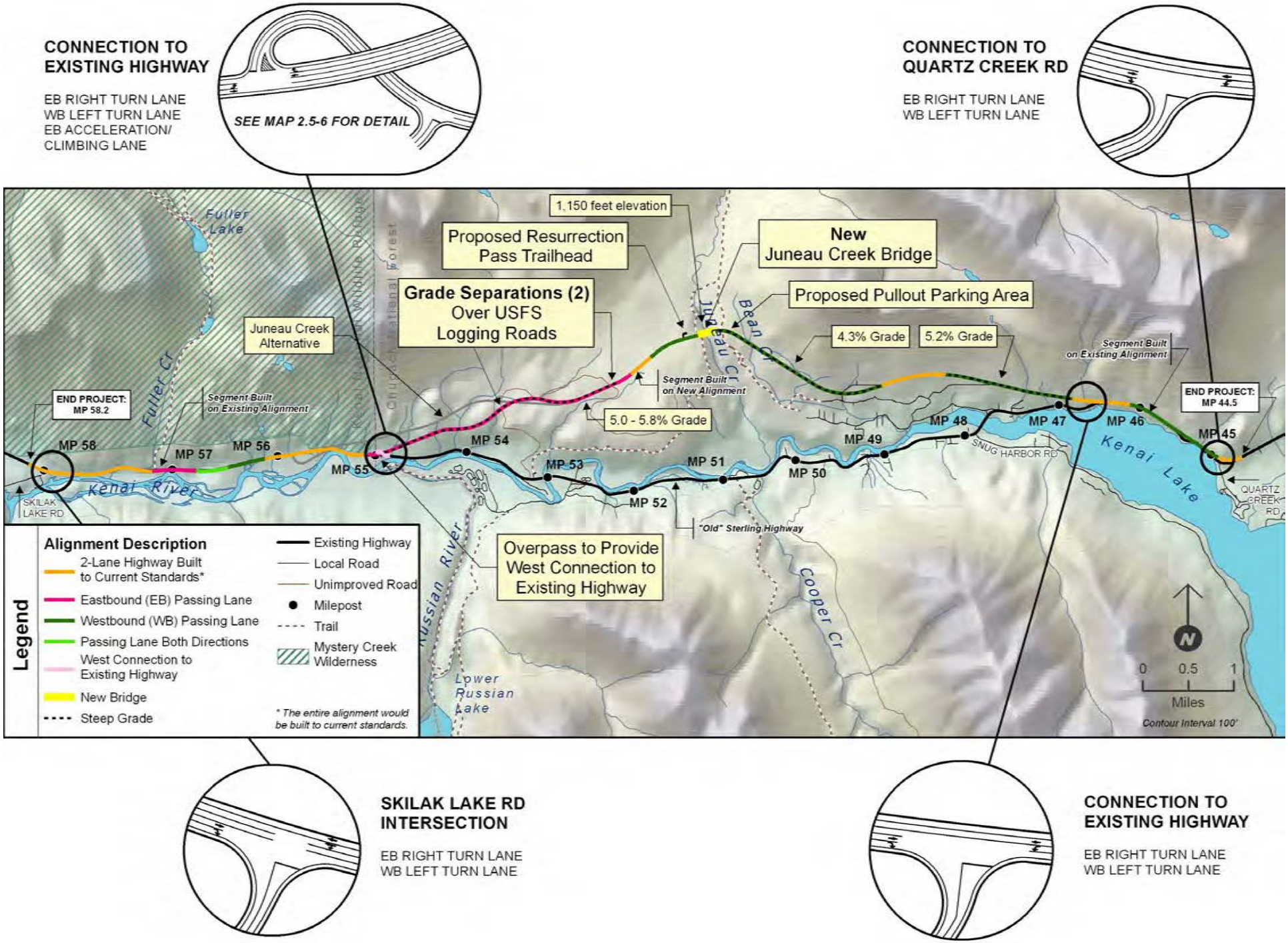
Cooper Creek Alternative



G-South Alternative



Juneau Creek Alternative



Juneau Creek Variant Alternative

APPENDIX B

HISTORICAL TRAFFIC VOLUMES

STERLING HIGHWAY AT COOPER LANDING - TOTAL

ROUTE: 110000 **MILEPOINT: 6.143** **STATION NUMBER: 11800015 9** **PERMANENT STN SUMMARY: 2012**

MNTH	MADT	% AADT	6AM - 10PM	10PM - 6AM	PERCENT OF AADT FOR DAY OF WEEK MON	TUE	WED	THU	FRI	WKDY	SAT	SUN
JAN	1164	39.9	91.9	8.1	96.0	77.2	82.4	86.2	128.6	94.1	116.8	112.6
FEB	1269	43.5	92.0	8.0	91.1	91.4	82.7	87.7	123.1	95.2	117.5	106.3
MAR	1601	54.9	92.2	7.8	87.6	79.3	83.3	91.6	128.4	94.0	110.3	119.2
APR	1960	67.2	92.0	8.0	85.7	83.8	83.7	91.6	127.5	94.5	112.1	115.6
MAY	3108	106.6	91.8	8.2	98.5	78.0	77.9	89.1	129.0	94.5	114.0	113.4
JUN	4754	163.1	90.1	9.9	86.6	80.6	83.2	91.3	121.1	92.6	115.1	122.1
JUL	7473	256.4	88.3	11.7	79.9	81.3	89.5	92.5	120.1	92.7	117.1	119.5
AUG	5127	175.9	91.3	8.7	96.4	83.9	84.1	87.2	113.8	93.1	111.2	123.6
SEP	3339	114.5	.0	.0	86.8	79.1	80.9	84.5	121.9	90.6	117.9	128.8
OCT	2189	75.1	92.1	7.9	83.3	80.1	79.6	93.6	125.7	92.5	119.0	118.7
NOV	1570	53.9	91.9	8.1	88.0	83.1	99.5	90.0	116.3	95.4	106.8	116.1
DEC	1421	48.7	90.9	9.1	85.3	78.6	91.5	99.9	126.8	96.4	112.5	105.5
AADT	2915		91.3	8.7	88.8	81.4	84.9	90.4	123.5	93.8	114.2	116.8

HISTORY YEAR	AADT	PERCENT GROWTH
2012	2915	-1.1
2011	2947	-3.0
2010	3037	-0.6
2009	3055	6.1
2008	2880	-7.7
2007	3120	2.8
2006	3036	-2.8
2005	3124	-0.3
2004	3132	1.6
2003	3082	1.3
2002	3042	4.3
2001	2917	

HIGH DAYS	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH	AVG
VOLUME	12229	12039	11639	9896	9646	9331	9240	9045	8882	7998	9995
DAY	07/22	07/21	07/20	07/27	07/29	07/28	07/15	07/19	07/18	07/17	
% AADT	419.5	413.0	399.3	339.5	330.9	320.1	317.0	310.3	304.7	274.4	342.9

HIGH HOURS	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH	20TH	30TH	40TH	50TH	AVG
VOLUME	1242	1094	1071	1051	1045	1024	1008	988	941	917	797	752	685	645	1038
HOUR	6PM	7PM	3PM	2PM	4PM	8PM	5PM	5PM	9PM	1PM	12AM	9PM	6PM	2PM	
DAY	07/20	07/20	07/22	07/22	07/22	07/20	07/22	07/20	07/20	07/22	07/21	07/27	07/15	07/28	
% AADT	42.6	37.5	36.7	36.1	35.8	35.1	34.6	33.9	32.3	31.5	27.3	25.8	23.5	22.1	35.6

PERCENT OF AADT BY HOUR

1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	12AM
1.2	0.9	0.8	0.7	0.7	1.0	1.6	2.3	3.4	4.8	5.9	6.6	7.1	7.5	7.9	7.9	7.7	7.3	6.6	5.8	4.7	3.5	2.5	1.7

STERLING HIGHWAY AT COOPER LANDING

ROUTE: 110000 **MILEPOINT: 6.143** **STATION NUMBER: 11800015 9** **PERMANENT STN SUMMARY: 2009**

MNTH	MADT	% AADT	6AM - 10PM	10PM - 6AM	PERCENT OF AADT FOR DAY OF WEEK MON	TUE	WED	THU	FRI	WKDY	SAT	SUN
JAN	1222	40.0	92.0	8.0	95.0	87.0	79.5	87.9	122.4	94.4	113.1	115.2
FEB	1421	46.5	92.6	7.4	91.4	77.1	81.2	85.1	133.0	93.6	118.6	113.3
MAR	1684	55.1	92.3	7.7	83.1	80.9	85.7	92.5	126.7	93.8	114.4	116.7
APR	2061	67.5	92.4	7.6	85.3	84.9	82.1	92.2	124.7	93.8	112.7	118.1
MAY	3527	115.5	91.5	8.5	102.6	79.9	75.8	88.1	124.9	94.3	111.9	116.7
JUN	5684	186.1	88.6	11.4	83.4	78.8	82.4	92.1	120.5	91.4	114.7	128.2
JUL	7344	240.4	88.6	11.4	86.1	77.0	80.3	93.5	117.6	90.9	116.3	129.2
AUG	4901	160.4	91.4	8.6	82.6	84.9	81.9	88.2	117.8	91.1	118.1	126.6
SEP	3424	112.1	93.1	6.9	94.4	75.9	74.3	83.0	123.9	90.3	123.3	125.2
OCT	2264	74.1	92.6	7.4	82.7	79.7	78.1	89.3	123.8	90.7	119.9	126.4
NOV	1587	51.9	92.8	7.2	80.6	84.0	97.3	91.1	118.1	94.2	111.5	117.3
DEC	1535	50.2	92.2	7.8	91.7	84.8	90.5	99.5	104.3	94.2	111.5	117.7
AADT	3055		91.7	8.3	88.2	81.2	82.4	90.2	121.5	92.7	115.5	120.9

HISTORY YEAR	AADT	PERCENT GROWTH
2009	3055	6.1
2008	2880	-7.7
2007	3120	2.8
2006	3036	-2.8
2005	3124	-0.3
2004	3132	1.6
2003	3082	1.3
2002	3042	4.3
2001	2917	

HIGH DAYS	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH	AVG
VOLUME	11268	10835	10328	10057	9312	9280	8943	8815	8248	8107	9519
DAY	07/19	07/17	07/18	07/25	07/05	07/26	07/03	07/24	06/21	07/12	
% AADT	368.8	354.7	338.1	329.2	304.8	303.8	292.7	288.5	270.0	265.4	311.6

DIR. DISTR.
NB - 49.8%
SB - 50.2%

HIGH HOURS	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH	20TH	30TH	40TH	50TH	AVG
VOLUME	1025	1024	1009	951	950	945	933	872	859	858	761	712	689	675	943
HOUR	4PM	2PM	5PM	3PM	3PM	8PM	3PM	6PM	7PM	4PM	6PM	12AM	6PM	4PM	
DAY	07/19	07/19	07/19	07/05	07/19	07/17	07/26	07/19	07/17	07/26	07/17	07/19	07/26	07/17	
% AADT	33.6	33.5	33.0	31.1	31.1	30.9	30.5	28.5	28.1	28.1	24.9	23.3	22.6	22.1	30.9

PERCENT OF AADT BY HOUR

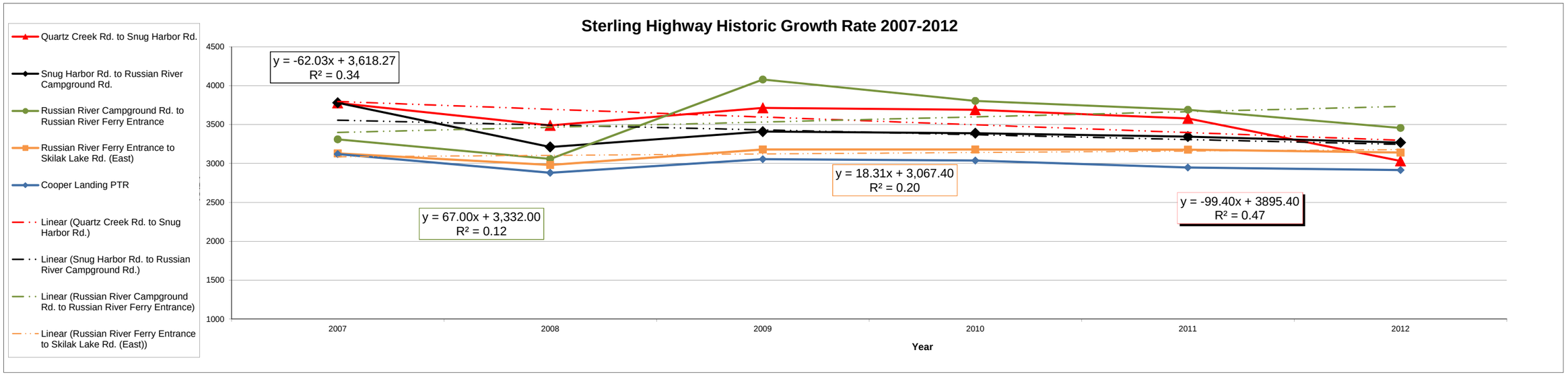
1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	12AM
1.1	0.8	0.7	0.6	0.7	1.0	1.6	2.4	3.7	4.9	5.8	6.5	7.0	7.3	7.7	7.9	7.7	7.4	6.8	6.0	4.7	3.5	2.5	1.7

Traffic Growth Summary

110000 Sterling Highway MP 45 to 60, Quartz Creek Road to Skilak Lake Road East

ANNUAL AVERAGE DAILY TRAFFIC

CDS MILE	DESCRIPTION	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
8.11 - 11.14	Quartz Creek Rd. to Snug Harbor Rd.	3006	3100	3100	2745	2300	2800	3223	3220	2928	3131	3320	3360	3410	3410	3029	3778	3490	3714	3690	3580	3033
11.14 - 15.67	Snug Harbor Rd. to Russian River Campground Rd.	2900	3150	3124	3100	2638	2475	2668	3029	2950	3050	3194	3240	3290	3461	3360	3780	3212	3410	3390	3345	3270
15.67 - 17.67	Russian River Campground Rd. to Russian River Ferry Entrance	2900	3150	3120	3100	2500	2500	2695	2690	2620	2710	2870	2668	2710	2710	3219	3310	3060	4079	3804	3690	3456
17.67 - 21.71	Russian River Ferry Entrance to Skilak Lake Rd. (East)	2500	2959	3000	3000	2367	2334	2740	2751	2680	2770	3200	3260	3280	3113	3040	3130	2981	3180	3180	3178	3140
6.14	Cooper Landing PTR										2917	3042	3082	3132	3124	3036	3120	2880	3055	3037	2947	2915



HISTORIC GROWTH RATES (Based on Linear Trend Line)

MILE	DESCRIPTION	EQUATION	R^2	TREND LINE VOLUME 2007	TREND LINE VOLUME 2012	GROWTH RATES 2007 - 2012
8.11 - 11.14	Quartz Creek Rd. to Snug Harbor Rd.	y = -99.4x + 3895.4	0.47	3796	3299	-2.77%
11.14 - 15.67	Snug Harbor Rd. to Russian River Campground Rd.	y = -62.03x + 3618.27	0.34	3556	3246	-1.81%
15.67 - 17.67	Russian River Campground Rd. to Russian River Ferry Entrance	y = 67x + 3332	0.12	3399	3734	1.90%
17.67 - 21.71	Russian River Ferry Entrance to Skilak Lake Rd. (East)	y = 18.31x + 3067.4	0.2	3086	3177	0.59%
6.14	Cooper Landing PTR	y = -24.06x + 3076.53	0.24	3052	2932	-0.80%

HISTORIC GROWTH RATES (Based on Beginning Year and Ending Year)

MILE	DESCRIPTION	BEGIN YEAR	BEGIN VOLUME	END YEAR	END VOLUME	GROWTH RATE
8.11 - 11.14	Quartz Creek Rd. to Snug Harbor Rd.	2007	3778	2012	3033	-4.30%
11.14 - 15.67	Snug Harbor Rd. to Russian River Campground Rd.	2007	3780	2012	3270	-2.86%
15.67 - 17.67	Russian River Campground Rd. to Russian River Ferry Entrance	2007	3310	2012	3456	0.87%
17.67 - 21.71	Russian River Ferry Entrance to Skilak Lake Rd. (East)	2007	3130	2012	3140	0.06%
6.14	Cooper Landing PTR	2007	3120	2012	2915	-1.35%

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GROWTH RATES LISTED ARE FOR YEARS THAT DATA IS AVAILABLE. IF ADDITIONAL INFORMATION IS NEEDED, PLEASE CONTATCT THE HIGHWAY DATA SECTION.

LINEAR TREND LINE ANALYSIS: A linear trend line analysis attempts to find a linear relationship among a given set of data. The equations given on this sheet are for the line that most closely fits the data.

HISTORICAL ANALYSIS: The historical analysis evaluates the change in data between two specified years. An annual compound growth rate calculation is applied to determine the growth rate from one year to another.

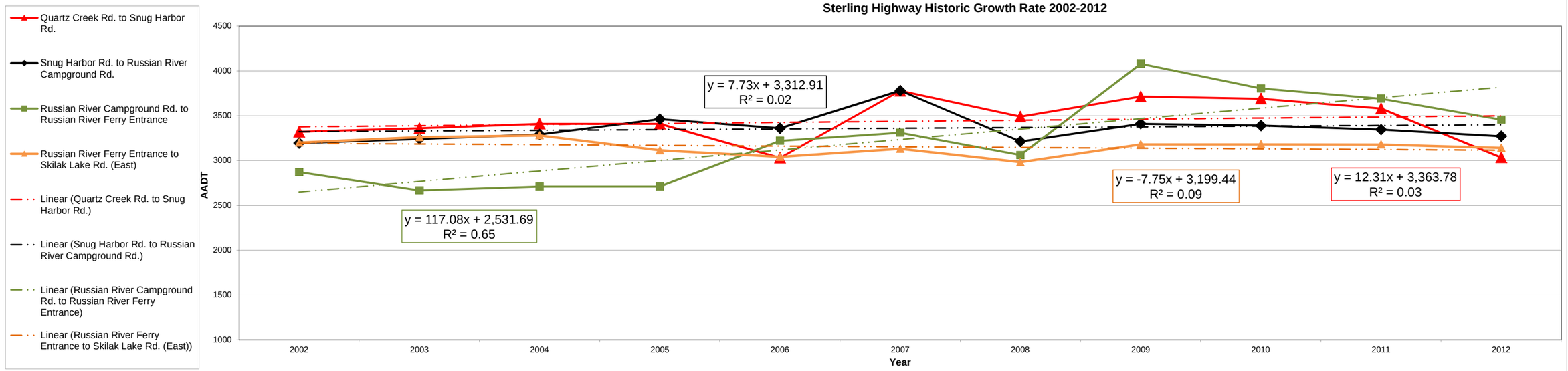
LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

Traffic Growth Summary

110000 Sterling Highway MP 45 to 60, Quartz Creek Road to Skilak Lake Road East

ANNUAL AVERAGE DAILY TRAFFIC

MILE	DESCRIPTION	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
8.11 - 11.14	Quartz Creek Rd. to Snug Harbor Rd.	3006	3100	3100	2745	2300	2800	3223	3220	2928	3131	3320	3360	3410	3410	3029	3778	3490	3714	3690	3580	3033
11.14 - 15.67	Snug Harbor Rd. to Russian River Campground Rd.	2900	3150	3124	3100	2638	2475	2668	3029	2950	3050	3194	3240	3290	3461	3360	3780	3212	3410	3390	3345	3270
15.67 - 17.67	Russian River Campground Rd. to Russian River Ferry Entrance	2900	3150	3120	3100	2500	2500	2695	2690	2620	2710	2870	2668	2710	2710	3219	3310	3060	4079	3804	3690	3456
17.67 - 21.71	Russian River Ferry Entrance to Skilak Lake Rd. (East)	2500	2959	3000	3000	2367	2334	2740	2751	2680	2770	3200	3260	3280	3113	3040	3130	2981	3180	3180	3178	3140



HISTORIC GROWTH RATES (Based on Linear Trend Line)

MILE	DESCRIPTION	EQUATION	R^2	TREND LINE VOLUME 2002	TREND LINE VOLUME 2012	GROWTH RATES 2002 - 2012
8.11 - 11.14	Quartz Creek Rd. to Snug Harbor Rd.	y = 12.31x + 3363.78	0.03	3376	3499	0.36%
11.14 - 15.67	Snug Harbor Rd. to Russian River Campground Rd.	y = 7.73x + 3312.91	0.02	3321	3398	0.23%
15.67 - 17.67	Russian River Campground Rd. to Russian River Ferry Entrance	y = 117.08x + 2531.69	0.65	2649	3820	3.73%
17.67 - 21.71	Russian River Ferry Entrance to Skilak Lake Rd. (East)	y = -7.75x + 3199.44	0.09	3192	3114	-0.25%

HISTORIC GROWTH RATES (Based on Beginning Year and Ending Year)

MILE	DESCRIPTION	BEGIN YEAR	BEGIN VOLUME	END YEAR	END VOLUME	GROWTH RATE
8.11 - 11.14	Quartz Creek Rd. to Snug Harbor Rd.	2002	3320	2012	3033	-0.90%
11.14 - 15.67	Snug Harbor Rd. to Russian River Campground Rd.	2002	3194	2012	3270	0.24%
15.67 - 17.67	Russian River Campground Rd. to Russian River Ferry Entrance	2002	2870	2012	3456	1.88%
17.67 - 21.71	Russian River Ferry Entrance to Skilak Lake Rd. (East)	2002	3200	2012	3140	-0.19%

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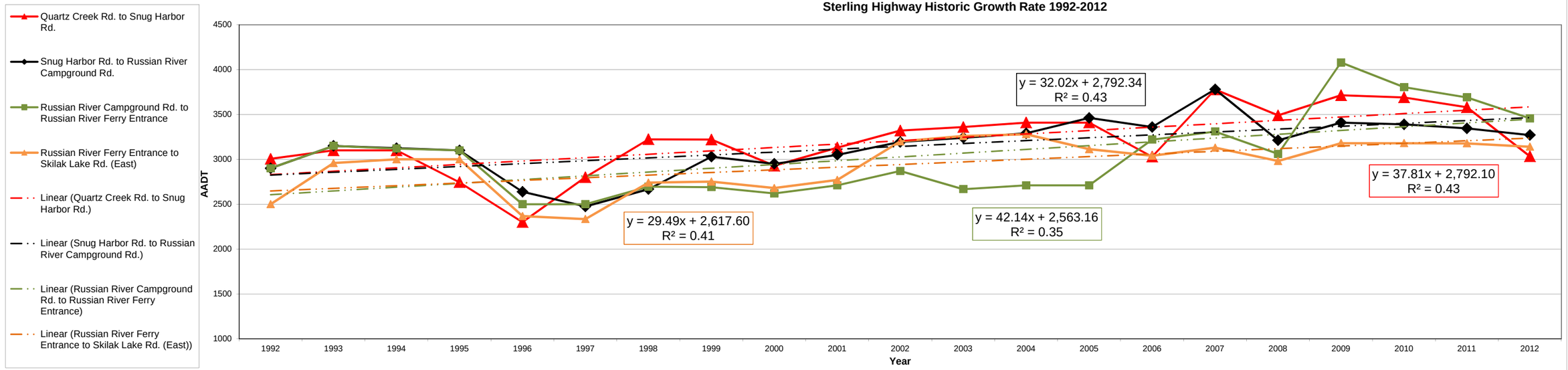
LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

Traffic Growth Summary

110000 Sterling Highway MP 45 to 60, Quartz Creek Road to Skilak Lake Road East

ANNUAL AVERAGE DAILY TRAFFIC

MILE	DESCRIPTION	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
8.11 - 11.14	Quartz Creek Rd. to Snug Harbor Rd.	3006	3100	3100	2745	2300	2800	3223	3220	2928	3131	3320	3360	3410	3410	3029	3778	3490	3714	3690	3580	3033
11.14 - 15.67	Snug Harbor Rd. to Russian River Campground Rd.	2900	3150	3124	3100	2638	2475	2668	3029	2950	3050	3194	3240	3290	3461	3360	3780	3212	3410	3390	3345	3270
15.67 - 17.67	Russian River Campground Rd. to Russian River Ferry Entrance	2900	3150	3120	3100	2500	2500	2695	2690	2620	2710	2870	2668	2710	2710	3219	3310	3060	4079	3804	3690	3456
17.67 - 21.71	Russian River Ferry Entrance to Skilak Lake Rd. (East)	2500	2959	3000	3000	2367	2334	2740	2751	2680	2770	3200	3260	3280	3113	3040	3130	2981	3180	3180	3178	3140



HISTORIC GROWTH RATES (Based on Linear Trend Line)

MILE	DESCRIPTION	EQUATION	R^2	TREND LINE VOLUME 1992	TREND LINE VOLUME 2012	GROWTH RATES 1992 - 2012
8.11 - 11.14	Quartz Creek Rd. to Snug Harbor Rd.	y = 37.81x + 2792.1	0.43	2830	3586	1.19%
11.14 - 15.67	Snug Harbor Rd. to Russian River Campground Rd.	y = 32.02x + 2792.34	0.43	2824	3465	1.03%
15.67 - 17.67	Russian River Campground Rd. to Russian River Ferry Entrance	y = 42.14x + 2563.16	0.35	2605	3448	1.41%
17.67 - 21.71	Russian River Ferry Entrance to Skilak Lake Rd. (East)	y = 29.49x + 2617.6	0.41	2647	3237	1.01%

HISTORIC GROWTH RATES (Based on Beginning Year and Ending Year)

MILE	DESCRIPTION	BEGIN YEAR	BEGIN VOLUME	END YEAR	END VOLUME	GROWTH RATE
8.11 - 11.14	Quartz Creek Rd. to Snug Harbor Rd.	1992	3006	2012	3033	0.04%
11.14 - 15.67	Snug Harbor Rd. to Russian River Campground Rd.	1992	2900	2012	3270	0.60%
15.67 - 17.67	Russian River Campground Rd. to Russian River Ferry Entrance	1992	2900	2012	3456	0.88%
17.67 - 21.71	Russian River Ferry Entrance to Skilak Lake Rd. (East)	1992	2500	2012	3140	1.15%

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LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

Route/Mpt	Route Name/Description	Length(mi)	FC	10AADT	11AADT	12AADT	DVMT
100137	ANDERSON WAY, SELDOVIA						
0.000	Jct with Alder Street	0.348	8	370	370	360	125
0.348	Jct with Shoreline Drive					Total	125
100139	SELDOVIA STREET, SELDOVIA						
0.000	Jct with Main Street	0.070	8	700	700	680	48
0.070	Jct with Alder Street					Total	48
100148	DOCK ROAD, SELDOVIA						
0.000	Soldotna Ferry Terminal	0.131	7	70	70	70	9
0.131	Jct with Main Street					Total	9
100150	JAKALOF BAY ROAD, SELDOVIA						
0.000	Jct with Shoreline Drive	2.376	8	290	290	280	665
2.376	Jct with Boone Lane	2.488	8	110	110	110	274
4.864	Jct with Bickford Circle	7.464	8	40	40	40	299
12.328	End of State Maintenance					Total	1238
110000	STERLING HIGHWAY						
0.000	Jct with Seward Highway	0.581	1	1666	1640	2256	1311
0.581	Jct with Sterling Wye (West Leg) - PTR	7.506	1	3037	2947	2915	21880
8.087	Jct with Quartz Creek Road	3.045	1	3690	3580	3033	9235
11.132	Jct with Snug Harbor Road	4.538	1	3390	3345	3270	14839
15.670	Jct with Russian River Campground Road	2.325	1	3804	3690	3456	8035
17.995	Jct with Russian River Ferry Entrance	3.769	1	3180	3178	3140	11835
21.764	Jct with Skilak Lake Road	17.176	1	2943	2850	2810	48265
38.940	Jct with Skilak Lake Road	3.894	1	3607	3480	3420	13317
42.834	Jct with Kenai Keys Road - PTR	2.843	1	3846	3711	3652	10383
45.677	Moose River Bridge	1.375	1	6128	5990	5950	8181
47.052	Jct with Swanson River Road	3.701	1	6090	8022	8030	29719
50.753	Jct with Robinson Loop Road - PTR	2.081	1	8425	8313	8314	17301
52.834	Jct with Forest Lane Road	2.868	1	10344	10230	10240	29368
55.702	Jct with Mackey Lake Road	1.473	1	14160	15409	15410	22699
57.175	Jct with Kenai Spur Highway	0.329	2	16900	16650	18085	5950
57.504	Jct with Birch Street	0.222	2	17320	18737	18740	4160

Route/Mpt	Route Name/Description	Length(mi)	FC	09AADT	10AADT	11AADT	DVMT
100139	SELDOVIA STREET, SELDOVIA						
0.000	Jct with Main Street	0.070	8	678	700	700	49
0.070	Jct with Alder Street					Total	49
100148	DOCK ROAD, SELDOVIA						
0.000	Soldotna Ferry Terminal	0.131	7	71	70	70	9
0.131	Jct with Main Street					Total	9
100150	JAKALOF BAY ROAD, SELDOVIA						
0.000	Jct with Shoreline Drive	2.376	8	279	290	290	689
2.376	Jct with Boone Lane	2.488	8	106	110	110	274
4.864	Jct with Bickford Circle	7.464	8	36	40	40	299
12.328	End of State Maintenance					Total	1261
110000	STERLING HIGHWAY						
0.000	Jct with Seward Highway	0.581	1	2001	1666	1640	953
0.581	Jct with Sterling Wye (West Leg) - PTR	7.506	1	3055	3037	2947	22120
8.087	Jct with Quartz Creek Road	3.045	1	3714	3690	3580	10901
11.132	Jct with Snug Harbor Road	4.538	1	3410	3390	3345	15180
15.670	Jct with Russian River Campground Road	2.325	1	4079	3804	3690	8579
17.995	Jct with Russian River Ferry Entrance	3.769	1	3180	3180	3178	11978
21.764	Jct with Skilak Lake Road	17.176	1	3500	2943	2850	48952
38.940	Jct with Skilak Lake Road	3.894	1	4220	3607	3480	13551
42.834	Jct with Kenai Keys Road - PTR	2.843	1	3802	3846	3711	10550
45.677	Moose River Bridge	1.375	1	6800	6128	5990	8236
47.052	Jct with Swanson River Road	3.701	1	6040	6090	8022	29689
50.753	Jct with Robinson Loop Road - PTR	2.081	1	8352	8425	8313	17299
52.834	Jct with Forest Lane Road	2.868	1	11720	10344	10230	29340
55.702	Jct with Mackey Lake Road	1.473	1	13908	14160	15409	22697
57.175	Jct with Kenai Spur Highway	0.329	2	16634	16900	16650	5478
57.504	Jct with Birch Street	0.222	2	17055	17320	18737	4160
57.726	Jct with Binkley Street	0.306	2	19010	18329	18060	5526
58.032	Jct with Kobuk Street	0.414	2	17414	17690	17430	7216
58.446	Jct with Kalifornsky Beach Road	4.251	2	5531	5580	5520	23466
62.697	Jct with Arc Loop Road	2.303	2	4607	4650	4824	11110

Route/Mpt	Route Name/Description	Length(mi)	FC	07AADT	08AADT	09AADT	VMT
080068	STANDARD OIL ROAD, BETHEL						
0.000	Jct with Chief Eddie Hoffman Highway	0.454	9	400	833	840	381
0.454	Yukon Fuel Company					Total	381
080076	NOEL POLTY BLVD, BETHEL						
0.000	Jct with Uqsuqak Road	1.764	9		837	850	1499
1.764	Jct with Tower Road					Total	1499
100100	AIRPORT AVENUE, SELDOVIA						
0.000	Jct with Main Street	0.675	7	210	200	388	262
0.675	Airport Parking					Total	262
100125	MAIN STREET, SELDOVIA						
0.183	Jct with Dock Road	0.203	7	560	530	540	110
0.386	Jct with Seldovia Street	0.160	7	670	640	748	120
0.546	Jct with Airport Avenue					Total	229
100137	ANDERSON WAY, SELDOVIA						
0.000	Jct with Alder Street	0.348	8	360	340	362	126
0.348	Jct with Shoreline Drive					Total	126
100139	SELDOVIA STREET, SELDOVIA						
0.000	Jct with Main Street	0.070	8	500	480	678	47
0.070	Jct with Alder Street					Total	47
100148	DOCK ROAD, SELDOVIA						
0.000	Soldotna Ferry Terminal	0.131	7	70	70	71	9
0.131	Jct with Main Street					Total	9
100150	JAKALOF BAY ROAD, SELDOVIA						
0.000	Jct with Shoreline Drive	2.376	8	360	340	279	663
2.376	Jct with Boone Lane	2.488	8	120	110	106	264
4.864	Jct with Bickford Circle	7.464	8	50	50	36	269
12.328	End of State Maintenance					Total	1195
110000	STERLING HIGHWAY						

Route/Mpt	Route Name/Description	Length(mi)	FC	07AADT	08AADT	09AADT	VMT
0.000	Jct with Seward Highway	0.581	1	1850	1710	2001	1163
0.581	Jct with Sterling Wye (West Leg) - PTR	7.506	1	3120	2880	3055	22931
8.087	Jct with Quartz Creek Road	3.045	1	3778	3490	3714	11309
11.132	Jct with Snug Harbor Road	4.538	1	3780	3212	3410	15475
15.670	Jct with Russian River Campground Road	2.325	1	3310	3060	4079	9484
17.995	Jct with Russian River Ferry Entrance	3.769	1	3130	2981	3180	11985
21.764	Jct with Skilak Lake Road	17.176	1	3458	3272	3500	60116
38.940	Jct with Skilak Lake Road	3.894	1	4217	3910	4220	16433
42.834	Jct with Kenai Keys Road - PTR	2.843	1	3800	3526	3802	10809
45.677	Moose River Bridge	1.375	1	6831	6410	6800	9350
47.052	Jct with Swanson River Road	3.701	1	7340	5782	6040	22354
50.753	Jct with Robinson Loop Road - PTR	2.081	1	8430	7997	8352	17381
52.834	Jct with Forest Lane Road	2.868	1	11827	11220	11720	33613
55.702	Jct with Mackey Lake Road	1.473	1	13690	13030	13908	20486
57.175	Jct with Kenai Spur Highway	0.329	2	14850	14120	16634	5473
57.504	Jct with Birch Street	0.222	2	17107	16270	17055	3786
57.726	Jct with Binkley Street	0.306	2	19247	18300	19010	5817
58.032	Jct with Kobuk Street	0.414	2	19070	18140	17414	7209
58.446	Jct with Kalifornsky Beach Road	4.251	2	6400	6070	5531	23512
62.697	Jct with Arc Loop Road	2.303	2	5500	5220	4607	10610
65.000	Jct with Reflection Lake Road	5.719	2	4120	3910	3901	22310
70.719	Jct with Kalifornsky Beach Road	2.021	2	5294	4767	4920	9943
72.740	Jct with Cohoe Loop Road (North)	2.869	2	3525	3689	3830	10988
75.609	Jct with Cohoe Loop Road (South)	3.248	2	3454	3210	3290	10686
78.857	Jct with Clam Gulch Road	9.471	2	2530	2970	3050	28887
88.328	Jct with Silver Lane	7.436	2	2060	1890	2553	18984
95.764	Jct with Mission Avenue	2.393	2	3465	3150	3170	7586
98.157	Jct with Deep Creek Road	13.825	2	2300	2090	2100	29033
111.982	Jct with Old Sterling at Stariski - PTR	4.574	2	2715	2467	2484	11362
116.556	Jct with North Fork Road (North)	0.253	2	4560	4150	4035	1021
116.809	Jct with Old Sterling Highway	7.093	2	3253	2960	3182	22570
123.902	Jct with North Fork Road (South)	0.480	2	3911	3560	3580	1718
124.382	Jct with Old Sterling Highway	2.251	2	3340	3320	3340	7518
126.633	Jct with Diamond Ridge Road	2.102	2	4097	3790	3800	7988
128.735	Jct with Rogers Loop (North)	0.504	2	4620	4723	4740	2389
129.239	Jct with Rogers Loop (South)	1.800	2	5500	4844	4860	8748

Route/Mpt	Route Name/Description	Length(mi)	FC	07AADT	08AADT	09AADT	VMT
131.039	Jct with West Hill Road	0.772	2	7762	7360	7380	5697
131.811	Jct with Crittenden Drive	0.145	2	9190	9275	9280	1346
131.956	Jct with Pioneer Avenue	0.256	2	9990	9640	8495	2175
132.212	Jct with Main Street - PTR	0.691	2	9595	9257	9266	6403
132.903	Jct with Lake Street	0.947	2	6410	6017	5970	5654
133.850	Jct with FAA Road - PTR	4.393	2	4125	3840	3773	16575
138.243	End of Homer Spit Road					Total	558874
110030	GREER ROAD, HOMER						
0.000	Jct with East End Road	0.894	9	255	240	240	215
0.894	Jct with Trappers Lane					Total	215
110040	FAA ROAD, HOMER						
0.000	Jct with Sterling Highway	0.525	8	780	727	740	389
0.525	Airport Parking Lot					Total	389
110100	PIONEER AVENUE, HOMER						
0.000	Jct with Lake Street	0.618	7	7590	7260	7396	4571
0.618	Jct with Main Street	0.370	7	4250	4060	4423	1637
0.988	Jct with Sterling Highway					Total	6207
110150	LAKE STREET, HOMER						
0.000	Jct with Sterling Highway	0.489	7	5067	4840	4349	2127
0.489	Jct with Pioneer Avenue					Total	2127
110200	KACHEMAK BAY DRIVE, HOMER						
0.000	Jct with Sterling Highway	1.014	7/8	1687	1620	2156	2186
1.014	Homer Boat Yard	2.510	8	1596	1530	1530	3840
3.524	Jct with East End Road					Total	6026
110300	EAST END ROAD, HOMER						
0.000	Jct with Lake Street - PTR	0.801	7	8338	7940	8053	6450
0.801	Jct with East Hill Road	2.770	7	5401	5095	5170	14321
3.571	Jct with Kachemak Bay Drive	5.525	7	2816	2970	3010	16630
9.096	Jct with Greer Road	3.173	7	1770	1281	1300	4125
12.269	Jct with Old East End Road (W Jct)	6.166	7	510	829	840	5179

