

Appendix G – 2045 Build Conditions Traffic Operations Technical Memorandum



Technical Memo

Date:	Friday, September 6, 2019
Project:	Southern Meade County Corridor Study
To:	Study Advisory Team
From:	HDR

Subject: 2045 Build Conditions Traffic Operations

Introduction

The purpose of this technical memorandum is to identify minimum build needs and present the associated Build Conditions traffic operations along the proposed east/west corridor between Erickson Ranch Road and 143rd Avenue for the following future-year scenario:

• 2045 Planning Horizon Build Conditions

Primary components of the Build Conditions scenario and this technical memorandum include:

- Traffic operations analysis of Build Conditions at primary intersections and along twolane highway segments.
- Review of turn lane warrants.
- Recommendations for minimum improvements needed to meet operational goals for this study.

Study Area

The study area is bound by, and includes, the following roadways:

- Elk Creek Road (north boundary)
- 143rd Avenue (east)
- Meade County border (south)
- Erickson Ranch Road (west)

While Elk Vale Road was not part of the original study area, it was included in the traffic forecasts because of its regional importance to connectivity along the eastern edge of the study area. Elk Vale Road provides a direct north/south connection to I-90 (Exit 61) and US16 Bypass.

Build Conditions Roadway Network

The primary difference between the 2045 No-Build and 2045 Build Conditions is the inclusion of a proposed east/west corridor north of the Meade County/Pennington County border that links Erickson Ranch Road, Haines Avenue, and 143rd Avenue. In this study, the corridor was extended over to Elk Vale Road for illustrative purposes as previously described. If the proposed east/west corridor is not extended east to 143rd Avenue, the segment volumes would be applicable to the 224th Street segment between 143rd Avenue and Elk Vale Road.

A series of east/west alignments between Elk Creek Road and the Meade County/Pennington County border were identified in the previous phase of this study. These alignments were narrowed down to three locations, as shown in **Figure 1**, through a comprehensive screening process documented in the May 23, 2019, *Alternatives Development Screening* technical memorandum. Because of the relative close proximity to each other within the overall study area, the same Build Conditions traffic forecasts are applicable to all three of these corridors carried forward for further consideration.

Assumptions used for the proposed east/west corridor operations analysis include:

- Erickson Ranch Road to Haines Avenue: Paved surface (hard surfaced road)
- East of Haines Avenue: Gravel surfacing
- 2-lane highway with 4-foot shoulders
- 30-40% no passing zones due to hilly terrain
- 55 mph design speed (50 mph posted speed)
- Eastbound/westbound approaches on the proposed corridor are stop-controlled
 - o Northbound/southbound free movements

Traffic Volume Development

Daily segment volumes and AM and PM peak hour intersection volumes were developed for 2019 Existing Conditions, 2045 No-Build Conditions, and 2045 Build Conditions scenarios.

The 2019 Existing Conditions volume set was developed for the study area using 2019 segment and peak hour counts, factored to a design season (August) to account for seasonal fluctuations. This volume set serves as the foundation for forecasting traffic throughout the study area.

Traffic forecasts for 2045, both Build and No-Build Conditions, were prepared using the most current version of the Rapid City Area MPO travel demand model (year 2040). Methodology used in the development of segment and intersection peak hour forecasts was consistent with NCHRP 765: Analytical Travel Forecasting Approaches for Project-Level Planning and Design.

For the forecasting, distribution, and assignment of traffic along the proposed corridor in the 2045 Build Conditions scenario, the following process was used (described further in the *Traffic Forecast* memo dated May 2019):



- 1. Estimate east/west corridor through trips and add to the potential corridor.
- 2. Estimate traffic volumes that would access the potential corridor based on travel demand model Transportation Analysis Zone (TAZ)/land use for adjacent TAZs.
- 3. Estimate traffic distribution throughout study area.
- 4. Assign TAZ/land use-based traffic to the potential corridor at mid-segments.
- 5. Estimate north/south through trips at the potential corridor intersections.
- 6. Estimate east/west corridor through trips and add to the potential corridor.
- 7. Smooth intersection volumes and balance where applicable.

Analysis traffic volumes for the 2045 Build Conditions are summarized provided in **Figure 2**. The *Traffic Forecasts* technical memorandum presents more details regarding the methodology and process of developing existing conditions and future-year peak hour traffic volumes.

2045 Traffic Forecasts and Proposed East/West Corridor Alternatives

It was found that much of the traffic assigned to the proposed east/west corridor is development driven and destined for an existing north/south route that leads towards Rapid City or an east/west route that leads to I-90. Given the predominant future 2040 land use throughout the study area is rural residential, the east/west travel along the corridor is likely focused on this directional travel to/from home and Rapid City/other areas outside of the study area. Nearly all of the traffic assigned to the east/west corridor comes from this future development identified in the travel demand model.

It would be expected that as the area continues to densify in the future, commercial and other land uses will develop in the area and create a need to accommodate shorter trips contained along the proposed east/west corridor and within the study area.

From a proposed east/west corridor alternative attractiveness standpoint, each of the proposed corridor alternative routes would serve very similar traffic. Each alternative is situated within the Boxelder Creek (and tributaries) valley and would experience similar natural connectivity limitations to development north and south.

Ultimately, the differentiation of future attractiveness between the three corridor alternatives is negligible. The most notable component of localized attractiveness is likely tied to the future location of more dense, urban types of development. Motorists typically seek the shortest/quickest route and do not like to go out of their way (drive past their destination). Therefore, if greater density development (such as an apartment) is constructed north of a proposed corridor route, those trips would likely be more prone to using the east/west corridor than if a similar development is constructed south of the corridor and has alternative access to a north/south route south of the corridor. Therefore, it is recommended that consideration be given to the proximity of natural barriers and that efficient, attractive access to future development is provided along the corridor.





SOUTHERN MEADE COUNTY CORRIDOR STUDY

SELECTED STUDY BUILD ALTERNATIVES

FIGURE

FIGURE 1



PEAK SEASON

FJS

2045 BUILD CONDITIONS TRAFFIC FORECASTS

DATE

FIGURE



5/6/2019

Traffic Operations Analysis Methodology

Intersection peak hour level of service (LOS) was calculated using 6th Edition of the Highway Capacity Manual (HCM6) analysis methodology replicated in Highway Capacity Software version 7.6 (HCS7). HCM6 analysis methods measure average control delay in terms of seconds of delay per vehicle (sec/veh) at intersections and percent time-spent following (PTSF) on two-lane highways. LOS values can be applied to these measures in accordance with thresholds presented in **Table 1**.

	Intersection Delay	Intersection Delay per Vehicle (sec/veh)							
LOS	Signalized Intersections	Two-Way Stop- Control*, All-Way Stop-Control, and Roundabouts	Percent Time-Spent Following (PTSF) Class II Highway						
А	≤ 10	≤ 10	≤ 40						
В	> 10 – 20	> 10 – 15	> 40 - 55						
С	> 20 - 35	> 15 - 25	> 55 – 70						
D	> 35 – 55	> 25 – 35	> 70 - 85						
E	> 55 - 80	> 35 – 50	> 85						
F	Demand exceeds capacity; > 80	Demand exceeds capacity; > 50	Demand exceeds capacity						

Table 1: Level of Service Thresholds

Source: Transportation Research Board, HCM6.

* Two-way stop-control LOS reflects worst-case stop-controlled approach.

HCS7 modules used for this analysis include:

- Two-Way Stop-Controlled (TWSC) Intersections HCS7 TWSC Module
- All-Way Stop-Controlled (AWSC) Intersections HCS7 AWSC Module
- Two-Lane Highway Segments HCS7 Two-Lane Module

Current HCM6 methodology does not directly analyze yield-control intersections. For this study, all yield-control approaches will be analyzed as stop-control.

Level of Service Goals for Study

The following minimum allowable LOS thresholds have been established for this study:

- Signalized intersections minimum allowable LOS LOS B
- Two-way stop-controlled intersections LOS LOS B (worst-case stop-controlled approach)
- Two-lane highways
 - Rural collector LOS LOS C
 - Rural minor arterial LOS LOS B



These LOS thresholds were used to guide the development of potential improvements and subsequent evaluation of concepts.

This memorandum focuses on the traffic operations at the following existing study area intersections:

- Elk Creek Road & Erickson Ranch Road
- Elk Creek Road & Haines Avenue
- Elk Creek Road & 143rd Avenue
- Peaceful Pines Road/Deadwood Avenue & Erickson Ranch Road
- 224th Street & 143rd Avenue
- Proposed east/west corridor & Erickson Ranch Road
- Proposed east/west corridor & Haines Avenue
- Proposed east/west corridor & 143rd Avenue

Intersection Traffic Operations Analysis

A summary of 2045 Build Conditions traffic operations analysis at the primary study area intersections is provided in **Table 2**. Each intersection was built-out, as needed, in the HCS7 traffic model to achieve LOS goals for this study. The resulting recommended intersection lane configurations are shown in **Figure 4**. HCS7 analysis reports are provided in **Appendix A**.

	Intersection	AM Peak F	Period	PM Peak Period		
Study Intersection	Control Type	Avg. Delay (sec/veh)	LOS	Avg. Delay (sec/veh)	LOS	
Elk Creek Road & Erickson Ranch Road	TWSC*	13.3	В	12.0	В	
Elk Creek Road & Haines Avenue	AWSC	7.7	А	8.1	А	
Elk Creek Road & 143 rd Avenue	TWSC*	9.4	А	9.4	А	
Peaceful Pines Road/ Deadwood Avenue & Erickson Ranch Road	TWSC*	11.1	В	9.7	A	
224 th Street & 143 rd Avenue	TWSC*	8.8	A	8.7	А	
East/West Corridor & Erickson Ranch Road	TWSC*	11.2	В	9.9	А	
East/West Corridor & Haines Avenue	TWSC* AWSC Roundabout	15.2 9.8 5.1	C A A	17.1 11.5 5.6	C B A	
East/West Corridor & 143 rd Avenue	TWSC*	9.8	А	9.8	А	

Table 2: Study Area Intersections – 2045 Build Conditions

* Two-way stop-control LOS reflects worst-case stop-controlled approach.



No modifications were needed to achieve LOS goals at any of the existing intersections and thus it can be concluded that the existing intersection configurations are adequate for futureyear volumes developed for this study.

Along the proposed corridor, each intersection was initially analyzed with a shared approach lane configuration of shared left/thru/right from a single lane. Locations where lanes were separated to achieve LOS goals are noted in discussion. As stated in the initial assumptions of the proposed east/west corridor, it was assumed that the east/west corridor was stop-controlled and the north/south roadways had free movements.

It was found that the primary location with notable delay in TWSC conditions was at the proposed east/west corridor and Haines Avenue. Worst-case stop-controlled approach delay was measured at LOS C in both the AM and PM peak periods. The greatest delays were measured on the low-volume westbound approach and thus separating left-turn and through traffic provides minimal benefit to this LOS measure. The weighted average intersection delay, which accounts for all measured delay throughout the intersection as well as the operational benefits afforded to the free movements at a TWSC intersection, was less than 7 and 6 seconds for AM and PM peak hours, respectively.

Two other intersection alternatives were analyzed at the proposed east/west corridor and Haines Avenue intersection. Both an AWSC intersection and roundabout result in acceptable LOS for this study and are feasible solutions to address future traffic volumes at this intersection. The roundabout configuration results in the lowest overall intersection delay of the three options.

Two-Lane Highway Traffic Operations Analysis

Two-lane highway segments were analyzed using Existing Conditions and 2045 No-Build Conditions traffic volumes for the following paved highway segments:

- Erickson Ranch Road
- Haines Avenue north of Virginia Lane
- Haines Avenue south of Virginia Lane
- Elk Creek Road
- Proposed east/west corridor

The 2045 Build Conditions assumes the same roadway conditions, but updates traffic volumes with the future-year Build forecasts. HCM6 methodology does not currently support analysis of gravel roadway segments, and thus existing gravel roadways were not analyzed as part of this review.