Route/Mpt	Route Name/Description	Length(mi)	FC	05AADT	06AADT	07AADT	VMT
080068	STANDARD OIL ROAD, BETHEL						
0.454	Yukon Fuel Company					Total	182
100100	AIRPORT AVENUE, SELDOVIA						
0.000	Jct with Main Street	0.675	7	212	210	210	142
0.675	Airport Parking					Total	142
100125	MAIN STREET, SELDOVIA						
0.183	Jct with Dock Road	0.203	7	562	560	560	114
0.386	Jct with Seldovia Street	0.160	7	678	670	670	107
0.546	Jct with Airport Avenue					Total	221
100137	ANDERSON WAY, SELDOVIA						
0.000	Jct with Alder Street	0.348	8	360	360	360	125
0.348	Jct with Shoreline Drive					Total	125
100139	SELDOVIA STREET, SELDOVIA						
0.000	Jct with Main Street	0.070	8	500	500	500	35
0.070	Jct with Alder Street					Total	35
100148	DOCK ROAD, SELDOVIA						
0.000	Soldotna Ferry Terminal	0.131	7	70	70	70	9
0.131	Jct with Main Street					Total	9
100150	JAKALOF BAY ROAD, SELDOVIA						
0.000	Jct with Shoreline Drive	2.376	8	360	360	360	855
2.376	Jct with Boone Lane	2.488	8	120	120	120	299
4.864	Jct with Bickford Circle	7.464	8	50	50	50	373
12.328	End of State Maintenance					Total	1527
110000	STERLING HIGHWAY						
0.000	Jct with Seward Highway	0.581	1	2170	1835	1850	1075
0.581	Jct with Sterling Wye (West Leg) - PTR	7.506	1	3124	3036	3120	23419
8.087	Jct with Quartz Creek Road	3.045	1	3410	3029	3778	11504
11.132	Jct with Snug Harbor Road	4.538	1	3461	3360	3780	17154
15.670	Jct with Russian River Campground Road	2.325	1	2710	3219	3310	7696

Route/Mpt	Route Name/Description	Length(mi)	FC	05AADT	06AADT	07AADT	VMT
110000	STERLING HIGHWAY						
17.995	Jct with Russian River Ferry Entrance	3.769	1	3113	3040	3130	11797
21.764	Jct with Skilak Lake Road	17.176	1	3150	3070	3458	59395
38.940	Jct with Skilak Lake Road	3.894	1	4100	4010	4217	16421
42.834	Jct with Kenai Keys Road - PTR	2.843	1	3771	3688	3800	10803
45.677	Moose River Bridge	1.375	1	6480	6340	6831	9393
47.052	Jct with Swanson River Road	3.701	1	7233	7150	7340	27165
50.753	Jct with Robinson Loop Road - PTR	2.081	1	8303	8212	8430	17543
52.834	Jct with Forest Lane Road	2.868	1	12949	12810	11827	33920
55.702	Jct with Mackey Lake Road	1.473	1	13590	13440	13690	20165
57.175	Jct with Kenai Spur Highway	0.329	2	14618	14460	14850	4886
57.504	Jct with Birch Street	0.222	2	16943	16760	17107	3798
57.726	Jct with Binkley Street	0.306	2	18658	18450	19247	5890
58.032	Jct with Kobuk Street	0.414	2	18892	18680	19070	7895
58.446	Jct with Kalifornsky Beach Road	4.251	2	6579	6230	6400	27206
62.697	Jct with Arc Loop Road	2.303	2	5419	5360	5500	12667
65.000	Jct with Reflection Lake Road	5.719	2	4840	4016	4120	23562
70.719	Jct with Kalifornsky Beach Road	2.021	2	5000	4950	5294	10699
72.740	Jct with Cohoe Loop Road (North)	2.869	2	4580	4530	3525	10113
75.609	Jct with Cohoe Loop Road (South)	3.248	2	2890	2860	3454	11219
78.857	Jct with Clam Gulch Road	9.471	2	2687	2462	2530	23962
88.328	Jct with Silver Lane	7.436	2	2170	2007	2060	15318
95.764	Jct with Mission Avenue	2.393	2	3240	3310	3465	8292
98.157	Jct with Deep Creek Road	13.825	2	2210	2260	2300	31798
111.982	Jct with Old Sterling at Stariski - PTR	4.574	2	2582	2641	2715	12418
116.556	Jct with North Fork Road (North)	0.253	2	4340	4440	4560	1154
116.809	Jct with Old Sterling Highway	7.093	2	3400	3480	3253	23074
123.902	Jct with North Fork Road (South)	0.480	2	3860	3950	3911	1877
124.382	Jct with Old Sterling Highway	2.251	2	3228	3250	3340	7518
126.633	Jct with Diamond Ridge Road	2.102	2	4340	4350	4097	8612
128.735	Jct with Rogers Loop (North)	0.504	2	4588	4580	4620	2328
129.239	Jct with Rogers Loop (South)	1.800	2	5464	5450	5500	9900
131.039	Jct with West Hill Road	0.772	2	7360	7350	7762	5992
131.811	Jct with Crittenden Drive	0.145	2	9295	9170	9190	1333
131.956	Jct with Pioneer Avenue	0.256	2	8840	9926	9990	2557
132.212	Jct with Main Street - PTR	0.691	2	9709	9578	9595	6630

Route/MiPt	Route Name/Description	Length(mi)	FC	03AADT	04AADT	05AADT	VMT
100150	**JAKALOF BAY ROAD, SELDOVIA**						
0.000	Jct with Shoreline Drive	2.376	8	290	290	360	855
2.376	Jct with Boone Lane	2.488	8	118	120	120	299
4.864	Jct with Bickford Circle	7.464	8	45	45	50	373
12.328	End of State Maintenance					Total	1527
110000	**STERLING HIGHWAY**						
0.000	Jct with Seward Highway	0.580	1	2129	2160	2170	1259
0.580	Jct with Sterling Wye (West Leg)	7.530	1	3082	3132	3124	23524
8.110	Jct with Quartz Creek Road	3.030	1	3360	3410	3410	10332
11.140	Jct with Snug Harbor Road	4.530	1	3240	3290	3461	15678
15.670	Jct with Russian River Campground Road	2.000	1	2668	2710	2710	5420
17.670	Jct with Russian River Ferry Entrance	4.040	1	3260	3280	3113	12577
21.710	Jct with Skilak Lake Road	17.210	1	2840	3135	3150	54212
38.920	Jct with Skilak Lake Road	3.890	1	3620	4083	4100	15949
42.810	Jct with Kenai Keys Road	2.810	1	3763	3757	3771	10597
45.620	Moose River Bridge	1.400	1	6580	6449	6480	9072
47.020	Jct with Swanson River Road	3.620	1	4160	4180	7233	26183
50.640	Jct with Robinson Loop Road	2.160	1	8221	8311	8303	17934
52.800	Jct with Forest Lane Road	2.880	1	11070	10348	12949	37293
55.680	Jct with Mackeys Lake Road	1.470	1	12980	15023	13590	19977
57.150	Jct with Kenai Spur Highway	0.330	2	11560	15870	14618	4824
57.480	Jct with Birch Street	0.220	2	16500	16710	16943	3727
57.700	Jct with Binkley Street	0.310	2	19790	19464	18658	5784
58.010	Jct with Kobuk Street	0.410	2	17290	17510	18892	7746
58.420	Jct with Kalifornsky Beach Road	4.240	2	6544	6620	6579	27895
62.660	Jct with Arc Loop Road	1.680	2	4270	4300	5419	9104
64.340	Jct with Reflection Lake Road	6.340	2	4882	4870	4840	30686
70.680	Jct with Kalifornsky Beach Road	2.030	2	5170	5030	5000	10150
72.710	Jct with Cohoe Loop Road	2.850	2	4620	4610	4580	13053
75.560	Jct with South Cohoe Loop Road	3.250	2	3360	2905	2890	9393
78.810	Jct with Clam Gulch Road	9.190	2	2620	2610	2687	24694
88.000	Jct with Sterling Lane	7.700	2	2180	2180	2170	16709
95.700	Jct with Mission Avenue	2.380	2	3340	3260	3240	7711
98.080	Jct with Deep Creek Road	13.800	2	2460	2221	2210	30498
111.880	Jct with Old Sterling at Stariski	4.580	2	2605	2601	2582	11826
116.460	Jct with North Fork Road	0.220	2	4379	4370	4340	955

Route/MiPt	Route Name/Description	Length(mi)	FC	03AADT	04AADT	05AADT	VMT
110000	**STERLING HIGHWAY**						
116.680	Jct with Old Sterling Highway	7.130	2	3426	3420	3400	24242
123.810	Jct with North Fork Road	0.480	2	4320	3884	3860	1853
124.290	Jct with Old Sterling Highway	2.250	2	3010	3000	3228	7263
126.540	Jct with Diamond Ridge Road	1.880	2	3850	4375	4340	8159
128.420	Jct with Rogers Loop	0.540	2	4910	4900	4588	2478
128.960	Jct with Rogers Loop	1.860	2	4960	4950	5464	10163
130.820	Jct with West Hill Road	0.910	2	6890	7438	7360	6698
131.730	Jct with Crittenden Drive	0.140	2	9370	9490	9295	1301
131.870	Jct with Pioneer Avenue	0.260	2	8838	8950	8840	2298
132.130	Jct with Main Street	0.740	2	9393	9830	9709	7185
132.870	Jct with Lake Street	1.060	2	6250	6410	6492	6882
133.930	Jct with FAA Road	4.250	2	4055	4075	4189	17803
138.180	Jct with Southwest Marine Highway					Total	571084
110030	**GREER ROAD, HOMER**						
0.000	Jct with Kalopi Court	0.905	9	230	405	400	362
0.905	Jct with Tappers Lane, Homer					Total	362
110040	**FAA ROAD, HOMER**						
0.000	Jct with Sterling Highway	0.516	8	658	670	743	383
0.516	Airport Parking Lot					Total	383
110100	**PIONEER AVENUE, HOMER**						
0.000	Jct with Lake Street	0.620	7	6871	7000	6990	4334
0.620	Jct with Main Street	0.374	7	4580	4670	4093	1531
0.994	Jct with Sterling Highway					Total	5865
110150	**LAKE STREET, HOMER**						
0.000	Jct with Sterling Highway	0.494	7	6110	4746	4740	2342
0.494	Jct with Pioneer Avenue					Total	2342
110200	**KACHEMAK BAY DRIVE, HOMER**						
0.000	Jct with Sterling Highway	1.026	7/8	2130	2170	2794	2867
1.026	Homer Boat Yard	2.523	8			3127	7889
3.549	Jct with East End Road					Total	10756

Route	MiPt	Description	Length(mi)	FC	01AADT	02AADT	03AADT	VMT
080054		**BIA HEADQUARTERS ROAD, BETHEL**						
	0.000	Jct with Chief Eddie Hoffman Highway	1.862	8/9	198	210	210	391
	1.862	BIA Headquarters Complex					Total	391
080068		**STANDARD OIL ROAD, BETHEL**						
	0.000	Jct with Chief Eddie Hoffman Hwy	0.454	9	452	470	480	218
	0.454	Yukon Fuel Company					Total	218
100100		**AIRPORT AVENUE, SELDOVIA**						
	0.000	Jct with Main Street	0.675	7	230	220	235	159
	0.675	Airport Parking					Total	159
100125		**MAIN STREET, SELDOVIA**						
	0.183	Jct with Dock Road	0.203	7	410	400	410	83
	0.386	Jct with Seldovia Street	0.160	7	730	710	720	115
	0.546	Jct with Airport Avenue					Total	198
100137		**ANDERSON WAY, SELDOVIA**						
	0.000	Jct with Alder Street	0.348	8	430	420	360	125
	0.348	Jct with Shoreline Drive					Total	125
100139		**SELDOVIA STREET, SELDOVIA**						
	0.000	Jct with Main Street	0.070	8	450	450	405	28
	0.070	Jct with Alder Street					Total	28
100148		**DOCK ROAD, SELDOVIA**						
	0.000	Soldotna Ferry Terminal	0.131	7	40	40	31	4
	0.131	Jct with Main Street					Total	4
100150		**JAKALOF BAY ROAD, SELDOVIA**						
	0.000	Jct with Shoreline Drive	2.376	8	300	290	290	689
	2.376	Jct with Boone Lane	2.488	8			118	294
	4.864	Jct with Bickford Circle	7.464	8	55	55	45	336
	12.328	End of State Maintenance					Total	1319
110000		**STERLING HIGHWAY**						
	0.000	Jct with Southwest Marine Highway	4.250	2	4023	4107	4055	17234
	4.250	Jct with FAA Road	1.060	2	5889	6111	6250	6625
	5.310	Jct with Lake Street	0.740	2	8587	8873	9393	6951

Route	MiPt	Description	Length(mi)	FC	01AADT	02AADT	03AADT	VMT
110000		**STERLING HIGHWAY**						
	6.050	Jct with Main Street	0.260	2	6290	6490	8838	2298
	6.310	Jct with Pioneer Avenue	0.140	2	7742	8957	9370	1312
	6.450	Jct with Crittenden Drive	0.910	2	6384	6590	6890	6270
	7.360	Jct with West Hill Road	1.860	2	3890	4773	4960	9226
	9.220	Jct with Rogers Loop	0.540	2	4660	4725	4910	2651
	9.760	Jct with Rogers Loop	1.880	2	3520	3710	3850	7238
	11.640	Jct with Diamond Ridge Road	2.250	2	3230	2929	3010	6773
	13.890	Jct with Old Sterling Highway	0.480	2	3992	4210	4320	2074
	14.370	Jct with North Fork Road	7.130	2	2830	2990	3426	24427
	21.500	Jct with Old Sterling Highway	0.220	2	3580	3780	4379	963
	21.720	Jct with Milo Fritz Road	4.580	2	2485	2622	2605	11931
	26.300	Jct with Stariski Loop Road	13.800	2	2350	2480	2460	33948
	40.100	Jct with Deep Creek Road	2.380	2	3180	3360	3340	7949
	42.480	Jct with Mission Avenue	7.700	2	2080	2190	2180	16786
	50.180	Jct with Sterling Lane	9.190	2	2450	2637	2620	24078
	59.370	Jct with Clam Gulch Road	3.250	2	3203	3380	3360	10920
	62.620	Jct with South Cohoe Loop Road	2.850	2	2970	3130	4620	13167
	65.470	Jct with Cohoe Loop Road	2.030	2	4912	5180	5170	10495
	67.500	Jct with Kalifornsky Beach Road	6.340	2	3288	3470	4882	30952
	73.840	Jct with Reflection Lake Road	1.680	2	4280	4281	4270	7174
	75.520	Jct with Arc Loop Road	4.240	2	5590	5960	6544	27747
	79.760	Jct with Kalifornsky Beach Road	0.410	2	15300	17327	17290	7089
	80.170	Jct with Kobuk Street	0.310	2	18940	19830	19790	6135
	80.480	Jct with Binkley Street	0.220	2	16300	16534	16500	3630
	80.700	Jct with South Birch Lane	0.330	2	14874	15580	11560	3815
	81.030	Jct with Kenai Spur Road	1.470	1	12900	13004	12980	19081
	82.500	Jct with Mackeys Lakes Road	2.880	1	10441	11090	11070	31882
	85.380	Jct with Forest Lane Road	2.160	1	7731	8238	8221	17757
	87.540	Jct with Robinson Loop Road	3.620	1	6150	4173	4160	15059
	91.160	Jct with Swanson River Road	1.400	1	6184	6590	6580	9212
	92.560	Moose River Bridge	2.810	1	3482	3689	3763	10574
	95.370	Jct with Kenai Keys Road	3.890	1	3350	3550	3620	14082
	99.260	Jct with Skilak Lake Road	17.210	1	2628	2780	2840	48876
	116.470	Jct with Skilak Lake Road	2.630	1	2770	3200	3260	8574
	119.100	Jct with Russian River Ferry Entrance	3.640	1	2710	2870	2668	9712

Route	MiPt	Description	Length(mi)	FC	01AADT	02AADT	03AADT	VMT
110000		**STERLING HIGHWAY**						
	122.740	Jct with Russian River Campground Road	4.300	1	3050	3194	3240	13932
	127.040	Jct with Snug Harbor Road	3.030	1	3131	3320	3360	10181
	130.070	Jct with Quartz Creek Road	7.530	1	2917	3042	3082	23207
	137.600	Jct with Sterling Wye (West Leg)	0.580	1	1450	1540	2129	1235
	138.180	Jct with Seward Highway					Total	543219
110030		**GREER ROAD, HOMER**						
	0.000	Jct with Kalopi Court	0.905	9	197	190	230	208
	0.905	Jct with Tappers Lane, Homer					Total	208
110040		**FAA ROAD, HOMER**						
	0.000	Jct with Sterling Highway	0.516	8			658	340
	0.516	Airport Parking Lot					Total	340
110100		**PIONEER AVENUE, HOMER**						
	0.000	Jct with Lake Street	0.620	7	6534	6450	6871	4260
	0.620	Jct with Main Street	0.374	7	6020	4513	4580	1713
	0.994	Jct with Sterling Highway					Total	5973
110150		**LAKE STREET, HOMER**						
	0.000	Jct with Sterling Highway	0.494	7	6075	6000	6110	3018
	0.494	Jct with Pioneer Avenue					Total	3018
110200		**KACHEMAK BAY DRIVE, HOMER**						
	0.000	Jct with Sterling Highway	1.008	7/8	1760	2100	2130	2147
	1.008	Lou's Storage Facility	2.541	8	633	600	610	1550
	3.549	Jct with East End Road					Total	3697
110300		**EAST END ROAD, HOMER**						
	0.000	Jct with Lake Street	0.805	7	7943	7574	7776	6260
	0.805	Jct with East Hill Road	2.782	7	5020	4522	4650	12936
	3.587	Jct with Kachemak Bay Drive	5.557	7	3419	3260	3350	18616
	9.144	Jct with Greer Road	9.800	7	858	820	840	8232
	18.944	Jct with Eagle Lake Road	3.403	8	370	411	420	1429
	22.347	End of Road					Total	47473
110302		**MCLAY ROAD, HOMER**						
	0.000	Jct with East End Road	0.500	9	250	240	230	115

Route	MiPt	Description	Length(mi)	FC	99AADT	00AADT	01AADT	VMT
088000		**BLUFF DRIVE/OLD 1ST AVE, BETHEL**						
	0.850	Jct with Chief Eddie Hoffman Highway					Total	384
088015		**1ST AVENUE/FRONT STREET, BETHEL**						
	0.000	Jct with Willow Road	0.210	9	360	370	517	109
	0.210	Begin Washout	0.310	9	0	0	0	0
	0.520	Jct with Main Street	0.170	8	600	610	620	105
	0.690	Jct with Tundra Street	0.190	8	340	350	360	68
	0.880	Jct with Chief Eddie Hoffman Highway					Total	282
088800		**BIA HEADQUARTERS ROAD, BETHEL**						
	0.000	Jct with Chief Eddie Hoffman Highway	1.860	**			198	368
	1.860	BIA Headquarters Complex					Total	368
100100		**AIRPORT AVENUE, SELDOVIA**						
	0.000	Jct with Main Street	0.675	7	390	231	230	155
	0.675	Airport Parking					Total	155
100125		**MAIN STREET, SELDOVIA**						
	0.183	Jct with Dock Road	0.203	7	690	416	410	83
	0.386	Jct with Seldovia Street	0.160	7	640	738	730	117
	0.546	Jct with Airport Avenue					Total	200
100137		**ANDERSON WAY, SELDOVIA**						
	0.000	Jct with Alder Street	0.348	8	460	430	430	150
	0.348	Jct with Shoreline Drive					Total	150
100148		**DOCK ROAD, SELDOVIA**						
	0.000	Soldotna Ferry Terminal	0.131	7	210	37	40	5
	0.131	Jct with Main Street					Total	5
100150		**JAKALOF BAY ROAD, SELDOVIA**						
	0.000	Jct with Shoreline Drive	4.384	8	400	301	300	1315
	4.384	Jct with Olstead Road	7.944	8	80	55	55	437
	12.328	End of State Maintenance					Total	1752
110000		**STERLING HIGHWAY**						
	0.000	Jct with Southwest Marine Highway	4.250	2	4009	4011	4023	17098

Route	MiPt	Description	Length(mi)	FC	99AADT	00AADT	01AADT	VMT
110000		**STERLING HIGHWAY**						
	4.250	Jct with FAA Road	1.060	2	6263	6240	5889	6242
	5.310	Jct with Lake Street	0.740	2	8286	8535	8587	6354
	6.050	Jct with Main Street	0.260	2	6230	6080	6290	1635
	6.310	Jct with Pioneer Avenue	0.140	2	6962	7050	7742	1084
	6.450	Jct with Crittenden Drive	0.910	2	6830	6920	6384	5809
	7.360	Jct with West Hill Road	1.860	2	4230	4210	3890	7235
	9.220	Jct with Rogers Loop	0.540	2	4464	4470	4660	2516
	9.760	Jct with Rogers Loop	1.880	2	3640	3610	3520	6618
	11.640	Jct with Diamond Ridge Road	2.250	2	3166	3140	3230	7268
	13.890	Jct with Old Sterling Highway	0.480	2	3470	3440	3992	1916
	14.370	Jct with North Fork Road	7.130	2	3750	2749	2830	20178
	21.500	Jct with Old Sterling Highway	0.220	2	2470	3478	3580	788
	21.720	Jct with Milo Fritz Road	4.580	2	2435	2413	2485	11381
	26.300	Jct with Stariski Loop Road	13.800	2	2420	2400	2350	32430
	40.100	Jct with Deep Creek Road	2.380	2	3980	3089	3180	7568
	42.480	Jct with Mission Avenue	7.700	2	2380	2696	2080	16016
	50.180	Jct with Sterling Lane	9.190	2	2400	2380	2450	22516
	59.370	Jct with Clam Gulch Road	3.250	2	2870	2840	3203	10410
	62.620	Jct with South Cohoe Loop Road	2.850	2	3440	2880	2970	8464
	65.470	Jct with Cohoe Loop Road	2.030	2	3980	3940	4912	9971
	67.500	Jct with Kalifornsky Beach Road	6.340	2	3550	4011	3288	20846
	73.840	Jct with Reflection Lake Road	1.680	2	4093	4090	4280	7190
	75.520	Jct with Arc Loop Road	4.240	2	4800	5312	5590	23702
	79.760	Jct with Kalifornsky Beach Road	0.410	2	15352	14641	15300	6273
	80.170	Jct with Kobuk Street	0.310	2	18040	18120	18940	5871
	80.480	Jct with Binkley Street	0.220	2	15516	15590	16300	3586
	80.700	Jct with South Birch Lane	0.330	2	15910	15980	14874	4908
	81.030	Jct with Kenai Spur Road	1.470	1	12304	12370	12900	18963
	82.500	Jct with Mackeys Lakes Road	2.880	1	10140	10180	10441	30070
	85.380	Jct with Forest Lane Road	2.160	1	7335	7344	7731	16699
	87.540	Jct with Robinson Loop Road	3.620	1	5830	5840	6150	22263
	91.160	Jct with Swanson River Road	1.400	1	4120	4130	6184	8658
	92.560	Moose River Bridge	2.810	1	3113	3137	3482	9784
	95.370	Jct with Kenai Keys Road	3.890	1	3160	3200	3350	13032
	99.260	Jct with Skilak Lake Road	17.210	1	2570	2520	2628	45228

Route	MiPt	Description	Length(mi)	FC	99AADT	00AADT	01AADT	VMT
110000		**STERLING HIGHWAY**						
	116.470	Jct with Skilak Lake Road	4.040	1	2751	2680	2770	11191
	120.510	Jct with Russian River Ferry Road	2.230	1	2690	2620	2710	6043
	122.740	Jct with Russian River Campground Road	4.300	1	3029	2950	3050	13115
	127.040	Jct with Snug Harbor Road	3.030	1	3220	2928	3131	9487
	130.070	Jct with Quartz Creek Road	7.530	1	2841	2760	2917	21965
	137.600	Jct with Sterling Wye (West Leg)	0.580	1	2020	1404	1450	841
	138.180	Jct with Seward Highway					Total	503214
110030		**GREER ROAD, HOMER**						
	0.000	Jct with Kalopi Court	0.905	9	110	120	197	178
	0.905	Jct with Tappers Lane, Homer					Total	178
110100		**PIONEER AVENUE, HOMER**						
	0.000	Jct with Lake Street	0.620	7	7300	7249	6534	4051
	0.620	Jct with Main Street	0.374	7	5890	6050	6020	2251
	0.994	Jct with Sterling Highway					Total	6303
110150		**LAKE STREET, HOMER**						
	0.000	Jct with Sterling Highway	0.494	7	5550	5700	6075	3001
	0.494	Jct with Pioneer Avenue					Total	3001
110200		**KACHEMAK BAY DRIVE, HOMER**						
	0.000	Jct with Sterling Highway	1.008	**	1720	1770	1760	1774
	1.008	Lou's Storage Facility	2.541	8	1100	1140	633	1608
	3.549	Jct with East End Road					Total	3383
110300		**EAST END ROAD, HOMER**						
	0.000	Jct with Lake Street	0.805	7	7705	8001	7943	6394
	0.805	Jct with East Hill Road	2.782	7	4870	5060	5020	13966
	3.587	Jct with Kachemak Bay Drive	5.557	7	2370	2460	3419	18999
	9.144	Jct with Greer Road	9.800	7	940	1009	858	8408
	18.944	Jct with Eagle Lake Road	1.238	8	360	370	370	458
	20.182	End of State Maintenance					Total	48226
110302		**MCLAY ROAD, HOMER**						
	0.000	Jct with East End Road	0.500	9	190	249	250	125

Route MiPt	Description	Lngth	FC	96AADT	97AADT	98AADT	99AADT
080000	**Chief Eddie Hoffman Hwy (CHEHH), Bethel**						
0.000	Jct with Hanger Lake Road	0.130	7	2000	2000	2246	2290
0.130	Jct with First Avenue	0.130	7	2300	2300	2588	2640
0.260	Jct with Tundra Street	0.410	7	3600	3600	3725	3800
0.670	Jct with Main Street	0.280	7	4800	4800	5357	5460
0.950	Jct with Ridgecrest Drive	0.270	7	7143	7138	7379	7581
1.220	Jct with Willow Road	0.490	7	4700	4700	6226	6350
1.710	Jct with Old Hospital Access Road	0.280	7	4500	4500	5447	5550
1.990	Jct with Willow Road	1.580	7	2700	2700	4265	4390
3.570	Jct with BIA Headquarters Road	0.730	7	1750	1750	2880	2940
087000	**Hanger Lake Road, Bethel**						
0.000	Jct with Bethel Highway	0.090	7	3500	3500	3620	3670
0.090	Jct with North Harbor Road	0.970	7	700	700	720	730
087300	**Tundra Street, Bethel**						
0.000	Jct with Bethel Highway	0.100	9	350	350	360	360
087600	**Main Street, Bethel**						
0.000	Jct with First Avenue	0.310	7	1150	1150	1253	1280
087800	**Willow Street/Ridgecrest Drive, Bethel**						
0.000	Jct with Bethel Highway	0.570	7	5000	5000	6776	6870
0.570	Jct with Akeek Street	0.310	7	1750	1750	3699	3800
088015	**1st Avenue/Front Street, Bethel**						
0.000	Jct with Willow Road	0.210	9	50	50	60	60
0.210	Begin Washout	0.310	9	0	0	0	0
0.520	Jct with Main Street	0.170	8	480	480	593	600
0.690	Jct with Tundra Street	0.190	8	310	310	332	340
100100	**Seldovia Airport Road**						
0.000	Seldovia Ferry Terminal	0.080	7	180	200	205	210
0.080	Jct with Main Street	0.200	7	580	656	670	690
0.280	Jct with Anderson Way	0.160	7	410	613	625	640
0.440	Jct with Airport Avenue	0.561	7	230	373	380	390
100110	**Seldovia/Jakolof Bay Road**						
0.000	Jct with Main Street	0.420	8	340	445	450	460
0.420	Jct with Shoreline Drive	4.310	8	310	384	390	400
4.730	Jct with Olestead Road	7.020	8	130	76	80	80
110000	**Sterling Highway**						
0.000	Jct with Southwest Marine Highway	4.250	2	4219	4245	4022	4009
4.250	Jct w/ Airport Bypass/Kachemak Bay Rd	1.060	2	7600	7700	8050	6263
5.310	Jct with Lake Street	0.740	2	7331	7420	7759	8286
6.050	Jct with Main Street	0.260	2	5500	5857	6120	6230
6.310	Jct with Pioneer Avenue	0.140	2	7000	7100	7440	6962
6.450	Jct with Crittenden Drive	0.910	2	6300	6400	6707	6830
7.360	Jct with West Hill Drive	1.860	2	4443	4672	5580	4230
9.220	Jct with Roger Loop Road	0.540	2	4300	3942	4175	4464

Route MiPt	Description	Lngth	FC	96AADT	97AADT	98AADT	99AADT
110000	**Sterling Highway**						Continued
9.760	Jct with Roger Loop Road	1.880	2	4100	3742	2043	3640
11.640	Jct with Diamond Ridge Road	2.250	2	2645	2700	3220	3166
13.890	Jct with Old Sterling Highway	0.480	2	3000	3000	3586	3470
14.370	Jct w/ North Anchor Point Rd (Pioneer)	7.130	2	2800	3240	3870	3750
21.500	Jct with Old Sterling Highway	0.220	2	2700	2410	2550	2470
21.720	Jct with Milo Fritz Road	4.580	2	2469	2505	2517	2435
26.300	Jct with Staritski Loop	13.800	2	2300	2350	2499	2420
40.100	Jct with Deep Creek Road	2.380	2	3500	3863	4107	3980
42.480	Jct with Ninilchik Road	7.700	2	1970	2324	2460	2380
50.180	Jct with Sterling Lane	9.190	2	2400	2496	2500	2400
59.370	Jct with Clam Gulch Road	3.250	2	3000	3300	2965	2870
62.620	Jct with Cohoe Loop	2.850	2	3000	3353	3550	3440
65.470	Jct with Cohoe Loop	2.030	2	3100	3400	4114	3980
67.500	Jct with Kalifonsky Beach Road	6.340	2	3300	3400	3664	3550
73.840	Jct with Reflection Lake Road	1.680	2	4059	4100	4420	4093
75.520	Jct with Arc Loop	4.240	2	5000	4496	4760	4800
79.760	Jct with Kalifonsky Beach Road	0.410	2	14826	14800	15760	15352
80.170	Jct with Kobuk Street	0.310	2	14800	14800	17862	18040
80.480	Jct with Binkley Street	0.220	2	14140	14200	15904	15516
80.700	Jct with South Birch Lane	0.330	2	14000	14000	15748	15910
81.030	Jct with Kenai Spur Road	1.470	1	11800	10034	10620	12304
82.500	Jct with Mackeys Lakes Road	2.880	1	9100	9400	10208	10140
85.380	Jct with Forest lane	2.160	1	6526	6871	7278	7335
87.540	Jct with Robinson Loop	3.620	1	5700	5206	5500	5830
91.160	Jct with Robinson Loop	1.400	1	5700	5200	4088	4120
92.560	Moose River Bridge	2.810	1	3800	3900	3100	3113
95.370	Jct with Kenai Keyes Road	3.890	1	2931	2959	3130	3160
99.260	Jct with Skilak Lake Road (West end)	17.210	1	2438	2500	2587	2570
116.470	Jct with Skilak Lake Road (East end)	2.630	1	2367	2334	2740	2751
119.100	Sportsmans Lodge	3.640	1	2500	2500	2695	2690
122.740	Jct with Russian River Campground Rd	4.300	1	2638	2475	2668	3029
127.040	Jct with Snug Harbor Road	3.030	1	2300	2800	3223	3220
130.070	Jct with Quartz Creek Road	7.530	1	2378	3210	3460	2841
137.600	Jct with Sterling Wye	0.580	1	1350	1870	2020	2020
110030	**Greer Road, Homer**						
0.085	Jct with East End Road	0.957	9	110	110	110	110
110100	**Pioneer Avenue, Homer**						
0.000	Jct with Lake Street & East End Road	0.620	7	7500	6839	7080	7300
0.620	Jct with Main Street	0.374	7	3800	5569	5730	5890
110150	**Lake Street, Homer**						
0.000	Jct with Sterling Highway	0.494	7	5100	5200	5382	5550

ANNUAL AVERAGE DAILY TRAFFIC (AADT)

ROUTE	MILE	DESCRIPTION	LENGTH	FC	93AADT	94AADT	95AADT
088015		First Avenue (Bethel)					
	0.00	Jct with Willow Road	0.21	9	50	50	50
	0.21	Begin Washout	0.31	9	0	0	0
	0.52	Jct with Main Street	0.17	8	470	470	470
	0.69	Jct with Tundra Street	0.19	8	310	310	310
100100		Seldovia Airport Road					
	0.00	Seldovia Ferry Terminal	0.08	7	100	174	180
	0.08	Jct with Main Street	0.20	7	640	567	580
	0.28	Jct with Anderson Way	0.16	7	580	409	410
	0.44	Jct with Airport Avenue	0.56	7	180	224	230
100110		Seldovia/Jakolof Bay Road					
	0.00	Jct with Main Street	0.42	8	310	338	340
	0.42	Jct with Shoreline Drive	4.31	8	300	310	310
	4.73	Jct with Olestead Road	7.02	8	40	125	130
110000		Sterling Highway					
	0.00	Jct with Southwest Marine Highway	4.25	2	4222	4199	4268
	4.25	Jct with Airport Bypass/Kachemak Bay Road	1.06	2	6900	6900	7419
	5.31	Jct with Lake Street	0.74	2	6804	6800	7122
	6.05	Jct with Main Street	0.26	2	4800	5218	5400
	6.31	Jct with Pioneer Avenue	0.14	2	6500	6500	6811
	6.45	Jct with Crittenden Drive	0.91	2	4400	4400	6157
	7.36	Jct with West Hill Drive	1.86	2	3478	3500	3800
	9.22	Jct with Roger Loop Road	0.54	2	3307	3400	3700
	9.76	Jct with Roger Loop Road	1.88	2	2600	2700	3383
	11.64	Jct with Diamond Ridge Road	2.25	2	2596	2700	3380
	13.89	Jct with Old Sterling Highway	0.48	2	2500	2600	3019
	14.37	Jct with North Anchor Point Road (Pioneer)	7.13	2	2480	2500	2800
	21.50	Jct with Old Sterling Highway	0.22	2	2100	2373	2700
	21.72	Jct with Milo Fritz Road	4.58	2	2009	2153	2482
	26.30	Jct with Staritski Loop	13.80	2	1700	1800	2305
	40.10	Jct with Deep Creek Road	2.38	2	2500	3140	3500
	42.48	Jct with Ninilchik Road	7.70	2	1637	1643	1876
	50.18	Jct with Sterling Lane	9.19	2	2145	2150	2400
	59.37	Jct with Clam Gulch Road	3.25	2	2400	2400	2973
	62.62	Jct with Cohoe Loop	2.85	2	2700	2675	3000
	65.47	Jct with Cohoe Loop	2.03	2	3700	3800	3115
	67.50	Jct with Kalifonsky Beach Road	6.34	2	2550	2970	3300
	73.84	Jct with Reflection Lake Road	1.01	2	3333	3500	3900
	74.85	Jct with Old Tote Road	0.67	2	3800	3900	4363
	75.52	Jct with Arc Loop	4.24	2	4300	4594	5000
	79.76	Jct with Kalifonsky Beach Road	0.41	2	14200	14600	16000
	80.17	Jct with Kobuk Street	0.41	2	14182	14600	15953
	80.48	Jct with Binkley Street	0.22	2	12667	13000	14100
	80.70	Jct with South Birch Lane	0.33	2	12590	12900	14000
	81.03	Jct with Kenai Spur Road	1.47	1	10394	10700	11600
	82.50	Jct with Mackeys Lakes Road	2.88	1	9200	9600	8931
	85.38	Jct with Forest lane	2.16	1	5898	6165	6406
	87.54	Jct with Robinson Loop	3.62	1	5218	5400	5600
	91.16	Jct with Robinson Loop	1.40	1	5200	5400	5600
	92.56	Moose River Bridge	2.81	1	3600	3800	3184
	95.37	Jct with Kenai Keyes Road	3.89	1	2800	2880	2900
	99.26	Jct with Skilak Lake Road (West end)	17.21	1	2600	2680	2700
	116.47	Jct with Skilak Lake Road (East end)	2.63	1	2959	3000	3000
	119.10	Sportsmans Lodge	3.33	1	3150	3120	3100
	122.43	Kenai River Bridge	0.29	1	3152	3124	3100
	122.74	Jct with Russian River Campground Road	4.30	1	3150	3124	3100
	127.04	Jct with Snug Harbor Road	3.03	1	3100	3100	2745
	130.07	Jct with Quartz Creek Road	7.53	1	2997	3000	3000
	137.60	Jct with Sterling Wye	0.58	1	1600	1635	1650

ANNUAL AVERAGE DAILY TRAFFIC (AADT)