Two-lane highway operational analysis results for the 2045 Build Conditions are summarized in **Table 3**. It was found that all analyzed segments, including the proposed east/west collector, result in a LOS C or better. This meets rural collector LOS goals for this study.

Study Two-Lane	Functional	Peak	Peak	AM Peak	Period	PM Peak	Period
Highway Segment	Classification	Hour	Hour Direction of Travel		LOS	PTSF ¹ (%)	LOS
Erickson Ranch Rd	Rural	AM	SB	46.9	В		
Elk Creek Rd – Westridge Rd	Collector	PM	NB			41.3	В
Erickson Ranch Rd	Rural	AM	SB	59.3	С		
Westridge Rd – East/West Corridor	Collector	PM	NB			48.4	В
Erickson Ranch Rd	Rural	AM	SB	64.9	С		
East/West Corridor – Peaceful Pines Rd	Collector	PM	NB			58.4	С
Haines Avenue	Rural	AM	SB	56.9	С		
Elk Creek Rd – East/West Corridor	Collector	PM	NB			50.1	В
Haines Avenue	Rural	AM	SB	65.0	С		
East/West Corridor – Pennington County	Collector	PM	NB			64.5	С
Elk Creek Road	Rural	AM	EB	29.0	Α		
Erickson Ranch Rd – Haines Ave	Collector	PM	WB			28.1	Α
East/West Corridor	Rural	AM	EB	50.7	В		
Erickson Ranch Rd – Haines Ave	Collector	PM	WB			49.5	В

Table 3: Two-Lane Highway Segments – 2045 Build Conditions

¹ PTSF reflects analysis in the peak direction

As found in the previous 2045 No-Build Conditions analysis, segments exhibiting the greatest percentage of time a vehicle spends following another vehicle are located towards the southern study area boundary.

The proposed east/west corridor 2-lane highway cross-section, paved between Erickson Ranch Road and Haines Avenue, is expected to meet LOS goals for this study. The proposed gravel segment between Haines Avenue and 143rd Avenue was not analyzed in HCS7.

Roadway Segment Capacity Assessment

Another method to estimate capacity-related needs is to compare daily segment volume forecasts, as presented in **Figure 2**, to LOS-based roadway segment capacity thresholds (as presented in the *South Dakota Department of Transportation Road Design Manual* Table 15-10). These thresholds, shown in **Table 4**, represent a planning-level guide to cross-sectional needs in terms of through lanes and potential turn lanes based on traffic volumes.

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Total	Description	Total Design Year ADT ¹					
Number of Lanes	Description	Rural Level	Urban				
2	1 lane in each direction	< 8,000	< 2,500				
3	1 lane in each direction plus center turn lane	2	2,500 to 16,000				
4	2 lanes in each direction	8,000 to 20,000 ³	3				
5	2 lanes in each direction plus center turn lane	2	16,000 to 30,000				
6	3 lanes in each direction	> 20,000 4	> 30,000 4				

Table 4: Estimated Number of Lanes Based on Daily Traffic Volumes

Source: South Dakota Department of Transportation Road Design Manual, Table 15-10 (as of 4/26/19)

1 Construction/Reconstruction projects are designed based on a typical 20 year ADT projection beyond the anticipated year of project construction.

2 Continuous left turn lanes may be considered based on left turn volumes and/or when intersections and/or approaches are closely spaced together.

3 Undivided sections may be used if left turn movements are low and there is no crash history, otherwise consider installing a median or 5 lane section.

4 Medians should be used.

All roadways within the study exhibit a 2045 daily traffic volume forecast that is less than the 'Rural Level' threshold of 8,000 for a two-lane roadway.

As Rapid City continues to grow northward and the area becomes more urbanized, particularly for the southern areas of Meade County, a 3-lane urban cross-section may be applicable. This would provide one lane in each direction plus a center turn lane.

Proposed East/West Corridor Intersection Turn Lanes

A turn lane warrant evaluation was conducted using 2045 Build Conditions traffic forecasts for the north/south free movements at the proposed east/west corridor intersections with Erickson Ranch Road, Haines Avenue, and 143rd Avenue. Turn lanes for the proposed east/west corridor stop-controlled approaches are typically dictated by operational (delay) needs, as all vehicles are required to stop at the intersection.

This evaluation serves as a tool to aid conceptual design. Conclusions from this evaluation do not require installation, or non-installation, of a turn lane. Turn lanes to crossroads and driveways provide operational and safety benefits to arterial roadway traffic by minimizing through traffic hazards and interference.

Engineering judgment and other factors such as lane balance, access density, route continuity, and sight distance, contribute to the ultimate determination whether a turn lane is constructed. Additionally, future development intensity, timeframe, and desired access play a role in the level of demand at these future minor street intersections and driveways.

Turn lane warrant criteria for the free intersection movements used in this analysis are based on standards for turn lanes presented in the SDDOT Road Design Manual, shown in **Figure 3**. These standards consider the relationship between traffic volumes, posted (or future) speed limits, and number of lanes on a facility to determine whether a turn lane is warranted.



Figure 3: Turn Lane Volume Warrant Criterion

Source: South Dakota Department of Transportation Road Design Manual, Figures 15-2 and 15-3 (as of 7/11/19); adapted from Oregon DOT Analysis Procedures Manual 2008.

Table 5 presents results of the turn lane analysis for the north/south free movements at proposed intersections with the east/west corridor.

Table 5: Proposed East/West Corridor Intersection Turn Lane Volume Warrant Review

Future East/West Corridor Intersection	Turn Movement	2045 Turn Lane Volume Warrant Satisfied
Erickson Ranch Road	NB RT	No
	SB LT	No
Haines Avenue	NB LT	Yes (AM & PM)
	NB RT	No
	SB LT	No*
	SB RT	No
143 rd Avenue	NB LT	No
	NB RT	No
	SB LT	No
	SB RT	No

Analysis Methodology Source: South Dakota Department of Transportation Road Design Manual, Figures 15-2 and 15-3 (as of 7/11/19)

* Consider LT lane when opposing direction includes warranted left-turn lane.

The primary turn lane need based on forecasted volumes for this study is the high volume northbound to westbound left-turn movement at the intersection of the proposed east/west corridor and Haines Avenue. A turn lane at this location would remove left-turning vehicles from the through movement and allow them to wait for a gap in southbound traffic in a turn lane. While not warranted, the complimentary southbound left-turn lane is also recommended to not only remove left-turning traffic from the free through movement but also provides better sight angles when there is a turning vehicle in the opposing left-turn lane.

While turn lanes are not warranted at other locations, further consideration to installation should be given during design due to the operational and safety benefits turn lanes provide.

Recommendations

The following summarizes minimum Build recommendations for the proposed east/west corridor for year 2045. The recommended lane configurations for the proposed east/west corridor are shown in **Figure 4**.

Proposed East/West Corridor Cross-Section

- 2-lane highway section meets LOS goals for this study
- Other cross-sectional elements shall meet current and applicable design standards for the proposed roadway.

Proposed East/West Corridor Intersections

ERICKSON RANCH ROAD

- Turn lanes: LOS goals achieved with shared left/through/right lane configurations.
- Assumes stop-control from proposed east/west corridor approach



- Two-Way Stop-Control Intersection
 - Worst-case stop-controlled approach does not meet LOS goals for this study, but delay is a low LOS C (less than 20 seconds for low volume westbound approach) and overall intersection delay is less than 7 seconds.
 - Turn Lanes: Northbound left-turn lane warranted; opposing southbound left-turn lane recommended.
 - o Assumes stop-control from proposed east/west corridor approach
- All-Way Stop-Control Intersection
 - Turn Lanes: shared left/through/right configuration meets LOS goals for this study
- Roundabout
 - Single-lane roundabout achieves LOS goals for this study and results in the lowest delay of all analyzed intersection configurations.

143RD AVENUE

- Turn lanes: LOS goals achieved with shared left/through/right lane configurations.
- Assumes stop-control from proposed east/west corridor approach

Additional Considerations

TURN LANES

It is recommended that turn lanes be considered at other unwarranted locations based on the operational and safety benefits they provide, particularly when removing turning traffic from high-speed through movements. One example is at the Erickson Ranch Road intersection.

EAST/WEST CORRIDOR ALIGNMENT ALTERNATIVES

Each of the three proposed east/west corridor alignment alternatives are within close proximity to each other from a study area perspective. At the greatest separation, they are still within the same section boundary (one-mile width). From a traffic perspective, each of these three alignments represent the most beneficial location as discussed in the May 23, 2019, *Alternatives Development Screening* technical memorandum. Overall differentiation between these three alignments with regard to traffic volumes is minimal. It will be important to manage access to/from development surrounding the corridor, providing safe and efficient connectivity that maintains the attractiveness and intended function of the corridor.



MINIMUM REQUIRED LANE CONFIGURATIONS TO MEET STUDY LOS AND TURN LANE WARRANT GOALS

SOUTHERN MEADE COUNTY CORRIDOR STUDY

FSS

DATE

7/12/2019

FIGURE



Appendix

- A. 2045 Build Conditions HCS7 Reports
- B. 2045 Turn Lane Volume Warrant Review



Appendix A – 2045 Build Conditions HCS7 Reports

Appendix G Page 17 of 140	HCS7	Two-Way	y Stop-Cont	trol Tex	kt Report				
File Name: Analyst: Agency: Date Performed: Time Analyzed: Jurisdiction: Analysis Year: Project Description: Units: Intersection Name: Major Street Direction: East/West Street Name: North/South Street Name: Analysis Time Period (hrs):	2045-1 HDR HDR 7/3/2(AM - 2 Meade 2045 South U.S. (224th East-1 224th	3uild_4 019 2045 Bu County ern Mea Customa St & 2	ade County ary 143rd Ave t	43rd_Tws	SC.xtw				
	Ve	nicle \	volumes and	d Adjust	ments				
Major Street: Approach Movement	1U U	East 1 L	tBound 2 T	3 R		4U U	WestB 4 L	ound 5 T	6 R
Volume		5	10					10	10
Peak Hour Factor, PHF Hourly Flow Rtae, HFR		6	13		0.80			13	13
Percent Heavy Vehicles Number of Lanes	0	3 0	1	0		0	0	1	0
Lane Configuration Median Type Median Storage		LT			Undivi	ded			TR
RT channelized? Left-Turn Lane Storage Upstream Signal?					Not Pr	esent			
Minor Street: Approach Movement			thBound	0			South 10	Bound 11	12
Movement		7 L	8 T	9 R	ł		L	Ť	R
Volume					0.80		20		5
Peak Hour Factor, PHF Hourly Flow Rtae, HFR Bancont Hoavy Vahieles					0.80		25		6
Percent Heavy Vehicles Number of Lanes Lane Configuration		0	0	0			3 0	1 LR	3 0
RT channelized? Flared Approach Storage Percent Grade			I				NO	 0	
	Pede:	strian	Volumes ar	nd Adius	stments				
Approach Movement			EB 13	5.00	WB 14		NB 15		SB 16
Flow (ped/hr) Lane width (ft) Walking Speed (ft/sec) Pedestrian Blockage Factor, f_pb	,		0		0				0
	_Delay. (Queue I	Length, and	d Level	of Servio				
Approach EB Movement 1U Lane Configuration			NB 4		orthBound 8	9	50 10	uthBound 11 LR	12
Flow Rate Lane Capacity	6 1583							31 978	
v/c 95% Queue Length	0.00 0.0							0.03 0.1	
Control Delay LOS	7.3							8.8 A	
Approach Delay Approach LOS	A 2.4							8.8 A	

Approach LOS Intersction Delay	4.3							A	
Major Street:		Step 1:	MOVEMEN	T PRIORI	TIES				
Approach		East	Bound				West	Bound	
Approach Priority	10	1	2	3	1	4U	4	5	6
Movement	11	1	т	R	i	11	1	т	R