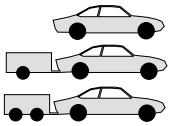
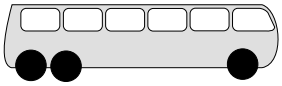
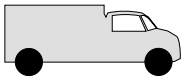
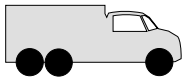
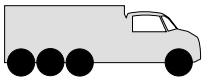
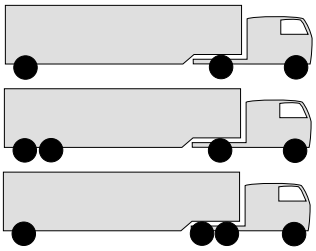
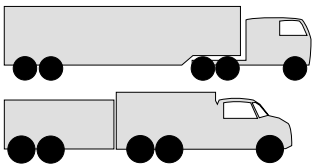
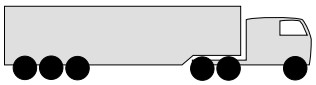
ROUTE	MILE	DESCRIPTION	LENGTH	FC	91AADT	92AADT	93AADT
100100		Seldovia Airport Road					
	0.00	Seldovia Ferry Terminal	0.08	7	100	100	100
	0.08	Jct with Main Street	0.20	7	643	640	640
	0.28	Jct with Anderson Way	0.16	7	575	580	580
	0.44	Jct with Airport Avenue	0.56	7	174	180	180
100110		Seldovia/Jakolof Bay Road					
	0.00	Jct with Main Street	0.42	8	308	310	310
	0.42	Jct with Shoreline Drive	4.31	8	304	300	300
	4.73	Jct with Olestead Road	7.02	8	44	40	40
110000		Sterling Highway					
	0.00	Jct with Southwest Marine Highway	4.25	2	3819	3976	4222
	4.25	Jct with Airport Bypass/Kachemak Bay Road	1.06	2	5880	6635	6900
	5.31	Jct with Lake Street	0.74	2	5969	6200	6804
	6.05	Jct with Main Street	0.26	2	4400	4580	4800
	6.31	Jct with Pioneer Avenue	0.14	2	5600	6137	6500
	6.45	Jct with Crittenden Drive	0.91	2	5860	4156	4400
	7.36	Jct with West Hill Drive	1.86	2	3300	3400	3478
	9.22	Jct with Roger Loop Road	0.54	2	2630	3223	3307
	9.76	Jct with Roger Loop Road	1.88	2	2551	2555	2600
	11.64	Jct with Diamond Ridge Road	2.25	2	2526	2548	2596
	13.89	Jct with Old Sterling Highway	0.48	2	2430	2265	2500
	14.37	Jct with North Anchor Point Road (Pioneer)	7.13	2	1960	2239	2480
	21.50	Jct with Old Sterling Highway	0.22	2	1804	1900	2100
	21.72	Jct with Milo Fritz Road	4.58	2	1734	1815	2009
	26.30	Jct with Staritski Loop	13.80	2	1960	1552	1700
	40.10	Jct with Deep Creek Road	2.38	2	2192	2300	2500
	42.48	Jct with Ninilchik Road	7.70	2	1405	1437	1637
	50.18	Jct with Sterling Lane	9.19	2	1860	1900	2145
	59.37	Jct with Clam Gulch Road	3.25	2	2690	2170	2400
	62.62	Jct with Cohoe Loop	2.85	2	2450	2500	2700
	65.47	Jct with Cohoe Loop	2.03	2	3430	3379	3700
	67.50	Jct with Kalifonsky Beach Road	6.34	2	2268	2124	2550
	73.84	Jct with Reflection Lake Road	1.01	2	3100	3200	3333
	74.85	Jct with Old Tote Road	0.67	2	3400	3559	3800
	75.52	Jct with Arc Loop	4.24	2	4100	4300	4300
	79.76	Jct with Kalifonsky Beach Road	0.41	2	12170	12960	14200
	80.17	Jct with Kobuk Street	0.41	2	12170	12804	14182
	80.48	Jct with Binkley Street	0.22	2	9530	12500	12667
	80.70	Jct with South Birch Lane	0.33	2	9530	11050	12590
	81.03	Jct with Kenai Spur Road	1.47	1	9580	8990	10394
	82.50	Jct with Mackeys Lakes Road	2.88	1	8250	8900	9200
	85.38	Jct with Forest lane	2.16	1	5158	5700	5898
	87.54	Jct with Robinson Loop	3.62	1	4150	4500	5218
	91.16	Jct with Robinson Loop	1.40	1	4900	5026	5200
	92.56	Moose River Bridge	6.70	1	3870	3370	3600
	99.26	Jct with Skilak Lake Road	17.21	1	2863	2419	2600
	116.47	Jct with Skilak Lake Road	2.63	1	3030	2500	2959
	119.10	Sportsmans Lodge	3.33	1	2800	2900	3150
	122.43	Kenai River Bridge	0.29	1	2800	2900	3152
	122.74	Jct with Russian River Campground Road	4.30	1	3670	2900	3150
	127.04	Jct with Snug Harbor Road	3.03	1	3500	3006	3100
	130.07	Jct with Quartz Creek Road	7.53	1	3370	3500	2997
	137.60	Jct with Sterling Wye	0.58	1	1454	1530	1600
110020		Lake Street/Pioneer Avenue					
	0.00	Jct with Sterling Highway	0.45	7	6100	5156	5500
	0.45	Jct with East End Road	0.62	7	7281	7197	7200
	1.07	Jct with Main Street	0.35	7	4200	4250	3696
110200		Airport Bypass/Kachemak Bay Road					
	0.00	Jct with Sterling Highway	1.01	7	2000	1843	1828
	1.01	Lou's Storage Facility	2.51	8	939	924	920

AVERAGE ANNUAL DAILY TRAFFIC (AADT)

ROUTE	MILE	DESCRIPTION	LENGTH	FC	87AADT	88AADT	89AADT	90AADT
089800		MEKORYUK AIRPORT RD, MEKORYUK-AIRPORT						
	0.00	MEKORYUK						
	3.00	END	3.00	7	44	45	47	50
091000		SLEETMUTE CITY STREETS						
	0.00	BEGIN SURFACE TYPE E						
	.60	END	.60	9	35	40	42	40
092000		KALSKAG RD, UPPER-LOWER KALSAG VIA AIRPORT						
	0.00	BEGIN SURFACE TYPE E						
	4.19	END	4.19	7	44	45	47	50
095000		PILOT STATION AIRPORT RD, PILOT STATION-AIRPORT						
	0.00	BEGIN SURFACE TYPE C						
	1.20	END	1.20	7	5	5	5	5
097000		ST MARYS/MT VILLAGE RD, ST MARYS-MOUNTAIN VILLAGE						
	0.00	BEGIN SUFACE TYPE E						
	20.25	END	20.25	7	148	150	156	155
097010		PITKAS POINT RD, ST MARYS/MT VILLAGE RD-PITKAS POINT						
	0.00	JCT WITH ST MARYS/MT VILLAGE RD						
	1.75	END	1.75	8	5	5	10	10
100100		SELDOVIA AIRPORT RD, SELDOVIA FERRY TERMINAL-AIRPORT						
	0.00	SELDOVIA FERRY TERMINAL						
	.12	JCT WITH KENAI ST	.12	7	232	195	202	200
	1.00	END	.88	7	804	806	840	840
100110		SELDOVIA/JAKOLOF BAY RD, SELDOVIA AIRPORT RD-END ROUTE						
	0.00	JCT WITH SELDOVIA AIRPORT RD						
	.42	JCT WITH SHORELINE DR	.42	8	440	424	440	440
	4.78	BARBARA CREEK	4.36	8	210	192	200	200
	11.75	END	6.97	8	105	97	101	100
110000		STERLING HWY, HOMER-SEWARD HWY						
	0.00	JCT WITH SOUTHWEST MARINE HWY						
	4.30	JCT WITH AIRPORT BYPASS/KACHEMAK RD	4.30	6	3604	3650	4203	3892
	5.36	JCT WITH LAKE ST	1.06	6	5900	5978	6874	6396
	5.92	JCT WITH MAIN ST	.56	6	5620	5690	5696	5300
	6.18	JCT WITH PIONEER AVE	.26	6	5560	5615	3786	3790
	6.31	JCT WITH ROAD TO HIGH SCHOOL	.13	6	5503	5558	5900	6706
	7.20	JCT WITH WEST HILL RD	.89	6	4600	4806	5140	5862
			1.81	6	3249	3314	3540	3571
	9.01	JCT WITH ROGER LOOP RD						
	9.62	JCT WITH ROGER LOOP RD	.61	6	2605	2657	2840	3515
	11.37	JCT WITH DIAMOND RIDGE RD	1.75	6	2747	2856	3050	3410
	13.61	JCT WITH OLD STERLING HWY	2.24	6	2889	2880	3080	3301
	14.10	JCT WITH NORTH ANCHOR RIVER/PIONEER LOOP	.49	6	2697	2600	2780	3137
	21.21	JCT WITH OLD STERLING HWY	7.11	6	2506	2400	2560	2061
	21.43	JCT WITH MILO FRITZ RD	.22	6	2180	2170	2320	1886
			4.59	6	2200	2150	1624	1711
	26.02	JCT WITH STARITSKI LOOP RD						
	39.83	JCT WITH DEEP CREEK RD	13.81	6	2100	2100	1489	1980
	42.20	JCT WITH NINILCHIK RD	2.37	6	2008	2055	2205	2249
	50.58	JCT WITH BEACH RD	8.38	6	1559	1738	1780	1988
	59.22	JCT WITH CLAM GULCH RD	8.64	6	1950	2067	2210	1863
	62.45	JCT WITH COHOE LOOP RD	3.23	6	2185	2200	2350	3244
	65.31	JCT WITH COHOE LOOP RD	2.86	6	2216	2700	2420	2946
			1.86	6	2450	3934	2530	4291
	67.17	JCT WITH KALIFONSKY BEACH RD						
	72.87	JCT WITH REFLECTION LAKE RD	5.70	6	2961	2980	2650	2791
	74.64	JCT WITH OLD TOTE RD	1.77	6	4100	4100	3060	3403
	75.31	JCT WITH ARC LOOP RD	.67	6	3665	3660	3800	3756
	78.91	JCT WITH KALIFONSKY BEACH RD	3.60	6	4119	4120	4280	4090
	80.52	JCT WITH SOUTH BIRCH LANE/BINKLEY ST	1.61	6	13205	13200	12550	11932
	80.85	JCT WITH KENAI SPUR RD	.33	6	15000	15000	14600	9337
			1.57	1	8024	8124	8440	9389
	82.42	JCT WITH MACKEYS LAKES RD						
	85.30	JCT WITH FOREST LANE RD	2.88	1	6500	8279	7930	8090
	87.48	JCT WITH ROBINSON LOOP RD	2.18	1	4764	4786	4956	5055
	91.11	JCT WITH ROBINSON LOOP RD	3.63	1	3495	5072	4900	4077
	92.40	JCT WITH MOOSE RIVER BRIDGE	1.29	1	4007	3727	4710	4800
	98.99	JCT WITH SKILAK LAKE RD	6.59	1	3990	3700	3562	3796
	116.85	JCT WITH SKILAK LAKE RD	17.86	1	2140	2500	2290	2749
			2.61	1	1900	1977	2050	2948
	119.46	SPORTSMANS LODGE						
	122.39	KENAI RIVER	2.93	1	1671	2200	2240	3324
	122.76	JCT WITH RUSSIAN RIVER CAMPGROUND RD	.37	1	1821	1830	2380	3585
	127.50	JCT WITH SNUG HARBOR RD	4.74	1	1972	1975	2500	3567
	130.45	JCT WITH QUARTZ CREEK RD	2.95	1	2097	2100	2652	3420
	138.00	JCT WITH STERLING WYE	7.55	1	1959	1960	2070	3268
	138.57	END	.57	1	1200	1200	1260	1642

FHWA VEHICLE CLASSIFICATION

COMMERCIAL VEHICLES

CLASS GROUP		DESCRIPTION	NO. OF AXLES
1		MOTORCYCLES	2
2		ALL PASSENGER CARS CARS W/ 1-AXLE TRAILER CARS W/ 2-AXLE TRAILER	2 3 4
3		PICK-UPS & VANS 1 & 2 AXLE TRAILERS	2, 3, & 4
4		BUSES	2 & 3
5		2-AXLE, SINGLE UNIT	2
6		3-AXLE, SINGLE UNIT	3
7		4-AXLE, SINGLE UNIT	4
8		2-AXLE, TRACTOR, 1-AXLE TRAILER (2&1) 2-AXLE, TRACTOR, 2-AXLE TRAILER (2&2) 3-AXLE, TRACTOR, 1-AXLE TRAILER (3&1)	3 4 4
9		3-AXLE, TRACTOR, 2-AXLE TRAILER (3&2) 3-AXLE, TRUCK W/ 2-AXLE TRAILER	5 5
10		TRACTOR W/ SINGLE TRAILER	6 & 7
11		5-AXLE MULTI-TRAILER	5
12		6-AXLE MULTI-TRAILER	6
13	ANY 7 OR MORE AXLE		7 or more
14	UNCLASSIFIED VEHICLES	NOT MEET THE ABOVE CRITERIA	
15	NOT USED		

Note: These are common vehicle classifications and do not represent all types of vehicles.

ROUTE	ROUTE NAME	MIPT	STATION	FC	DIR	YR	MTH	DAYS	TOTAL VHCLS	% Single Unit CLS 1	CLS 2	CLS 3	CLS 4	CLS 5	CLS 6	CLS 7	% Single Trailer CLS 8	CLS 9	CLS 10	% Multi Trailer CLS 11	CLS 12	CLS 13	% Total Cmrcl Vhcls
110000	**Sterling Highway (Cont'd)**																						
At Cooper Landing		6.143	11800015	1	1	2012	6	30	69182	0.23	54.01	33.82	0.15	6.73	0.56	0.04	0.77	1.68	0.77	0.00	0.01	1.24	11.94
					5		6	21	51396	0.15	50.04	35.01	0.20	8.95	0.65	0.01	1.18	1.58	0.83	0.00	0.01	1.38	14.79
					1		7	31	114784	0.14	51.26	37.03	0.10	7.25	0.39	0.02	1.04	1.33	0.57	0.00	0.00	0.87	11.57
					5		7	31	114115	0.10	47.87	38.08	0.13	9.25	0.47	0.01	1.25	1.33	0.57	0.00	0.00	0.92	13.94
					1		8	18	48642	0.21	54.14	33.44	0.13	6.95	0.49	0.06	1.06	1.67	0.72	0.00	0.00	1.11	12.22
					5		8	17	45929	0.14	51.32	34.63	0.18	8.61	0.58	0.02	0.98	1.64	0.78	0.00	0.00	1.10	13.90
					1		10	31	32870	0.05	43.88	39.79	0.08	8.46	0.79	0.07	0.35	2.83	1.20	0.00	0.01	2.50	16.28
					5		10	28	29880	0.14	45.26	37.56	0.24	8.54	0.97	0.02	0.52	2.90	1.36	0.00	0.01	2.49	17.04
					1		11	29	22014	0.03	51.16	36.33	0.06	4.87	0.86	0.01	0.29	3.13	1.05	0.00	0.01	2.19	12.48
					5		11	16	13009	0.17	50.12	36.94	0.23	5.66	0.98	0.00	0.30	2.91	0.92	0.00	0.01	1.78	12.78
					1		12	31	21034	0.09	51.67	37.15	0.05	4.26	0.84	0.02	0.23	2.96	0.71	0.00	0.00	2.01	11.09
					5		12	28	20410	0.64	46.77	37.70	0.50	5.90	1.76	0.01	0.60	3.30	0.82	0.00	0.01	1.99	14.89
Btwn Bean Creek Rd & Quartz Creek Rd		9.303	51219000	1	3	2012	8	7	19055	1.09	54.64	32.85	0.11	6.09	1.12	0.06	0.99	1.43	0.86	0.00	0.00	0.77	11.43
					7		8	7	18250	0.99	49.47	34.94	0.26	8.47	1.98	0.02	1.08	1.18	1.01	0.00	0.00	0.60	14.60
West of Kenai Keys		42.904	51180000	1	1	2012	1	31	26678	0.62	48.18	40.09	0.16	5.76	0.57	0.02	0.31	2.42	0.89	0.00	0.00	0.97	11.10
					5		1	31	26684	0.56	47.95	40.04	0.19	6.05	0.68	0.01	0.32	2.54	0.81	0.00	0.00	0.86	11.45
					1		2	29	26668	0.73	47.67	40.69	0.14	5.73	0.61	0.01	0.27	2.45	0.79	0.00	0.00	0.93	10.92
					5		2	19	18513	0.62	48.24	40.19	0.13	5.84	0.61	0.03	0.31	2.47	0.68	0.00	0.00	0.88	10.94
					1		3	30	32402	0.70	50.05	39.35	0.13	5.09	0.63	0.01	0.22	2.13	0.69	0.00	0.01	1.00	9.90
					5		3	30	32940	0.68	49.81	39.20	0.09	5.49	0.63	0.01	0.31	2.13	0.67	0.00	0.01	0.97	10.30
					1		4	30	38775	1.09	51.39	36.59	0.13	5.08	0.66	0.01	0.38	2.33	1.12	0.00	0.01	1.22	10.93
					5		4	30	39437	1.01	49.83	37.23	0.12	6.11	0.61	0.01	0.46	2.23	1.13	0.00	0.01	1.26	11.92
					1		5	31	59905	1.22	50.73	36.77	0.12	6.06	0.86	0.01	0.51	1.78	0.93	0.00	0.01	1.03	11.29
					5		5	31	61510	1.04	49.70	36.77	0.11	7.17	0.83	0.01	0.68	1.73	0.89	0.00	0.00	1.07	12.49
					1		6	30	82337	1.28	51.69	35.97	0.07	6.24	0.76	0.01	0.72	1.48	0.85	0.00	0.01	0.90	11.06
					5		6	30	86567	1.06	50.78	36.26	0.07	7.05	0.74	0.00	0.90	1.44	0.83	0.00	0.01	0.85	11.90
					1		7	31	132647	0.82	49.63	38.79	0.06	6.82	0.50	0.01	0.93	1.16	0.64	0.00	0.00	0.62	10.76
					5		7	31	131818	0.72	48.56	39.02	0.05	7.66	0.51	0.00	1.01	1.20	0.62	0.00	0.00	0.64	11.69
					1		8	31	89777	1.01	51.99	35.78	0.08	6.55	0.62	0.02	0.83	1.50	0.87	0.00	0.00	0.76	11.23
					5		8	31	87501	0.89	51.57	35.75	0.08	7.16	0.64	0.01	0.74	1.51	0.89	0.00	0.00	0.76	11.80
					1		9	30	58696	0.91	49.59	37.60	0.12	6.09	0.86	0.02	0.52	1.77	1.44	0.00	0.00	1.08	11.89
					5		9	30	57654	0.89	47.99	38.06	0.14	7.05	0.85	0.00	0.54	1.95	1.43	0.00	0.00	1.09	13.06
					1		10	31	44113	1.02	48.43	38.57	0.10	5.67	0.93	0.02	0.35	2.25	1.21	0.00	0.00	1.44	11.98
					5		10	31	43966	0.88	47.52	38.44	0.13	6.66	0.92	0.02	0.50	2.40	1.15	0.00	0.00	1.38	13.16
					1		11	29	31182	0.87	49.39	38.50	0.10	5.53	0.77	0.01	0.27	2.22	1.02	0.00	0.01	1.33	11.25
					5		11	29	31163	0.69	49.37	38.41	0.11	5.66	0.86	0.01	0.41	2.21	1.07	0.00	0.01	1.19	11.53
					1		12	31	30252	0.77	49.40	39.57	0.15	5.02	0.73	0.01	0.32	2.11	0.78	0.00	0.00	1.14	10.26
					5		12	31	30624	0.73	49.22	39.45	0.19	5.22	0.80	0.00	0.38	2.21	0.73	0.00	0.00	1.04	10.59

ROUTE	ROUTE NAME	MIPT	STATION	FC	DIR	YR	MTH	DAYS	TOTAL VHCLS	% Single Unit CLS 1	CLS 2	CLS 3	CLS 4	CLS 5	CLS 6	CLS 7	% Single Trailer CLS 8	CLS 9	CLS 10	% Multi Trailer CLS 11	CLS 12	CLS 13	% Total Cmrcl Vhcls
110000	**Sterling Highway**																						
Cooper Landing		6.143	11800015	1	1	2009	1	31	18802	0.10	51.43	33.15	0.06	8.58	0.82	0.00	0.23	3.11	0.73	0.00	0.00	1.78	15.32
					5		1	11	7019	0.57	51.28	32.98	0.11	10.13	0.87	0.00	0.13	2.14	0.73	0.00	0.00	1.07	15.17
					1		2	28	19958	0.13	51.63	34.53	0.07	7.84	0.63	0.01	0.27	2.69	0.71	0.00	0.00	1.49	13.71
					1		3	26	21215	0.06	53.21	32.72	0.05	8.28	0.49	0.01	0.26	2.61	0.74	0.00	0.00	1.56	14.01
					1		4	30	30006	0.08	42.72	30.14	0.26	21.24	0.25	0.01	0.14	2.11	1.31	0.00	0.00	1.74	27.06
					5		4	30	30760	0.51	49.41	33.11	0.14	11.59	0.67	0.01	0.28	2.33	0.62	0.00	0.00	1.33	16.97
					1		5	31	54002	0.22	52.62	32.29	0.14	10.59	0.39	0.01	0.22	1.79	0.61	0.00	0.00	1.12	14.87
					5		5	31	56130	0.33	49.11	32.90	0.17	13.29	0.54	0.01	0.36	1.77	0.51	0.00	0.00	1.01	17.67
					1		6	30	82218	0.24	52.90	32.79	0.09	10.49	0.45	0.00	0.24	1.51	0.44	0.00	0.00	0.85	14.06
					5		6	30	84744	0.21	49.05	32.58	0.11	14.35	0.59	0.01	0.31	1.43	0.55	0.00	0.00	0.81	18.16
					1		7	31	110935	0.23	51.53	33.57	0.07	11.51	0.39	0.00	0.29	1.37	0.36	0.00	0.00	0.68	14.68
					5		7	31	113722	0.19	47.85	33.11	0.12	15.49	0.43	0.00	0.43	1.28	0.48	0.00	0.00	0.62	18.85
					1		8	31	78224	0.23	53.73	30.90	0.13	11.03	0.39	0.00	0.26	1.54	0.80	0.00	0.00	0.97	15.13
					5		8	28	65675	0.25	49.90	30.76	0.20	14.35	0.64	0.00	0.31	1.78	0.92	0.00	0.00	0.89	19.10
					1		9	30	50407	0.16	52.84	32.29	0.16	10.46	0.44	0.00	0.24	1.56	0.58	0.00	0.01	1.24	14.70
					5		9	28	46540	0.27	48.77	32.95	0.20	13.52	0.61	0.01	0.31	1.62	0.75	0.00	0.01	0.99	18.01
					1		10	31	34592	0.05	52.06	32.72	0.15	10.03	0.51	0.00	0.25	1.91	0.84	0.00	0.01	1.47	15.17
					5		10	28	31688	0.23	48.29	33.75	0.18	12.15	0.82	0.00	0.34	2.21	0.76	0.00	0.01	1.27	17.73
					1		11	29	22419	0.25	52.97	33.26	0.11	7.87	0.80	0.02	0.22	2.55	0.75	0.00	0.00	1.20	13.52
					5		11	14	10520	0.70	48.35	33.13	0.28	11.26	1.00	0.01	0.22	2.89	0.83	0.00	0.01	1.33	17.82
					1		12	31	23479	0.14	51.84	34.72	0.09	8.14	0.54	0.02	0.22	2.56	0.51	0.00	0.00	1.22	13.30
West of Kenai Keys		42.904	51180000	1	1	2009	1	31	27828	0.05	53.26	34.41	0.02	7.64	0.47	0.02	0.15	2.16	0.77	0.00	0.00	1.04	12.27
					1		2	28	28768	0.02	54.04	35.11	0.08	6.61	0.46	0.01	0.15	1.93	0.77	0.00	0.00	0.82	10.82
					1		3	29	32941	0.05	54.36	34.36	0.03	6.91	0.42	0.02	0.25	1.86	0.76	0.00	0.00	1.00	11.24
					1		4	30	40594	0.08	51.88	34.55	0.06	9.11	0.40	0.00	0.25	2.04	0.68	0.00	0.00	0.96	13.49
					1		5	31	68005	0.24	51.17	34.71	0.07	10.24	0.37	0.01	0.37	1.52	0.52	0.00	0.00	0.79	13.88
					1		6	30	88839	0.29	51.58	34.21	0.04	10.12	0.57	0.00	0.38	1.45	0.55	0.00	0.00	0.80	13.92
					1		7	31	125199	0.24	49.65	35.33	0.04	11.34	0.64	0.00	0.48	1.23	0.43	0.00	0.00	0.63	14.79
					1		8	9	29813	0.25	51.80	33.80	0.04	10.89	0.31	0.00	0.50	1.26	0.46	0.00	0.00	0.68	14.14
					1		10	9	11809	0.57	49.68	33.66	0.08	11.53	0.72	0.00	0.24	2.00	0.86	0.00	0.02	0.65	16.09
					5		10	9	12377	0.57	45.11	35.85	0.11	14.03	0.72	0.00	0.23	1.96	0.77	0.00	0.02	0.64	18.48
					1		11	29	32189	0.57	50.86	32.93	0.09	11.31	0.67	0.01	0.22	1.92	0.72	0.00	0.01	0.70	15.64
					5		11	29	32561	0.64	50.50	32.80	0.10	11.73	0.69	0.01	0.15	1.84	0.74	0.00	0.01	0.80	16.06
					1		12	28	30443	0.54	50.46	33.85	0.08	11.18	0.51	0.01	0.24	1.87	0.51	0.00	0.00	0.76	15.15
					5		12	28	30676	0.47	50.05	33.94	0.07	11.55	0.52	0.01	0.25	1.85	0.56	0.00	0.00	0.72	15.54

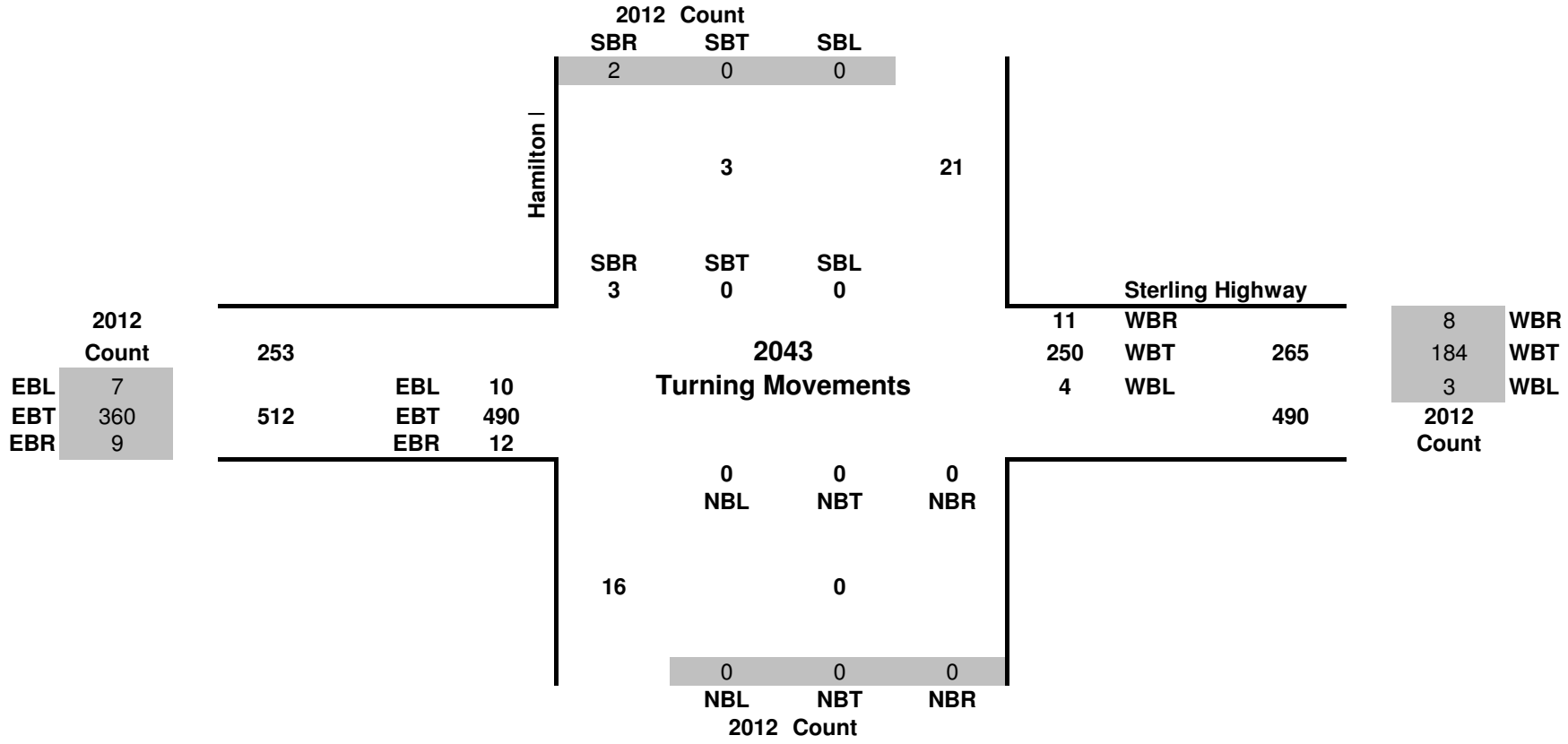
APPENDIX C

INTERSECTION TURNING MOVEMENTS

APPENDIX C1
NO BUILD

INTERSECTION TURNING MOVEMENT PROJECTIONS
No-Build Alternative
2043 Sterling Highway and Hamilton Place

E/W Street:	Sterling Highway				
N/S Street:	Hamilton Place				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	

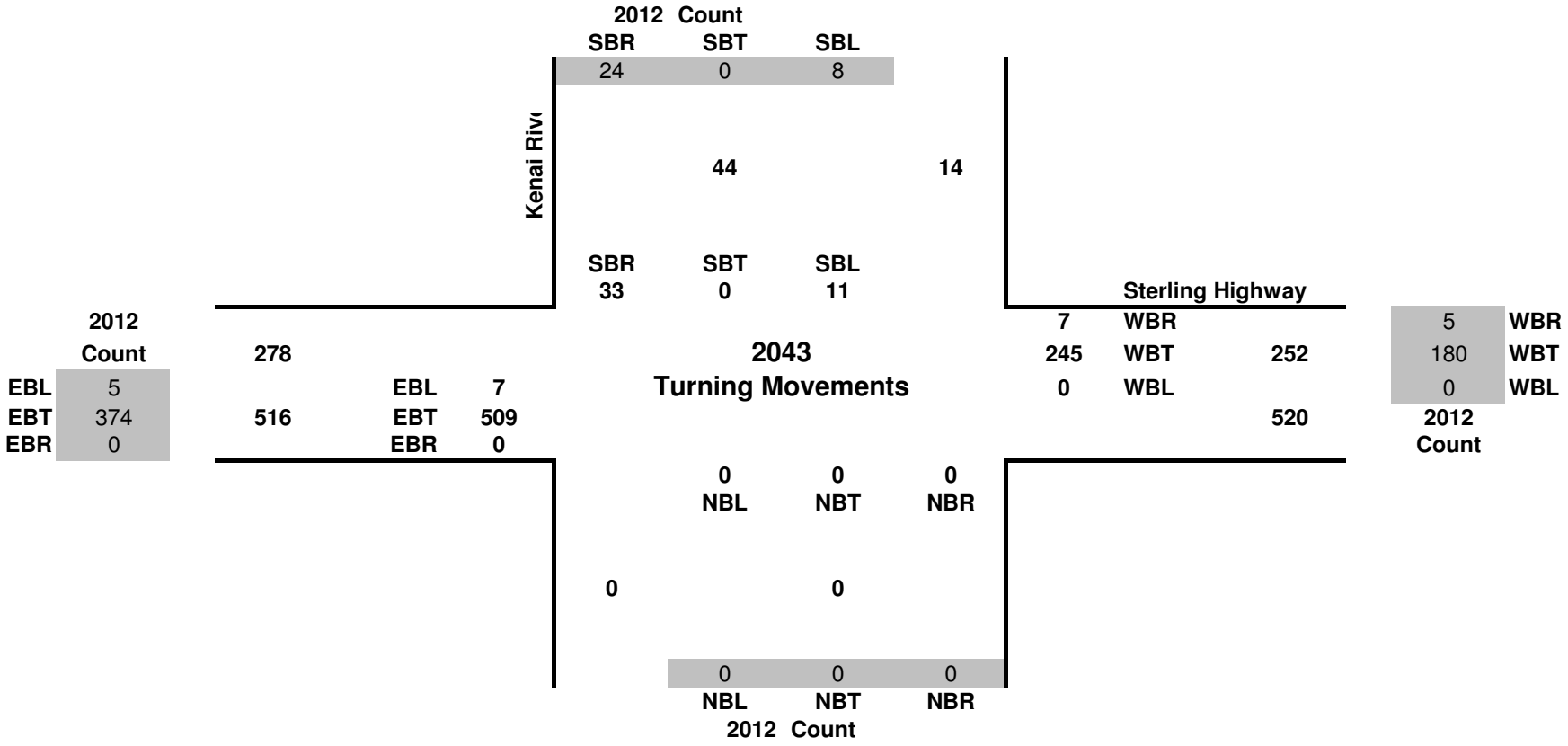


11/27/2013

LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
No-Build Alternative
2043 Sterling Highway and Kenai River

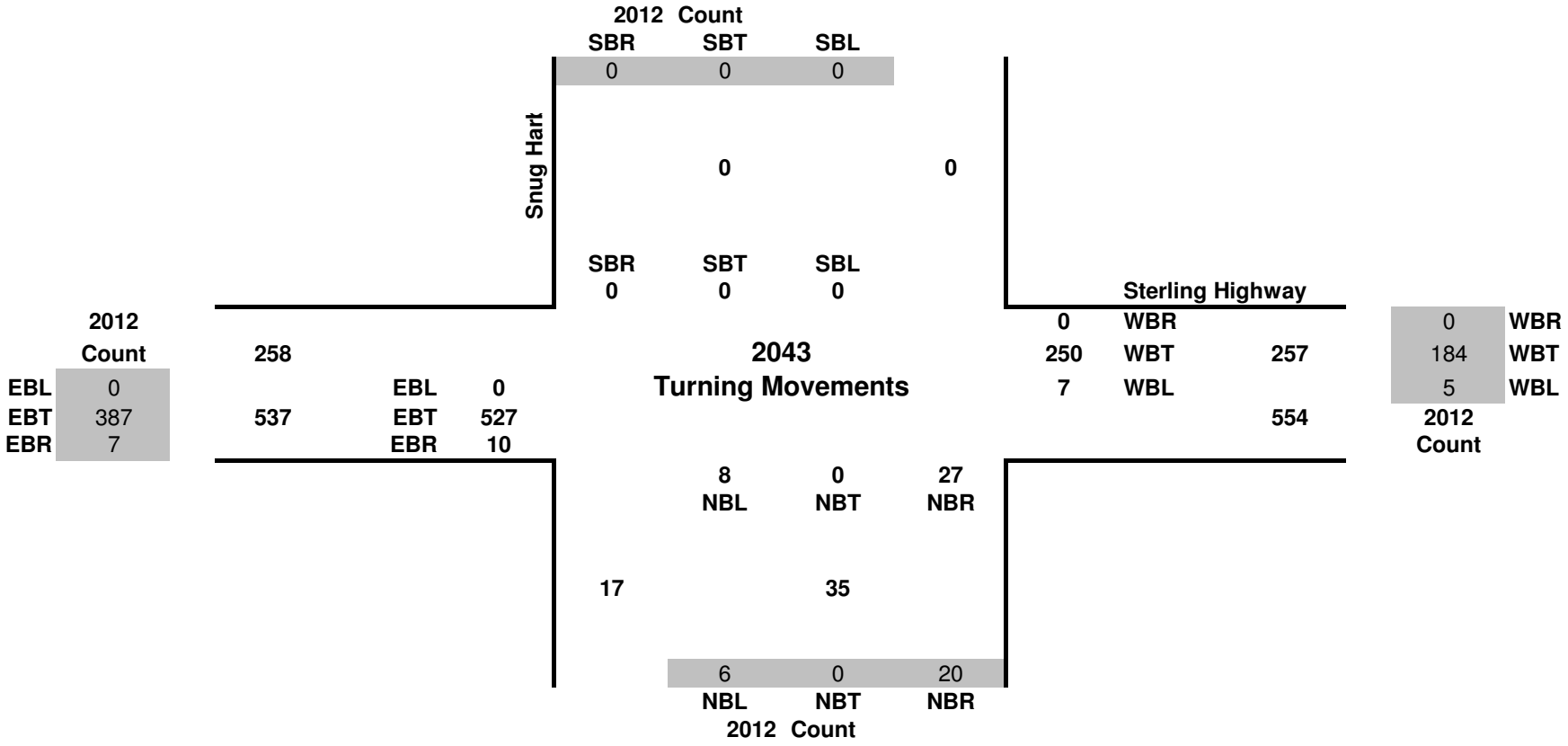
E/W Street:	Sterling Highway				
N/S Street:	Kenai River				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
No-Build Alternative
2043 Sterling Highway and Snug Harbor Road

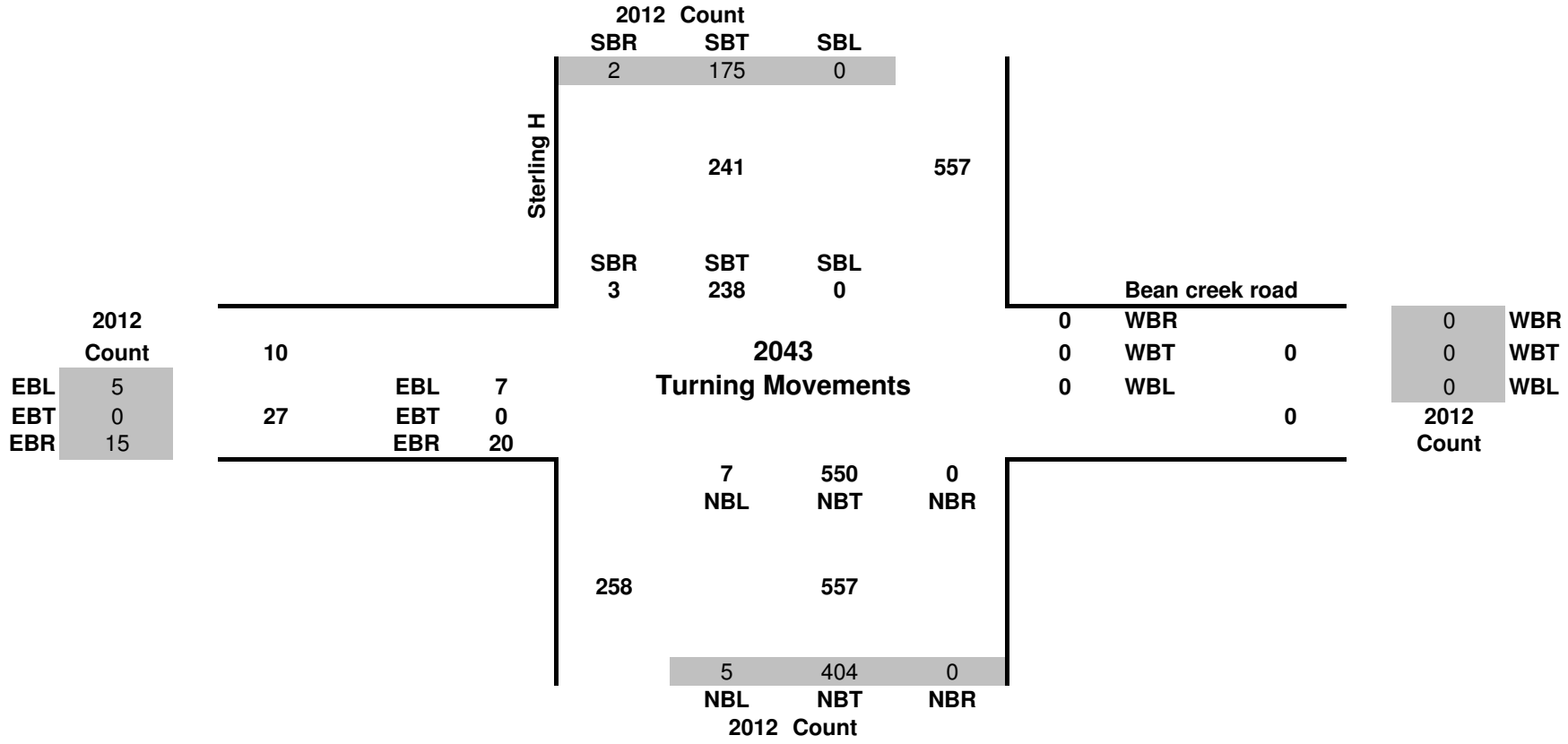
E/W Street:	Sterling Highway				
N/S Street:	Snug Harbor Road				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
No-Build Alternative
2043 Bean creek road and Sterling Highway

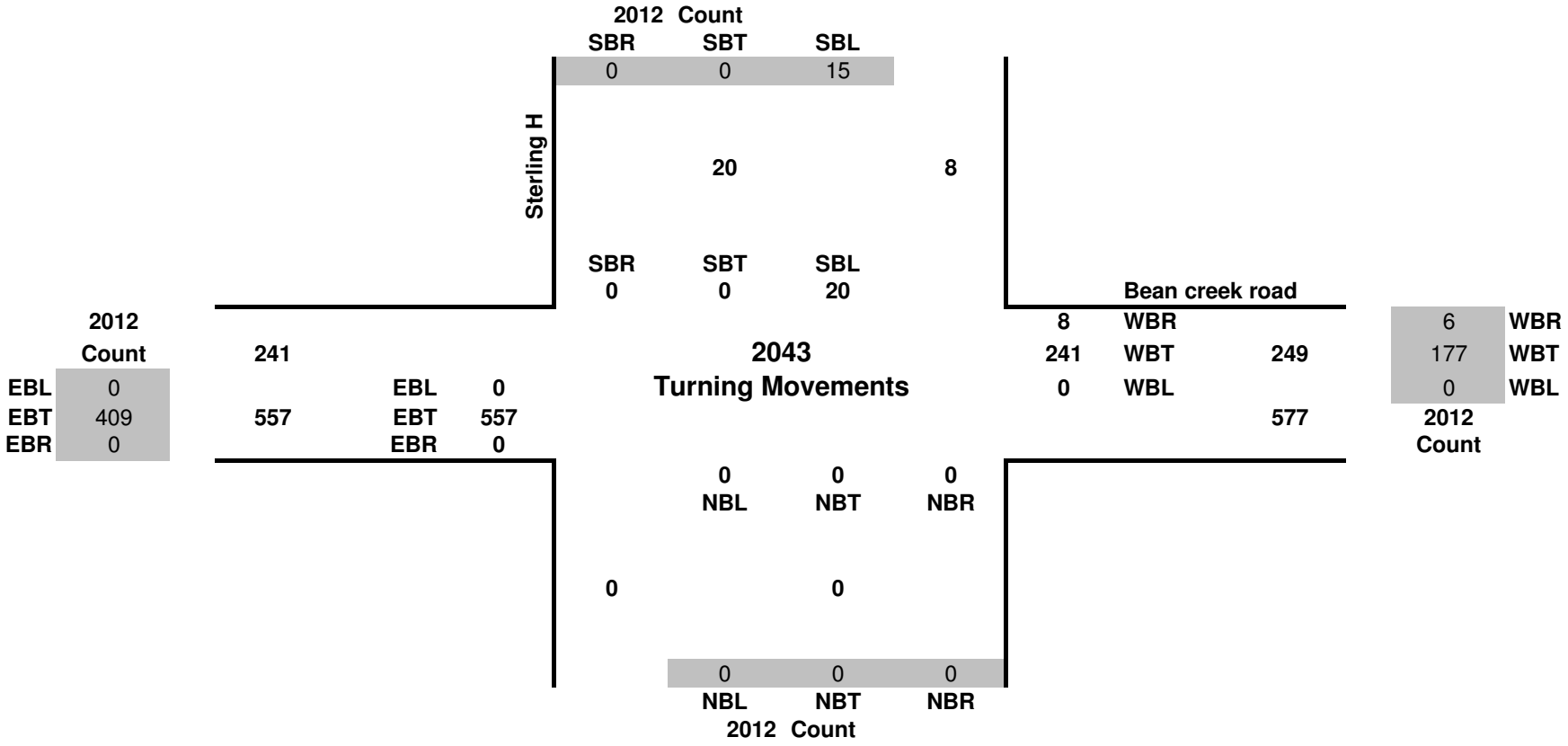
E/W Street:	Bean creek road				
N/S Street:	Sterling Highway				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
No-Build Alternative
2043 Bean creek road and Sterling Highway

E/W Street:	Sterling Highway				
N/S Street:	Bean creek road				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



11/27/2013

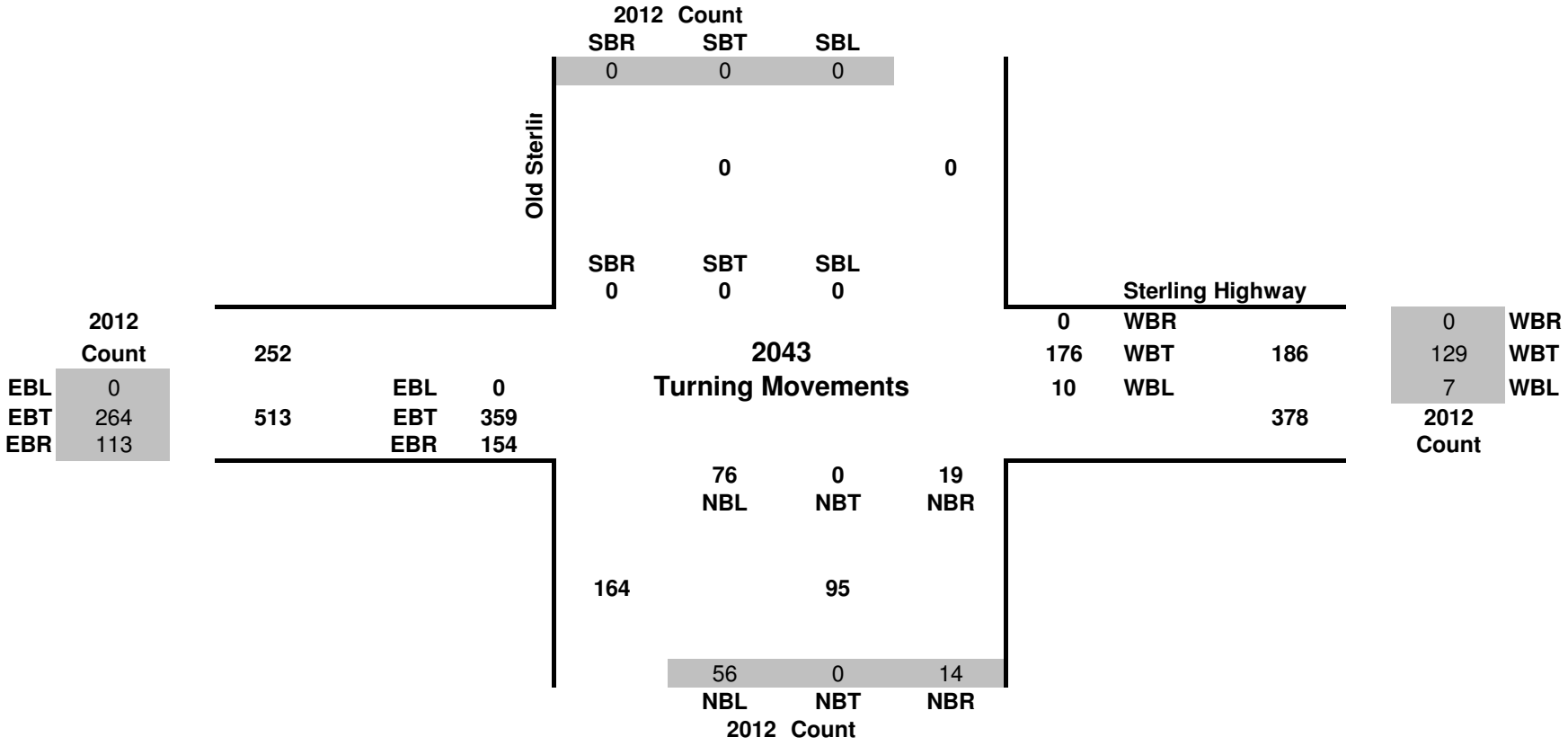
LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

APPENDIX C2

Juneau Creek and G-South

INTERSECTION TURNING MOVEMENT PROJECTIONS
Juneau Creek and G-South Alternatives
2043 Sterling Highway and Old Sterling Highway

E/W Street:	Sterling Highway				
N/S Street:	Old Sterling Highway				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



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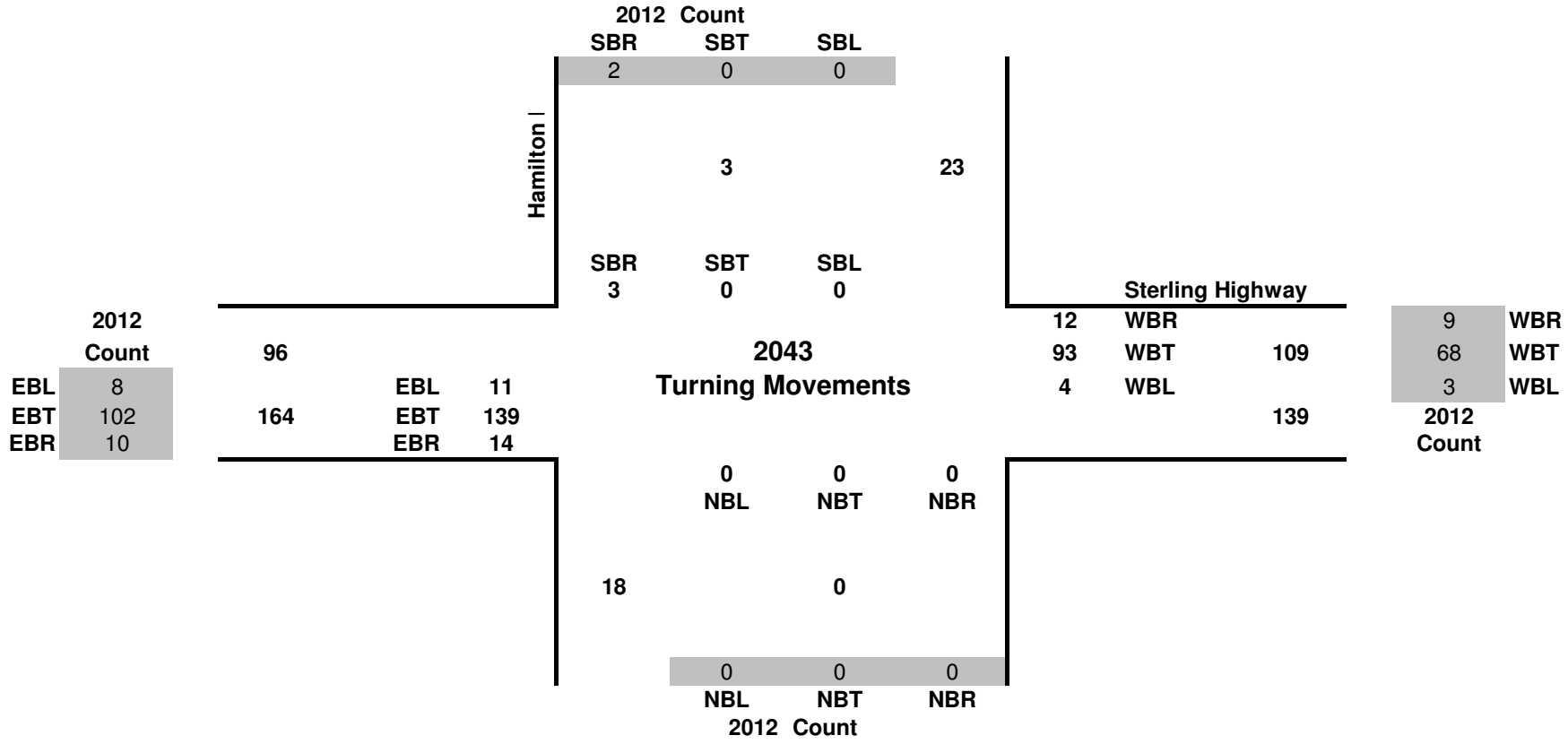
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Juneau Creek and G-South Alternatives
2043 Sterling Highway and Hamilton Place

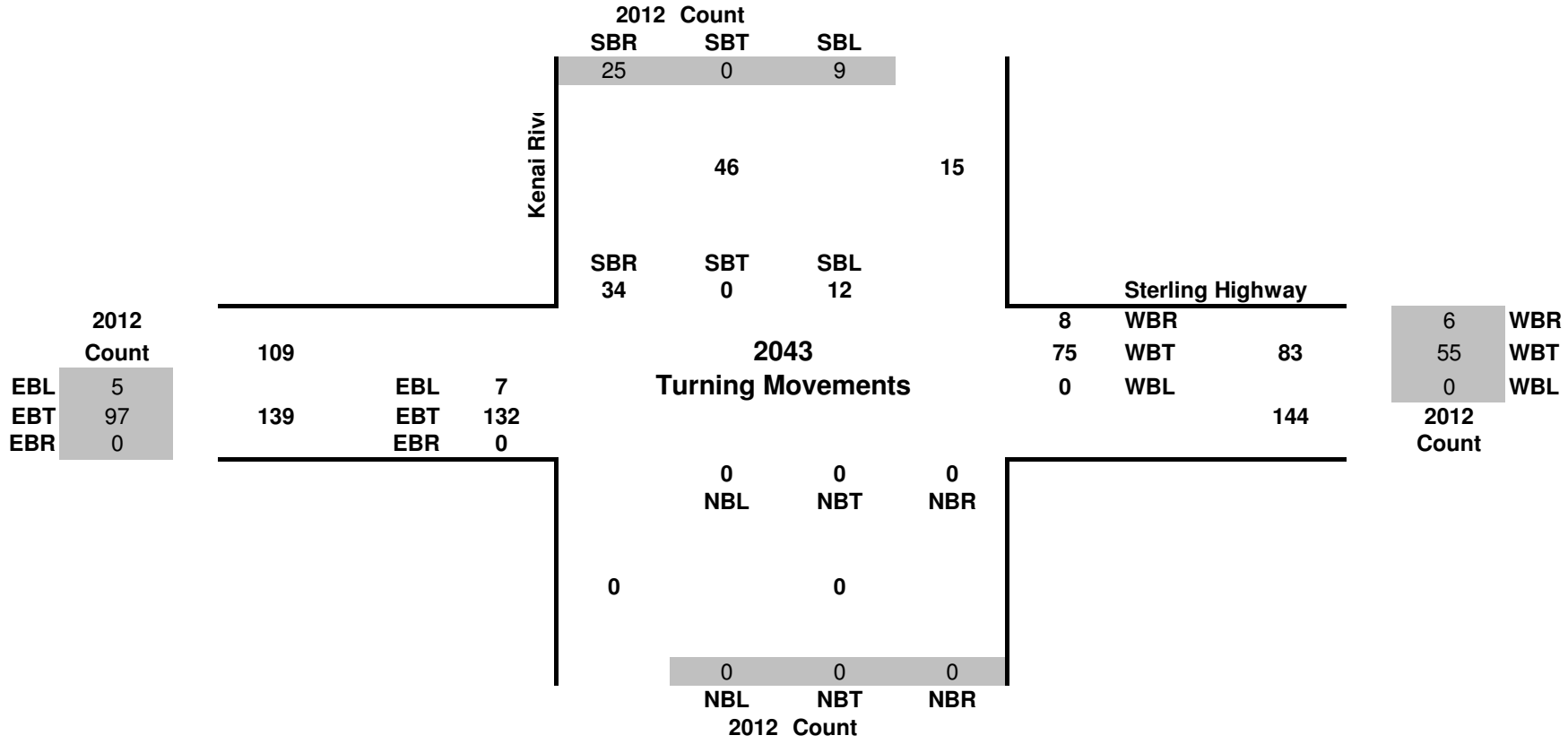
E/W Street:	Sterling Highway				
N/S Street:	Hamilton Place				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Juneau Creek and G-South Alternatives
2043 Sterling Highway and Kenai River

E/W Street:	Sterling Highway				
N/S Street:	Kenai River				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



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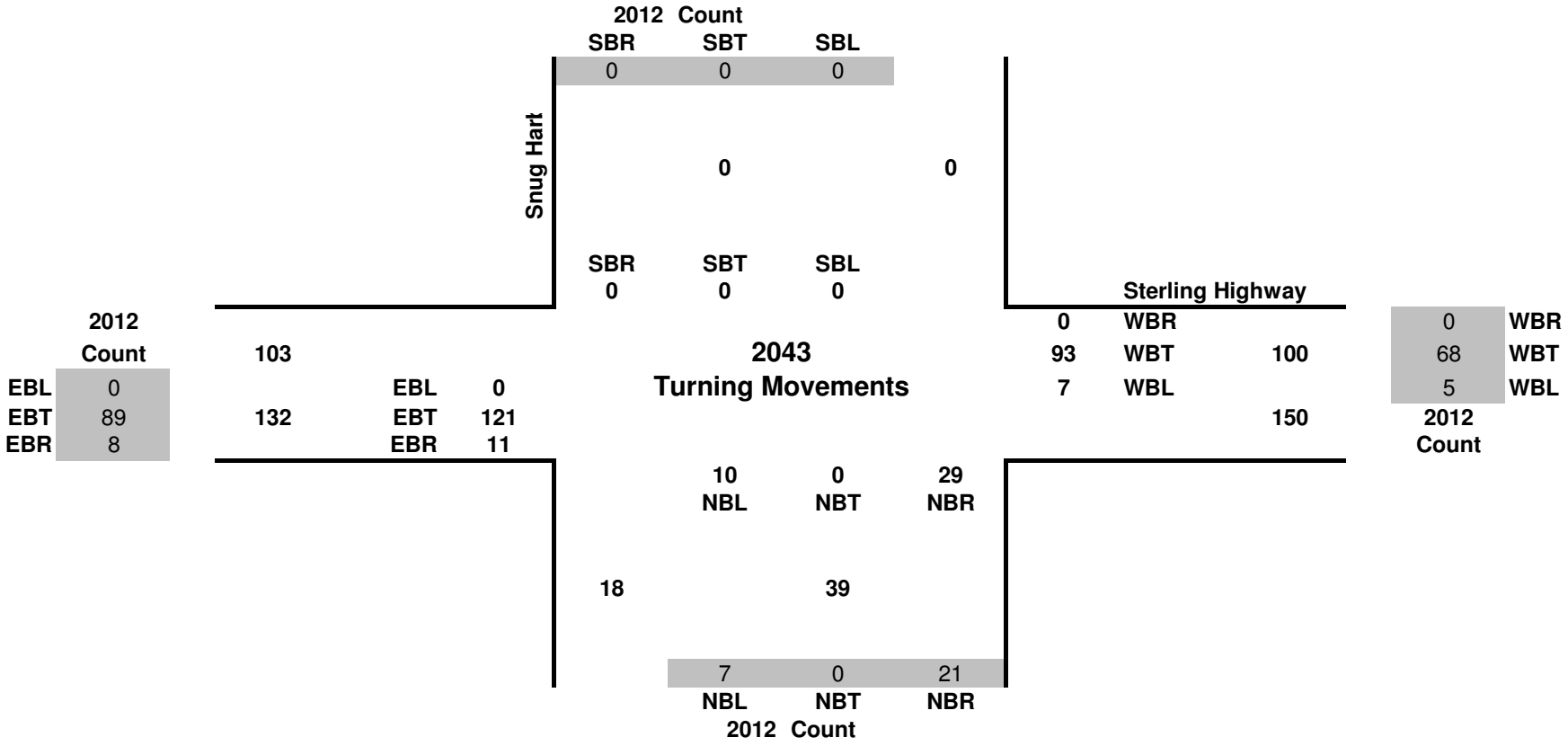
LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Juneau Creek and G-South Alternatives
2043 Sterling Highway and Snug Harbor Road

E/W Street:	Sterling Highway				
N/S Street:	Snug Harbor Road				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	

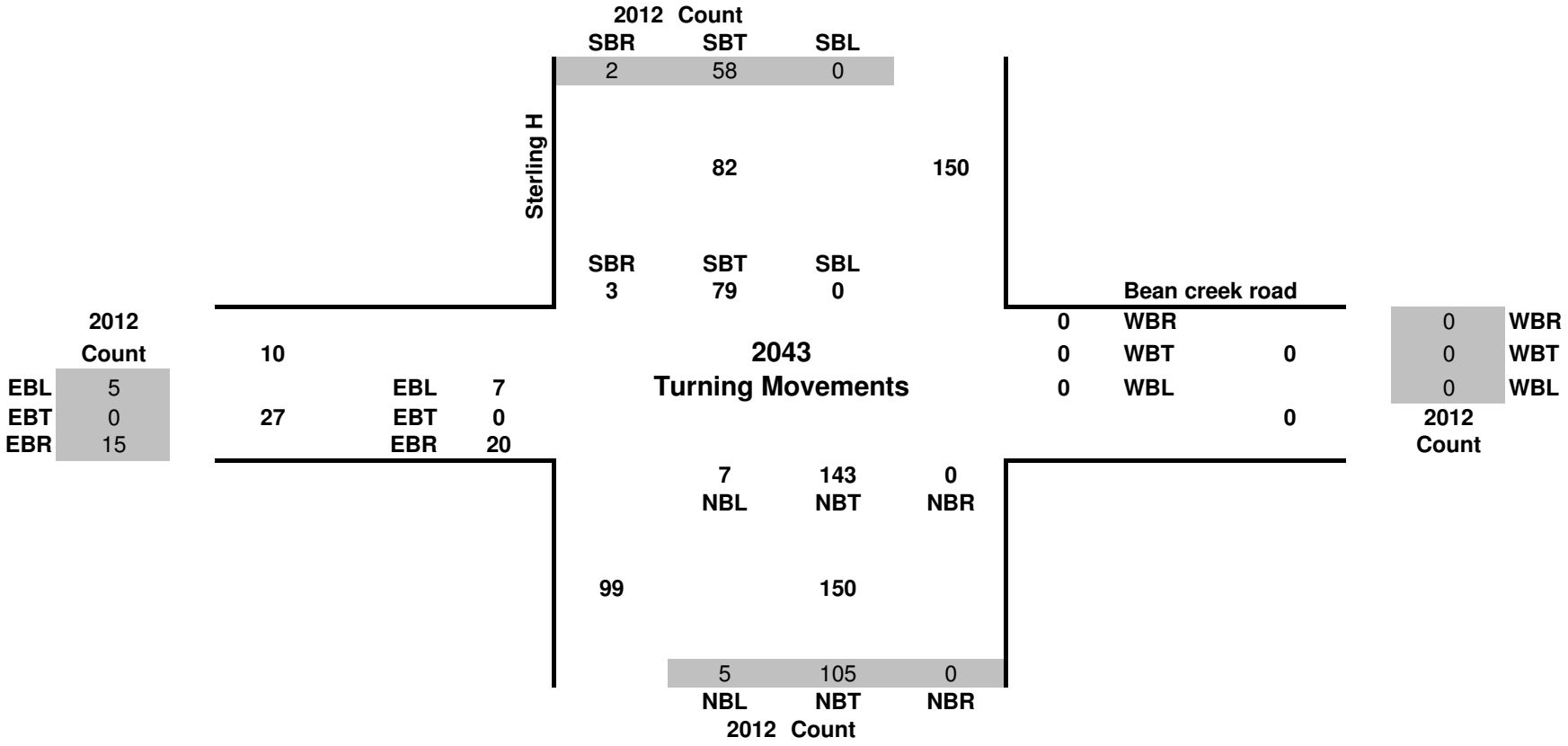


11/27/2013

LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Juneau Creek and G-South Alternatives
2043 Bean creek road and Sterling Highway

E/W Street:	Bean creek road				
N/S Street:	Sterling Highway				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



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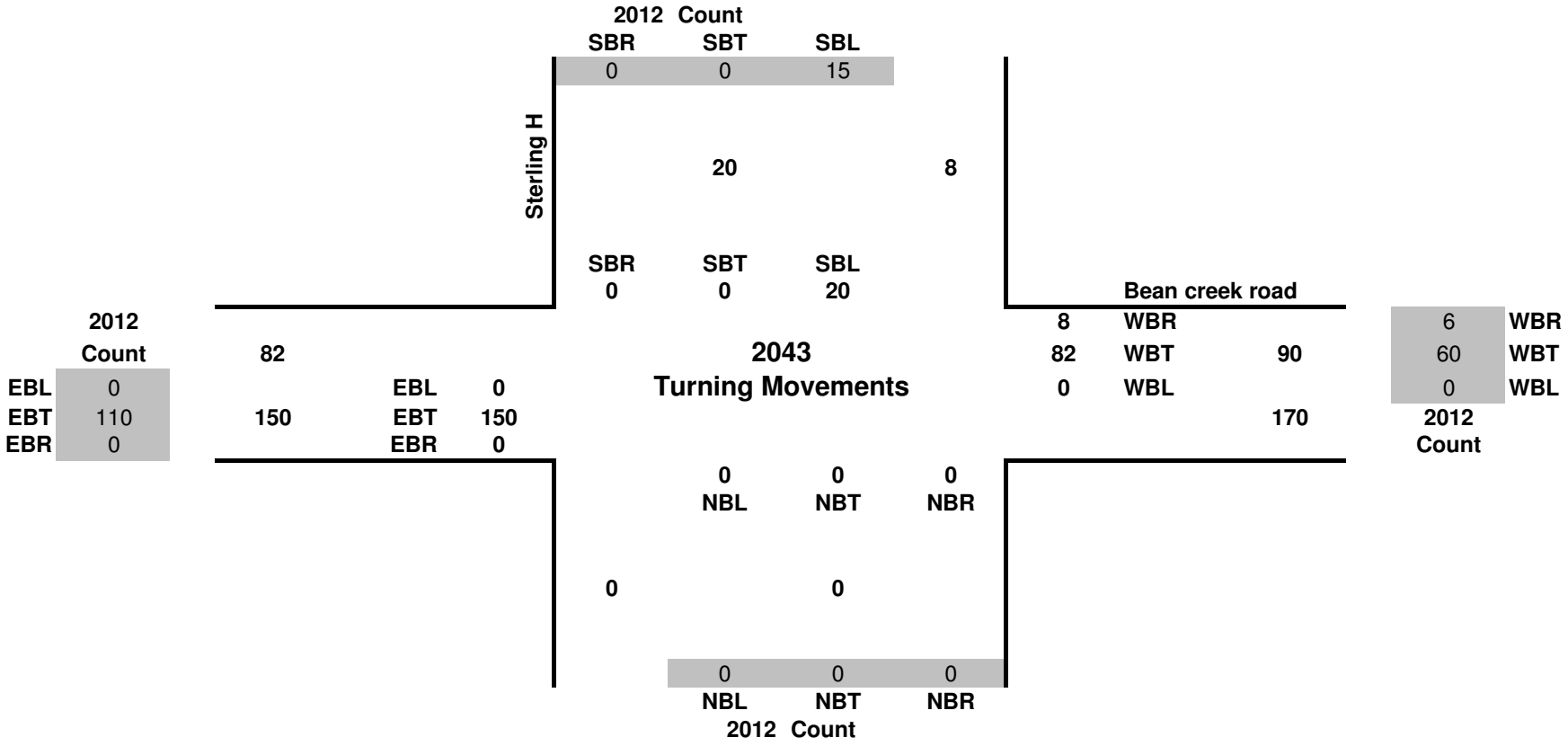
LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Juneau Creek and G-South Alternatives
2043 Bean creek road and Sterling Highway

E/W Street:	Sterling Highway				
N/S Street:	Bean creek road				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



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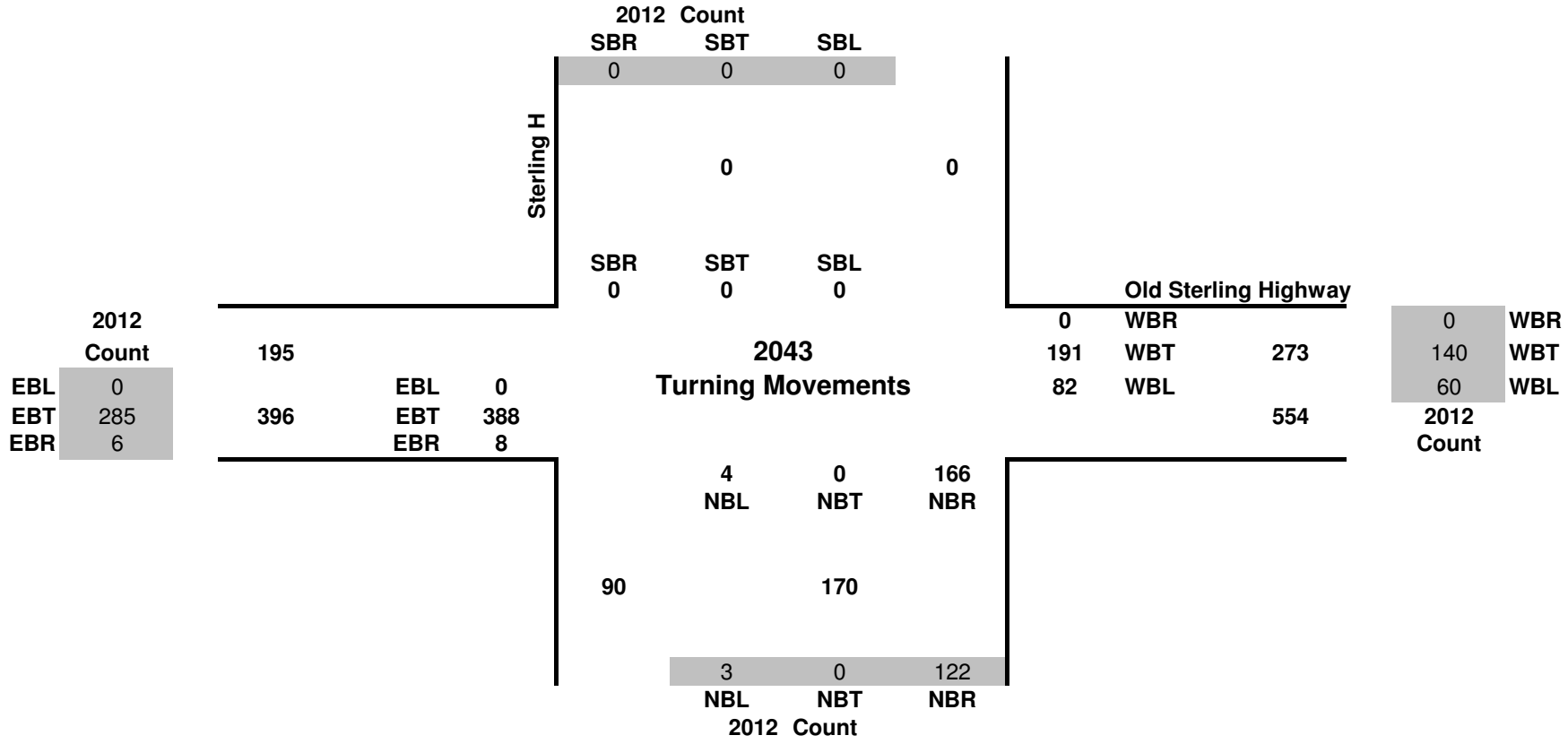
LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Juneau Creek and G-South Alternatives
2043 Old Sterling Highway and Sterling Highway

E/W Street:	Sterling Highway				
N/S Street:	Old Sterling Highway				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



11/27/2013

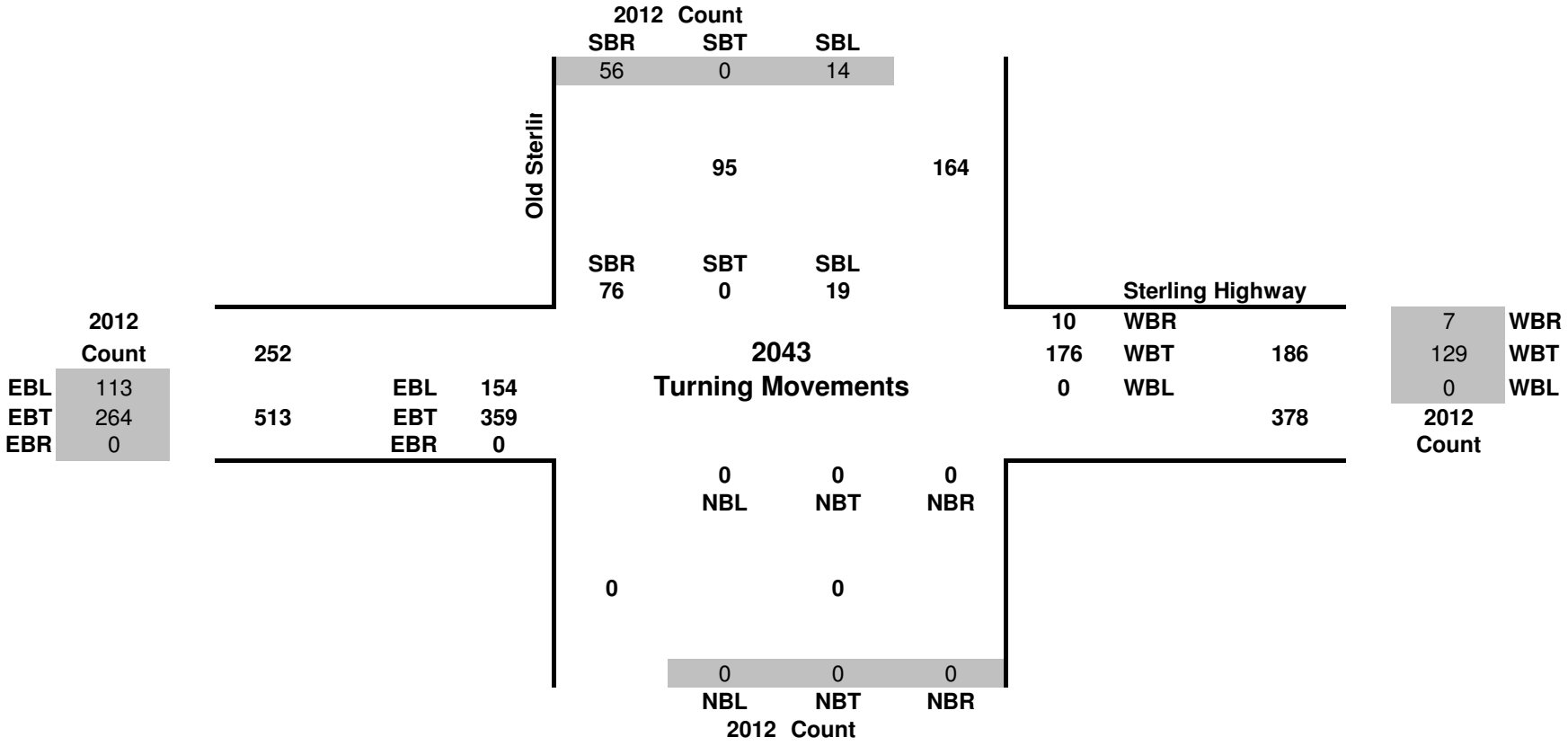
LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

APPENDIX C3

Cooper Creek

INTERSECTION TURNING MOVEMENT PROJECTIONS
Cooper Creek Alternative
2043 Sterling Highway and Old Sterling Highway

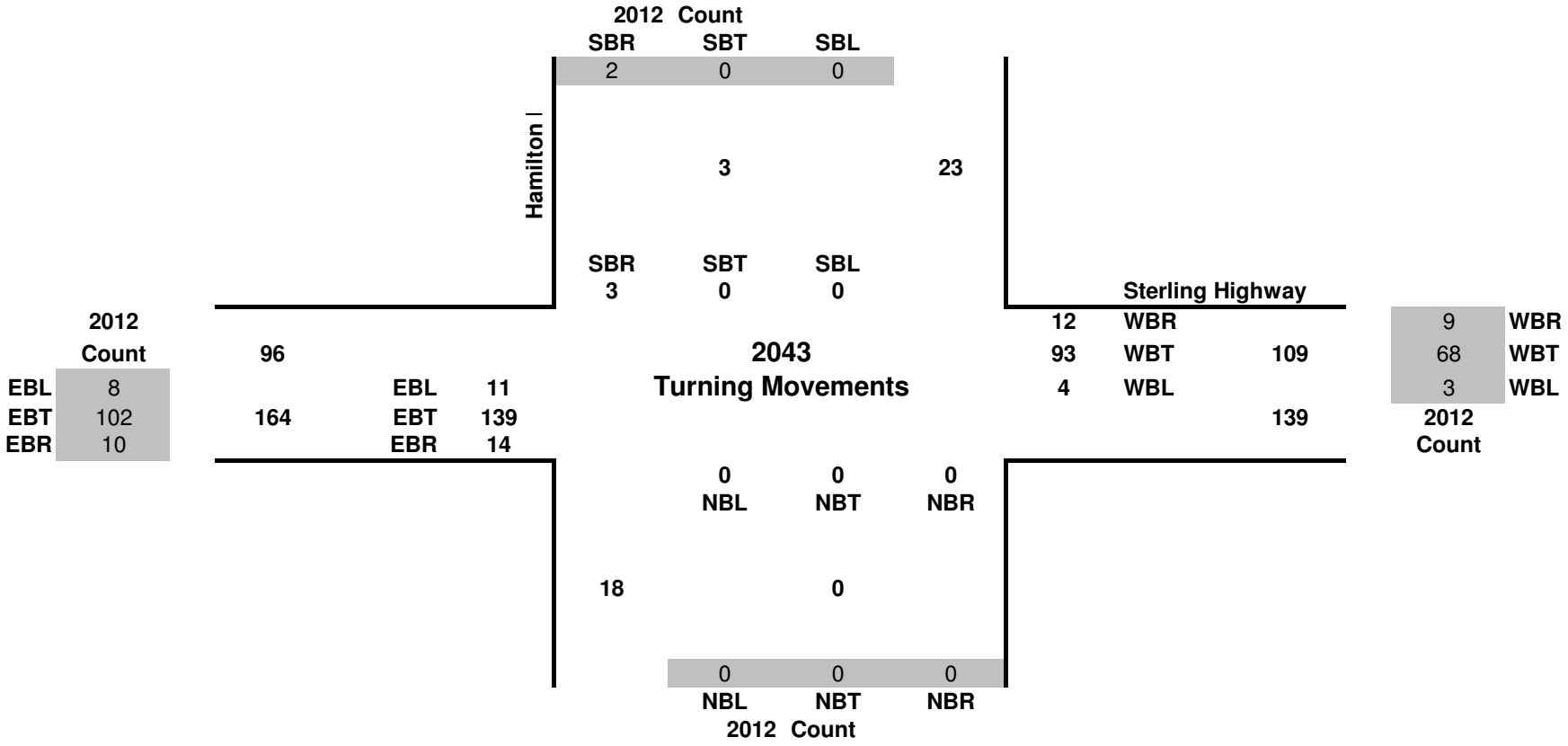
E/W Street:	Sterling Highway				
N/S Street:	Old Sterling Highway				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Cooper Creek Alternative
2043 Sterling Highway and Hamilton Place