Minor Street:

Appendix G Page 18 c Approach Priority Movement	of 140		NorthBo 7 L	ound 8 T	9 R			SouthB 10 L	ound 11 T	12 R
	Step	2: MOVE	EMENT DEM	MAND VO	LUMES AN	ID FLOW R	ATES			
Major Street: Approach Movement		10 U	EastBou 1 L		3 R		4U U	WestBo 4 L	und 5 T	6 R
Volume, V_x Flow Rate, v_x			5 6	10 13					10 13	10 13
Minor Street: Approach Movement			NorthBo 7 L	ound 8 T	9 R			SouthBo 10 L	ound 11 T	12 R
Volume, V_x Flow Rate, v_x								20 25		5 6
		Ster	o 3: CONF			ATES				
Major Street: Approach Movement		10 U	EastBou 1 L		3 R		4U U	WestBo 4 L	und 5 T	6 R
Flow Rate, v_x Conflicting Flow, v_c,x			6 25	13					13	13
Minor Street: Approach Movement			NorthBo 7 L	ound 8 T	9 R			SouthB 10 L	ound 11 T	12 R
Flow Rate, v_x Conflicting Flow, v_c,x								25 44		6 19
	Step	4: CRIT	ICAL HEAD	DWAYS a	nd FOLLC	W-UP HEA	DWAYS			
CRITICAL HEADWAYS Approach	EB		WB		NO	rthBound		Sou	thBound	
Movement	1U U	1 L	40 U	4 L	7 L	8 T	9 R	10 L	11 T	12 R
t_c,base Single Stage Stage I Stage II		4.1						7.1		6.2
t_c,HV P_HV t_c,G		1.0 0.03						1.0 0.03 0.2		1.0 0.03 0.1
G t_3,LT		0.0						0 0.7		0 0.0
t_c Single Stage Stage I Stage II		4.13						6.43		6.23
FOLLOW-UP HEADWAYS Approach Movement	EB 1U U	1 L	WB 4U U	4 L	No 7 L	orthBound 8 T	9 R	Sou [.] 10 L	thBound 11 T	12 R
t_f,base t_f,HV P_HV t_f		2.2 0.9 0.03 2.23						3.5 0.9 0.03 3.53		3.3 0.9 0.03 3.33
		Ste	ep 5: POT	TENTIAL	CAPACIT	IES				
NO UPSTREAM SIGNAL EFFECT Approach Movement	S PRESENT EB 1U U	- 1 L	WB 4U U	4 L	NO 7 L	orthBound 8 T	9 R	Sou [.] 10 L	thBound 11 T	12 R
v_c,x t_c,x t_f,x c_p,x		25 4.13 2.23 1583						44 6.43 3.53 964		19 6.23 3.33 1057
		Steps	s 6 - 9:	MOVEME	ΝΤ CAPAC	ITIES				

Steps 6 - 9: MOVEMENT CAPACITIES

EΒ

WB

NB

SB

Appendix G Page 19 of 140 Movement	13	14	15	16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb	0	0		0
Major-Street Left-Turn Movements		1	4	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State	2, p*_0,j	25 1583 1.000 1583 0.996 0.996		
Minor-Street Right-Turn Movements		9	12	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j			19 1057 1.000 1057 0.994	
Major-Street U-Turn Movements		10	40	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j				
Minor-Street Through Movements		8	11	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				
Minor-Street Left-Turn Movements		7	10	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor, Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	p"		44 964 1.000 0.996 961	
Step 10 SHARED-LANE CAPACITY OF MINOR STREET APPROA): FINAL CAPACITY	ADJUSTMENTS		
Approach Movement Lane Configuration	NorthB 7 8	ound 9 	SouthBour 10 11 LR	nd 12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH			961 31 978	1057
	tep 11: CONTROL D	ELAY		
CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTS Approach EB Movement 1U 1	WB 4U 4 7	NorthBound 8 9	SouthBour 10 11	nd 12
Flow Rate 6 Movement Capacity 1583 Lane Configuration LT Shared Capacity Control Delay 7.3			25 961 LR 978 8.8	
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement		EB 2	WB 5	
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, Delay to Major Left-turning Vehicles, d_ML1 Major Street Through Vehicles in Shared Lar Major Street Turning Vehicles in Shared Lar	ne, v_i1 ne, v_i2	1 0.996 7.3 13 6	1	
Saturation Flow Rate for Major Street Throu	ign, s_il	1700	1700	

Appendix G Page 20 of 140 Saturation Flow Rate for Major Street Right-Turn, s_i2 Delay to Rank 1 Vehicles, d_Rank1

1700

0.0

Step Approach	s 12 - 13: EB	APPROACH,	/INTERSEC WB	TION	CONTROL	DELAY and NorthBound			S uthBound	
Movement Lane Configuration	10	1 LT	4U	4	7	8	9	10	11 LR	12
Flow Rate		6					<u>A</u>		31	
Lane Capacity		1583							978	
v/c		0.00							0.03	
95% Queue Length		0.0							0.1	
Control Delay		7.3							8.8	
LOS		А							А	
Approach Delay		2.4							8.8	
Approach LOS									А	
Intersction Delay		4.3								

This TWSC text report was created in HCS™ TWSC Version 7.8 on 9/5/2019 2:50:05 PM

Appendix G Page 21 of 140	HCS7 Two-Way Stop-Control Text Report										
File Name: Analyst: Agency: Date Performed: Time Analyzed: Jurisdiction: Analysis Year: Project Description: Units: Intersection Name: Major Street Direction: East/West Street Name: North/South Street Name: Analysis Time Period (hrs):	2045-E HDR HDR 7/3/20 AM - 2 Meade 2045 Southe U.S. C E/W CO North-	19 045 Buil County rn Meade ustomary orridor & South lest Corr	EastWest d Cond. County 143rd A	Corrido Corrido	or-143rd_1	WSC.xtw					
Major Street:	Veh	icle Vol	umes and	Adjust	ments						
Approach Movement	10	NorthB 1	ound 2	3	I	4U	South 4	Bound 5	6		
Hovement	U	Ĺ	Ť	R	ļ	U	Ĺ	T	R		
Volume Peak Hour Factor, PHF		5	15	5	0.80		5	20	5		
Hourly Flow Rtae, HFR Percent Heavy Vehicles		6 20	19	6	0100		6 20	25	6		
Number of Lanes Lane Configuration	0	0	1 LTR	0		0	0	1 LTR	0		
Median Type Median Storage			LIK		Undivi	ded		LIN			
RT channelized? Left-Turn Lane Storage											
Upstream Signal?					Not Pr	resent					
Minor Street: Approach		WestBo	und				EastBo	ound			
Movement		7 L	8 T	9 R			10 L	11 T	12 R		
Volume Peak Hour Factor, PHF		5	30	5	0.80		5	20	5		
Hourly Flow Rtae, HFR Percent Heavy Vehicles		6 20	38 20	6 20	0100		6 20	25 20	6 20		
Number of Lanes Lane Configuration		0	1 LTR	Ō			0	1 LTR	0		
RT channelized? Flared Approach Storage		NO					No				
Percent Grade		NO	ò					Ó			
	Pedes	trian Vo		d Adjus							
Approach Movement			NB 13		SB 14		WB 15		EB 16		
Flow (ped/hr)			0		0		0		0		
Lane width (ft) Walking Speed (ft/sec) Pedestrian Blockage Factor, f_pb											
Approach	Delay, Q		gth, and		of Servic	ce		o the basis of			
Approach NB Movement 1U Lane Configuration	1	SB 4U	4	7 7	/estBound 8 LTR	9	Ea 10	astBound 11 LTR	12		
Flow Rate Lane Capacity	6 1472		6 1480		50 801	· · · · · · · · · · · · · · · · · · ·		38 808			
v/c 95% Queue Length	$0.00 \\ 0.0$		$0.00 \\ 0.0$		0.06			0.05			
Control Delay LOS	7.5		7.4		9.8 A			9.7			
Approach Delay Approach LOS	A 1.5		A 1.3		9.8 A			A 9.7 A			
Intersction Delay	6.1				A			A			
	S	step 1: M	OVEMENT	PRIORIT	IES						
Major Street: Approach	_	NorthB	-	r.			South		_		
Priority Movement	1U U	1 L	2 T	3 R		40 U	4 L	5 T	6 R		

Minor Street:

Appendix G Page 22 o Approach Priority Movement	f 140		WestBou 7 L	und 8 T	9 R			EastBo 10 L	und 11 T	12 R
	Ste	D 2: MOVE	EMENT DEM	MAND VOL	UMES AND	FLOW RA	TES			
Major Street: Approach			NorthBo					SouthB	ound	
Movement		10	1	2	3	ļ	4U	4	5	6
		U	L	Т	R	I	U	L	Т	R
Volume, V_x Flow Rate, v_x			5 6	15 19	5 6			5 6	20 25	5 6
Minor Street:										
Approach Movement			WestBou 7	und 8	9	I		EastBo 10	und 11	12
			Ĺ	T	R	İ		L	T	R
Volume, V_x			5	30	5			5	20	5
Flow Rate, v_x			6	38	6			6	25	6
		C t a								
Major Street:		Step	5 3: CON	FLICTING	FLOW RA	TES				
Approach		a	NorthBo		-		4	SouthB		<u>,</u>
Movement		10 U	1 L	2 T	3 R		40 U	4 L	5 T	6 R
			_							
Flow Rate, v_x Conflicting Flow, v_c,x			6 31	19	6			6 25	25	6
Minor Street: Approach			WestBou	und				EastBo	und	
Movement			7	8	9			10	11	12
			L	Т	R	I		L	Т	R
Flow Rate, v_x			6	38	6			6	25	6
Conflicting Flow, v_c,x			91	78	22			97	78	28
	Step	4: CRITI	ΓΟΑΙ ΗΕΑΓ	DWAYS an	d FOLLOW	-UP HEAD	WAYS			
CRITICAL HEADWAYS	-									
Approach Movement	NB 1U	1	SB 4U	4	We 7	stBound 8	9	Ea 10	stBound 11	12
		1 L		4 L			9 R			12 R
Movement	10		4U		7	8	-	10	11	
Movement t_c,base Single Stage	10		4U		7	8	-	10	11	
Movement t_c,base Single Stage Stage I	10	L 4.1	4U	L 4.1	7 L	8 T	R	10 L	11 T	R
Movement t_c,base Single Stage Stage I Stage II t_c,HV	10	L 4.1 1.0	4U	L 4.1 1.0	7 L 7.1 1.0	8 T 6.5 1.0	R 6.2 1.0	10 L 7.1 1.0	11 T 6.5 1.0	R 6.2 1.0
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV	10	L 4.1	4U	L 4.1	7 L 7.1	8 T 6.5 1.0 0.20	R 6.2	10 L 7.1 1.0 0.20	11 T 6.5	R 6.2 1.0 0.20
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G	10	4.1 1.0 0.20	4U	L 4.1 1.0 0.20	7 L 7.1 1.0 0.20 0.2 0	8 T 6.5 1.0 0.20 0.2 0	R 6.2 1.0 0.20 0.1 0	10 L 7.1 1.0 0.20 0.2 0	11 T 6.5 1.0 0.20 0.2 0	R 6.2 1.0 0.20 0.1 0
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT	10	L 4.1 1.0	4U	L 4.1 1.0	7 L 7.1 1.0 0.20 0.2	8 T 6.5 1.0 0.20 0.2	R 6.2 1.0 0.20 0.1	10 L 7.1 1.0 0.20 0.2	11 T 6.5 1.0 0.20 0.2	R 6.2 1.0 0.20 0.1
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage	10	4.1 1.0 0.20	4U	L 4.1 1.0 0.20	7 L 7.1 1.0 0.20 0.2 0	8 T 6.5 1.0 0.20 0.2 0	R 6.2 1.0 0.20 0.1 0	10 L 7.1 1.0 0.20 0.2 0	11 T 6.5 1.0 0.20 0.2 0	R 6.2 1.0 0.20 0.1 0
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I	10	L 4.1 1.0 0.20 0.0	4U	L 4.1 1.0 0.20 0.0	7 L 7.1 1.0 0.20 0.2 0.0	8 T 6.5 1.0 0.20 0.2 0.0	R 6.2 1.0 0.20 0.1 0.0	10 L 7.1 1.0 0.20 0.2 0.0	11 T 6.5 1.0 0.20 0.2 0.0	R 6.2 1.0 0.20 0.1 0 0.0
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II	10	L 4.1 1.0 0.20 0.0	4U	L 4.1 1.0 0.20 0.0	7 L 7.1 1.0 0.20 0.2 0.0	8 T 6.5 1.0 0.20 0.2 0.0	R 6.2 1.0 0.20 0.1 0.0	10 L 7.1 1.0 0.20 0.2 0.0	11 T 6.5 1.0 0.20 0.2 0.0	R 6.2 1.0 0.20 0.1 0 0.0
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I	10	L 4.1 1.0 0.20 0.0 4.30	4U	L 4.1 1.0 0.20 0.0 4.30	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30	8 T 6.5 1.0 0.20 0.2 0.0	R 6.2 1.0 0.20 0.1 0 0.0 6.40	10 L 7.1 1.0 0.20 0.2 0 0.0 7.30 Ea	11 T 6.5 1.0 0.20 0.2 0.0	R 6.2 1.0 0.20 0.1 0 0.0 6.40
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS	10 U NB 10	L 4.1 1.0 0.20 0.0 4.30	4U U SB 4U	L 4.1 1.0 0.20 0.0 4.30	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 We 7	8 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 8	R 6.2 1.0 0.20 0.1 0 0.0 6.40	10 L 7.1 1.0 0.20 0.2 0 0.0 7.30 Ea 10	11 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 11	R 6.2 1.0 0.20 0.1 0 0.0 6.40
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement	1U U NB	L 4.1 1.0 0.20 0.0 4.30	4U U SB	L 4.1 1.0 0.20 0.0 4.30	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 We 7 L	8 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 8 T	R 6.2 1.0 0.20 0.1 0.0 6.40 9 R	10 L 7.1 1.0 0.20 0.2 0 0.0 7.30 Ea 10 L	11 T 6.5 1.0 0.20 0.2 0 0.0 6.70 stBound	R 6.2 1.0 0.20 0.1 0 0.0 6.40
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base	10 U NB 10	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2	4U U SB 4U	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 We 7 L 3.5	8 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 8 T 4.0	R 6.2 1.0 0.20 0.1 0.0 6.40 9 R 3.3	10 L 7.1 1.0 0.20 0.2 0 0.0 7.30 Ea 10 L 3.5	11 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 11 T 4.0	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3
Movement t_c, base Single Stage Stage I Stage II t_c, HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f, base t_f,HV P_HV	10 U NB 10	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20	4U U SB 4U	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 We 7 L	8 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 8 T 4.0 0.9 0.20	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20	10 L 7.1 1.0 0.20 0.2 0 0.0 7.30 Ea 10 L	11 T 6.5 1.0 0.20 0.2 0 0.0 6.70 stBound 11 T	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base	10 U NB 10	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9	4U U SB 4U	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9	7 L 7.1 1.0 0.20 0.2 0.0 7.30 We 7 L 3.5 0.9	8 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 8 T 4.0 0.9	R 6.2 1.0 0.20 0.1 0.0 6.40 9 R 3.3	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 Ea 10 L 3.5 0.9	11 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 11 T 4.0 0.9	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3
Movement t_c, base Single Stage Stage I Stage II t_c, HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f, base t_f,HV P_HV	10 U NB 10	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38	4U U SB 4U U	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 We 7 L 3.5 0.9 0.20 3.68	8 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 8 T 4.0 0.9 0.20 4.18	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 Ea 10 L 3.5 0.9 0.20	11 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 11 T 4.0 0.9 0.20	R 6.2 1.0 0.20 0.1 0.0 6.40 12 R 3.3 0.9 0.20
Movement t_c, base Single Stage Stage I Stage II t_c, HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f, base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT		L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38	4U U SB 4U U SB 20 5: POT	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38	7 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 We 7 L 3.5 0.9 0.20 3.68 CAPACITI	8 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 8 T 4.0 0.9 0.20 4.18 ES_	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 Ea 10 L 3.5 0.9 0.20 3.68	11 T 6.5 1.0 0.20 0.2 0 0.0 6.70 stBound 11 T 4.0 0.9 0.20 4.18	R 6.2 1.0 0.20 0.1 0.0 6.40 12 R 3.3 0.9 0.20
Movement t_c, base Single Stage Stage I Stage II t_c, HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f, base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach	1U U NB 1U U S PRESEN NB	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38	4U U SB 2P 5: POT SB	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38 TENTIAL	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 We 7 L 3.5 0.9 0.20 3.68 CAPACITI We	8 T 6.5 1.0 0.20 0.2 0 0.0 6.70 stBound 8 T 4.0 0.9 0.20 4.18 ESstBound	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20 3.48	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 Ea 10 L 3.5 0.9 0.20 3.68 Ea	11 T 6.5 1.0 0.20 0.2 0 0.0 6.70 stBound 11 T 4.0 0.9 0.20 4.18 stBound	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9 0.20 3.48
Movement t_c, base Single Stage Stage I Stage II t_c, HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f, base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT	1U U NB 1U U S PRESEN	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38	4U U SB 4U U SB 20 5: POT	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38	7 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 We 7 L 3.5 0.9 0.20 3.68 CAPACITI	8 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 8 T 4.0 0.9 0.20 4.18 ES_	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 Ea 10 L 3.5 0.9 0.20 3.68	11 T 6.5 1.0 0.20 0.2 0 0.0 6.70 stBound 11 T 4.0 0.9 0.20 4.18	R 6.2 1.0 0.20 0.1 0.0 6.40 12 R 3.3 0.9 0.20
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach Movement	1U U NB 1U U S PRESENT NB 1U	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38 5 te 1 L	40 9 40 9 9 5: PO 58 40	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38 FENTIAL 4 L	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 We 7 L 3.5 0.9 0.20 3.68 CAPACITI We 7 L	8 T 6.5 1.0 0.20 0.2 0.0 6.70 5tBound 8 T 4.0 0.9 0.20 4.18 ES stBound 8 T	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20 3.48 9 R	10 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 Ea 10 L 3.5 0.9 0.20 3.68 Ea 10 L Ea	11 T 6.5 1.0 0.20 0.2 0 0.0 6.70 stBound 11 T 4.0 0.9 0.20 4.18 stBound 11 T	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9 0.20 3.48 12 R
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach Movement V_C,X t_c,X t_c,X	1U U NB 1U U S PRESENT NB 1U	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38 	40 9 40 9 9 5: PO 58 40	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38 TENTIAL 4 L 25 4.30	7 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 We 7 L 3.5 0.9 0.20 3.68 CAPACITI We 7 L 91 7.30	8 T 6.5 1.0 0.20 0.2 0 0.0 6.70 5tBound 8 T 4.0 0.9 0.20 4.18 ES stBound 8 T 78 6.70	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20 3.48 9 R 9 R 22 6.40	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 Ea 10 L 3.5 0.9 0.20 3.68 Ea 10 L Ea 10 L Ea 7.30	11 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 11 T 4.0 0.9 0.20 4.18 stBound 11 T 78 6.70	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9 0.20 3.48 12 R 12 R 28 6.40
Movement t_c, base Single Stage Stage I Stage II t_c, HV P_HV t_c, G G t_3, LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f, base t_f, HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach Movement V_C, X t_c, X t_f, X	1U U NB 1U U S PRESENT NB 1U	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38 5 te 1 L 31 4.30 2.38	40 9 40 9 9 5: PO 58 40	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38 TENTIAL 4 L 25 4.30 2.38	7 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 7.30 8 7 L 3.5 0.9 0.20 3.68 CAPACITI We 7 L We 7 L 91 7.30 3.68	8 T 6.5 1.0 0.20 0.2 0 0.0 6.70 5tBound 8 T 4.0 0.9 0.20 4.18 ES stBound 8 T 78 6.70 4.18	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20 3.48 9 R 22 6.40 3.48	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 Ea 10 L 3.5 0.9 0.20 3.68 Ea 10 L Ea 10 L Ea 3.68	11 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 11 T 4.0 0.9 0.20 4.18 stBound 11 T 78 6.70 4.18	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9 0.20 3.48 12 R 12 R 28 6.40 3.48
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach Movement V_C,X t_c,X t_c,X	1U U NB 1U U S PRESENT NB 1U	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38 	40 9 40 9 9 5: PO 58 40	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38 TENTIAL 4 L 25 4.30	7 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 We 7 L 3.5 0.9 0.20 3.68 CAPACITI We 7 L We 7 L 91 7.30	8 T 6.5 1.0 0.20 0.2 0 0.0 6.70 5tBound 8 T 4.0 0.9 0.20 4.18 ES stBound 8 T 78 6.70	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20 3.48 9 R 9 R 22 6.40	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 Ea 10 L 3.5 0.9 0.20 3.68 Ea 10 L Ea 10 L Ea 7.30	11 T 6.5 1.0 0.20 0.2 0.0 6.70 stBound 11 T 4.0 0.9 0.20 4.18 stBound 11 T 78 6.70	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9 0.20 3.48 12 R 12 R 28 6.40

Pedestrian Impedance Approach

Steps 6 - 9: MOVEMENT CAPACITIES

SB

WB

EΒ

Appendix G Page 23 of 140 Movement	13	14	15	16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb	0	0	0	0
Major-Street Left-Turn Movements		1	4	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State	e, p*_0,j	31 1472 1.000 1472 0.996 0.996	25 1480 1.000 1480 0.996 0.996	i
Minor-Street Right-Turn Movements		9	12	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j		22 1006 1.000 1006 0.994	28 997 1.000 997 0.994	
Major-Street U-Turn Movements		10	4U	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j				
Minor-Street Through Movements		8	11	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j		78 779 1.000 0.991 772 0.951	78 779 1.000 0.991 772 0.968	
Minor-Street Left-Turn Movements		7	10	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor, Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	p"	91 852 1.000 0.959 0.969 0.963 821	97 844 1.000 0.943 0.957 0.951 803	,
Step 10 SHARED-LANE CAPACITY OF MINOR STREET APPROA Approach Movement Lane Configuration		TY ADJUSTMENTS StBound 8 9 LTR	E	astBound 11 12 LTR
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH	821	50 772 1006 801	803	38 772 997 808
S CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTS	tep 11: CONTRO	_ DELAY		
Approach NB	SB 4U 4	WestBound 7 8	e E 9 10	astBound 11 12
Flow Rate 6 Movement Capacity 1472 Lane Configuration Shared Capacity Control Delay 7.5	6 1480 7.4	6 38 821 772 LTR 801 9.8	6 6 1006 803	25 6 772 997 LTR 808 9.7
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement		NB 2	SB 5	
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, Delay to Major Left-turning Vehicles, d_MLT Major Street Through Vehicles in Shared Lan Major Street Turning Vehicles in Shared Lan Saturation Flow Rate for Major Street Throu	ne, v_i1 ne, v_i2	1 0.996 7.5 19 13 1700	1 0.996 7.4 25 13 1700	;

Appendix G Page 24 of 140		
Saturation Flow Rate for Major Street Right-Turn, s_i2	1700	1700
Delay to Rank 1 Vehicles, d_Rank1	0.0	0.0

Approach	_Steps 1	L2 - 13: / NB	APPROACH/	INTERSEC/ SB	TION COM	ITROL	DELAY and WestBound			S astBound	
Movement Lane Configurati	on	10	1	4U	4	7	8 LTR	9	10	11 LTR	12
Flow Rate Lane Capacity v/c			6 1472 0.00		6 1480 0.00		50 801 0.06			38 808 0.05	
95% Queue Length Control Delay			0.0		0.0 7.4		0.2 9.8			0.1 9.7	
LOS Approach Delay Approach LOS			А 1.5		А 1.3		A 9.8 A			А 9.7 А	
Intersction Dela	у		6.1								

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Appendix G Page 25 of 140	HCS7	Two-Way	Stop-Con	trol Tex	kt Report						
File Name: Analyst: Agency: Date Performed: Time Analyzed: Jurisdiction: Analysis Year: Project Description: Units: Intersection Name: Major Street Direction: East/West Street Name: North/South Street Name: Analysis Time Period (hrs):	2045- HDR HDR 7/3/2 AM - 2045 South U.S. E/W C North East/	HDR 7/3/2019 AM - 2045 Build Cond. Meade County 2045 Southern Meade County Corridor Study U.S. Customary E/W Corridor & Elk Vale R North-South East/West Corridor Elk Vale Rd									
Maion Stroot	Ve	hicle Vo	lumes an	d Adjus	tments						
Major Street: Approach			Bound	-				Bound			
Movement	1U U	1 L	2 T	3 R		40 U	4 L	5 T	6 R		
Volume		10	20		·			50	10		
Peak Hour Factor, PHF		13	25		0.80			63	13		
Hourly Flow Rtae, HFR Percent Heavy Vehicles		14									
Number of Lanes Lane Configuration	0	0 LT	1	0		0	0	1	0 TR		
Median Type					Undiv	ided					
Median Storage RT channelized?											
Left-Turn Lane Storage Upstream Signal?					Not P	resent					
Minor Street: Approach		WestB	ound				EastB	ound			
Movement		7 L	8 T	9 R			10 L	11 T	12 R		
		L	•					•			
Volume Peak Hour Factor, PHF					0.80		5		25		
Hourly Flow Rtae, HFR Percent Heavy Vehicles							6 14		31 14		
Number of Lanes		0	0	0			0	1	0		
Lane Configuration RT channelized?								LR			
Flared Approach Storage Percent Grade			I				NO	 0			
								0			
too yoo ah	Pede	strian v	olumes a	nd Adjus							
Approach Movement			NB 13		SB 14		WB 15		EB 16		
Flow (ped/hr)			0		0				0		
Lane Width (ft)			·		·				·		
Walking Speed (ft/sec) Pedestrian Blockage Factor, f_pl)										
		0	- العام م	al 1 7	-f						
Approach NE		Queue Le SB			of Servi VestBound	ce	E	astBound			
Movement 1U Lane Configuration	1 LT	4U	4	7	8	9	10	11 LR	12		
Flow Rate Lane Capacity	13 1451							38 939			
v/c 95% Queue Length	$\begin{array}{c} 0.01 \\ 0.0 \end{array}$							0.04 0.1			
Control Delay	7.5							9.0			
LOS Approach Delay	A 2.5							А 9.0			
Approach LOS Intersction Delay	2.9							А			
Little Sector Deray	2.5										
Major Street:		Step 1:	MOVEMENT	PRIORI	TIES						
Approach	_		Bound	-				Bound	<u>,</u>		
Priority Movement	1U U	1 L	2 T	3 R		40 U	4 L	5 T	6 R		
					•						

Minor Street:

Appendix G Page 26 o Approach Priority Movement	f 140		WestBou 7 L	ind 8 T	9 R			EastBou 10 L	und 11 T	12 R
	Step	2: MOVE	MENT DEM	IAND VOL	UMES A	ND FLOW RA	TES			
Major Street: Approach Movement		1U U	NorthBo 1 L	ound 2 T	3 R		4U U	SouthBo 4 L	ound 5 T	6 R
Volume, V_x Flow Rate, V_x			10 13	20 25					50 63	10 13
Minor Street: Approach Movement			WestBou 7 L	ind 8 T	9 R			EastBou 10 L	und 11 T	12 R
Volume, V_x Flow Rate, v_x								5		25 31
			_					Ū		51
Major Street:		Step	3: CONF	LICTING	5 FLOW I	RATES				
Approach Movement		1U U	NorthBo 1 L	ound 2 T	3 R		4U U	SouthBo 4 L	bund 5 T	6 R
Flow Rate, v_x Conflicting Flow, v_c,x			13 75	25					63	13
Minor Street: Approach Movement			WestBou 7 L	und 8 T	9 R			EastBou 10 L	und 11 T	12 R
Flow Rate, v_x Conflicting Flow, v_c,x								6 119		31 69
CRITICAL HEADWAYS	Step	4: CRITI	CAL HEAD	WAYS ar	nd FOLLO	OW-UP HEAD	WAYS			
Approach	NB		SB			WestBound			stBound	10
Movement	1U U	1 L	4U U	4 L	7 L	8 T	9 R	10 L	11 T	12 R
t_c,base Single Stage Stage I Stage II t_c,HV		4.1						7.1		6.2
L_C,G G		0.14						0.14 0.2 0		0.14 0.1 0
t_3,LT t_c		0.0						0.7		0.0
Single Stage Stage I Stage II		4.24						6.54		6.34
FOLLOW-UP HEADWAYS Approach Movement	NB 1U U	1 L	SB 4U U	4 L	7 L	NestBound 8 T	9 R	Eas 10 L	stBound 11 T	12 R
t_f,base t_f,HV P_HV t_f		2.2 0.9 0.14 2.33						3.5 0.9 0.14 3.63		3.3 0.9 0.14 3.43
			ер 5: РОТ	ENTIAL	CAPACI	TIES				
NO UPSTREAM SIGNAL EFFECT Approach Movement	S PRESENT NB 1U U	1 L	SB 4U U	4 L	۲ L	WestBound 8 T	9 R	Eas 10 L	StBound 11 T	12 R
v_c,x t_c,x t_f,x c_p,x		75 4.24 2.33 1451						119 6.54 3.63 849		69 6.34 3.43 962
		Steps	6 - 9:	MOVEMEN	IT CAPA	CITIES				

MENI

NB

SB

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Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb Major-Street Left-Turn Movements 1 4 Conflicting Flow, v_c,x 75 Potential Capacity, c_p,x 1451 Pedestrian Impedance Factor, p_p,x 1.000 Movement Capacity, c_m,x 1451	0
Major-Street Left-Turn Movements14Conflicting Flow, v_c,x75Potential Capacity, c_p,x1451Pedestrian Impedance Factor, p_p,x1.000Movement Capacity, c_m,x1451	
Potential Čapacity, c_p,x 1451 Pedestrian Impedance Factor, p_p,x 1.000 Movement Capacity, c_m,x 1451	
Probability of Queue-free State, p_0,j 0.991 Major L-Shared Probability Queue-free State, p*_0,j 0.991	
Minor-Street Right-Turn Movements 9 12	
Conflicting Flow, v_c,x69Potential Capacity, c_p,x962Pedestrian Impedance Factor, p_p,x1.000Movement Capacity, c_m,x962Probability of Queue-free State, p_0,j0.968	
Major-Street U-Turn Movements 1U 4U	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j	
Minor-Street Through Movements 8 11	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j	
Minor-Street Left-Turn Movements 7 10	
Conflicting Flow, v_c,x119Potential Capacity, c_p,x849Pedestrian Impedance Factor, p_p,x1.000Major L, Minor T Adjusted Impedance Factor, p'0.001Major L, Minor T Impedance Factor, p'0.991Capacity Adjustment Factor, f_x0.991Movement Capacity, c_m,x842	
Approach WestBound EastBound	12
Shared Flow Rate, v_y38Movement Capacity, c_m,x842Shared Capacity, c_SH939	962
Step 11: CONTROL DELAY	
CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTS Approach NB SB WestBound EastBound Movement 1U 1 4U 4 7 8 9 10 11	12
Flow Rate136Movement Capacity1451842Lane ConfigurationLTLRShared Capacity939Control Delay7.59.0	31 962
CONTROL DELAY TO RANK 1 MOVEMENTSApproachNBSBMovement25	
Number of Major Street Through Lanes, N11Proportion of Rank 1 vehicles not blocked, p*_0,j0.991Delay to Major Left-turning Vehicles, d_MLT7.5Major Street Through Vehicles in Shared Lane, v_i125Major Street Turning Vehicles in Shared Lane, v_i213Saturation Flow Rate for Major Street Through, s_i11700	

Appendix G Page 28 of 140 Saturation Flow Rate for Major Street Right-Turn, s_i2 Delay to Rank 1 Vehicles, d_Rank1

1700

0.1

Steps 1 Approach	.2 - 13: A NB	APPROACH/	INTERSE SB	CTION (CONTROL	DELAY and WestBound			IS astBound	
Movement Lane Configuration	10	1 LT	40	4	7	8	9	10	11 LR	12
Flow Rate Lane Capacity V/C 95% Queue Length Control Delay LOS Approach Delay Approach LOS Intersction Delay		13 1451 0.01 0.0 7.5 A 2.5 2.9							38 939 0.04 0.1 9.0 A 9.0 A	

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Appendix G Page 29 of 140	HCS7	HCS7 Two-Way Stop-Control Text Report											
File Name: Analyst: Agency: Date Performed: Time Analyzed: Jurisdiction: Analysis Year: Project Description: Units: Intersection Name: Major Street Direction: East/West Street Name: North/South Street Name: Analysis Time Period (hrs):													
Major Street:	Vel	nicle Vol	umes and	l Adjust	ments								
Approach	1	NorthB		2		4	South		C				
Movement	1U U	1 L	2 T	3 R		40 U	4 L	5 T	6 R				
Volume			65	20			15	175					
Peak Hour Factor, PHF Hourly Flow Rtae, HFR			81	25	0.80		19	219					
Percent Heavy Vehicles Number of Lanes	0	0	1	0		0	5	1	0				
Lane Configuration	0	0	T	TR			LT	Ŧ	0				
Median Type Median Storage					Undivi	ded							
RT channelizēd? Left-Turn Lane Storage Upstream Signal?					Not Pr	resent							
Minor Street:								-					
Approach Movement		WestBo 7	ound 8	9	I		EastB 10	ound 11	12				
		L	Т	R	İ		L	т	R				
Volume		65		25									
Peak Hour Factor, PHF Hourly Flow Rtae, HFR		81		31	0.80								
Percent Heavy Vehicles Number of Lanes		5 0	1	5 0			0	0	0				
Lane Configuration		Ū	LR	U			Ū	0	0				
RT channelized? Flared Approach Storage Percent Grade		No	 0					I					
	D a d a		.										
Approach	Pedes	strian Vo	NB	ia Aajus	SB		WB		EB				
Movement			13		14		15		16				
Flow (ped/hr) Lane Width (ft) Walking Speed (ft/sec) Pedestrian Blockage Factor, f_pb			0		0		0						
			ath are		of Servic								
Approach NB	-	SB	-	W	estBound			astBound					
Movement 1U Lane Configuration	1	40	4 LT	7	8 LR	9	10	11	12				
Flow Rate			19		113								
Lane Capacity			$1466 \\ 0.01$		$\overline{697} \\ 0.16$								
v/c 95% Queue Length			0.0		0.6								
Control Delay LOS			7.5 A		11.2 B								
Approach Delay Approach LOS			0.7		11.2 B								
Intersction Delay	3.1				0								
		Step 1: M	IOVEMENT	PRIORTT	IES								
Major Street:	······································	NorthB					South	Bound					
Approach Priority	10	1	2	3	ļ	4U	4	5	6				
Movement	U	L	Т	R	Ι	U	L	Т	R				