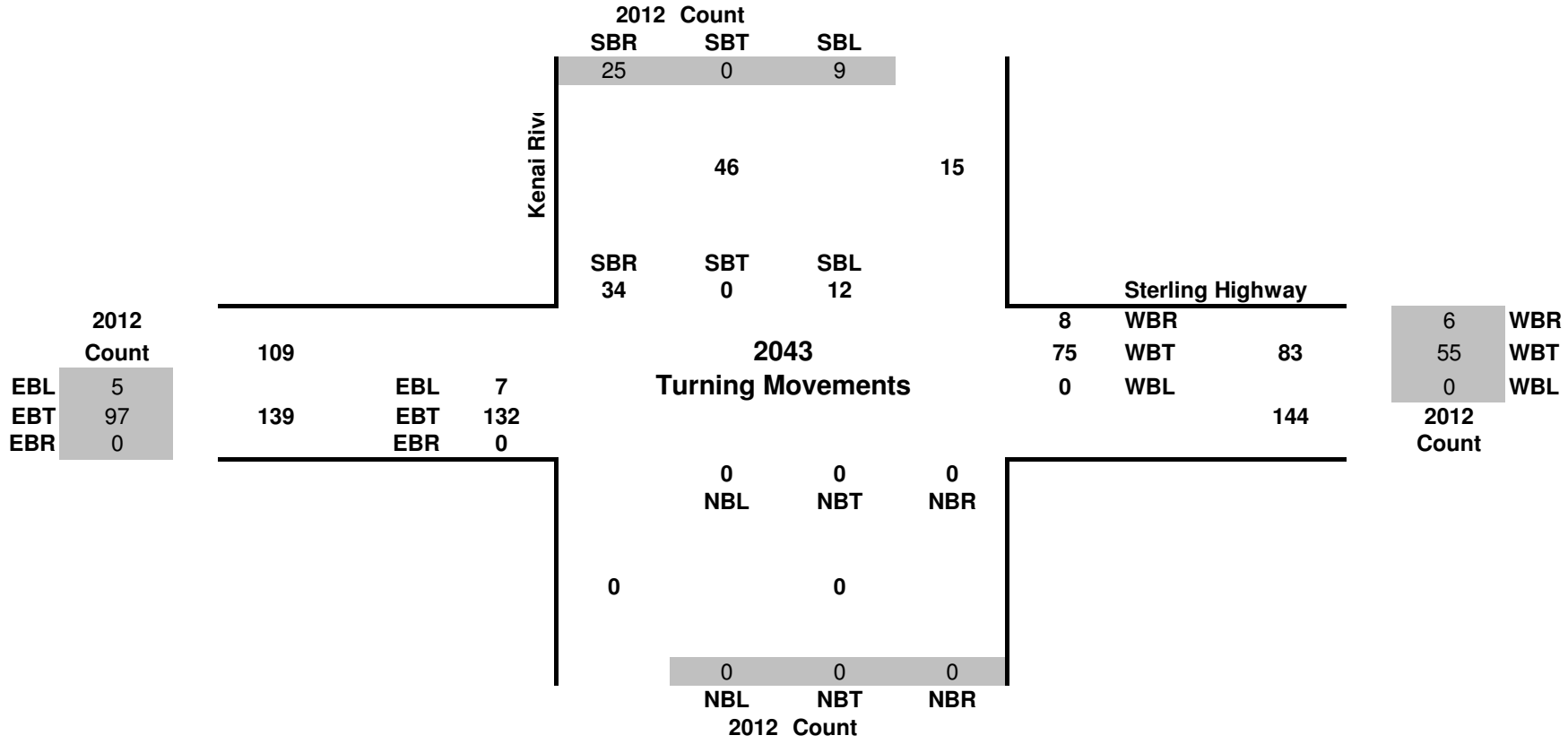
E/W Street:	Sterling Highway				
N/S Street:	Hamilton Place				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Cooper Creek Alternative
2043 Sterling Highway and Kenai River

E/W Street:	Sterling Highway				
N/S Street:	Kenai River				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



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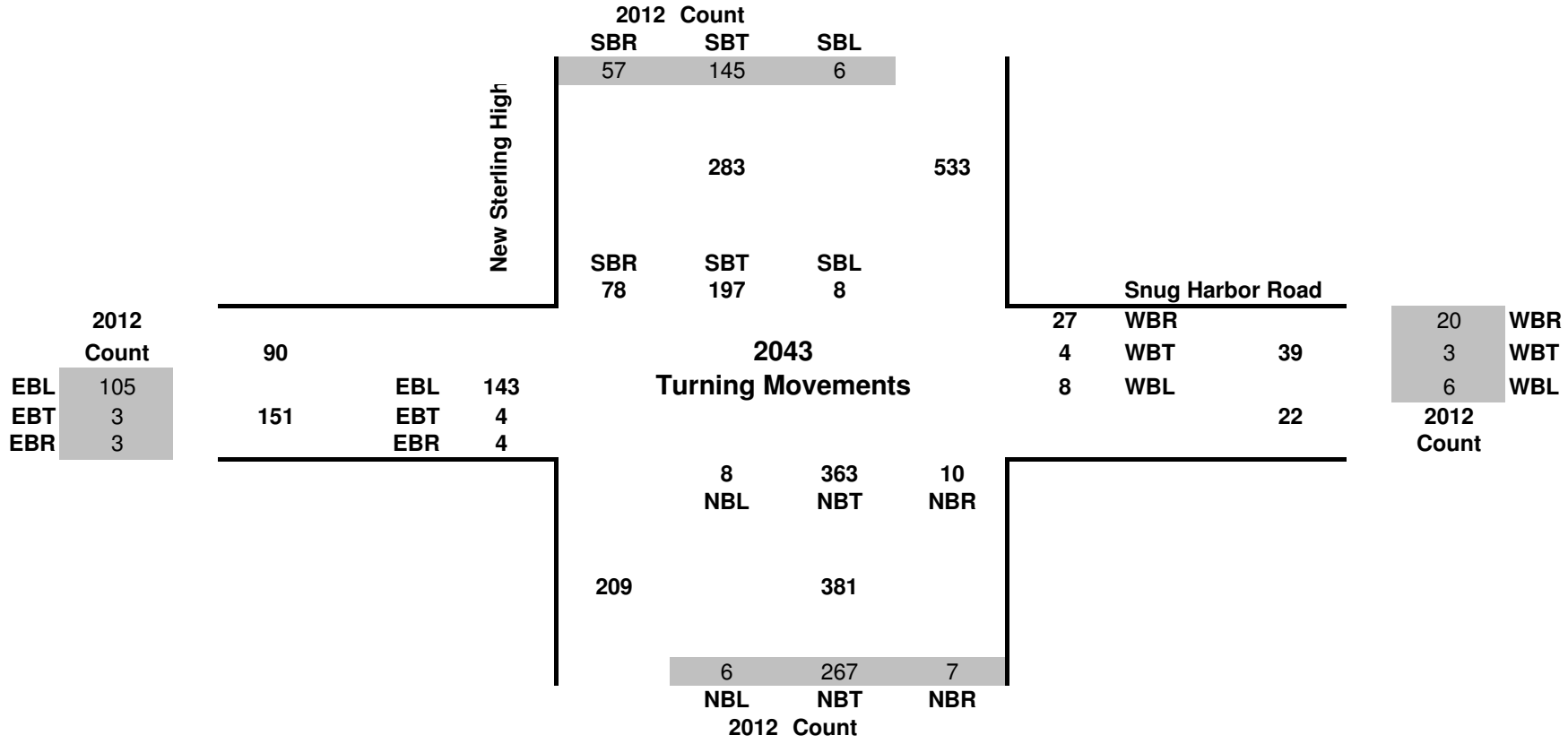
LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Cooper Creek Alternative
2043 Snug Harbor Road and New Sterling Highway

E/W Street:	Snug Harbor Road				
N/S Street:	New Sterling Highway				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	

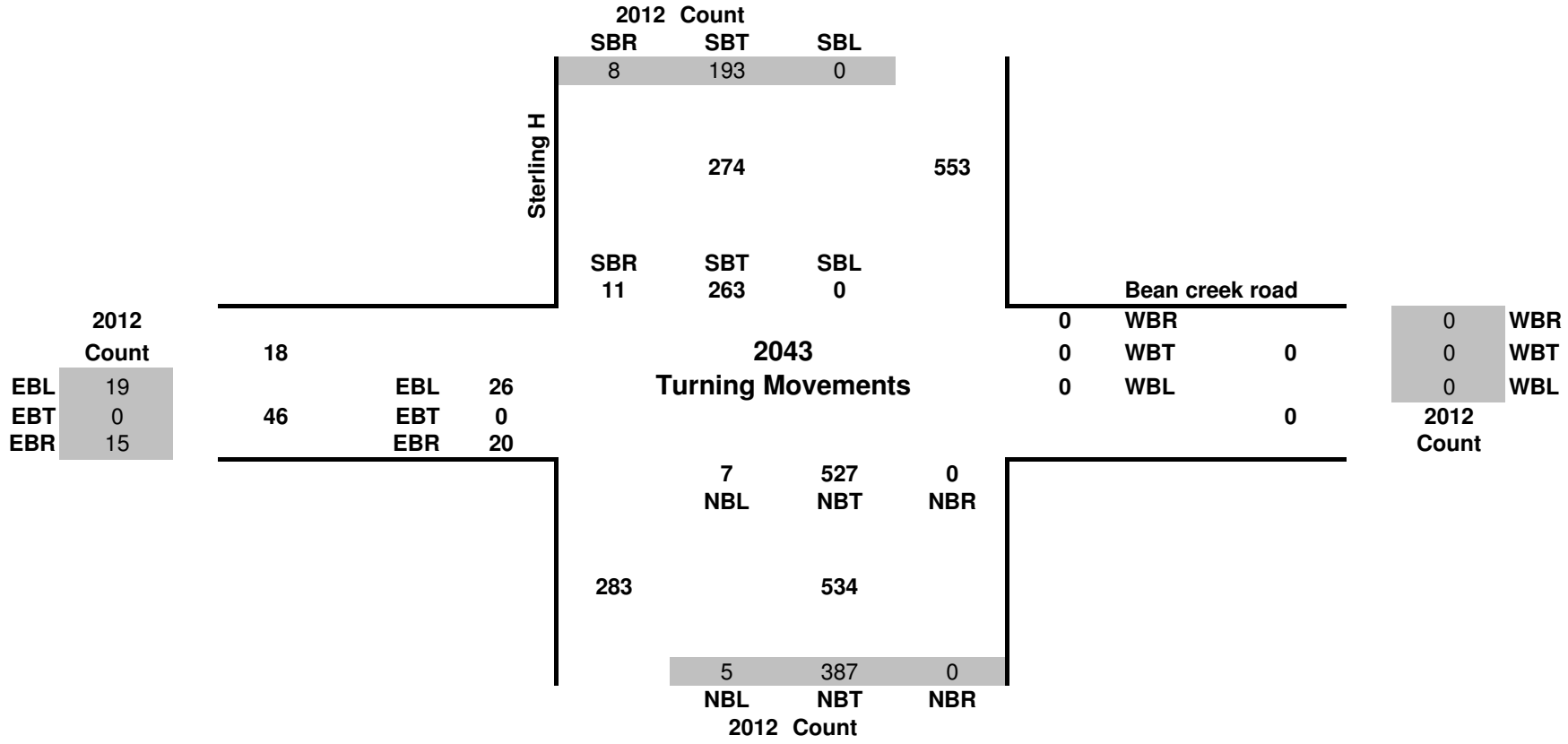


11/27/2013

LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Cooper Creek Alternative
2043 Bean creek road and Sterling Highway

E/W Street:	Bean creek road				
N/S Street:	Sterling Highway				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



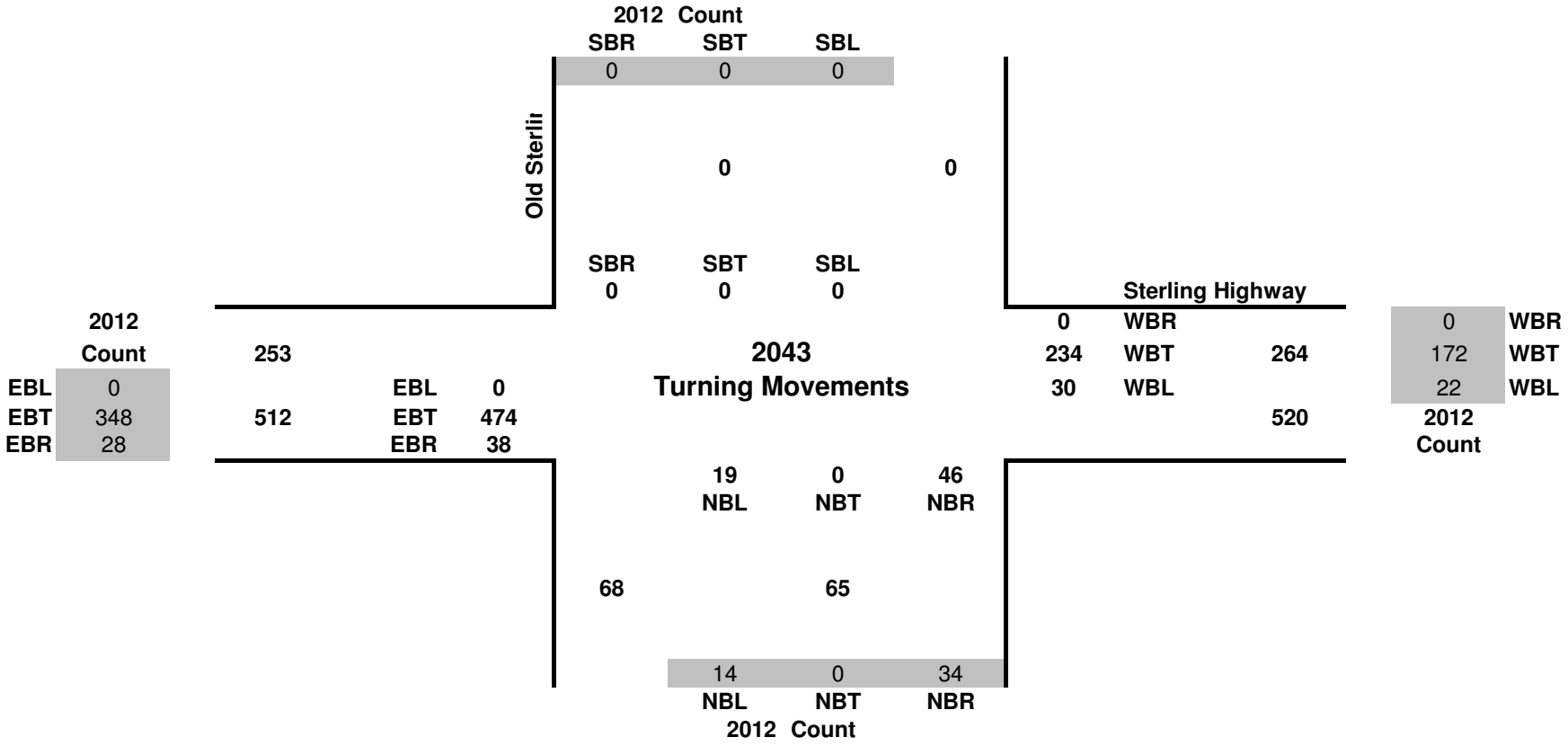
LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

APPENDIX C4

Juneau Creek without Bridge

INTERSECTION TURNING MOVEMENT PROJECTIONS
Juneau Creek Alternative Without Schooner Bend Bridge
2043 Sterling Highway and Old Sterling Highway

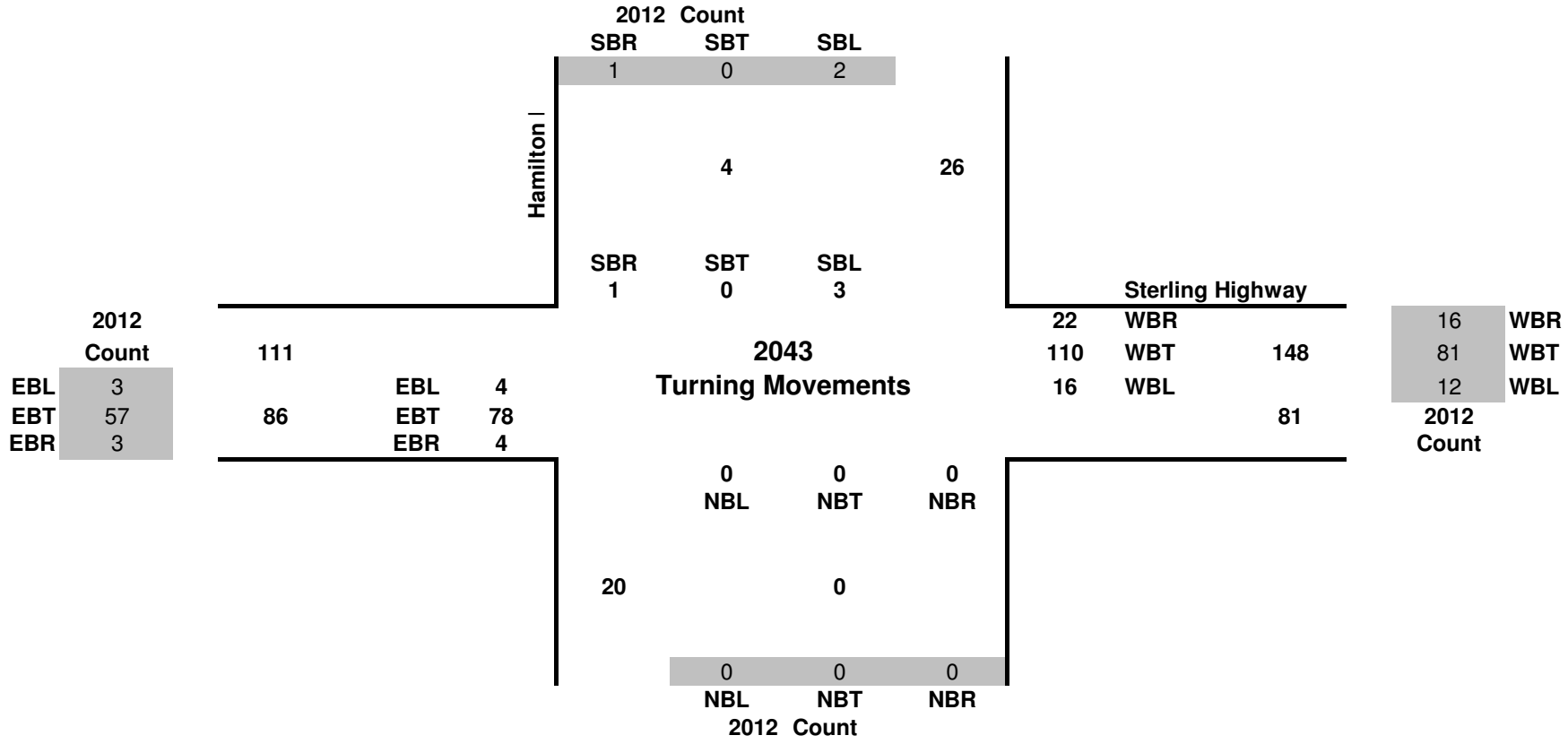
E/W Street:	Sterling Highway				
N/S Street:	Old Sterling Highway				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Juneau Creek Alternative Without Schooner Bend Bridge
2043 Sterling Highway and Hamilton Place

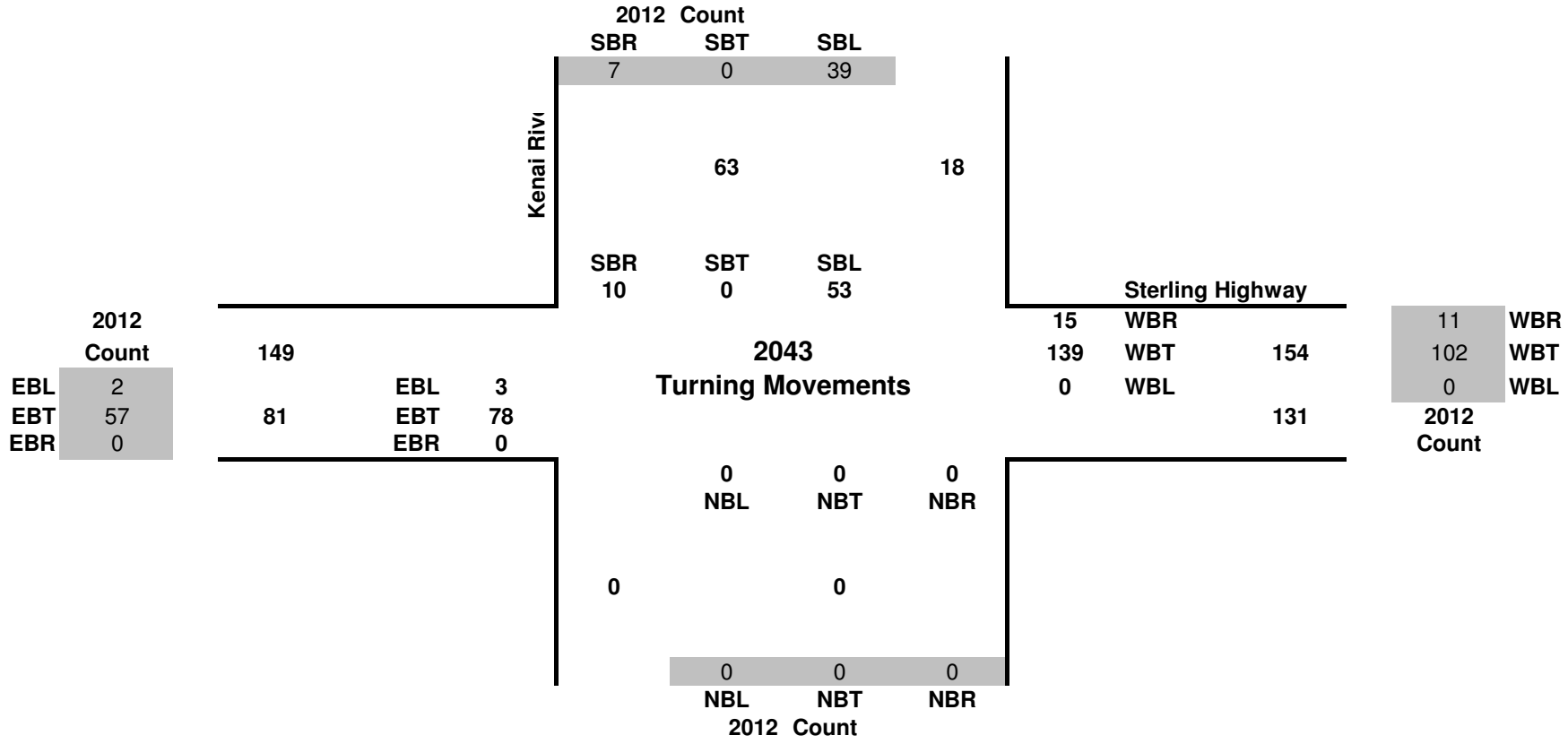
E/W Street:	Sterling Highway				
N/S Street:	Hamilton Place				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Juneau Creek Alternative Without Schooner Bend Bridge
2043 Sterling Highway and Kenai River

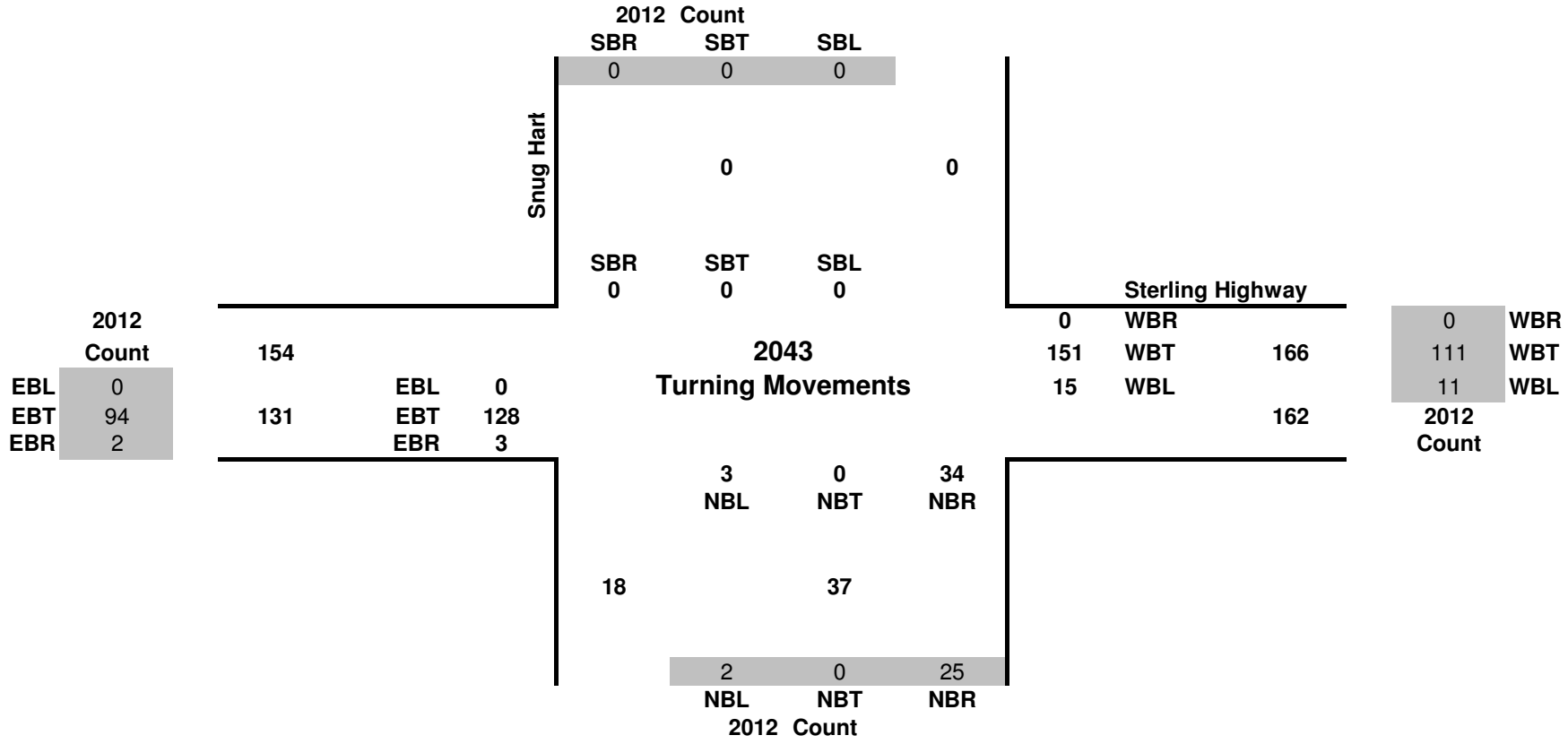
E/W Street:	Sterling Highway				
N/S Street:	Kenai River				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Juneau Creek Alternative Without Schooner Bend Bridge
2043 Sterling Highway and Snug Harbor Road

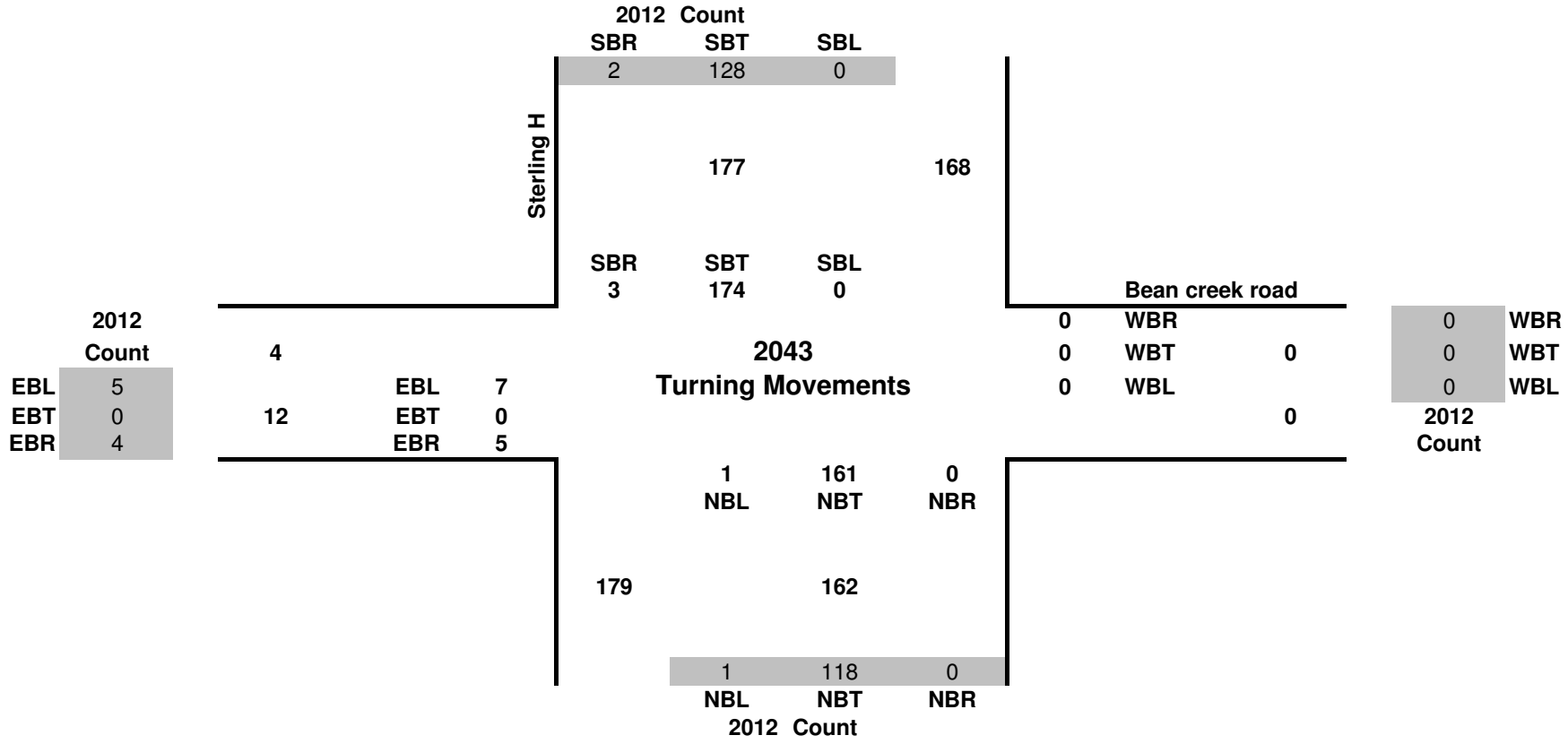
E/W Street:	Sterling Highway				
N/S Street:	Snug Harbor Road				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Juneau Creek Alternative Without Schooner Bend Bridge
2043 Bean creek road and Sterling Highway

E/W Street:	Bean creek road				
N/S Street:	Sterling Highway				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



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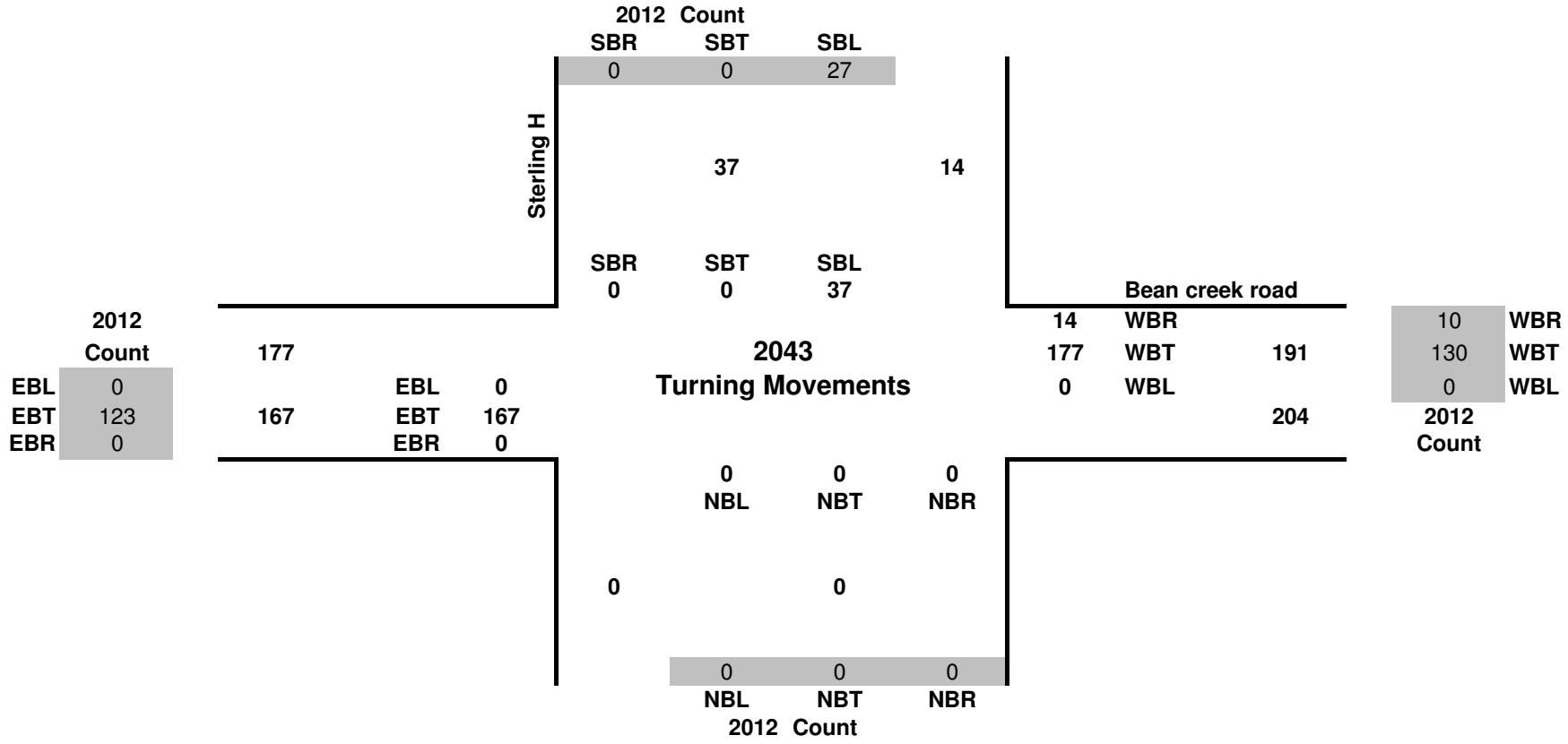
LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Juneau Creek Alternative Without Schooner Bend Bridge
2043 Bean creek road and Sterling Highway

E/W Street:	Sterling Highway			
N/S Street:	Bean creek road			
Existing Count Year:	2012			
Projected Year:	2043			
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%

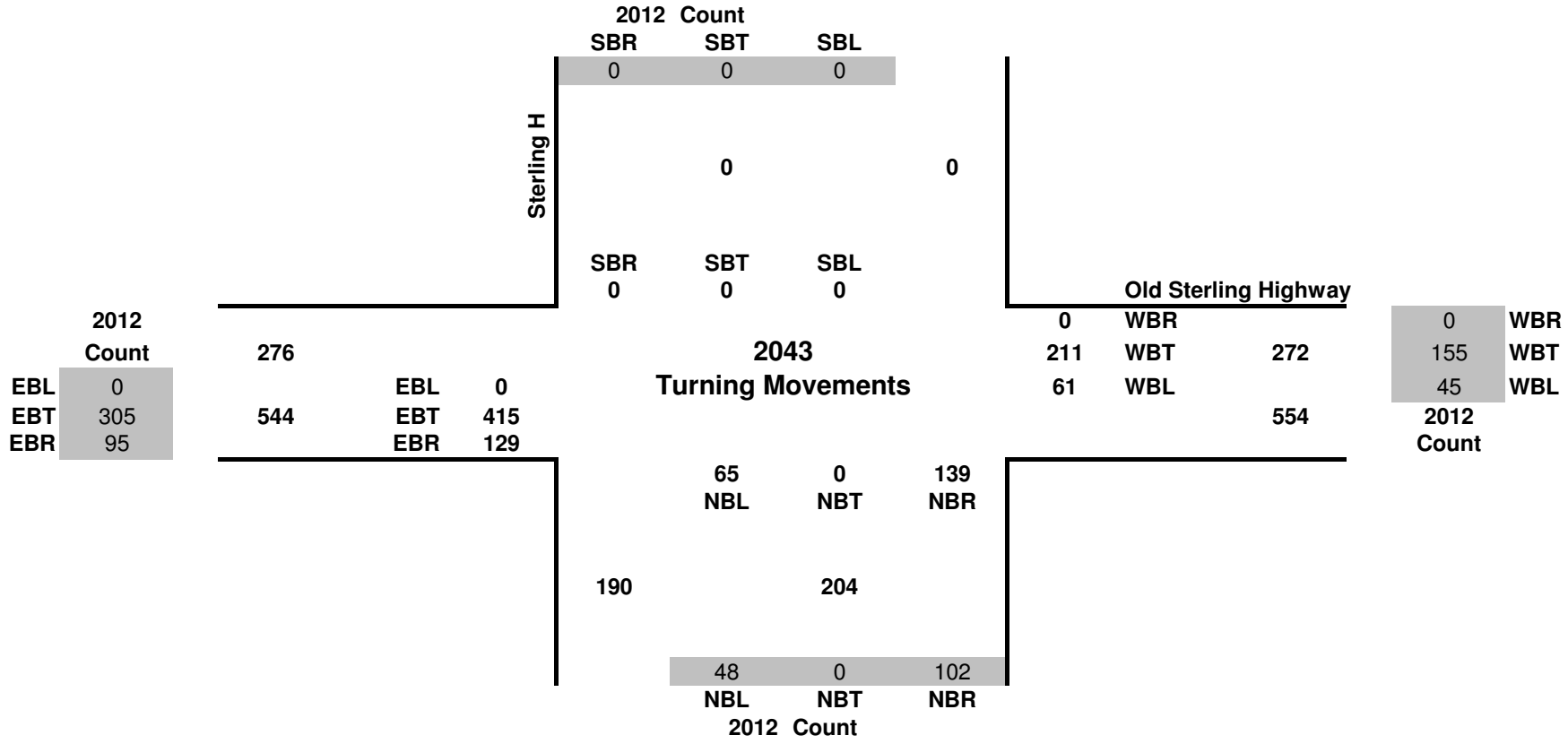


11/27/2013

LOUNSBURY and ASSOCIATES, INC.
SURVEYORS ENGINEERS PLANNERS

INTERSECTION TURNING MOVEMENT PROJECTIONS
Juneau Creek Alternative Without Schooner Bend Bridge
2043 Old Sterling Highway and Sterling Highway