Appendix G Page 30 o Approach Priority Movement	f 140		WestBou 7 L	und 8 T	9 R			EastBo 10 L	und 11 T	12 R
	Step	2: MOVE	MENT DE	MAND VOL	UMES AND	FLOW RA	TES			
Major Street: Approach Movement		1U U	NorthBo 1 L		3 R		4U U	SouthB 4 L	ound 5 T	6 R
Volume, V_x Flow Rate, v_x				65 81	20 25			15 19	175 219	
Minor Street: Approach Movement			WestBou 7 L	und 8 T	9 R			EastBo 10 L	und 11 T	12 R
Volume, V_x Flow Rate, v_x			65 81		25 31					
		Ster	3: CONF	FLICTING	FLOW RA	TES				
Major Street: Approach Movement		1U U	NorthBo 1 L		3 R		4U U	SouthB 4 L	ound 5 T	6 R
Flow Rate, v_x Conflicting Flow, v_c,x				81	25			19 106	219	
Minor Street: Approach Movement			WestBou 7 L	und 8 T	9 R			EastBo 10 L	und 11 T	12 R
Flow Rate, v_x Conflicting Flow, v_c,x			81 350		31 94					
	Step	4: CRITI	CAL HEAD	DWAYS and	d FOLLOW	-UP HEAD	WAYS			
CRITICAL HEADWAYS Approach Movement	NB 1U U	1 L	SB 4U U	4 L	We 7 L	stBound 8 T	9 R	Ea 10 L	stBound 11 T	12 R
t_c,base Single Stage Stage I				4.1	7.1		6.2			
Stage II t_c,HV P_HV t_c,G				1.0 0.05	1.0 0.05 0.2		1.0 0.05 0.1			
G t_3,LT				0.0	0 0.7		0 0.0			
t_c Single Stage Stage I Stage II				4.15	6.45		6.25			
FOLLOW-UP HEADWAYS Approach Movement	NB 1U U	1 L	SB 4U U	4 L	We 7 L	stBound 8 T	9 R	Ea 10 L	stBound 11 T	12 R
t_f,base t_f,HV P_HV t_f				2.2 0.9 0.05 2.25	3.5 0.9 0.05 3.55		3.3 0.9 0.05 3.35			
			ер 5: РОТ	TENTIAL	CAPACITI	ES				
NO UPSTREAM SIGNAL EFFECT Approach Movement	S PRESENT NB 1U U	1 L	SB 4U U	4 L	We: 7 L	stBound 8 T	9 R	Ea 10 L	stBound 11 T	12 R
V_C,X t_C,X t_f,X c_p,X				106 4.15 2.25 1466	350 6.45 3.55 641		94 6.25 3.35 955			
		Steps	5 6 - 9:	MOVEMEN	T CAPACI	TIES				

Steps 6 - 9: MOVEMENT CAPACITIES

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Appendix G Page 31 of 140 Movement	13		14		15		16
Pedestrian Flow Rate v_x Lane width, w walking Speed, S_p Pedestrian Blockage Factor, f_pb	0		0		0		
Major-Street Left-Turn Movements			1		4		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State, p*	_0,j				106 146 1.0 146 0.9 0.9	6 00 6 87	
Minor-Street Right-Turn Movements			9		12		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j			94 955 1.000 955 0.967				
Major-Street U-Turn Movements			10		4U		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j							
Minor-Street Through Movements			8		11		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j							
Minor-Street Left-Turn Movements			7		10		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor, p" Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x			350 641 1.000 0.985 632				
Step 10: FI		Y ADJUST	MENTS				
Approach Movement Lane Configuration		tBound 8 LR	9		10	EastBound 11	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH	632	113 697	955				
	11: CONTROL	DELAY					
CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTSApproachNBMovement1U1U1	B 4	Wes 7	stBound 8	9	10	EastBound 11	12
Flow Rate Movement Capacity Lane Configuration Shared Capacity Control Delay	19 1466 LT 7.5	81 632	LR 697 11.2	31 955			
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement			NB 2		SB 5		
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, p*_0 Delay to Major Left-turning Vehicles, d_MLT Major Street Through Vehicles in Shared Lane, v Major Street Turning Vehicles in Shared Lane, v Saturation Flow Rate for Major Street Through,	_i1 _i2		1 1700		1 0.9 7.5 219 19 170		

Appendix G Page 32 of 140 Saturation Flow Rate for Major Street Right-Turn, s_i2 1700 Delay to Rank 1 Vehicles, d_Rank1

0	1	

Steps Approach	12 - 13: / NB	APPROACH	/INTERSE SB		NTROL	DELAY and 9 WestBound	95% QUEU		S astBound	
Movement	10	1	4U	4	7	8	9	10	11	12
Lane Configuration				LT		LR				
Flow Rate				19		113				
Lane Capacity				1466		697				
v/c				0.01		0.16				
95% Queue Length				0.0		0.6				
Control Delay				7.5		11.2				
LOS				A		В				
Approach Delay				0.7		11.2				
Approach LOS						В				
Intersction Delay		3.1								

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Encs / All-Way stop Control Report									
General Information		Site Information	Site Information						
Analyst	HDR	Intersection	E/W Corridor & Haines Ave						
Agency/Co.	HDR	Jurisdiction	Meade County						
Date Performed	7/11/2019	East/West Street	East/West Corridor						
Analysis Year	2045	North/South Street	Haines Avenue						
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.80						
Time Analyzed	AM - 2045 Build Conditon								
Project Description	Southern Meade County C	orridor Study							
lanos									

Lanes



Vehicle Volume and Adjustments

venicie volume and Adjusti	nents											
Approach		Eastbound			Westbound	ł	1	Northboun	d	Southbound		
Movement	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Volume	10	15	155	20	25	5	40	40	5	5	205	15
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	225			63			106			281		
Percent Heavy Vehicles	6			6			6			6		
Departure Headway and Se	rvice Ti	me										
Initial Departure Headway, hd (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.200			0.056			0.094			0.250		
Final Departure Headway, hd (s)	4.57			5.31			5.15			4.83		
Final Degree of Utilization, x	0.286			0.092			0.152			0.377		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, ts (s)	2.57			3.31			3.15			2.83		
Capacity, Delay and Level o	f Servic	e										
Flow Rate, v (veh/h)	225			63			106			281		
Capacity	788			678			699			746		
95% Queue Length, Q ₉₅ (veh)	1.2			0.3			0.5			1.8		
Control Delay (s/veh)	9.4			8.9			9.1			10.7		
Level of Service, LOS	A			А			А			В		
Approach Delay (s/veh)		9.4		8.9				9.1		10.7		
Approach LOS		А			A			А			В	
Intersection Delay, s/veh LOS			9	.8						4		

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				HCS	57 Ro	unda	abo	outs R	ep	ort									
General Information							Site	e Info	rma	atior	ו								
Analyst	HDR					-	Inter				ntersection				E/W Corridor & Haines Ave				
Agency or Co.	HDR			_	← E/W S					W Street Name E				West C	Corridor				
Date Performed	7/11/	2019							treet Nar	ne		Haine	es Aver	านe					
Analysis Year	2045				↓ w ^N +€ ↑ Analys				sis Time l	Period (h	rs)	0.25							
Time Analyzed	AM -	2045 Bu	ild Cond	ition						Hour Fact	tor		0.80						
Project Description	South	iern Mea	de Cour	ity Cor						iction			Mead	de Cou	nty				
Volume Adjustments	and S	Site C	haract	teristic	s														
Approach		E	B		WB					N	В				SB				
Movement	U	L	Т	R	U	L	Т	R		U	L	Т	R	U	L	Т	R		
Number of Lanes (N)	0	0	1	0	0	0	1	0		0	0	1	0	0	0	1	0		
Lane Assignment			Ľ	ſR			LTR		Ť			LT	R				LTR		
Volume (V), veh/h	0	10	15	155	0	20	25	5		0	40	40	5	0	5	205	15		
Percent Heavy Vehicles, %	6	6	6	6	6	6	6	6		6	6	6	6	6	6	6	6		
Flow Rate (VPCE), pc/h	0	13	20	205	0	27	33	7		0	53	53	7	0	7	272	20		
Right-Turn Bypass		None					None					None				None			
Conflicting Lanes			1		1					1				1					
Pedestrians Crossing, p/h		(C			()		T		0			0					
Critical and Follow-U	Јр Неа	adway	/ Adju	stmen	t														
Approach				EB				WB				NB				SB			
Lane			Left	Right	Bypas	s Le	ft	Right	By	/pass	Left	Right	Bypas	s l	_eft	Right	Bypass		
Critical Headway (s)				4.9763				4.9763				4.9763				4.9763			
Follow-Up Headway (s)				2.6087				2.6087				2.6087				2.6087			
Flow Computations,	Capad	city ar	nd v/c	Ratio	5														
Approach				EB		Τ		WB				NB				SB			
Lane			Left	Right	Bypas	s Le	ft	Right	By	/pass	Left	Right	Bypas	s l	_eft	Right	Bypass		
Entry Flow (v _e), pc/h				238				67				113				299			
Entry Volume, veh/h				225				63				107				282			
Circulating Flow (v _c), pc/h				306				119		40				113					
Exiting Flow (vex), pc/h				34				106		73				504					
Capacity (c _{pce}), pc/h				1010				1222		1325				1230					
Capacity (c), veh/h				953				1153				1250				1160			
v/c Ratio (x)				0.24				0.05				0.09				0.24			
Delay and Level of S	ervice																		
Approach				EB				WB				NB				SB			
Lane			Left	Right	Bypas	s Le	ft	Right	Ву	/pass	Left	Right	Bypas	s L	eft	Right	Bypass		
Lane Control Delay (d), s/veh				6.1				3.6				3.6				5.3			
Lane LOS				A				А				A				А			
95% Queue, veh				0.9				0.2				0.3				1.0			
Approach Delay, s/veh				6.1				3.6				3.6				5.3			
Approach LOS				А				А				А				А			
Intersection Delay, s/veh LO	c					5.1	1							A					