E/W Street:	Sterling Highway				
N/S Street:	Old Sterling Highway				
Existing Count Year:	2012				
Projected Year:	2043				
Approach Annual Growth Rate (% per Year):	**EB** 1.0%	**WB** 1.0%	**NB** 1.0%	**SB** 1.0%	



LOUNSBURY and ASSOCIATES, INC.
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APPENDIX D

TWO-WAY STOP CONTROL SUMMARY

APPENDIX D1
NO BUILD

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *No Build Alternative*

East/West Street: *STERLING HIGHWAY* | North/South Street: *BEAN CREAK (NORTH)*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*557*			*241*	*8*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*586*	*0*	*0*	*253*	*8*
Percent Heavy Vehicles	*24*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*20*		*0*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*21*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*24*	*0*	*24*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*0*						*21*	
C (m) (veh/h)	*1186*						*306*	
v/c	*0.00*						*0.07*	
95% queue length	*0.00*						*0.22*	
Control Delay (s/veh)	*8.0*						*17.6*	
LOS	*A*						*C*	
Approach Delay (s/veh)	--	--					*17.6*	
Approach LOS	--	--					*C*	

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	
Agency/Co.	
Date Performed	*11/20/2013*
Analysis Time Period	

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2043*

Project Description *No Build Alternative*

East/West Street: *BEAN CREEK (SOUTH)* | North/South Street: *STERLING HIGHWAY*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*7*	*550*			*238*	*3*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*7*	*578*	*0*	*0*	*250*	*3*
Percent Heavy Vehicles	*24*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*7*		*20*			
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*7*	*0*	*21*	*0*	*0*	*0*
Percent Heavy Vehicles	*24*	*0*	*24*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*7*						*28*	
C (m) (veh/h)	*1194*						*543*	
v/c	*0.01*						*0.05*	
95% queue length	*0.02*						*0.16*	
Control Delay (s/veh)	*8.0*						*12.0*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--					*12.0*	
Approach LOS	--	--					*B*	

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	
Agency/Co.	
Date Performed	*11/20/2013*
Analysis Time Period	

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2043*

Project Description *No Build Alternative*

East/West Street: *STERLING HIGHWAY* | North/South Street: *SNUG HARBOR*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*527*	*10*	*7*	*250*	*0*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*554*	*10*	*7*	*263*	*0*
Percent Heavy Vehicles	*24*	--	--	*24*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*8*		*27*			
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*8*	*0*	*28*	*0*	*0*	*0*
Percent Heavy Vehicles	*24*	*0*	*24*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LR*				
v (veh/h)	*0*	*7*		*36*				
C (m) (veh/h)	*1184*	*907*		*432*				
v/c	*0.00*	*0.01*		*0.08*				
95% queue length	*0.00*	*0.02*		*0.27*				
Control Delay (s/veh)	*8.0*	*9.0*		*14.1*				
LOS	*A*	*A*		*B*				
Approach Delay (s/veh)	--	--	*14.1*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *No Build Alternative*

East/West Street: *STERLING HIGHWAY* | North/South Street: *KENAI RIVER*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*7*	*509*			*245*	*7*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*7*	*535*	*0*	*0*	*257*	*7*
Percent Heavy Vehicles	*24*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*11*		*33*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*11*	*0*	*34*
Percent Heavy Vehicles	*0*	*0*	*0*	*24*	*0*	*24*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*7*						*45*	
C (m) (veh/h)	*1183*						*554*	
v/c	*0.01*						*0.08*	
95% queue length	*0.02*						*0.26*	
Control Delay (s/veh)	*8.1*						*12.1*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--					*12.1*	
Approach LOS	--	--					*B*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *No Build Alternative*

East/West Street: *STERLING HIGHWAY* | North/South Street: *HAMILTON PLACE*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*10*	*490*	*12*	*4*	*250*	*11*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*10*	*515*	*12*	*4*	*263*	*11*
Percent Heavy Vehicles	*24*	--	--	*24*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*0*	*0*	*0*	*0*	*3*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*3*
Percent Heavy Vehicles	*24*	*24*	*24*	*24*	*24*	*24*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*10*	*4*		*0*			*3*	
C (m) (veh/h)	*1172*	*937*					*721*	
v/c	*0.01*	*0.00*					*0.00*	
95% queue length	*0.03*	*0.01*					*0.01*	
Control Delay (s/veh)	*8.1*	*8.9*					*10.0*	
LOS	*A*	*A*					*B*	
Approach Delay (s/veh)	--	--				*10.0*		
Approach LOS	--	--				*B*		

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APPENDIX D2

Juneau Creek and G-South

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/21/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Juneau Creek and G-South Alternative 2*

East/West Street: *NEW STERLING HIGHWAY* North/South Street: *OLD STERLING HIGHWAY EC*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*388*	*8*	*82*	*191*	
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*408*	*8*	*86*	*201*	*0*
Percent Heavy Vehicles	*0*	--	--	*24*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*1*	*1*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*4*		*166*			
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*4*	*0*	*174*	*0*	*0*	*0*
Percent Heavy Vehicles	*24*	*0*	*24*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*0*	*1*	*0*	*0*	*0*
Configuration	*L*		*R*			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*86*	*4*		*174*			
C (m) (veh/h)		*1034*	*306*		*598*			
v/c		*0.08*	*0.01*		*0.29*			
95% queue length		*0.27*	*0.04*		*1.20*			
Control Delay (s/veh)		*8.8*	*16.9*		*13.5*			
LOS		*A*	*C*		*B*			
Approach Delay (s/veh)	--	--	*13.5*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Juneau Creek and G-South Alternative*

East/West Street: *STERLING HIGHWAY* | North/South Street: *BEAN CREAK (NORTH)*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*150*			*82*	*8*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*157*	*0*	*0*	*86*	*8*
Percent Heavy Vehicles	*24*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*20*		*0*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*21*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*24*	*0*	*24*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*0*						*21*	
C (m) (veh/h)	*1373*						*696*	
v/c	*0.00*						*0.03*	
95% queue length	*0.00*						*0.09*	
Control Delay (s/veh)	*7.6*						*10.3*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--				*10.3*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	
Agency/Co.	
Date Performed	*11/20/2013*
Analysis Time Period	

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2043*

Project Description *Juneau Creek and G-South Alternative*

East/West Street: *BEAN CREEK (SOUTH)* North/South Street: *STERLING HIGHWAY*

Intersection Orientation: *North-South* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*7*	*143*			*79*	*3*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*7*	*150*	*0*	*0*	*83*	*3*
Percent Heavy Vehicles	*24*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*7*		*20*			
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*7*	*0*	*21*	*0*	*0*	*0*
Percent Heavy Vehicles	*24*	*0*	*24*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*7*						*28*	
C (m) (veh/h)	*1382*						*848*	
v/c	*0.01*						*0.03*	
95% queue length	*0.02*						*0.10*	
Control Delay (s/veh)	*7.6*						*9.4*	
LOS	*A*						*A*	
Approach Delay (s/veh)	--	--				*9.4*		
Approach LOS	--	--				*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*10/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Juneau Creek and G-South Alternative*

East/West Street: *STERLING HIGHWAY* North/South Street: *SNUG HARBOR*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*121*	*11*	*7*	*93*	
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*127*	*11*	*7*	*97*	*0*
Percent Heavy Vehicles	*11*	--	--	*24*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*10*		*29*			
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*10*	*0*	*30*	*0*	*0*	*0*
Percent Heavy Vehicles	*24*	*0*	*24*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (veh/h)		*7*		*40*				
C (m) (veh/h)		*1321*		*813*				
v/c		*0.01*		*0.05*				
95% queue length		*0.02*		*0.15*				
Control Delay (s/veh)		*7.7*		*9.7*				
LOS		*A*		*A*				
Approach Delay (s/veh)	--	--	*9.7*					
Approach LOS	--	--	*A*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Juneau Creek and G-South Alternative*

East/West Street: *STERLING HIGHWAY* North/South Street: *KENAI RIVER*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*7*	*132*			*75*	*8*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*7*	*138*	*0*	*0*	*78*	*8*
Percent Heavy Vehicles	*24*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*12*		*34*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*12*	*0*	*35*
Percent Heavy Vehicles	*0*	*0*	*0*	*24*	*0*	*24*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*7*						*47*	
C (m) (veh/h)	*1382*						*853*	
v/c	*0.01*						*0.06*	
95% queue length	*0.02*						*0.17*	
Control Delay (s/veh)	*7.6*						*9.5*	
LOS	*A*						*A*	
Approach Delay (s/veh)	--	--					*9.5*	
Approach LOS	--	--					*A*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Juneau Creek and G-South Alternative*

East/West Street: *STERLING HIGHWAY* North/South Street: *HAMILTON PLACE*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*11*	*139*	*14*	*4*	*93*	*12*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*11*	*146*	*14*	*4*	*97*	*12*
Percent Heavy Vehicles	*24*	--	--	*24*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*0*	*0*	*0*	*0*	*3*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*3*
Percent Heavy Vehicles	*24*	*24*	*24*	*24*	*24*	*24*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*11*	*4*		*0*			*3*	
C (m) (veh/h)	*1355*	*1296*					*895*	
v/c	*0.01*	*0.00*					*0.00*	
95% queue length	*0.02*	*0.01*					*0.01*	
Control Delay (s/veh)	*7.7*	*7.8*					*9.0*	
LOS	*A*	*A*					*A*	
Approach Delay (s/veh)	--	--					*9.0*	
Approach LOS	--	--					*A*	

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/21/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Juneau Creek and G-South Alternative*

East/West Street: *NEW STERLING HIGHWAY* North/South Street: *OLD STERLING HIGHWAY WC*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*359*	*154*	*10*	*176*	
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*377*	*162*	*10*	*185*	*0*
Percent Heavy Vehicles	*0*	--	--	*24*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*1*	*1*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*76*	*0*	*19*			
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*80*	*0*	*20*	*0*	*0*	*0*
Percent Heavy Vehicles	*24*	*0*	*24*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*		*LTR*				
v (veh/h)		*10*		*100*				
C (m) (veh/h)		*927*		*464*				
v/c		*0.01*		*0.22*				
95% queue length		*0.03*		*0.81*				
Control Delay (s/veh)		*8.9*		*14.9*				
LOS		*A*		*B*				
Approach Delay (s/veh)	--	--	*14.9*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	
Agency/Co.	
Date Performed	*11/21/2013*
Analysis Time Period	

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2043*

Project Description *Juneau Creek Alternative Variant 1 and 3*

East/West Street: *NEW STERLING HIGHWAY* | North/South Street: *OLD STERLING HIGHWAY*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*154*	*359*			*176*	*10*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*162*	*377*	*0*	*0*	*185*	*10*
Percent Heavy Vehicles	*24*	--	--	*11*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*0*	*1*	*1*
Configuration	*L*	*T*			*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*19*	*0*	*76*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*20*	*0*	*80*
Percent Heavy Vehicles	*11*	*0*	*11*	*24*	*0*	*24*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*1*	*0*
Configuration					*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*						*LTR*	
v (veh/h)	*162*						*100*	
C (m) (veh/h)	*1257*						*558*	
v/c	*0.13*						*0.18*	
95% queue length	*0.44*						*0.65*	
Control Delay (s/veh)	*8.3*						*12.9*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--					*12.9*	
Approach LOS	--	--					*B*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/21/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Juneau Creek Alternative Variant 2*

East/West Street: *NEW/OLD STERLING HIGHWAY* | North/South Street: *SPORTSMAN'S ACCESS*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*131*	*33*	*19*	*76*	
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*137*	*34*	*20*	*80*	*0*
Percent Heavy Vehicles	*0*	--	--	*24*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*1*	*1*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*19*		*33*			
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*20*	*0*	*34*	*0*	*0*	*0*
Percent Heavy Vehicles	*24*	*0*	*24*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*		*LR*				
v (veh/h)		*20*		*54*				
C (m) (veh/h)		*1283*		*779*				
v/c		*0.02*		*0.07*				
95% queue length		*0.05*		*0.22*				
Control Delay (s/veh)		*7.9*		*10.0*				
LOS		*A*		*A*				
Approach Delay (s/veh)	--	--	*10.0*					
Approach LOS	--	--	*A*					

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APPENDIX D3

Cooper Creek

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	
Agency/Co.	
Date Performed	*11/20/2013*
Analysis Time Period	

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2043*

Project Description *Cooper Creek Alternative*

East/West Street: *BEAN CREEK* | North/South Street: *STERLING HIGHWAY*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*7*	*527*			*263*	*11*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*7*	*554*	*0*	*0*	*276*	*11*
Percent Heavy Vehicles	*24*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*0*	*1*	*1*
Configuration	*L*	*T*			*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*26*		*20*			
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*27*	*0*	*21*	*0*	*0*	*0*
Percent Heavy Vehicles	*24*	*0*	*24*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*0*	*1*	*0*	*0*	*0*
Configuration	*L*		*R*			

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*					*L*		*R*
v (veh/h)	*7*					*27*		*21*
C (m) (veh/h)	*1159*					*304*		*713*
v/c	*0.01*					*0.09*		*0.03*
95% queue length	*0.02*					*0.29*		*0.09*
Control Delay (s/veh)	*8.1*					*18.0*		*10.2*
LOS	*A*					*C*		*B*
Approach Delay (s/veh)	--	--				*14.6*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Cooper Creek Alternative*

East/West Street: *SNUG HARBOR* North/South Street: *STERLING HIGHWAY*

Intersection Orientation: *North-South* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*8*	*363*	*10*	*8*	*197*	*78*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*8*	*382*	*10*	*8*	*207*	*82*
Percent Heavy Vehicles	*24*	--	--	*24*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*1*
Lanes	*1*	*1*	*1*	*1*	*1*	*1*
Configuration	*L*	*T*	*R*	*L*	*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*143*	*4*	*4*	*8*	*4*	*27*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*150*	*4*	*4*	*8*	*4*	*28*
Percent Heavy Vehicles	*24*	*24*	*24*	*24*	*24*	*24*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*1*			*1*
Lanes	*0*	*1*	*1*	*0*	*1*	*1*
Configuration	*LT*		*R*	*LT*		*R*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*	*LT*		*R*	*LT*		*R*
v (veh/h)	*8*	*8*	*12*		*28*	*154*		*4*
C (m) (veh/h)	*1243*	*1066*	*348*		*619*	*344*		*781*
v/c	*0.01*	*0.01*	*0.03*		*0.05*	*0.45*		*0.01*
95% queue length	*0.02*	*0.02*	*0.11*		*0.14*	*2.22*		*0.02*
Control Delay (s/veh)	*7.9*	*8.4*	*15.7*		*11.1*	*23.7*		*9.6*
LOS	*A*	*A*	*C*		*B*	*C*		*A*
Approach Delay (s/veh)	--	--	*12.5*			*23.3*		
Approach LOS	--	--	*B*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Cooper Creek Alternative*

East/West Street: *STERLING HIGHWAY* North/South Street: *KENAI RIVER*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*7*	*132*			*75*	*8*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*7*	*138*	*0*	*0*	*78*	*8*
Percent Heavy Vehicles	*24*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*12*		*34*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*12*	*0*	*35*
Percent Heavy Vehicles	*0*	*0*	*0*	*24*	*0*	*24*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*7*						*47*	
C (m) (veh/h)	*1382*						*853*	
v/c	*0.01*						*0.06*	
95% queue length	*0.02*						*0.17*	
Control Delay (s/veh)	*7.6*						*9.5*	
LOS	*A*						*A*	
Approach Delay (s/veh)	--	--				*9.5*		
Approach LOS	--	--				*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Cooper Creek Alternative*

East/West Street: *STERLING HIGHWAY* | North/South Street: *HAMILTON PLACE*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*11*	*139*	*14*	*4*	*93*	*12*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*11*	*146*	*14*	*4*	*97*	*12*
Percent Heavy Vehicles	*24*	--	--	*24*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*0*	*0*	*0*	*0*	*3*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*3*
Percent Heavy Vehicles	*24*	*24*	*24*	*24*	*24*	*24*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*11*	*4*		*0*			*3*	
C (m) (veh/h)	*1355*	*1296*					*895*	
v/c	*0.01*	*0.00*					*0.00*	
95% queue length	*0.02*	*0.01*					*0.01*	
Control Delay (s/veh)	*7.7*	*7.8*					*9.0*	
LOS	*A*	*A*					*A*	
Approach Delay (s/veh)	--	--				*9.0*		
Approach LOS	--	--				*A*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	
Agency/Co.	
Date Performed	*11/20/2013*
Analysis Time Period	

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2043*

Project Description *Cooper Creek Alternative*

East/West Street: *STERLING HIGHWAY*

North/South Street: *OLD STERLING HIGHWAY WC*

Intersection Orientation: *East-West*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*154*	*359*			*176*	*10*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*162*	*377*	*0*	*0*	*185*	*10*
Percent Heavy Vehicles	*24*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*0*	*1*	*1*
Configuration	*L*	*T*			*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*19*	*0*	*76*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*20*	*0*	*80*
Percent Heavy Vehicles	*0*	*0*	*0*	*24*	*0*	*24*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*1*	*0*
Configuration					*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*						*LTR*	
v (veh/h)	*162*						*100*	
C (m) (veh/h)	*1257*						*558*	
v/c	*0.13*						*0.18*	
95% queue length	*0.44*						*0.65*	
Control Delay (s/veh)	*8.3*						*12.9*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--				*12.9*		
Approach LOS	--	--				*B*		

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APPENDIX D4

Juneau Creek without Bridge

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Juneau Creek Alternative Without Schooner Bend Bridge*

East/West Street: *NEW STERLING HIGHWAY* North/South Street: *OLD STERLING HIGHWAY EC*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*415*	*129*	*61*	*211*	
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*436*	*135*	*64*	*222*	*0*
Percent Heavy Vehicles	*0*	--	--	*24*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*1*	*1*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*65*		*139*			
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*68*	*0*	*146*	*0*	*0*	*0*
Percent Heavy Vehicles	*24*	*0*	*24*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*0*	*1*	*0*	*0*	*0*
Configuration	*L*		*R*			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*64*	*68*		*146*			
C (m) (veh/h)		*901*	*308*		*576*			
v/c		*0.07*	*0.22*		*0.25*			
95% queue length		*0.23*	*0.83*		*1.00*			
Control Delay (s/veh)		*9.3*	*20.0*		*13.4*			
LOS		*A*	*C*		*B*			
Approach Delay (s/veh)	--	--	*15.5*					
Approach LOS	--	--	*C*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Juneau Creek Alternative Without Schooner Bend Bridge*

East/West Street: *STERLING HIGHWAY* | North/South Street: *BEAN CREAK (NORTH)*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*167*			*177*	*14*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*175*	*0*	*0*	*186*	*14*
Percent Heavy Vehicles	*24*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*37*		*0*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*38*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*24*	*0*	*24*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*0*						*38*	
C (m) (veh/h)	*1251*						*591*	
v/c	*0.00*						*0.06*	
95% queue length	*0.00*						*0.21*	
Control Delay (s/veh)	*7.9*						*11.5*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--				*11.5*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Juneau Creek Alternative Without Schooner Bend Bridge*

East/West Street: *BEAN CREEK (SOUTH)* | North/South Street: *STERLING HIGHWAY*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*1*	*161*			*174*	*3*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*1*	*169*	*0*	*0*	*183*	*3*
Percent Heavy Vehicles	*24*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*7*		*5*			
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*7*	*0*	*5*	*0*	*0*	*0*
Percent Heavy Vehicles	*24*	*0*	*24*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*1*						*12*	
C (m) (veh/h)	*1267*						*672*	
v/c	*0.00*						*0.02*	
95% queue length	*0.00*						*0.05*	
Control Delay (s/veh)	*7.8*						*10.5*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--				*10.5*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Juneau Creek Alternative Without Schooner Bend Bridge*

East/West Street: *STERLING HIGHWAY* North/South Street: *SNUG HARBOR*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*128*	*3*	*15*	*151*	
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*134*	*3*	*15*	*158*	*0*
Percent Heavy Vehicles	*11*	--	--	*24*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*3*		*34*			
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*3*	*0*	*35*	*0*	*0*	*0*
Percent Heavy Vehicles	*24*	*0*	*24*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (veh/h)		*15*		*38*				
C (m) (veh/h)		*1322*		*832*				
v/c		*0.01*		*0.05*				
95% queue length		*0.03*		*0.14*				
Control Delay (s/veh)		*7.8*		*9.5*				
LOS		*A*		*A*				
Approach Delay (s/veh)	--	--	*9.5*					
Approach LOS	--	--	*A*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*11/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Juneau Creek Alternative Without Schooner Bend Bridge*

East/West Street: *STERLING HIGHWAY* North/South Street: *KENAI RIVER*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*3*	*78*			*139*	*15*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*3*	*82*	*0*	*0*	*146*	*15*
Percent Heavy Vehicles	*24*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*53*		*10*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*55*	*0*	*10*
Percent Heavy Vehicles	*0*	*0*	*0*	*24*	*0*	*24*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*3*						*65*	
C (m) (veh/h)	*1295*						*717*	
v/c	*0.00*						*0.09*	
95% queue length	*0.01*						*0.30*	
Control Delay (s/veh)	*7.8*						*10.5*	
LOS	*A*						*B*	
Approach Delay (s/veh)	--	--				*10.5*		
Approach LOS	--	--				*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*10/20/2013*	Analysis Year	*2043*
Analysis Time Period			

Project Description *Juneau Creek Alternative Without Schooner Bend Bridge*

East/West Street: *STERLING HIGHWAY* North/South Street: *HAMILTON PLACE*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*4*	*78*	*4*	*16*	*110*	*22*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*4*	*82*	*4*	*16*	*115*	*23*
Percent Heavy Vehicles	*24*	--	--	*24*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*0*	*0*	*3*	*0*	*1*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*3*	*0*	*1*
Percent Heavy Vehicles	*24*	*24*	*24*	*24*	*24*	*24*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*4*	*16*		*0*			*4*	
C (m) (veh/h)	*1321*	*1382*					*695*	
v/c	*0.00*	*0.01*					*0.01*	
95% queue length	*0.01*	*0.04*					*0.02*	
Control Delay (s/veh)	*7.7*	*7.6*					*10.2*	
LOS	*A*	*A*					*B*	
Approach Delay (s/veh)	--	--				*10.2*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	
Agency/Co.	
Date Performed	*11/20/2013*
Analysis Time Period	

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2043*

Project Description *Juneau Creek Alt W/o Schooner Bend Bridge*

East/West Street: *STERLING HIGHWAY* | North/South Street: *OLD STERLING HIGHWAY WC*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*474*	*38*	*30*	*234*	
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*498*	*40*	*31*	*246*	*0*
Percent Heavy Vehicles	*11*	--	--	*24*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*1*	*1*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*19*	*0*	*46*			
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*20*	*0*	*48*	*0*	*0*	*0*
Percent Heavy Vehicles	*24*	*0*	*24*	*11*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*		*LTR*				
v (veh/h)		*31*		*68*				
C (m) (veh/h)		*928*		*440*				
v/c		*0.03*		*0.15*				
95% queue length		*0.10*		*0.54*				
Control Delay (s/veh)		*9.0*		*14.7*				
LOS		*A*		*B*				
Approach Delay (s/veh)	--	--	*14.7*					
Approach LOS	--	--	*B*					

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APPENDIX E

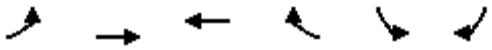
INTERSECTION CAPACITY UTILIZATION RESULTS

APPENDIX E1
NO BUILD

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	527	10	7	250	8	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	573	11	8	272	9	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			584		865	578
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			584		865	578
tC, single (s)			4.3		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.7	3.5
p0 queue free %			99		97	94
cM capacity (veh/h)			891		294	476

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	584	279	38
Volume Left	0	8	9
Volume Right	11	0	29
cSH	1700	891	417
Volume to Capacity	0.34	0.01	0.09
Queue Length (ft)	0	1	7
Control Delay (s)	0.0	0.3	14.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	14.5
Approach LOS			B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	7	509	245	7	11	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	553	266	8	12	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	274				839	270
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	274				839	270
tC, single (s)	4.3				6.6	6.4
tC, 2 stage (s)						
tF (s)	2.4				3.7	3.5
p0 queue free %	99				96	95
cM capacity (veh/h)	1172				306	719

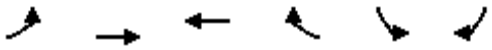
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	561	274	48
Volume Left	8	0	12
Volume Right	0	8	36
cSH	1172	1700	538
Volume to Capacity	0.01	0.16	0.09
Queue Length (ft)	0	0	7
Control Delay (s)	0.2	0.0	12.3
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	12.3
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	490	12	4	250	11	0	0	0	0	0	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	533	13	4	272	12	0	0	0	0	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	284			546			851	853	539	847	854	278
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	284			546			851	853	539	847	854	278
tC, single (s)	4.3			4.3			7.3	6.7	6.4	7.3	6.7	6.4
tC, 2 stage (s)												
tF (s)	2.4			2.4			3.7	4.2	3.5	3.7	4.2	3.5
p0 queue free %	99			100			100	100	100	100	100	100
cM capacity (veh/h)	1162			922			253	269	502	256	269	711

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	557	288	0	3
Volume Left	11	4	0	0
Volume Right	13	12	0	3
cSH	1162	922	1700	711
Volume to Capacity	0.01	0.00	0.00	0.00
Queue Length (ft)	1	0	0	0
Control Delay (s)	0.3	0.2	0.0	10.1
Lane LOS	A	A	A	B
Approach Delay (s)	0.3	0.2	0.0	10.1
Approach LOS			A	B

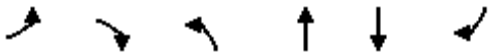
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	557	241	8	20	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	605	262	9	22	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	271				872	266
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	271				872	266
tC, single (s)	4.3				6.6	6.4
tC, 2 stage (s)						
tF (s)	2.4				3.7	3.5
p0 queue free %	100				93	100
cM capacity (veh/h)	1176				294	722

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	605	271	22
Volume Left	0	0	22
Volume Right	0	9	0
cSH	1176	1700	294
Volume to Capacity	0.00	0.16	0.07
Queue Length (ft)	0	0	6
Control Delay (s)	0.0	0.0	18.2
Lane LOS			C
Approach Delay (s)	0.0	0.0	18.2
Approach LOS			C

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	39.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	7	20	7	550	238	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	22	8	598	259	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	873	260	262			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	873	260	262			
tC, single (s)	6.6	6.4	4.3			
tC, 2 stage (s)						
tF (s)	3.7	3.5	2.4			
p0 queue free %	97	97	99			
cM capacity (veh/h)	292	728	1185			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	29	605	262
Volume Left	8	8	0
Volume Right	22	0	3
cSH	525	1185	1700
Volume to Capacity	0.06	0.01	0.15
Queue Length (ft)	4	0	0
Control Delay (s)	12.3	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	12.3	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX E2

Juneau Creek and G-South

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	121	11	7	93	10	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	132	12	8	101	11	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			143		254	138
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			143		254	138
tC, single (s)			4.3		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.7	3.5
p0 queue free %			99		98	96
cM capacity (veh/h)			1315		686	856

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	143	109	42
Volume Left	0	8	11
Volume Right	12	0	32
cSH	1700	1315	804
Volume to Capacity	0.08	0.01	0.05
Queue Length (ft)	0	0	4
Control Delay (s)	0.0	0.6	9.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.6	9.7
Approach LOS			A

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	20.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	388	8	82	191	4	166
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	422	9	89	208	4	180
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						4
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			430		808	422
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			430		808	422
tC, single (s)			4.3		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.7	3.5
p0 queue free %			91		99	69
cM capacity (veh/h)			1021		294	587

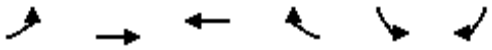
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	422	9	89	208	185
Volume Left	0	0	89	0	4
Volume Right	0	9	0	0	180
cSH	1700	1700	1021	1700	602
Volume to Capacity	0.25	0.01	0.09	0.12	0.31
Queue Length (ft)	0	0	7	0	32
Control Delay (s)	0.0	0.0	8.9	0.0	13.9
Lane LOS			A		B
Approach Delay (s)	0.0		2.7		13.9
Approach LOS					B

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	359	154	10	176	76	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	390	167	11	191	83	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			558		603	390
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			558		603	390
tC, single (s)			4.3		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.7	3.5
p0 queue free %			99		80	97
cM capacity (veh/h)			912		423	613

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NW 1
Volume Total	390	167	11	191	103
Volume Left	0	0	11	0	83
Volume Right	0	167	0	0	21
cSH	1700	1700	912	1700	451
Volume to Capacity	0.23	0.10	0.01	0.11	0.23
Queue Length (ft)	0	0	1	0	22
Control Delay (s)	0.0	0.0	9.0	0.0	15.3
Lane LOS			A		C
Approach Delay (s)	0.0		0.5		15.3
Approach LOS					C

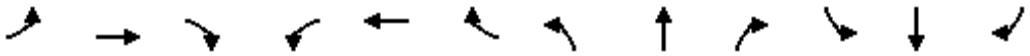
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	30.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	150	82	8	20	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	163	89	9	22	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	98				257	93
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	98				257	93
tC, single (s)	4.3				6.6	6.4
tC, 2 stage (s)						
tF (s)	2.4				3.7	3.5
p0 queue free %	100				97	100
cM capacity (veh/h)	1368				687	906

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	163	98	22
Volume Left	0	0	22
Volume Right	0	9	0
cSH	1368	1700	687
Volume to Capacity	0.00	0.06	0.03
Queue Length (ft)	0	0	2
Control Delay (s)	0.0	0.0	10.4
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.4
Approach LOS			B

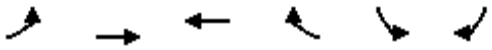
Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	17.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	11	139	14	4	93	12	0	0	0	0	0	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	151	15	4	101	13	0	0	0	0	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	114			166			302	305	159	299	307	108
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114			166			302	305	159	299	307	108
tC, single (s)	4.3			4.3			7.3	6.7	6.4	7.3	6.7	6.4
tC, 2 stage (s)												
tF (s)	2.4			2.4			3.7	4.2	3.5	3.7	4.2	3.5
p0 queue free %	99			100			100	100	100	100	100	100
cM capacity (veh/h)	1349			1289			601	566	832	606	566	890

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	178	118	0	3
Volume Left	12	4	0	0
Volume Right	15	13	0	3
cSH	1349	1289	1700	890
Volume to Capacity	0.01	0.00	0.00	0.00
Queue Length (ft)	1	0	0	0
Control Delay (s)	0.6	0.3	0.0	9.1
Lane LOS	A	A	A	A
Approach Delay (s)	0.6	0.3	0.0	9.1
Approach LOS			A	A

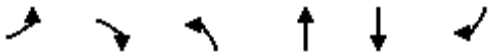
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	22.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	7	132	75	8	12	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	143	82	9	13	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	90				245	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	90				245	86
tC, single (s)	4.3				6.6	6.4
tC, 2 stage (s)						
tF (s)	2.4				3.7	3.5
p0 queue free %	99				98	96
cM capacity (veh/h)	1377				694	915

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	151	90	50
Volume Left	8	0	13
Volume Right	0	9	37
cSH	1377	1700	845
Volume to Capacity	0.01	0.05	0.06
Queue Length (ft)	0	0	5
Control Delay (s)	0.4	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	0.4	0.0	9.5
Approach LOS			A

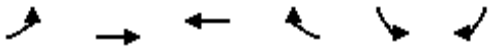
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	22.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	7	20	7	143	79	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	22	8	155	86	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	258	88	89			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	258	88	89			
tC, single (s)	6.6	6.4	4.3			
tC, 2 stage (s)						
tF (s)	3.7	3.5	2.4			
p0 queue free %	99	98	99			
cM capacity (veh/h)	682	913	1379			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	29	163	89
Volume Left	8	8	0
Volume Right	22	0	3
cSH	839	1379	1700
Volume to Capacity	0.03	0.01	0.05
Queue Length (ft)	3	0	0
Control Delay (s)	9.4	0.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	0.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	23.2%	ICU Level of Service	A
Analysis Period (min)	15		



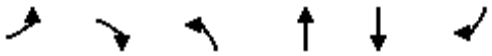
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	154	359	176	10	19	76
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	167	390	191	11	21	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	202				916	191
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	202				916	191
tC, single (s)	4.3				6.6	6.4
tC, 2 stage (s)						
tF (s)	2.4				3.7	3.5
p0 queue free %	87				91	90
cM capacity (veh/h)	1249				239	797

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	167	390	191	11	103
Volume Left	167	0	0	0	21
Volume Right	0	0	0	11	83
cSH	1249	1700	1700	1700	544
Volume to Capacity	0.13	0.23	0.11	0.01	0.19
Queue Length (ft)	12	0	0	0	17
Control Delay (s)	8.3	0.0	0.0	0.0	13.2
Lane LOS	A				B
Approach Delay (s)	2.5		0.0		13.2
Approach LOS					B

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX E3

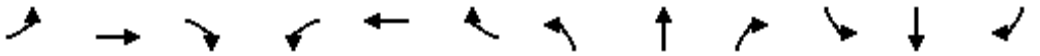
Cooper Creek



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	26	20	7	527	263	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	22	8	573	286	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	880	292	298			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	880	292	298			
tC, single (s)	6.6	6.4	4.3			
tC, 2 stage (s)						
tF (s)	3.7	3.5	2.4			
p0 queue free %	90	97	99			
cM capacity (veh/h)	289	698	1148			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	50	580	298
Volume Left	28	8	0
Volume Right	22	0	12
cSH	388	1148	1700
Volume to Capacity	0.13	0.01	0.18
Queue Length (ft)	11	1	0
Control Delay (s)	15.7	0.2	0.0
Lane LOS	C	A	
Approach Delay (s)	15.7	0.2	0.0
Approach LOS	C		

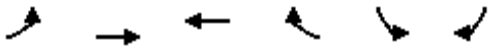
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	143	4	4	8	4	27	8	363	10	6	145	57
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	155	4	4	9	4	29	9	395	11	7	158	62
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	585	583	158	585	583	395	158			395		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	585	583	158	585	583	395	158			395		
tC, single (s)	7.3	6.7	6.4	7.3	6.7	6.4	4.3			4.3		
tC, 2 stage (s)												
tF (s)	3.7	4.2	3.5	3.7	4.2	3.5	2.4			2.4		
p0 queue free %	58	99	99	98	99	95	99			99		
cM capacity (veh/h)	366	391	833	383	391	609	1299			1054		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	160	4	13	29	9	395	11	7	158	62
Volume Left	155	0	9	0	9	0	0	7	0	0
Volume Right	0	4	0	29	0	0	11	0	0	62
cSH	367	833	385	609	1299	1700	1700	1054	1700	1700
Volume to Capacity	0.44	0.01	0.03	0.05	0.01	0.23	0.01	0.01	0.09	0.04
Queue Length (ft)	54	0	3	4	1	0	0	0	0	0
Control Delay (s)	22.2	9.3	14.7	11.2	7.8	0.0	0.0	8.4	0.0	0.0
Lane LOS	C	A	B	B	A			A		
Approach Delay (s)	21.8		12.3		0.2			0.2		
Approach LOS	C		B							

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	40.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	7	132	75	8	12	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	143	82	9	13	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	90				245	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	90				245	86
tC, single (s)	4.3				6.6	6.4
tC, 2 stage (s)						
tF (s)	2.4				3.7	3.5
p0 queue free %	99				98	96
cM capacity (veh/h)	1377				694	915

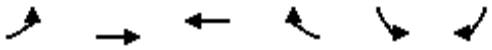
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	151	90	50
Volume Left	8	0	13
Volume Right	0	9	37
cSH	1377	1700	845
Volume to Capacity	0.01	0.05	0.06
Queue Length (ft)	0	0	5
Control Delay (s)	0.4	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	0.4	0.0	9.5
Approach LOS			A

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	22.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	11	139	14	4	93	12	0	0	0	0	0	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	151	15	4	101	13	0	0	0	0	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	114			166			302	305	159	299	307	108
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114			166			302	305	159	299	307	108
tC, single (s)	4.3			4.3			7.3	6.7	6.4	7.3	6.7	6.4
tC, 2 stage (s)												
tF (s)	2.4			2.4			3.7	4.2	3.5	3.7	4.2	3.5
p0 queue free %	99			100			100	100	100	100	100	100
cM capacity (veh/h)	1349			1289			601	566	832	606	566	890

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	178	118	0	3
Volume Left	12	4	0	0
Volume Right	15	13	0	3
cSH	1349	1289	1700	890
Volume to Capacity	0.01	0.00	0.00	0.00
Queue Length (ft)	1	0	0	0
Control Delay (s)	0.6	0.3	0.0	9.1
Lane LOS	A	A	A	A
Approach Delay (s)	0.6	0.3	0.0	9.1
Approach LOS			A	A

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	22.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	154	359	176	10	19	76
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	167	390	191	11	21	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	202				916	191
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	202				916	191
tC, single (s)	4.3				6.6	6.4
tC, 2 stage (s)						
tF (s)	2.4				3.7	3.5
p0 queue free %	87				91	90
cM capacity (veh/h)	1249				239	797

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	167	390	191	11	103
Volume Left	167	0	0	0	21
Volume Right	0	0	0	11	83
cSH	1249	1700	1700	1700	544
Volume to Capacity	0.13	0.23	0.11	0.01	0.19
Queue Length (ft)	12	0	0	0	17
Control Delay (s)	8.3	0.0	0.0	0.0	13.2
Lane LOS	A				B
Approach Delay (s)	2.5		0.0		13.2
Approach LOS					B

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		

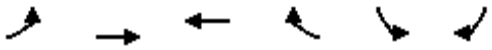
APPENDIX E4

Juneau Creek without Bridge

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	415	129	61	211	65	139
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	451	140	66	229	71	151
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			591		813	451
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			591		813	451
tC, single (s)			4.3		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.7	3.5
p0 queue free %			93		76	73
cM capacity (veh/h)			885		296	565

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	451	140	66	229	71	151
Volume Left	0	0	66	0	71	0
Volume Right	0	140	0	0	0	151
cSH	1700	1700	885	1700	296	565
Volume to Capacity	0.27	0.08	0.07	0.13	0.24	0.27
Queue Length (ft)	0	0	6	0	23	27
Control Delay (s)	0.0	0.0	9.4	0.0	21.0	13.7
Lane LOS			A		C	B
Approach Delay (s)	0.0		2.1		16.0	
Approach LOS					C	

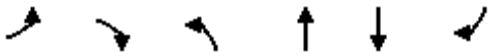
Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	167	177	14	37	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	182	192	15	40	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	208				382	200
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	208				382	200
tC, single (s)	4.3				6.6	6.4
tC, 2 stage (s)						
tF (s)	2.4				3.7	3.5
p0 queue free %	100				93	100
cM capacity (veh/h)	1243				580	788

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	182	208	40
Volume Left	0	0	40
Volume Right	0	15	0
cSH	1243	1700	580
Volume to Capacity	0.00	0.12	0.07
Queue Length (ft)	0	0	6
Control Delay (s)	0.0	0.0	11.7
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.7
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	20.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	7	5	1	161	174	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	5	1	175	189	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	368	191	192			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	368	191	192			
tC, single (s)	6.6	6.4	4.3			
tC, 2 stage (s)						
tF (s)	3.7	3.5	2.4			
p0 queue free %	99	99	100			
cM capacity (veh/h)	590	798	1260			

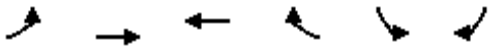
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	13	176	192
Volume Left	8	1	0
Volume Right	5	0	3
cSH	662	1260	1700
Volume to Capacity	0.02	0.00	0.11
Queue Length (ft)	2	0	0
Control Delay (s)	10.5	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	10.5	0.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	19.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	128	3	15	151	3	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	139	3	16	164	3	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			142		338	141
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			142		338	141
tC, single (s)			4.3		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.7	3.5
p0 queue free %			99		99	96
cM capacity (veh/h)			1316		608	852

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	142	180	40
Volume Left	0	16	3
Volume Right	3	0	37
cSH	1700	1316	825
Volume to Capacity	0.08	0.01	0.05
Queue Length (ft)	0	1	4
Control Delay (s)	0.0	0.8	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.8	9.6
Approach LOS			A

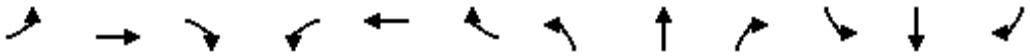
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	3	78	139	15	53	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	85	151	16	58	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	167				251	159
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	167				251	159
tC, single (s)	4.3				6.6	6.4
tC, 2 stage (s)						
tF (s)	2.4				3.7	3.5
p0 queue free %	100				92	99
cM capacity (veh/h)	1287				691	832

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	88	167	68
Volume Left	3	0	58
Volume Right	0	16	11
cSH	1287	1700	710
Volume to Capacity	0.00	0.10	0.10
Queue Length (ft)	0	0	8
Control Delay (s)	0.3	0.0	10.6
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	10.6
Approach LOS			B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	18.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	4	78	4	16	110	22	0	0	0	3	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	85	4	17	120	24	0	0	0	3	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	143			89			263	274	87	262	264	132
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	143			89			263	274	87	262	264	132
tC, single (s)	4.3			4.3			7.3	6.7	6.4	7.3	6.7	6.4
tC, 2 stage (s)												
tF (s)	2.4			2.4			3.7	4.2	3.5	3.7	4.2	3.5
p0 queue free %	100			99			100	100	100	99	100	100
cM capacity (veh/h)	1315			1379			638	588	914	640	596	862

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	93	161	0	4
Volume Left	4	17	0	3
Volume Right	4	24	0	1
cSH	1315	1379	1700	684
Volume to Capacity	0.00	0.01	0.00	0.01
Queue Length (ft)	0	1	0	0
Control Delay (s)	0.4	0.9	0.0	10.3
Lane LOS	A	A	A	B
Approach Delay (s)	0.4	0.9	0.0	10.3
Approach LOS			A	B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	23.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	474	38	30	234	19	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	515	41	33	254	21	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			557		835	515
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			557		835	515
tC, single (s)			4.3		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.7	3.5
p0 queue free %			96		93	90
cM capacity (veh/h)			913		299	518

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	515	41	33	254	71
Volume Left	0	0	33	0	21
Volume Right	0	41	0	0	50
cSH	1700	1700	913	1700	427
Volume to Capacity	0.30	0.02	0.04	0.15	0.17
Queue Length (ft)	0	0	3	0	15
Control Delay (s)	0.0	0.0	9.1	0.0	15.1
Lane LOS			A		C
Approach Delay (s)	0.0		1.0		15.1
Approach LOS					C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	35.5%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX F

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEETS

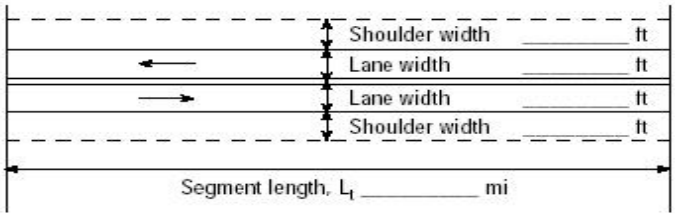
APPENDIX F1
EXISTING 2012

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 1*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2012*

Project Description: *Existing 2012*

Input Data



Class I highway ☑ Class II highway ☐ Class III highway ☐

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *20%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *337*veh/h

Opposing direction vol., V_o *225*veh/h

Shoulder width ft *1.0*

Lane Width ft *11.0*

Segment Length mi *3.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.0*	*2.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.920*	*0.908*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.87*	*0.78*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*443*	*334*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.7 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*46.0 mi/h*
		Percent free flow speed, PFFS	*86.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.953*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.88*	*0.82*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*420*	*303*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*42.2*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*31.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*60.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1290*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1387*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*354.7*
Effective width, Wv (Eq. 15-29) ft	*12.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.95*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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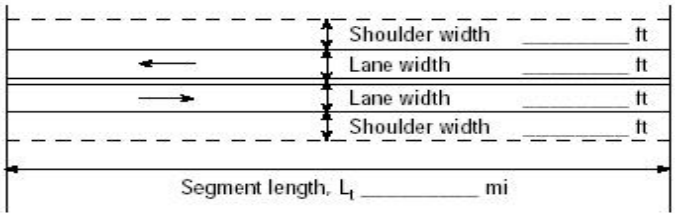
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 1*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2012*

Project Description: *Existing 2012*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF *0.95*
No-passing zone *20%*
% Trucks and Buses , P_T *7%*
% Recreational vehicles, P_R *17%*
Access points *mi* *8*/mi

Analysis direction vol., V_d *225*veh/h
Opposing direction vol., V_o *337*veh/h
Shoulder width ft *1.0*
Lane Width ft *11.0*
Segment Length mi *3.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.2*	*2.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.908*	*0.920*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.78*	*0.87*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*334*	*443*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.7 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*46.1 mi/h*
		Percent free flow speed, PFFS	*86.6 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.953*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.82*	*0.88*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*303*	*420*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*35.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*31.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*48.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.20*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1423*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1505*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*236.8*
Effective width, Wv (Eq. 15-29) ft	*12.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.75*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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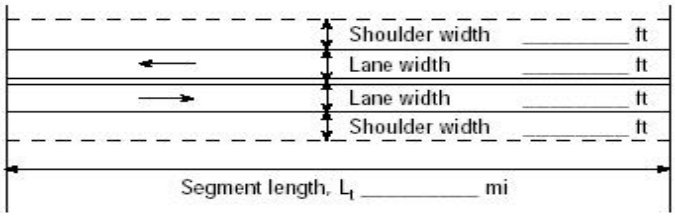
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2, 3, 4, & 5*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2012*

Project Description: *Existing 2012*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *100%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *349*veh/h

Opposing direction vol., V_o *234*veh/h

Shoulder width ft *1.0*

Lane Width ft *11.0*

Segment Length mi *3.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.0*	*2.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.920*	*0.908*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.88*	*0.79*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*454*	*343*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.7 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*44.0 mi/h*
		Percent free flow speed, PFFS	*82.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.953*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.88*	*0.82*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*435*	*315*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*44.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*44.7*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*70.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.27*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1305*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1403*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*367.4*
Effective width, Wv (Eq. 15-29) ft	*12.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.97*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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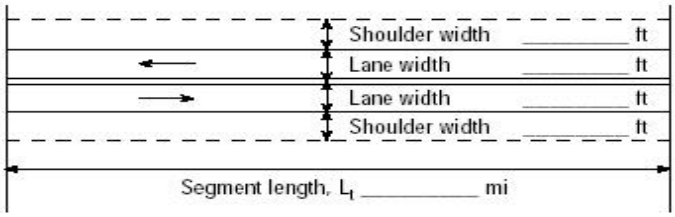
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2, 3, 4, & 5*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2012*

Project Description: *Existing 2012*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *100%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *234*veh/h

Opposing direction vol., V_o *349*veh/h

Shoulder width ft *1.0*

Lane Width ft *11.0*

Segment Length mi *3.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.2*	*2.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.908*	*0.920*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.79*	*0.88*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*343*	*454*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.7 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*2.5 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*44.6 mi/h*
		Percent free flow speed, PFFS	*83.6 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.953*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.82*	*0.88*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*315*	*435*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*36.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*44.7*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*55.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.20*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1448*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1521*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*83.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*246.3*
Effective width, Wv (Eq. 15-29) ft	*12.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.77*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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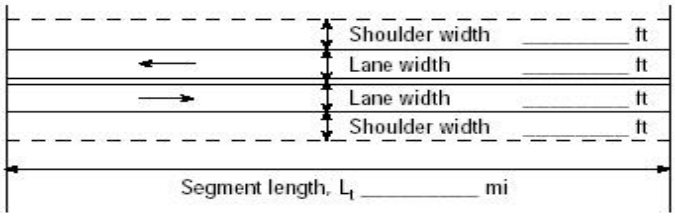
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 6*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2012*

Project Description: *Existing 2012*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF *0.95*
No-passing zone *100%*
% Trucks and Buses , P_T *7%*
% Recreational vehicles, P_R *17%*
Access points *mi* *8*/mi

Analysis direction vol., V_d *364*veh/h
Opposing direction vol., V_o *243*veh/h
Shoulder width ft *1.0*
Lane Width ft *11.0*
Segment Length mi *2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.0*	*2.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.920*	*0.908*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.89*	*0.79*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*468*	*357*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.7 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*43.9 mi/h*
		Percent free flow speed, PFFS	*82.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.953*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.89*	*0.83*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*449*	*323*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*45.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*43.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*70.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.28*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1321*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1403*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*383.2*
Effective width, Wv (Eq. 15-29) ft	*12.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.99*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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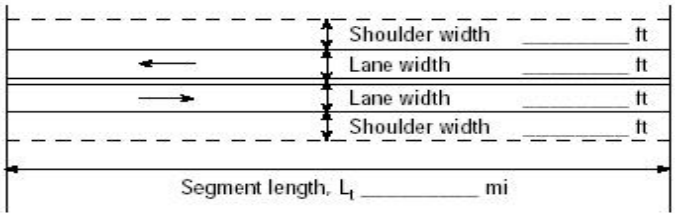
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 6*
Date Performed	*11/21/2013*	Jurisdiction	*wb*
Analysis Time Period		Analysis Year	*2012*

Project Description: *Existing 2012*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *100%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *243*veh/h

Opposing direction vol., V_o *364*veh/h

Shoulder width ft *1.0*

Lane Width ft *11.0*

Segment Length mi *2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.2*	*2.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.908*	*0.920*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.79*	*0.89*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*357*	*468*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.7 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*2.5 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*44.4 mi/h*
		Percent free flow speed, PFFS	*83.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.953*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.83*	*0.89*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*323*	*449*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*38.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*43.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*56.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.21*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1448*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1538*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*83.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*255.8*
Effective width, Wv (Eq. 15-29) ft	*12.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.79*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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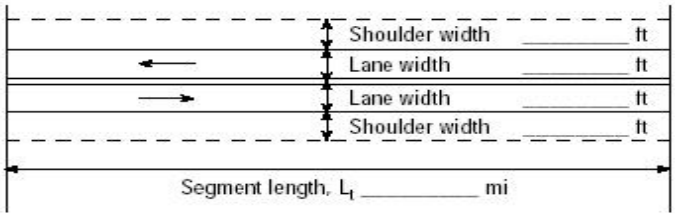
APPENDIX F_2
NO BUILD

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 1*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *No Build Alternative*

Input Data



Analysis direction vol., V_d *459* veh/h

Opposing direction vol., V_o *307* veh/h

Shoulder width ft *1.0*

Lane Width ft *11.0*

Segment Length mi *3.0*

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *20%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.932*	*0.914*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.94*	*0.85*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*551*	*416*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	*4.7 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*44.6 mi/h*
		Percent free flow speed, PFFS	*83.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	*1.4*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.95*	*0.86*
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*523*	*392*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*51.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*66.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.32*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1392*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1468*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*83.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*483.2*
Effective width, Wv (Eq. 15-29) ft	*12.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.11*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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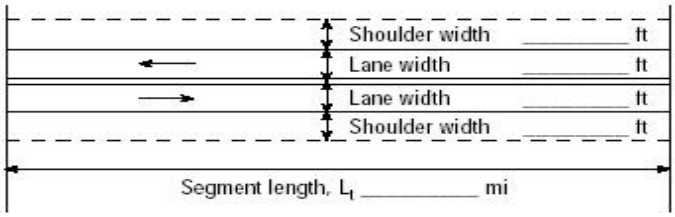
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 1*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *No Build Alternative*

Input Data



Class I highway ☑ Class II highway ☐ Class III highway ☐

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *20%*

Analysis direction vol., V_d	*307*veh/h	% Trucks and Buses , P_T	*7*%
Opposing direction vol., V_o	*459*veh/h	% Recreational vehicles, P_R	*17*%
Shoulder width ft	*1.0*	Access points *mi*	*8*/mi
Lane Width ft	*11.0*		
Segment Length mi	*3.0*		

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.914*	*0.932*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.85*	*0.94*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*416*	*551*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.7 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.9 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*44.9 mi/h*
		Percent free flow speed, PFFS	*84.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.973*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.86*	*0.95*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*392*	*523*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*44.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*55.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.24*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1505*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1609*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*323.2*
Effective width, Wv (Eq. 15-29) ft	*12.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.91*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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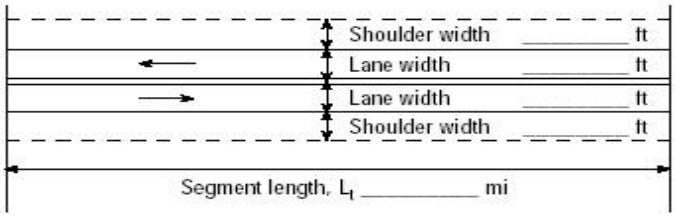
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2, 3, 4, & 5*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *No-Build*

Input Data



Analysis direction vol., V_d *476* veh/h

Opposing direction vol., V_o *318* veh/h

Shoulder width ft *1.0*
Lane Width ft *11.0*
Segment Length mi *3.0*

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF *0.95*
No-passing zone *100%*
% Trucks and Buses , P_T *7%*
% Recreational vehicles, P_R *17%*
Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.932*	*0.914*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.95*	*0.85*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*566*	*431*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	*4.7 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*2.6 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*42.9 mi/h*
		Percent free flow speed, PFFS	*80.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	*1.2*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.96*	*0.87*
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*529*	*401*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*51.2*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*38.3*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*73.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.33*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1408*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1488*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*501.1*
Effective width, Wv (Eq. 15-29) ft	*12.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.13*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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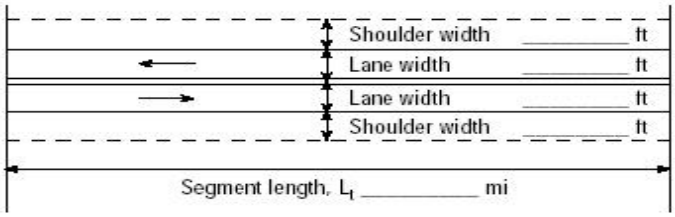
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2, 3, 4, & 5*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *No Build Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *100%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *318*veh/h

Opposing direction vol., V_o *476*veh/h

Shoulder width ft *1.0*

Lane Width ft *11.0*

Segment Length mi *3.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.914*	*0.932*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.85*	*0.95*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*431*	*566*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.7 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*2.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*43.5 mi/h*
		Percent free flow speed, PFFS	*81.6 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.986*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.87*	*0.96*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*401*	*529*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*45.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*38.3*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*61.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.25*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1521*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1609*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*334.7*
Effective width, Wv (Eq. 15-29) ft	*12.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.93*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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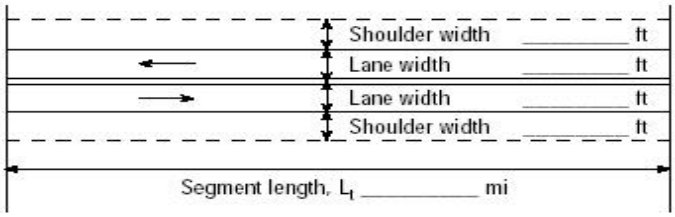
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 6*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *No Build Alternative*

Input Data



Class I highway ☑ Class II highway ☐ Class III highway ☐

Terrain ☐ Level ☑ Rolling

Analysis direction vol., V_d	*495*veh/h	Grade Length	mi Up/down
Opposing direction vol., V_o	*331*veh/h	Peak-hour factor, PHF	*0.95*
Shoulder width ft	*1.0*	No-passing zone	*100*%
Lane Width ft	*11.0*	% Trucks and Buses , P_T	*7*%
Segment Length mi	*2.0*	% Recreational vehicles, P_R	*17*%
		Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.932*	*0.914*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.95*	*0.86*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*588*	*443*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.7 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*2.6 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*42.7 mi/h*
		Percent free flow speed, PFFS	*80.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.2*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.96*	*0.87*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*550*	*417*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*53.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*37.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*74.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.35*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1423*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1505*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*521.1*
Effective width, Wv (Eq. 15-29) ft	*12.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.15*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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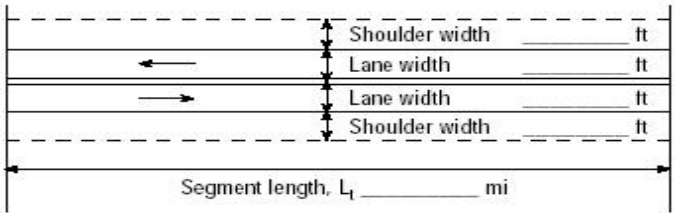
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 6*
Date Performed	*11/21/2013*	Jurisdiction	*wb*
Analysis Time Period		Analysis Year	*2043*

Project Description: *No Build Alternative*

Input Data



Class I highway ☑ Class II highway ☐ Class III highway ☐

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *100%*

Analysis direction vol., V_d	*331*veh/h	% Trucks and Buses , P_T	*7%*
Opposing direction vol., V_o	*495*veh/h	% Recreational vehicles, P_R	*17%*
Shoulder width ft	*1.0*	Access points *mi*	*8*/mi
Lane Width ft	*11.0*		
Segment Length mi	*2.0*		

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.914*	*0.932*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.86*	*0.95*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*443*	*588*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.7 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*2.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*43.3 mi/h*
		Percent free flow speed, PFFS	*81.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.986*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.87*	*0.96*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*417*	*550*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*46.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*37.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*62.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1521*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1626*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*348.4*
Effective width, Wv (Eq. 15-29) ft	*12.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.94*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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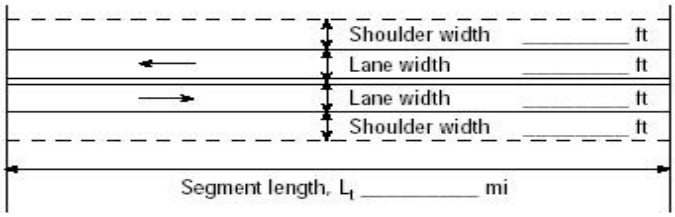
APPENDIX F3
JUNEAU CREEK

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 1*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper, G-South, & Juneau Alt*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *20%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *459*veh/h

Opposing direction vol., V_o *307*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *2.8*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.932*	*0.914*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.94*	*0.85*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*551*	*416*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.2 mi/h*
		Percent free flow speed, PFFS	*84.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.95*	*0.86*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*523*	*392*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*51.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*66.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.32*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1392*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1468*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*483.2*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.95*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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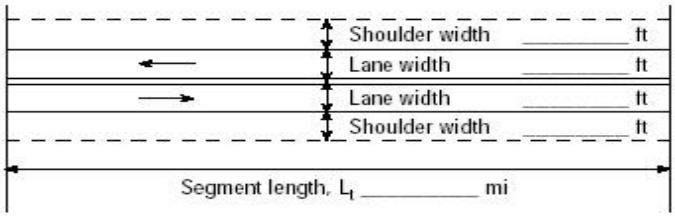
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 1*
Date Performed	*11/21/2011*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper, G-South, & Juneau Alt*

Input Data



Analysis direction vol., V_d *307* veh/h
Opposing direction vol., V_o *459* veh/h
Shoulder width ft *6.0*
Lane Width ft *12.0*
Segment Length mi *4.0*

☑ Class I highway ☐ Class II highway ☐ Class III highway
Terrain ☐ Level ☑ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF *0.95*
No-passing zone *20%*
% Trucks and Buses , P_T *7%*
% Recreational vehicles, P_R *17%*
Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.914*	*0.932*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.85*	*0.94*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*416*	*551*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.4 mi/h*
		Percent free flow speed, PFFS	*85.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	*1.6*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.973*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.86*	*0.95*
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*392*	*523*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*44.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*55.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.24*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1505*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1609*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*85.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*323.2*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.75*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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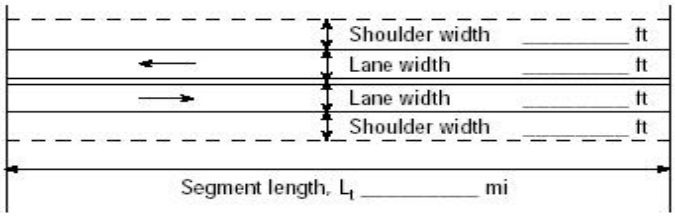
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2*
Date Performed	*11/21/2013*	Jurisdiction	*eb*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alternative*

Input Data



Analysis direction vol., V_d *333*veh/h
Opposing direction vol., V_o *223*veh/h
Shoulder width ft *6.0*
Lane Width ft *12.0*
Segment Length mi *4.0*

☑ Class I highway ☐ Class II highway ☐ Class III highway
Terrain ☐ Level ☐ Rolling
Grade Length *4.00* mi Up/down *4.0*
Peak-hour factor, PHF *0.95*
No-passing zone *0%*
% Trucks and Buses , P_T *7%*
% Recreational vehicles, P_R *17%*
Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*12.1*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.2*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.551*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.76*	*1.00*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*837*	*243*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.7 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*48.0 mi/h*
		Percent free flow speed, PFFS	*82.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.950*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*369*	*236*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*36.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*45.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.49*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*649*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1603*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*350.5*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.79*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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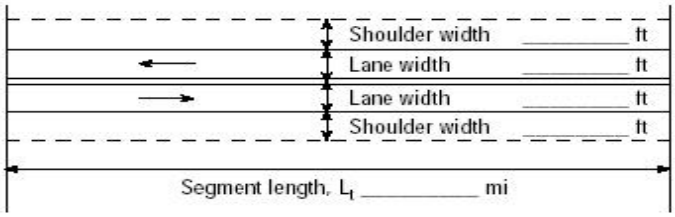
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2*
Date Performed	*11/21/2013*	Jurisdiction	*wb*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alternative*

Input Data



Analysis direction vol., V_d *223*veh/h
Opposing direction vol., V_o *333*veh/h
Shoulder width ft *6.0*
Lane Width ft *12.0*
Segment Length mi *4.0*

☑ Class I highway ☐ Class II highway ☐ Class III highway
Terrain ☐ Level ☐ Rolling
Grade Length *4.00* mi Up/down *4.0*
Peak-hour factor, PHF *0.95*
No-passing zone *0*%
% Trucks and Buses , P_T *7*%
% Recreational vehicles, P_R *17*%
Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*12.2*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.3*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.545*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.70*	*1.00*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*615*	*358*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0* *mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0* *mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0* *mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.4* *mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0* *mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.0* *mi/h*
		Percent free flow speed, PFFS	*84.5* *%*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.943*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*249*	*353*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*29.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*35.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.36*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*712*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1616*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*234.7*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.59*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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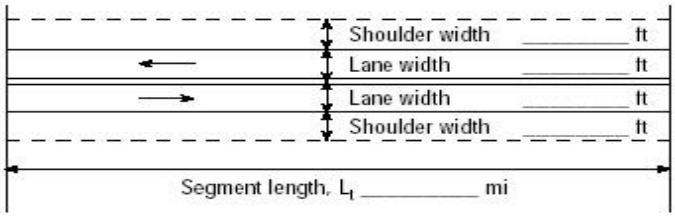
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 3*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alternative*

Input Data



Analysis direction vol., V_d *333*veh/h

Opposing direction vol., V_o *223*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *3.0*

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☐ Rolling

Grade Length *4.00* mi Up/down *4.0*

Peak-hour factor, PHF *0.95*

No-passing zone *0%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*12.1*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.2*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.551*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.76*	*1.00*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*837*	*243*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.7 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*48.0 mi/h*
		Percent free flow speed, PFFS	*82.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.950*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*369*	*236*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*36.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*45.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.49*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*649*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1603*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*350.5*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.79*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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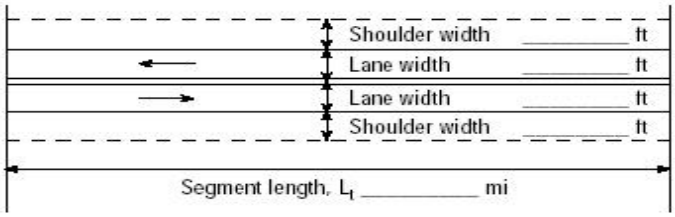
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 3*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alternative*

Input Data



Analysis direction vol., V_d *223*veh/h
Opposing direction vol., V_o *333*veh/h
Shoulder width ft *6.0*
Lane Width ft *12.0*
Segment Length mi *3.0*

☑ Class I highway ☐ Class II highway ☐ Class III highway
Terrain ☐ Level ☐ Rolling
Grade Length *4.00* mi Up/down *4.0*
Peak-hour factor, PHF *0.95*
No-passing zone *0*%
% Trucks and Buses , P_T *7*%
% Recreational vehicles, P_R *17*%
Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*12.2*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.3*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.545*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.70*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*615*	*358*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0* *mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	*0.0* *mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0* *mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.4* *mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0* *mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.0* *mi/h*
		Percent free flow speed, PFFS	*84.5* *%*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	*1.9*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.943*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*249*	*353*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*29.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*35.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.36*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*712*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1616*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*234.7*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.59*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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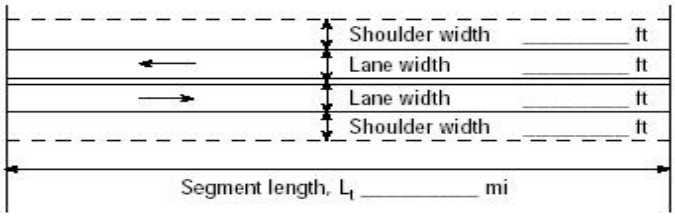
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 4*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *10%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *333*veh/h

Opposing direction vol., V_o *223*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *1.3*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.0*	*2.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.920*	*0.908*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.87*	*0.78*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*438*	*331*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.5 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.5 mi/h*
		Percent free flow speed, PFFS	*87.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.953*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.88*	*0.82*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*415*	*300*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*42.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*23.0*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*55.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1290*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1378*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*87.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*350.5*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.79*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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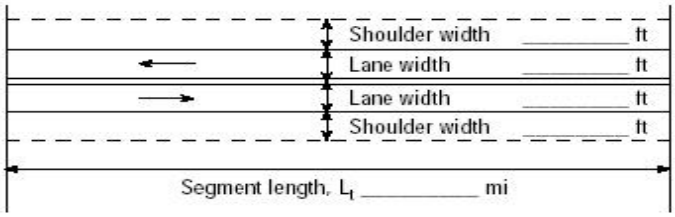
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 4*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *10%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *223*veh/h

Opposing direction vol., V_o *333*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *1.3*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.2*	*2.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.908*	*0.920*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.78*	*0.87*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*331*	*438*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.7 mi/h*
		Percent free flow speed, PFFS	*87.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.953*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.82*	*0.88*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*300*	*415*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*35.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*23.0*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*45.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*B*
Volume to capacity ratio, *v/c*	*0.19*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1423*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1505*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*87.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*234.7*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.59*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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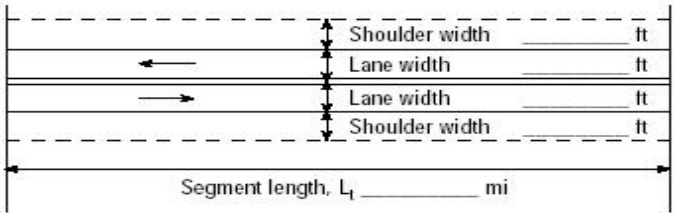
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 5*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alternative*

Input Data



Analysis direction vol., V_d *333*veh/h
Opposing direction vol., V_o *223*veh/h
Shoulder width ft *6.0*
Lane Width ft *12.0*
Segment Length mi *1.2*

☑ Class I highway ☐ Class II highway ☐ Class III highway
Terrain ☐ Level ☑ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF *0.95*
No-passing zone *20%*
% Trucks and Buses , P_T *7%*
% Recreational vehicles, P_R *17%*
Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.0*	*2.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.920*	*0.908*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.87*	*0.78*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*438*	*331*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.5 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.5 mi/h*
		Percent free flow speed, PFFS	*87.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.953*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.88*	*0.82*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*415*	*300*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*42.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*31.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*60.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1290*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1378*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*87.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*350.5*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.79*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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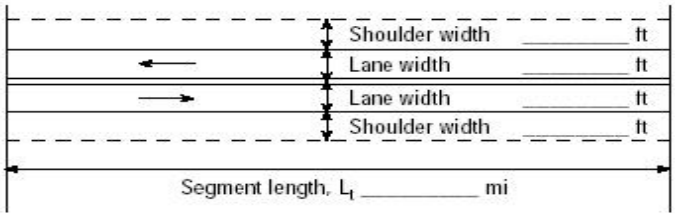
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 5*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alternative*

Input Data



Analysis direction vol., V_d *223*veh/h
Opposing direction vol., V_o *333*veh/h
Shoulder width ft *6.0*
Lane Width ft *12.0*
Segment Length mi *1.2*

☑ Class I highway ☐ Class II highway ☐ Class III highway
Terrain ☐ Level ☑ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF *0.95*
No-passing zone *10%*
% Trucks and Buses , P_T *7%*
% Recreational vehicles, P_R *17%*
Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.2*	*2.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.908*	*0.920*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.78*	*0.87*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*331*	*438*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.7 mi/h*
		Percent free flow speed, PFFS	*87.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.953*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.82*	*0.88*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*300*	*415*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*35.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*23.0*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*45.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*B*
Volume to capacity ratio, *v/c*	*0.19*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1423*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1505*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*87.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*234.7*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.59*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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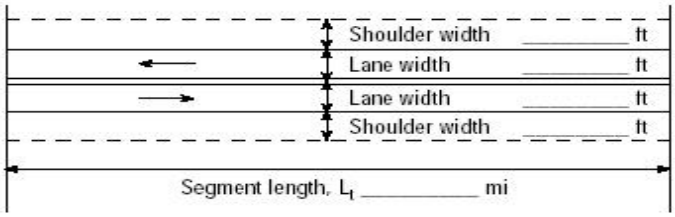
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 6*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alternative*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *50%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *495*veh/h

Opposing direction vol., V_o *331*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.932*	*0.914*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.95*	*0.86*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*588*	*443*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*2.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*48.0 mi/h*
		Percent free flow speed, PFFS	*82.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.2*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.96*	*0.87*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*550*	*417*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*53.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*32.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*71.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.35*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1423*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1505*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*521.1*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.99*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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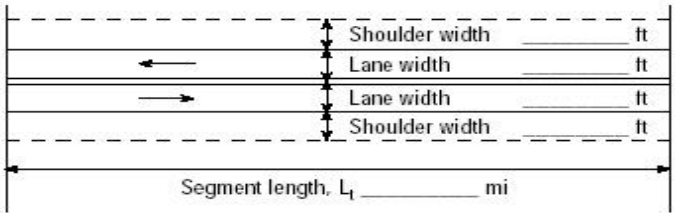
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 6*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alternative*

Input Data



Analysis direction vol., V_d *331* veh/h
Opposing direction vol., V_o *495* veh/h
Shoulder width ft *6.0*
Lane Width ft *12.0*
Segment Length mi *2.0*

☑ Class I highway ☐ Class II highway ☐ Class III highway
Terrain ☐ Level ☑ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF *0.95*
No-passing zone *10%*
% Trucks and Buses , P_T *7%*
% Recreational vehicles, P_R *17%*
Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.914*	*0.932*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.86*	*0.95*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*443*	*588*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.0 mi/h*
		Percent free flow speed, PFFS	*84.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	*1.6*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.986*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.87*	*0.96*
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*417*	*550*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*46.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*19.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*54.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1521*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1626*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*348.4*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.78*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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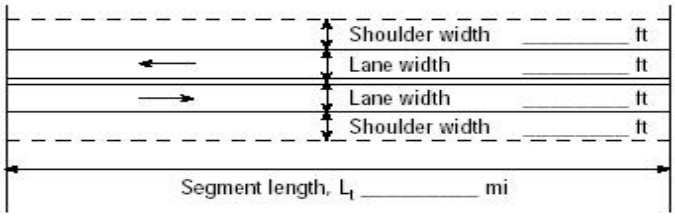
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2 existing*
Date Performed	*11/22/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alternative*

Input Data



Analysis direction vol., V_d *142*veh/h

Opposing direction vol., V_o *96*veh/h

Shoulder width ft *1.0*

Lane Width ft *11.0*

Segment Length mi *4.0*

☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *100*%

% Trucks and Buses , P_T *7*%

% Recreational vehicles, P_R *17*%

Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.5*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.891*	*0.880*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.71*	*0.67*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*236*	*171*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.7 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.6 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*48.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*41.6 mi/h*
		Percent free flow speed, PFFS	*86.1* %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.8*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.947*	*0.947*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.76*	*0.73*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*208*	*146*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*22.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*55.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*55.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.12*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*0*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1223*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*149.5*
Effective width, Wv (Eq. 15-29) ft	*15.48*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.04*
Bicycle level of service (Exhibit 15-4)	*E*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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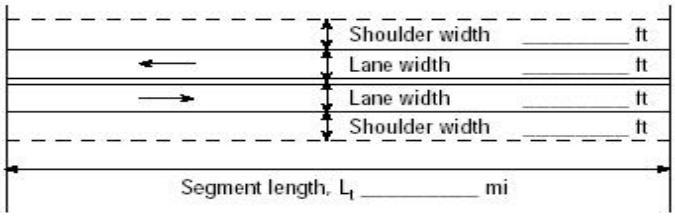
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2 existing*
Date Performed	*11/22/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alternative*

Input Data



☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *100%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *96*veh/h

Opposing direction vol., V_o *142*veh/h

Shoulder width ft *1.0*

Lane Width ft *11.0*

Segment Length mi *4.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.7*	*2.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.880*	*0.891*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.71*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*171*	*236*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.7 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.8 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*46.3 mi/h*
		Percent free flow speed, PFFS	*86.9 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.941*	*0.941*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.76*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*147*	*209*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*16.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*55.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*39.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.09*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1167*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1296*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*101.1*
Effective width, Wv (Eq. 15-29) ft	*18.24*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.37*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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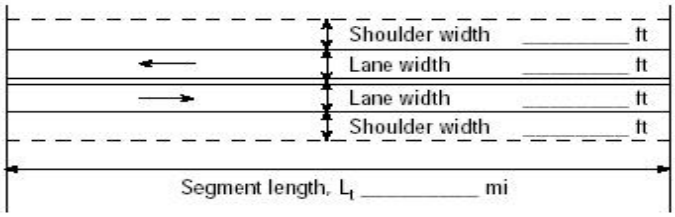
APPENDIX F4
G-SOUTH

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 1*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper, G-South, & Juneau Alt*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *20%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *459*veh/h

Opposing direction vol., V_o *307*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *2.8*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.932*	*0.914*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.94*	*0.85*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*551*	*416*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.2 mi/h*
		Percent free flow speed, PFFS	*84.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.95*	*0.86*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*523*	*392*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*51.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*66.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.32*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1392*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1468*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*483.2*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.95*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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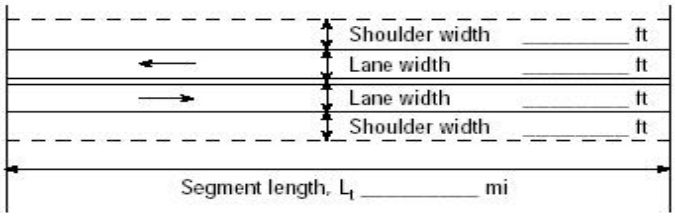
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 1*
Date Performed	*11/21/2011*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper, G-South, & Juneau Alt*

Input Data



Analysis direction vol., V_d *307* veh/h
Opposing direction vol., V_o *459* veh/h
Shoulder width ft *6.0*
Lane Width ft *12.0*
Segment Length mi *4.0*

☑ Class I highway ☐ Class II highway ☐ Class III highway
Terrain ☐ Level ☑ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF *0.95*
No-passing zone *20%*
% Trucks and Buses , P_T *7%*
% Recreational vehicles, P_R *17%*
Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.914*	*0.932*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.85*	*0.94*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*416*	*551*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.4 mi/h*
		Percent free flow speed, PFFS	*85.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	*1.6*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.973*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.86*	*0.95*
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*392*	*523*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*44.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*55.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.24*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1505*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1609*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*85.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*323.2*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.75*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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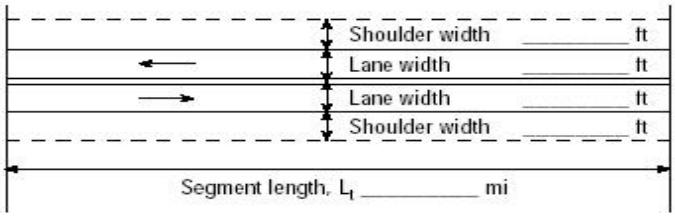
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *G-South Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *20%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *476*veh/h