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Appendix G Page 35 of 140	Control	L Toyt D	oport								
HCS7 Two-Way Stop			-								
Analyst:HDRAgency:HDRDate Performed:7/3/2019Time Analyzed:AM - 2045 Build GJurisdiction:Meade CountyAnalysis Year:2045Project Description:Southern Meade CGUnits:U.S. CustomaryIntersection Name:E/W Corridor & HaMajor Street Direction:North-SouthEast/West Street Name:N. Haines AveAnalysis Time Period (hrs):0.25	HDR 7/3/2019 AM - 2045 Build Cond. Meade County 2045 Southern Meade County Corridor Study U.S. Customary E/W Corridor & Haines Ave North-South East/West Corridor N. Haines Ave										
Major Street:		Juschien	LS		SouthBo	und					
Movement 10 1 2	2 3	3 र		4U U	4 L	5 T	6 R				
		5	I		5	205	15				
Peak Hour Factor, PHF	50 6		0.80		6	256	19				
Percent Heavy Vehicles 6	L (0	6 0	1	0				
			Undivid		U	L TR	Ū				
Median Storage RT channelized?				Cu							
Left-Turn Lane Storage Upstream Signal?			Not Pre	sent							
Minor Street:											
Approach WestBound Movement 7 8	d 3 9	Ð			EastBou 10	ind 11	12				
	Г F				L	Т	R				
Peak Hour Factor, PHF	25 5	5	0.80		10	15	155				
	31 6 5 6				13 6	19 6	194 6				
Number of Lanes 0	L C _TR)			0	1 LTR	0				
RT channelized? Flared Approach Storage No					NO	I					
	þ					Ò					
Pedestrian Volum	nes and A NB		nts SB		WB		 EB				
Movement	13		14		15		16				
Flow (ped/hr) Lane width (ft) Walking Speed (ft/sec) Pedestrian Blockage Factor, f_pb)	I	0		0		0				
Delay, Queue Lengt											
	n and le	evel of	service								
Approach NB SB Movement 1U 1 4U Lane Configuration		West	Service Bound 8 LTR	9	Eas 10	tBound 11 LTR	12				
Movement1U14ULane ConfigurationFlow Rate50	4 7 5	West 7	Bound 8 LTR 63			11 LTR 225	12				
Movement1U14ULane ConfigurationFlow Rate50Lane Capacity1265v/c0.04	4 7 5 1523 0.00	West 7	Bound 8 LTR 63 414 0.15			11 LTR 225 705 0.32	12				
Movement1U14ULane Configuration1014UFlow Rate500Lane Capacity12651V/c0.04095% Queue Length0.10Control Delay8.01	4 7 5 1523 0.00 0.0 7.4	West	Bound 8 LTR 63 414 0.15 0.5 15.2			11 LTR 225 705 0.32 1.4 12.5	12				
Movement1U14ULane Configuration1014UFlow Rate506Lane Capacity12651V/C0.04695% Queue Length0.16Control Delay8.01LOSAAApproach Delay3.96	4 7 5 1523 0.00 0.0	West	Bound 8 LTR 63 414 0.15 0.5 15.2 C 15.2			11 LTR 225 705 0.32 1.4 12.5 B 12.5	12				
Movement1U14ULane Configuration1014UFlow Rate500Lane Capacity12651V/C0.04095% Queue Length0.10Control Delay8.01LOSA4	4 7 5 1523 0.00 0.0 7.4	West	Bound 8 LTR 63 414 0.15 0.5 15.2 C			11 LTR 225 705 0.32 1.4 12.5 B	12				
Movement1U14ULane Configuration1014UFlow Rate506Lane Capacity12651V/C0.04695% Queue Length0.16Control Delay8.01LOSA4Approach Delay3.96Intersction Delay6.35	4 7 5 1523 0.00 0.0 7.4 4 0.2	West	Bound 8 LTR 63 414 0.15 0.5 15.2 C 15.2 C			11 LTR 225 705 0.32 1.4 12.5 B 12.5	12				
Movement Lane Configuration1U14UFlow Rate Lane Capacity506Lane Capacity12651265v/c0.04695% Queue Length Control Delay0.16LOS Approach LOS Intersction Delay3.96Major Street: ApproachStep 1: MOVE NorthBour	4 7 5 1523 0.00 7.4 0.2 EMENT PRI	West	Bound 8 LTR 63 414 0.15 0.5 15.2 C 15.2 C			11 LTR 225 705 0.32 1.4 12.5 B 12.5 B	6				

Minor Street:
Appendix G Page 36 o Approach Priority Movement	f 140		WestBou 7 L	und 8 T	9 R			EastBo 10 L	ound 11 T	12 R
	540	ο 2• ΜΟ\/F				FLOW RA	TES			
Major Street: Approach Movement	J	10 U	NorthBo 1 L		3 R		4U U	SouthB 4 L	ound 5 T	6 R
Volume, V_x Flow Rate, v_x			40 50	40 50	5 6			5 6	205 256	15 19
Minor Street: Approach Movement			WestBou 7 L	und 8 T	9 R			EastBo 10 L	ound 11 T	12 R
Volume, V_x Flow Rate, v_x			20 25	25 31	5 6			10 13	15 19	155 194
		Step	0 3: CONF	FLICTING	FLOW RA	TES				
Major Street: Approach Movement		1U U	NorthBo 1 L	ound 2 T	3 R		4U U	SouthB 4 L	ound 5 T	6 R
Flow Rate, v_x Conflicting Flow, v_c,x			50 275	50	6			6 56	256	19
Minor Street: Approach Movement			WestBou 7 L	und 8 T	9 R			EastBo 10 L	ound 11 T	12 R
Flow Rate, v_x Conflicting Flow, v_c,x			25 538	31 441	6 53			13 450	19 434	194 266
	Step	4: CRITI	CAL HEAD	DWAYS an	d FOLLOW	-UP HEAD	WAYS			
CRITICAL HEADWAYS Approach Movement	Step NB 1U U	4: CRITI 1 L	CAL HEAD SB 4U U	DWAYS an 4 L		-UP HEAD stBound 8 T	WAYS 9 R	Ea 10 L	stBound 11 T	12 R
Approach	NB 1U	1	SB 4U	4	We 7	stBound 8	9	10	11	
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G	NB 1U	1 L	SB 4U	4 L	We 7 L 7.1 1.0 0.06 0.2	stBound 8 T 6.5 1.0 0.06 0.2	9 R 6.2 1.0 0.06 0.1	10 L 7.1 1.0 0.06 0.2	11 T 6.5 1.0 0.06 0.2	R 6.2 1.0 0.06 0.1
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT	NB 1U	1 L 4.1 1.0	SB 4U	4 L 4.1 1.0	We 7 L 7.1 1.0 0.06	stBound 8 T 6.5 1.0 0.06	9 R 6.2 1.0 0.06	10 L 7.1 1.0 0.06	11 T 6.5 1.0 0.06	R 6.2 1.0 0.06
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G	NB 1U	1 L 4.1 1.0 0.06	SB 4U	4 4.1 1.0 0.06	We 7 L 7.1 1.0 0.06 0.2 0	stBound 8 T 6.5 1.0 0.06 0.2 0	9 R 6.2 1.0 0.06 0.1 0	10 L 7.1 1.0 0.06 0.2 0	11 T 6.5 1.0 0.06 0.2 0	R 6.2 1.0 0.06 0.1 0
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I	NB 1U	1 4.1 1.0 0.06 0.0	SB 4U	4 4.1 1.0 0.06 0.0	We 7 7.1 1.0 0.06 0.2 0 0.0 7.16	stBound 8 T 6.5 1.0 0.06 0.2 0.0	9 R 6.2 1.0 0.06 0.1 0.0	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16	11 T 6.5 1.0 0.06 0.2 0 0.0	R 6.2 1.0 0.06 0.1 0 0.0
Approach Movement t_c, base Single Stage Stage I Stage II t_c, HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach	U U NB U NB 1U	1 4.1 1.0 0.06 0.0 4.16	4U U SB 4U	4 4.1 1.0 0.06 0.0 4.16	We 7 7.1 7.1 1.0 0.06 0.2 0.0 7.16 We 7	stBound 8 T 6.5 1.0 0.06 0.2 0.0 6.56 stBound 8	9 R 6.2 1.0 0.06 0.1 0.0 6.26 9	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56	R 6.2 1.0 0.06 0.1 0 0.0 6.26
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f	NB U U U NB U U	1 4.1 1.0 0.06 0.0 4.16 1 L 2.2 0.9 0.06 2.25 Ste	4U U SB 4U	4 4.1 1.0 0.06 0.0 4.16 4 L 2.2 0.9 0.06 2.25	We 7 L 7.1 1.0 0.06 0.2 0 0.0 7.16 We 7 L 3.5 0.9 0.06 3.55	stBound 8 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 8 T 4.0 0.9 0.06 4.05	9 R 6.2 1.0 0.06 0.1 0 0.0 6.26 9 R 3.3 0.9 0.06	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10 L 3.5 0.9 0.06	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 11 T 4.0 0.9 0.06	R 6.2 1.0 0.06 0.1 0 0.0 6.26 12 R 3.3 0.9 0.06
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV	NB U U U NB U U	1 4.1 1.0 0.06 0.0 4.16 1 L 2.2 0.9 0.06 2.25 Ste	4U U SB 4U U SB	4 4.1 1.0 0.06 0.0 4.16 4 L 2.2 0.9 0.06 2.25	We 7 7.1 7.1 1.0 0.06 0.2 0 0.0 7.16 We 7 L 3.5 0.9 0.06 3.55 CAPACITI	stBound 8 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 8 T 4.0 0.9 0.06 4.05	9 R 6.2 1.0 0.06 0.1 0 0.0 6.26 9 R 3.3 0.9 0.06	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10 L 3.5 0.9 0.06 3.55	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 11 T 4.0 0.9 0.06	R 6.2 1.0 0.06 0.1 0 0.0 6.26 12 R 3.3 0.9 0.06
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach	NB 1U U NB 1U U S PRESEN NB 1U	1 4.1 1.0 0.06 0.0 4.16 1 L 2.2 0.9 0.06 2.25 	4U U SB 4U U SB 4U SB	4 4.1 1.0 0.06 0.0 4.16 4 2.2 0.9 0.06 2.25 FENTIAL 4 L 56 4.16 2.25 1523	We 7 1 7.1 1.0 0.06 0.2 0 0.0 7.16 We 7 L 3.5 0.9 0.06 3.55 CAPACITI We 7 L 538 7.16 3.55 448	stBound 8 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 8 T 4.0 0.9 0.06 4.05 ES stBound 8 T 4.1 6.56 4.05 505	9 R 6.2 1.0 0.06 0.1 0 0.0 6.26 9 R 3.3 0.9 0.06 3.35	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10 L 3.5 0.9 0.06 3.55 Ea 10	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56 tstBound 11 T 4.0 0.9 0.06 4.05	R 6.2 1.0 0.06 0.1 0 0.0 6.26 12 R 3.3 0.9 0.06 3.35

Pedestrian Impedance Approach

Steps 6 - 9: MOVEMENT CAPACITIES

NB

SB

WB

EB

Appendix G Page 37 of 140 Movement		13		14		15		16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb		0		0		0		0
Major-Street Left-Turn Movements				1		4		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State	e, p*_0,	j		275 1265 1.000 1265 0.960 0.959		56 1523 1.000 1523 0.996 0.995		
Minor-Street Right-Turn Movements				9		12		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				53 1003 1.000 1003 0.994		266 763 1.000 763 0.746		
Major-Street U-Turn Movements				10		4U		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j								
Minor-Street Through Movements				8		11		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				441 505 1.000 0.954 482 0.935		434 509 1.000 0.954 486 0.961		
Minor-Street Left-Turn Movements				7		10		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor, Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	, p"			538 448 1.000 0.918 0.937 0.699 313		450 513 1.000 0.893 0.918 0.912 467		
Step 10 SHARED-LANE CAPACITY OF MINOR STREET APPROA Approach Movement Lane Configuration			Y ADJUST tBound 8 LTR	ments 9		Ea 10	stBound 11 LTR	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH		313	63 482 414	1003		467	225 486 705	763
S	Step 11:	CONTROL	DELAY					
CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTS Approach NB Movement 1U 1	S SB 4U	4	Wes 7	tBound 8	9	Ea 10	stBound 11	12
Flow Rate 50 Movement Capacity 1265 Lane Configuration Shared Capacity Control Delay 8.0		6 1523 7.4	25 313	31 482 LTR 414 15.2	6 1003	13 467	19 486 LTR 705 12.5	194 763
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement				NB 2		SB 5		
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, Delay to Major Left-turning Vehicles, d_MLT Major Street Through Vehicles in Shared Lan Major Street Turning Vehicles in Shared Lan Saturation Flow Rate for Major Street Throu	ne, v_i1 ne, v_i2	1		1 0.959 8.0 50 56 1700		1 0.995 7.4 256 25 1700		

Appendix G Page 38 of 140		
Saturation Flow Rate for Major Street Right-Turn, s_i2 Delay to Rank 1 Vehicles, d_Rank1	1700 0.3	1700 0.0
Deray to kank i venteres, u_kanki	0.5	0.0

S [.] Approach	teps 12 - 13: N	APPROACH/ B	INTERSEC/ SB	TION CON	TROL	DELAY and 9 WestBound	5% QUEU		S astBound	
Movement Lane Configuration	10	1	40	4	7	8 LTR	9	10	11 LTR	12
Flow Rate Lane Capacity v/c		50 1265 0.04		6 1523 0.00		63 414 0.15			225 705 0.32	
95% Queue Length Control Delay		0.1 8.0		0.0 7.4		0.5			1.4 12.5	
LOS Approach Delay Approach LOS		А 3.9		A 0.2		15.2 C			В 12.5 В	
Intersction Delay		6.3								

This TWSC text report was created in HCS™ TWSC Version 7.8 on 9/5/2019 2:52:41 PM