Opposing direction vol., V_o *318*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *4.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.932*	*0.914*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.95*	*0.85*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*566*	*431*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.0 mi/h*
		Percent free flow speed, PFFS	*84.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.2*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.96*	*0.87*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*529*	*401*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*51.2*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*66.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.33*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1408*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1488*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*501.1*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.97*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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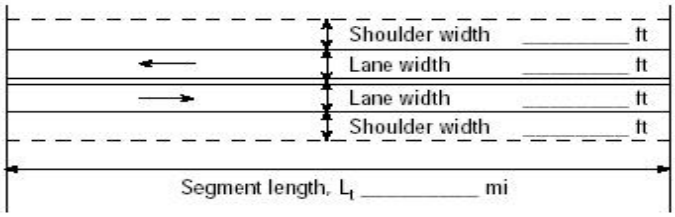
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *G-South Alternative*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Analysis direction vol., V_d	*318*veh/h	Grade Length	mi Up/down
Opposing direction vol., V_o	*476*veh/h	Peak-hour factor, PHF	*0.95*
Shoulder width ft	*6.0*	No-passing zone	*20%*
Lane Width ft	*12.0*	% Trucks and Buses , P_T	*7%*
Segment Length mi	*4.5*	% Recreational vehicles, P_R	*17%*
		Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.914*	*0.932*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.85*	*0.95*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*431*	*566*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*49.2 mi/h*
		Percent free flow speed, PFFS	*84.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.986*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.87*	*0.96*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*401*	*529*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*45.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*56.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.25*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1521*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1609*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*334.7*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.77*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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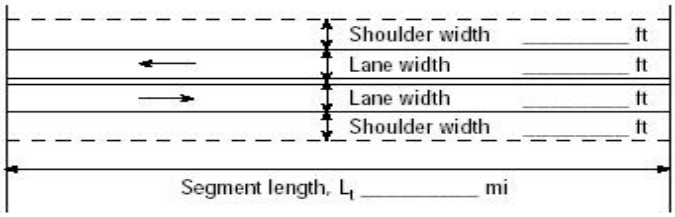
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 3*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *G-South Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Analysis direction vol., V_d	*333*veh/h	Grade Length	mi Up/down
Opposing direction vol., V_o	*223*veh/h	Peak-hour factor, PHF	*0.95*
Shoulder width ft	*6.0*	No-passing zone	*0*%
Lane Width ft	*12.0*	% Trucks and Buses , P_T	*7*%
Segment Length mi	*1.1*	% Recreational vehicles, P_R	*17*%
		Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.0*	*2.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.920*	*0.908*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.87*	*0.78*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*438*	*331*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*52.0 mi/h*
		Percent free flow speed, PFFS	*89.7* %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.953*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.88*	*0.82*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*415*	*300*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*42.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.1*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*50.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1290*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1378*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*350.5*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.79*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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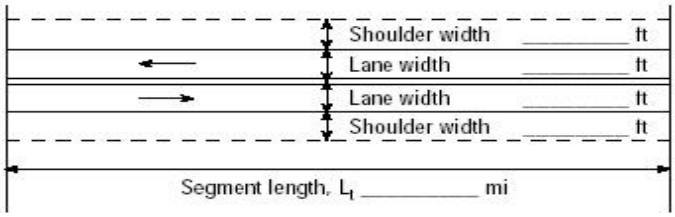
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 3*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *G-South Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *0%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *223*veh/h

Opposing direction vol., V_o *333*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *1.1*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.2*	*2.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.908*	*0.920*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.78*	*0.87*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*331*	*438*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.7 mi/h*
		Percent free flow speed, PFFS	*87.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.953*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.82*	*0.88*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*300*	*415*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*35.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.1*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*41.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*B*
Volume to capacity ratio, *v/c*	*0.19*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1423*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1505*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*87.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*234.7*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.59*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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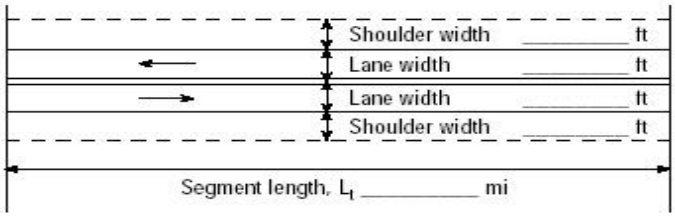
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 4*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *G-South Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *20%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *333*veh/h

Opposing direction vol., V_o *223*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *3.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.0*	*2.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.920*	*0.908*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.87*	*0.78*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*438*	*331*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*52.0 mi/h*
		Percent free flow speed, PFFS	*89.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.953*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.88*	*0.82*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*415*	*300*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*42.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*31.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*60.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1290*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1378*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*350.5*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.79*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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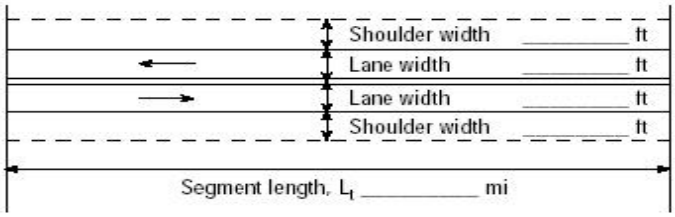
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 4*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *G-South Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Analysis direction vol., V_d	*223*veh/h	Grade Length	mi Up/down
Opposing direction vol., V_o	*333*veh/h	Peak-hour factor, PHF	*0.95*
Shoulder width ft	*6.0*	No-passing zone	*20%*
Lane Width ft	*12.0*	% Trucks and Buses , P_T	*7%*
Segment Length mi	*3.5*	% Recreational vehicles, P_R	*17%*
		Access points *mi*	*8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.2*	*2.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.908*	*0.920*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.78*	*0.87*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*331*	*438*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*52.0 mi/h*
		Percent free flow speed, PFFS	*89.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.953*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.82*	*0.88*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*300*	*415*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*35.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*31.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*48.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*B*
Volume to capacity ratio, *v/c*	*0.19*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1423*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1505*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*234.7*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.59*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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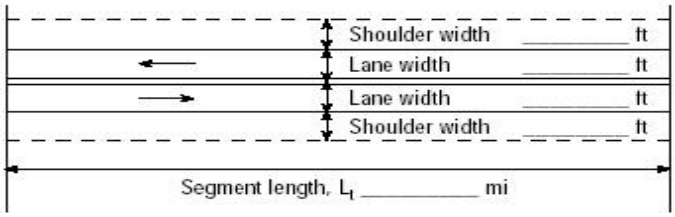
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 5*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *G-South Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *10%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *333*veh/h

Opposing direction vol., V_o *223*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *1.2*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.0*	*2.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.920*	*0.908*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.87*	*0.78*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*438*	*331*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*52.0 mi/h*
		Percent free flow speed, PFFS	*89.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.953*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.88*	*0.82*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*415*	*300*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*42.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*23.0*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*55.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1290*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1378*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*350.5*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.79*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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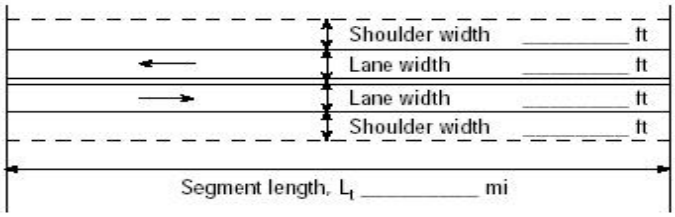
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 5*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *G-South Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF *0.95*
No-passing zone *10%*
% Trucks and Buses , P_T *7%*
% Recreational vehicles, P_R *17%*
Access points *mi* *8*/mi

Analysis direction vol., V_d *223*veh/h
Opposing direction vol., V_o *333*veh/h
Shoulder width ft *6.0*
Lane Width ft *12.0*
Segment Length mi *1.2*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.2*	*2.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.908*	*0.920*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.78*	*0.87*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*331*	*438*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*52.0 mi/h*
		Percent free flow speed, PFFS	*89.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.953*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.82*	*0.88*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*300*	*415*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*35.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*23.0*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*45.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*B*
Volume to capacity ratio, *v/c*	*0.19*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1423*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1505*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*234.7*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.59*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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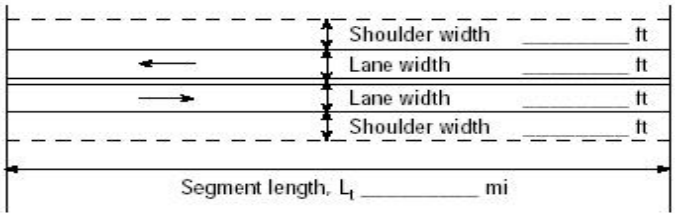
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 6*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *G-South Alternative*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *50%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *495*veh/h

Opposing direction vol., V_o *331*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.932*	*0.914*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.95*	*0.86*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*588*	*443*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.0 mi/h*
		Percent free flow speed, PFFS	*86.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.2*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.96*	*0.87*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*550*	*417*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*53.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*32.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*71.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.35*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1423*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1505*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*521.1*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.99*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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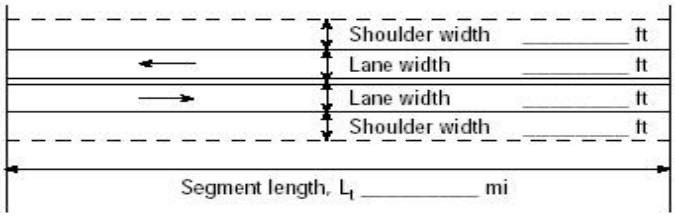
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 6*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *G-South Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *10%*

Show North Arrow

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *331*veh/h

Opposing direction vol., V_o *495*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.914*	*0.932*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.86*	*0.95*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*443*	*588*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.0 mi/h*
		Percent free flow speed, PFFS	*86.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.986*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.87*	*0.96*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*417*	*550*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*46.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*19.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*54.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1521*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1626*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*348.4*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.78*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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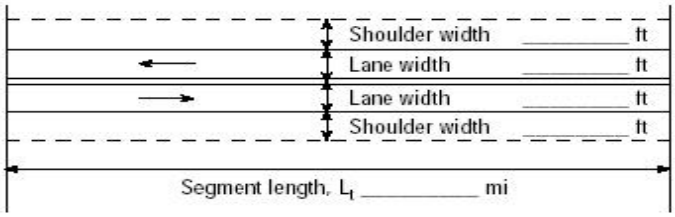
APPENDIX F5
COOPER CREEK

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 1*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper, G-South, & Juneau Alt*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *20%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *459*veh/h

Opposing direction vol., V_o *307*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *2.8*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.932*	*0.914*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.94*	*0.85*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*551*	*416*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.2 mi/h*
		Percent free flow speed, PFFS	*84.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.95*	*0.86*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*523*	*392*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*51.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*66.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.32*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1392*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1468*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*483.2*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.95*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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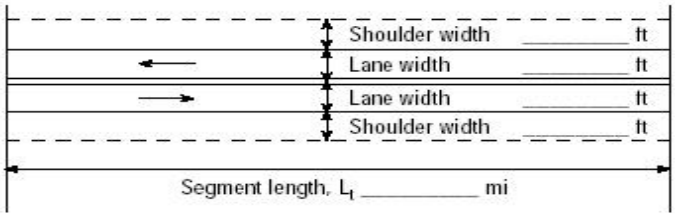
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 1*
Date Performed	*11/21/2011*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper, G-South, & Juneau Alt*

Input Data



Analysis direction vol., V_d *307* veh/h
Opposing direction vol., V_o *459* veh/h
Shoulder width ft *6.0*
Lane Width ft *12.0*
Segment Length mi *4.0*

☑ Class I highway ☐ Class II highway ☐ Class III highway
Terrain ☐ Level ☑ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF *0.95*
No-passing zone *20%*
% Trucks and Buses , P_T *7%*
% Recreational vehicles, P_R *17%*
Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.914*	*0.932*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.85*	*0.94*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*416*	*551*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.4 mi/h*
		Percent free flow speed, PFFS	*85.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	*1.6*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.973*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.86*	*0.95*
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*392*	*523*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*44.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*55.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.24*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1505*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1609*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*85.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*323.2*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.75*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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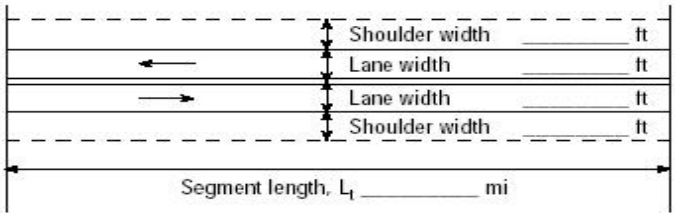
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper Creek Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *20%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *476*veh/h

Opposing direction vol., V_o *318*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *4.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.932*	*0.914*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.95*	*0.85*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*566*	*431*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.0 mi/h*
		Percent free flow speed, PFFS	*84.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.2*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.96*	*0.87*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*529*	*401*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*51.2*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*66.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.33*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1408*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1488*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*501.1*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.97*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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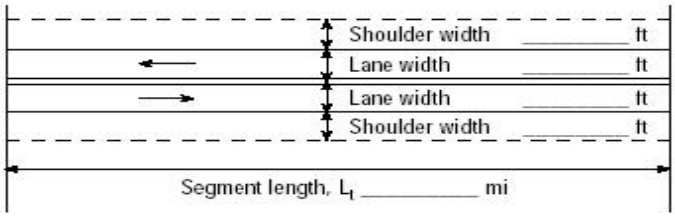
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper Creek Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *30%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *318*veh/h

Opposing direction vol., V_o *476*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *4.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.914*	*0.932*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.85*	*0.95*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*431*	*566*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.1 mi/h*
		Percent free flow speed, PFFS	*84.6 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.986*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.87*	*0.96*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*401*	*529*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*45.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*28.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*57.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.25*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1521*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1609*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*334.7*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.77*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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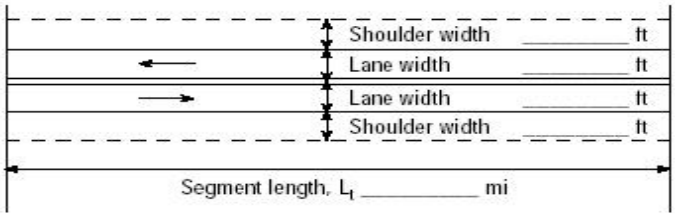
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 3*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper Creek Alternative*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☐ Rolling

Grade Length *4.00* mi Up/down *4.0*

Peak-hour factor, PHF *0.95*

No-passing zone *0%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *333*veh/h

Opposing direction vol., V_o *223*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *1.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*12.1*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.2*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.551*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.76*	*1.00*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*837*	*243*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.7 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*48.0 mi/h*
		Percent free flow speed, PFFS	*82.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.950*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*369*	*236*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*36.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*45.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.49*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*649*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1603*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*350.5*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.79*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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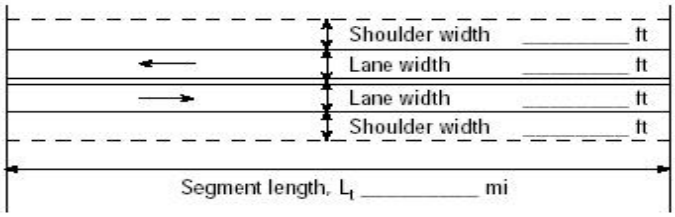
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 3*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper Creek Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☐ Rolling

Grade Length *4.00* mi Up/down *4.0*

Peak-hour factor, PHF *0.95*

No-passing zone *0%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *223*veh/h

Opposing direction vol., V_o *333*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *1.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*12.2*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.3*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.545*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.70*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*615*	*358*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.4 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.0 mi/h*
		Percent free flow speed, PFFS	*84.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.943*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*249*	*353*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*29.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*35.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.36*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*712*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1616*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*234.7*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.59*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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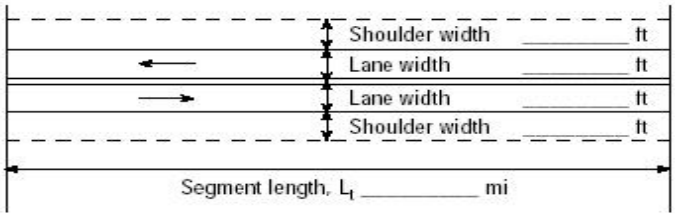
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 4*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper Creek Alternative*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☐ Rolling

Grade Length *4.00* mi Up/down *4.0*

Peak-hour factor, PHF *0.95*

No-passing zone *0%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *333*veh/h

Opposing direction vol., V_o *223*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*12.1*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.2*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.551*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.76*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*837*	*243*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.7 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*48.0 mi/h*
		Percent free flow speed, PFFS	*82.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.950*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*369*	*236*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*36.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*45.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.49*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*649*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1603*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*350.5*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.79*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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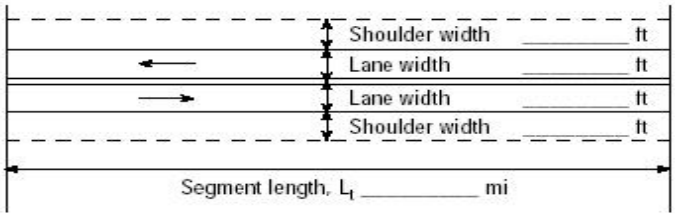
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 4*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper Creek Alternative*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☐ Rolling

Grade Length *4.00* mi Up/down *4.0*

Peak-hour factor, PHF *0.95*

No-passing zone *0%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d	*223*veh/h
Opposing direction vol., V_o	*333*veh/h
Shoulder width ft	*6.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*12.2*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.3*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.545*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.70*	*1.00*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*615*	*358*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.4 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.0 mi/h*
		Percent free flow speed, PFFS	*84.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.943*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*249*	*353*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*29.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*35.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.36*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*712*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1616*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*234.7*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.59*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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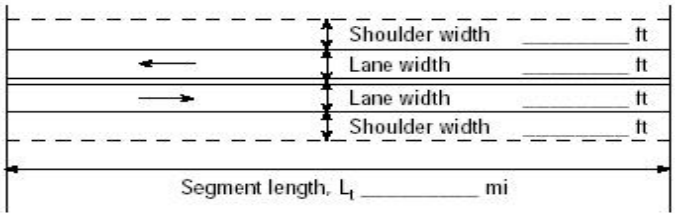
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 5*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper Creek Alternative*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *100%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *476*veh/h

Opposing direction vol., V_o *318*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *1.4*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.932*	*0.914*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.95*	*0.85*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*566*	*431*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*47.0 mi/h*
		Percent free flow speed, PFFS	*81.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.2*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.96*	*0.87*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*529*	*401*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*51.2*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*38.3*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*73.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.33*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1408*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1488*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*501.1*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.97*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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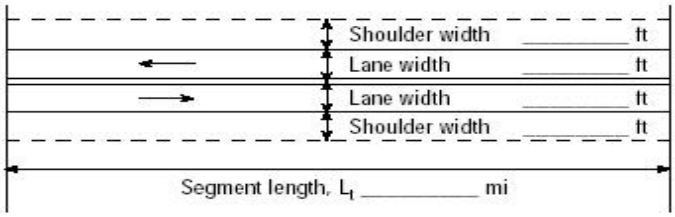
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 5*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper Creek Alternative*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *100%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *318*veh/h

Opposing direction vol., V_o *476*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *1.4*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.914*	*0.932*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.85*	*0.95*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*431*	*566*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*2.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*48.0 mi/h*
		Percent free flow speed, PFFS	*82.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.986*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.87*	*0.96*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*401*	*529*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*45.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*38.3*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*61.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.25*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1521*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1609*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*334.7*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.77*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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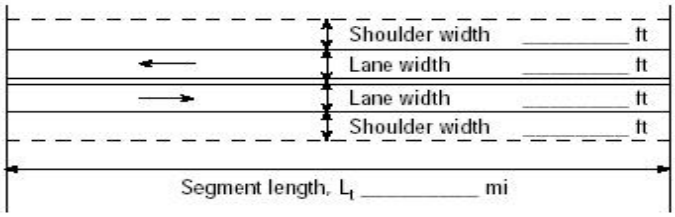
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 6*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper Creek Alternative*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *25%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *495*veh/h

Opposing direction vol., V_o *331*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.932*	*0.914*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.95*	*0.86*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*588*	*443*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0* *mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0* *mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0* *mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.4* *mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0* *mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*48.6* *mi/h*
		Percent free flow speed, PFFS	*83.8* *%*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.2*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.96*	*0.87*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*550*	*417*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*53.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*68.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.35*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1423*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1505*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*83.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*521.1*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.99*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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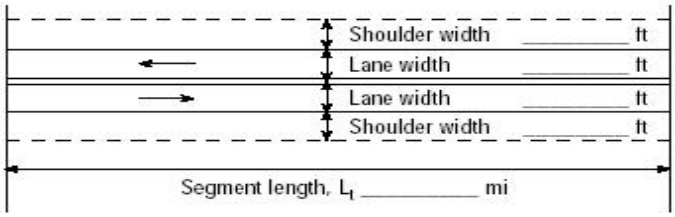
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 6*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Cooper Creek Alternative*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *10%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *331*veh/h

Opposing direction vol., V_o *495*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.914*	*0.932*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.86*	*0.95*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*443*	*588*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.0 mi/h*
		Percent free flow speed, PFFS	*84.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.986*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.87*	*0.96*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*417*	*550*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*46.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*19.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*54.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1521*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1626*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*348.4*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.78*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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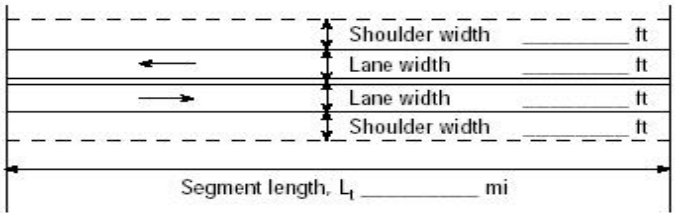
APPENDIX F6
JUNEAU CREEK WITHOUT BRIDGE

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 1*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *20%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *459*veh/h

Opposing direction vol., V_o *307*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *2.8*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.932*	*0.914*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.94*	*0.85*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*551*	*416*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.2 mi/h*
		Percent free flow speed, PFFS	*84.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.95*	*0.86*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*523*	*392*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*51.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*66.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.32*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1392*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1468*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*483.2*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.95*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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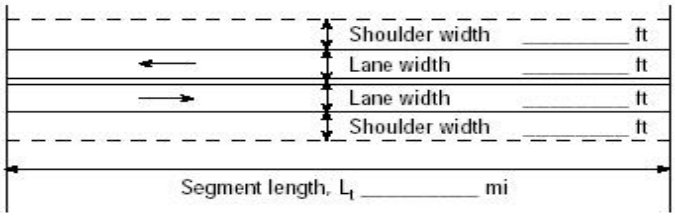
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 1*
Date Performed	*11/21/2013*	Jurisdiction	*wb*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *20%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *307*veh/h

Opposing direction vol., V_o *459*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *4.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.914*	*0.932*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.85*	*0.94*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*416*	*551*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.4 mi/h*
		Percent free flow speed, PFFS	*85.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.973*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.86*	*0.95*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*392*	*523*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*44.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*55.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.24*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1505*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1609*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*85.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*323.2*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.75*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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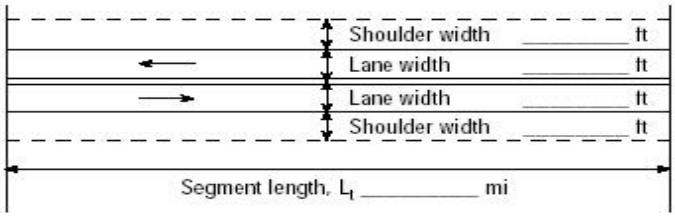
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2*
Date Performed	*11/21/2013*	Jurisdiction	*eb*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☐ Rolling

Grade Length *3.00* mi Up/down *4.0*

Peak-hour factor, PHF *0.95*

No-passing zone *0%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *380*veh/h

Opposing direction vol., V_o *255*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *4.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.951*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.78*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*539*	*276*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.6 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.1 mi/h*
		Percent free flow speed, PFFS	*86.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.2*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*406*	*270*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*41.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*49.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*B*
Volume to capacity ratio, *v/c*	*0.32*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*709*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1678*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*400.0*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.86*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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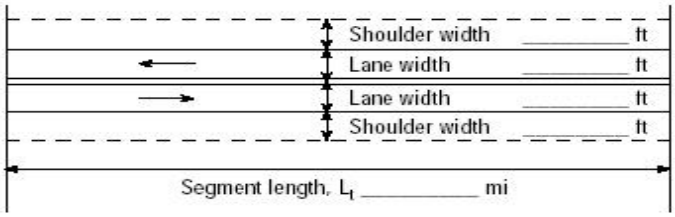
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2*
Date Performed	*11/21/2013*	Jurisdiction	*wb*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☐ Rolling

Grade Length *4.00* mi Up/down *4.0*

Peak-hour factor, PHF *0.95*

No-passing zone *0%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *255*veh/h

Opposing direction vol., V_o *380*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *4.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*12.2*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.3*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.545*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.72*	*1.00*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*684*	*408*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*48.2 mi/h*
		Percent free flow speed, PFFS	*83.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.8*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.945*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*284*	*403*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*33.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.3*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*39.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.40*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*747*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1622*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*83.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*268.4*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.65*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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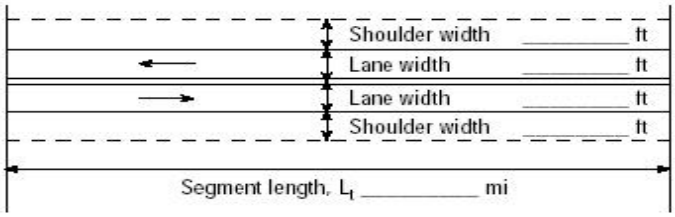
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 3*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☐ Rolling

Grade Length *2.00* mi Up/down *4.0*

Peak-hour factor, PHF *0.95*

No-passing zone *0%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *380*veh/h

Opposing direction vol., V_o *255*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *3.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*9.9*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.610*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.79*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*830*	*276*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.6 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*47.8 mi/h*
		Percent free flow speed, PFFS	*82.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.99*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*404*	*270*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*41.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*49.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.49*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*745*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1678*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*400.0*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.86*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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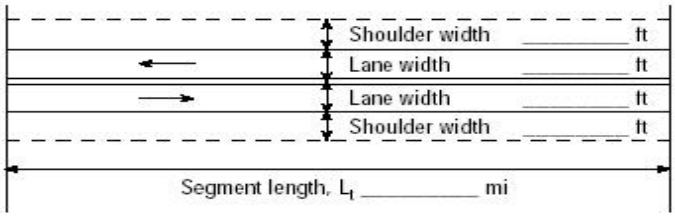
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 3*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



Analysis direction vol., V_d *255*veh/h
Opposing direction vol., V_o *380*veh/h
Shoulder width ft *6.0*
Lane Width ft *12.0*
Segment Length mi *3.0*

☑ Class I highway ☐ Class II highway ☐ Class III highway
Terrain ☐ Level ☐ Rolling
Grade Length *2.00* mi Up/down *4.0*
Peak-hour factor, PHF *0.95*
No-passing zone *0%*
% Trucks and Buses , P_T *7%*
% Recreational vehicles, P_R *17%*
Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*10.0*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.2*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.600*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.73*	*1.00*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*613*	*408*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*48.7 mi/h*
		Percent free flow speed, PFFS	*84.0 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.99*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*272*	*403*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*32.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*14.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*37.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.36*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*829*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1682*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*268.4*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.65*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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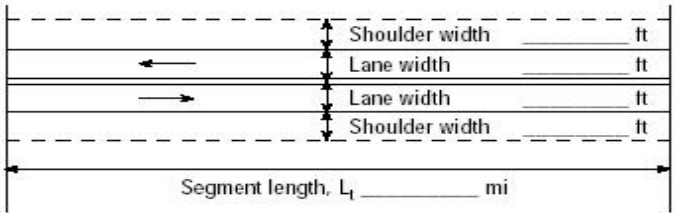
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 4*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *10%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *380*veh/h

Opposing direction vol., V_o *255*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *1.3*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.0*	*2.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.920*	*0.908*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.90*	*0.80*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*483*	*370*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.4 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.0 mi/h*
		Percent free flow speed, PFFS	*86.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.953*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.90*	*0.83*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*463*	*339*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*46.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*20.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*59.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.28*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1336*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1419*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*400.0*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.86*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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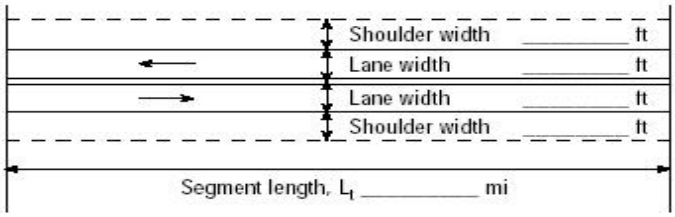
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 4*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



Analysis direction vol., V_d *255*veh/h
Opposing direction vol., V_o *380*veh/h
Shoulder width ft *6.0*
Lane Width ft *12.0*
Segment Length mi *1.3*

☑ Class I highway ☐ Class II highway ☐ Class III highway
Terrain ☐ Level ☑ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF *0.95*
No-passing zone *10%*
% Trucks and Buses , P_T *7%*
% Recreational vehicles, P_R *17%*
Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.2*	*2.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.908*	*0.920*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.80*	*0.90*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*370*	*483*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.2 mi/h*
		Percent free flow speed, PFFS	*86.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.953*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.83*	*0.90*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*339*	*463*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*38.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*20.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*47.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*B*
Volume to capacity ratio, *v/c*	*0.22*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1464*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1554*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*268.4*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.65*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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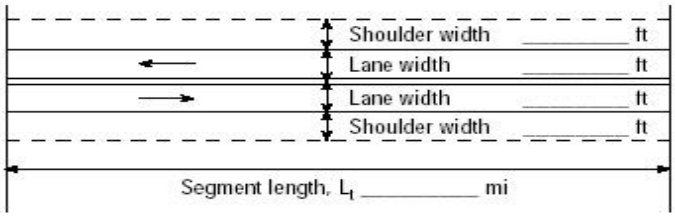
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 5*
Date Performed	*11/21/2013*	Jurisdiction	*EB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *20%*

Analysis direction vol., V_d *380*veh/h

Opposing direction vol., V_o *255*veh/h

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Shoulder width ft *6.0*

Lane Width ft *12.0*

Access points *mi* *8*/mi

Segment Length mi *1.2*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.0*	*2.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.920*	*0.908*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.90*	*0.80*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*483*	*370*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.4 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.0 mi/h*
		Percent free flow speed, PFFS	*86.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.953*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.90*	*0.83*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*463*	*339*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*46.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*28.3*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*63.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.28*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1336*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1419*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*400.0*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.86*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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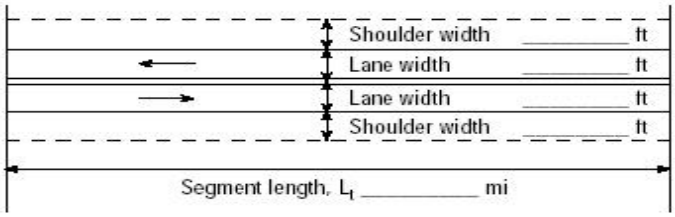
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 5*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *10%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *255*veh/h

Opposing direction vol., V_o *380*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *1.2*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.2*	*2.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.908*	*0.920*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.80*	*0.90*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*370*	*483*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.2 mi/h*
		Percent free flow speed, PFFS	*86.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.7*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.953*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.83*	*0.90*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*339*	*463*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*38.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*20.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*47.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*B*
Volume to capacity ratio, *v/c*	*0.22*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1464*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1554*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*268.4*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.65*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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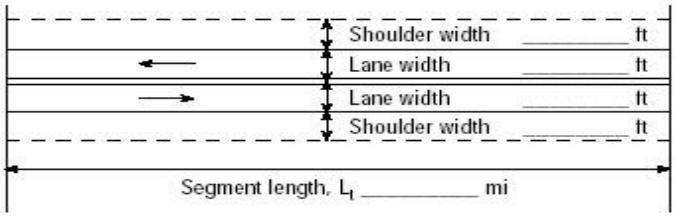
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 6*
Date Performed	*11/21/2013*	Jurisdiction	*eb*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *50%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *495*veh/h

Opposing direction vol., V_o *331*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*2.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.932*	*0.914*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.95*	*0.86*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*588*	*443*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*2.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*48.0 mi/h*
		Percent free flow speed, PFFS	*82.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.2*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.960*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.96*	*0.87*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*550*	*417*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*53.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*32.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*71.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.35*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1423*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1505*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*521.1*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.99*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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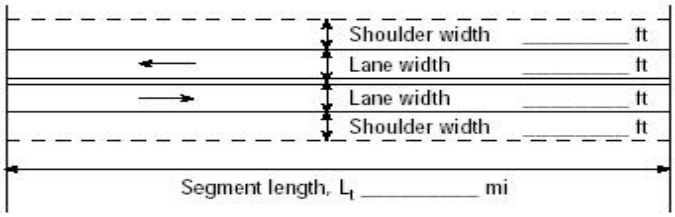
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 6*
Date Performed	*11/21/2013*	Jurisdiction	*WB*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *10%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *331*veh/h

Opposing direction vol., V_o *495*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.914*	*0.932*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.86*	*0.95*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*443*	*588*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*58.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.0 mi/h*
		Percent free flow speed, PFFS	*84.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.986*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.87*	*0.96*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*417*	*550*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*46.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*19.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*54.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1521*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1626*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*348.4*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.78*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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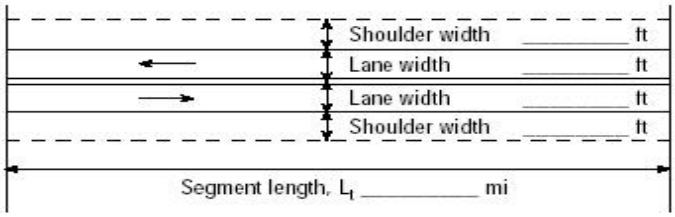
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2*
Date Performed	*11/21/2013*	Jurisdiction	*EB EXISTING (20%)*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



Analysis direction vol., V_d *95*veh/h

Opposing direction vol., V_o *64*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *4.0*

☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *0%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.951*	*0.880*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.67*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*157*	*114*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.5 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*50.4 mi/h*
		Percent free flow speed, PFFS	*95.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.941*	*0.941*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.73*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*146*	*98*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*16.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*11.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*23.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.09*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*0*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1167*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*95.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*100.0*
Effective width, Wv (Eq. 15-29) ft	*33.45*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*0.44*
Bicycle level of service (Exhibit 15-4)	*A*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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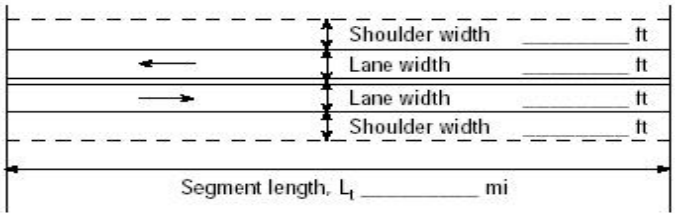
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 2*
Date Performed	*11/21/2013*	Jurisdiction	*WB EXISTING (20%)*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



Analysis direction vol., V_d *64*veh/h

Opposing direction vol., V_o *95*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *4.0*

☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *0%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.951*	*0.880*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.67*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*106*	*170*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.8 mi/h*
		Percent free flow speed, PFFS	*93.9 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.926*	*0.926*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.73*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*100*	*148*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*11.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*11.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*16.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.06*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1075*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1223*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*93.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*67.4*
Effective width, Wv (Eq. 15-29) ft	*36.24*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*-0.74*
Bicycle level of service (Exhibit 15-4)	*A*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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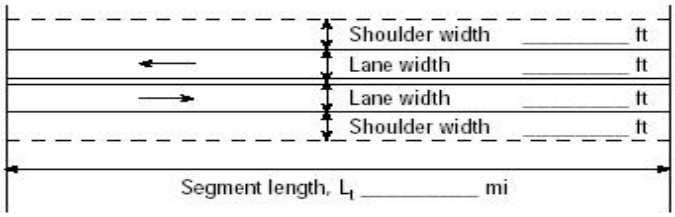
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 3, 4, & 5*
Date Performed	*11/21/2013*	Jurisdiction	*EB Existing (30%)*
Analysis Time Period		Analysis Year	*2043*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



Analysis direction vol., V_d *142*veh/h

Opposing direction vol., V_o *96*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *4.0*

☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *100*%

% Trucks and Buses , P_T *7*%

% Recreational vehicles, P_R *17*%

Access points *mi* *8*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*2.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.951*	*0.880*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.71*	*0.67*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*221*	*171*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0* *mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0* *mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0* *mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.6* *mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.0* *mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*46.3* *mi/h*
		Percent free flow speed, PFFS	*87.4* %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.8*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.947*	*0.947*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.76*	*0.73*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*208*	*146*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*22.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*55.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*55.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.12*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*0*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1223*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*87.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*149.5*
Effective width, Wv (Eq. 15-29) ft	*29.22*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*1.97*
Bicycle level of service (Exhibit 15-4)	*B*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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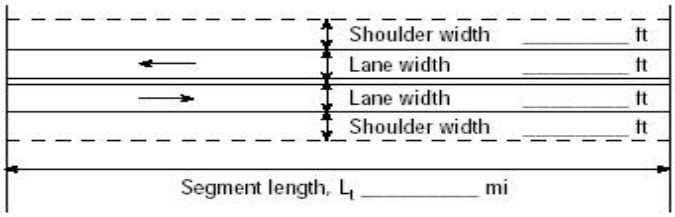
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst		Highway / Direction of Travel	*Sterling*
Agency or Company		From/To	*Segment 3, 4, & 5*
Date Performed	*11/21/2013*	Jurisdiction	*WB EXISTING (30%)*
Analysis Time Period		Analysis Year	*2035*

Project Description: *Juneau Creek Alt w/o bridge*

Input Data



☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.95*

No-passing zone *100%*

% Trucks and Buses , P_T *7%*

% Recreational vehicles, P_R *17%*

Access points *mi* *8*/mi

Analysis direction vol., V_d *96*veh/h

Opposing direction vol., V_o *142*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *4.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*2.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.951*	*0.891*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.67*	*0.71*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*159*	*236*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.0 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.8 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*53.0 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*46.1 mi/h*
		Percent free flow speed, PFFS	*87.0 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.8*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.947*	*0.947*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.73*	*0.76*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*146*	*208*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*16.2*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*55.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*39.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*
Volume to capacity ratio, *v/c*	*0.09*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1167*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1296*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*87.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*101.1*
Effective width, Wv (Eq. 15-29) ft	*33.36*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*0.47*
Bicycle level of service (Exhibit 15-4)	*A*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
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