HCS7 Two-Way Stop-Control Text Report

	TWO-WAY STOP CONTROL (TWSC) Analysis
File Name:	2045-Build_AM_ElkCreek-143rd_TWSC.xtw
Analyst:	HDR
Agency:	HDR
Date Performed:	7/3/2019
Time Analyzed:	AM - 2045 Build Cond.
Jurisdiction:	Meade County
Analysis Year:	2045
Project Description:	Southern Meade County Corridor Study
Units:	U.S. Customary
Intersection Name:	Elk Creek & 143rd Ave
Major Street Direction:	East-West
East/West Street Name:	Elk Creek Road
North/South Street Name:	143rd Avenue
Analysis Time Period (hrs):	0.25
Major Street:	

Major Street: Approach			EastB	ound			We	stBound	
Movement		10	1	2	3		4U 4	5	6
		U	L	т	R	I	U L	Т	R
Volume			5	15	10		5	35	5
Peak Hour Factor, PHF			6	10	4.5	0.80	6		6
Hourly Flow Rtae, HFR Percent Heavy Vehicles			6 20	19	13		6 20	44	6
Number of Lanes		0	0	1	0		0 0	1	0
ane Configuration		•	Ū	ĹTR	Ũ			ĹTR	Ŭ
edian Type						Undivide	d		
ledian Storage T channelized?									
eft-Turn Lane Storage									
Jpstream Signal?						Not Pres	ent		
inor Street:									
pproach			North	Bound			So	uthBound	
lovement			7	8	9	I	10	11	12
			L	т	R	I	L	Т	R
/olume			5	5	5		5	5	5
eak_Hour Factor, PHF						0.80			
lourly Flow Rtae, HFR			6	6	6		6	6 20	6
vercent Heavy Vehicles Number of Lanes			20 0	20 1	20 0		20 0	1	20 0
ane Configuration			Ū	LTR	0		Ū	ĹTR	U
RT channelized?									
Flared Approach Storage Percent Grade			NO	0			NO	0	
				0				0	
		Pede	strian V	olumes an	d Adius	tments			
Approach				EB	· · J · ·	WB	NB		SB
lovement				13		14	15		16
low (ped/hr)				0		0	0		0
ane Width (ft)				-		-	-		-
alking Speed (ft/sec)	£								
edestrian Blockage Factor,	т_рр								
	De	Jav		nath and		of Service_			
pproach	EB	iay,	WB	iycii, anu	NO	orthBound		SouthBound	dt
lovement	10	1	4U	4	7	8	9 10		12
ane Configuration						LTR		LTR	
low Rate		6		6		19		19	
ane Capacity		1449		1472		845		837	
//C		0.00		0.00		0.02		0.02	
95% Queue Length Control Delay		0.0 7.5		0.0 7.5		0.1 9.4		0.1 9.4	
.OS		7.5 A		7.5 A		9.4 A		9.4 A	
Approach Delay		1.3		0.9		9.4		9.4	
Approach LOS						А		А	

Approach LOS Intersction Delay	3.4				A			A	
Major Street:		_Step 1:	MOVEMEN	T PRIORIT	TIES				
Approach		East	Bound				West	Bound	
Approach Priority	10	1	2	3	1	4U	4	5	6
Movement	U	L	Т	R	İ	U	L	Т	R
Minor Street:		L	•		I		-	•	

Appendix G Page 40 c Approach Priority Movement	of 140		NorthBo 7 L	ound 8 T	9 R			SouthB 10 L	ound 11 T	12 R
	Step	2: MOVE	EMENT DEM	AND VOL	UMES AND	FLOW RA	TES			
Major Street: Approach			EastBou	ind				WestBo	und	
Movement		10	1	2	3	1	4U	4	5	6
		U	L	Т	R	I	U	L	Т	R
Volume, V_x Flow Rate, v_x			5 6	15 19	10 13			5 6	35 44	5 6
Minor Street:								C		
Approach Movement			NorthBo 7	suna 8	9	1		SouthB 10	ound 11	12
			L	Т	R	i		L	т	R
Volume, V_x			5	5	5			5	5	5
Flow Rate, v_x			6	6	6			6	6	6
		C tor	2. CON			тгс				
Major Street:		step	o 3: CONI	-LICTING	FLOW RA	IES				
Approach Movement		10	EastBou 1	und 2	3	I.	4U	WestBo 4	ound 5	6
Movement		U	Ĺ	T	R	ł	U	L	T	R
Flow Rate, v_x			6	19	13			6	44	6
Conflicting Flow, v_c,x			50	10				31		U
Minor Street:										
Approach			NorthBo		0			SouthB		10
Movement			7 L	8 T	9 R			10 L	11 T	12 R
Flow Rate, v_x			6	6	6	-		6	6	6
Conflicting Flow, v_c,x			103	100	25			103	103	47
		_								
CRITICAL HEADWAYS	Step	4: CRITI	ICAL HEAD	DWAYS and	d FOLLOW	-UP HEAD	WAYS			
Approach	EB	1	WB	4		thBound	0		thBound	10
Approach Movement	EB 1U U	1 L	WB 4U U	4 L	Nor 7 L	thBound 8 T	9 R	Sou 10 L	thBound 11 T	12 R
Movement	10		4U		7	8		10	11	
Movement t_c,base Single Stage	10		4U		7	8		10	11	
Movement t_c,base Single Stage Stage I	10	L	4U	L	7 L	8 T	R	10 L	11 T	R
Movement t_c,base Single Stage Stage I Stage II t_c,HV	10	L 4.1 1.0	4U	L 4.1 1.0	7 L 7.1 1.0	8 T 6.5 1.0	R 6.2 1.0	10 L 7.1 1.0	11 T 6.5 1.0	R 6.2 1.0
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV	10	L 4.1	4U	L 4.1	7 L 7.1 1.0 0.20	8 T 6.5 1.0 0.20	R 6.2 1.0 0.20	10 L 7.1 1.0 0.20	11 T 6.5 1.0 0.20	R 6.2 1.0 0.20
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G	10	L 4.1 1.0 0.20	4U	L 4.1 1.0 0.20	7 L 7.1 1.0 0.20 0.2 0	8 T 6.5 1.0 0.20 0.2 0	R 6.2 1.0 0.20 0.1 0	10 L 7.1 1.0 0.20 0.2 0	11 T 6.5 1.0 0.20 0.2 0	R 6.2 1.0 0.20 0.1 0
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT	10	L 4.1 1.0	4U	L 4.1 1.0	7 L 7.1 1.0 0.20 0.2	8 T 6.5 1.0 0.20 0.2	R 6.2 1.0 0.20 0.1	10 L 7.1 1.0 0.20 0.2	11 T 6.5 1.0 0.20 0.2	R 6.2 1.0 0.20 0.1
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage	10	L 4.1 1.0 0.20	4U	L 4.1 1.0 0.20	7 L 7.1 1.0 0.20 0.2 0	8 T 6.5 1.0 0.20 0.2 0	R 6.2 1.0 0.20 0.1 0	10 L 7.1 1.0 0.20 0.2 0	11 T 6.5 1.0 0.20 0.2 0	R 6.2 1.0 0.20 0.1 0
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c	10	L 4.1 1.0 0.20 0.0	4U	L 4.1 1.0 0.20 0.0	7 L 7.1 1.0 0.20 0.2 0 0.0	8 T 6.5 1.0 0.20 0.2 0.0	R 6.2 1.0 0.20 0.1 0 0.0	10 L 7.1 1.0 0.20 0.2 0.0	11 T 6.5 1.0 0.20 0.2 0.0	R 6.2 1.0 0.20 0.1 0 0.0
Movement t_c,base Single Stage Stage I t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II	10	L 4.1 1.0 0.20 0.0	4U	L 4.1 1.0 0.20 0.0	7 L 7.1 1.0 0.20 0.2 0 0.0	8 T 6.5 1.0 0.20 0.2 0.0	R 6.2 1.0 0.20 0.1 0 0.0	10 L 7.1 1.0 0.20 0.2 0.0	11 T 6.5 1.0 0.20 0.2 0.0	R 6.2 1.0 0.20 0.1 0 0.0
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach	1U U EB	L 4.1 1.0 0.20 0.0 4.30	4U U WB	L 4.1 1.0 0.20 0.0 4.30	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30	8 T 6.5 1.0 0.20 0.2 0.0 6.70 thBound	R 6.2 1.0 0.20 0.1 0 0.0 6.40	10 L 7.1 1.0 0.20 0.2 0 0.0 7.30	11 T 6.5 1.0 0.20 0.2 0 0.0 6.70	R 6.2 1.0 0.20 0.1 0 0.0 6.40
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS	10 U EB 10	L 4.1 1.0 0.20 0.0 4.30	40 U WB 40	L 4.1 1.0 0.20 0.0 4.30	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 Nor 7	8 T 6.5 1.0 0.20 0.2 0.0 6.70 thBound 8	R 6.2 1.0 0.20 0.1 0 0.0 6.40	10 L 7.1 1.0 0.20 0.2 0 0.0 7.30 Sou	11 T 6.5 1.0 0.20 0.2 0 0.0 6.70	R 6.2 1.0 0.20 0.1 0 0.0 6.40
Movement t_c,base Single Stage Stage I t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement	1U U EB	L 4.1 1.0 0.20 0.0 4.30	4U U WB	L 4.1 1.0 0.20 0.0 4.30 4	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 Nor 7 L	8 T 6.5 1.0 0.20 0.2 0.0 6.70 thBound 8 T	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R	10 L 7.1 1.0 0.20 0.2 0 0.0 7.30 South L	11 T 6.5 1.0 0.20 0.2 0.0 6.70	R 6.2 1.0 0.20 0.1 0 0.0 6.40
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base	10 U EB 10	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2	40 U WB 40	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30	8 T 6.5 1.0 0.20 0.2 0.0 6.70 thBound 8 T 4.0	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 Sout 10 L 3.5	11 T 6.5 1.0 0.20 0.2 0.0 6.70 ThBound 11 T 4.0	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV	10 U EB 10	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20	40 U WB 40	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 Nor 7 L 3.5 0.9 0.20	8 T 6.5 1.0 0.20 0.2 0.0 6.70 thBound 8 T 4.0 0.9 0.20	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 Sout 10 L 3.5 0.9 0.20	11 T 6.5 1.0 0.20 0.2 0.0 6.70 thBound 11 T 4.0 0.9 0.20	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9 0.20
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV	10 U EB 10	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9	40 U WB 40	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 Nor 7 L 3.5 0.9	8 T 6.5 1.0 0.20 0.2 0.0 6.70 thBound 8 T 4.0 0.9	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 Sout 10 L 3.5 0.9	11 T 6.5 1.0 0.20 0.2 0.0 6.70 thBound 11 T 4.0 0.9	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f	10 U U EB 10 U	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38	40 U WB 40	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 Nor 7 L 3.5 0.9 0.20 3.68	8 T 6.5 1.0 0.20 0.2 0.0 6.70 thBound 8 T 4.0 0.9 0.20 4.18	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 Sout 10 L 3.5 0.9 0.20	11 T 6.5 1.0 0.20 0.2 0.0 6.70 thBound 11 T 4.0 0.9 0.20	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9 0.20
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT	1U U EB 1U U	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38	40 U 40 U WB 40 U 20 20 20 20 20 20 20 20 20 20 20 20 20	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 7.30 7.30 7.30 7.30 7.3	8 T 6.5 1.0 0.20 0.0 6.70 thBound 8 T 4.0 0.9 0.20 4.18 ES	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 Sout 10 L 3.5 0.9 0.20 3.68	11 T 6.5 1.0 0.20 0.2 0.0 6.70 thBound 11 T 4.0 0.9 0.20 4.18	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9 0.20
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f	1U U EB 1U U S PRESENT EB 1U	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38 1	40 U 40 U 20 20 20 5: PO 40 WB	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38 FENTIAL 0 4	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 7.30 7.30 7.30 7.30 7.3	8 T 6.5 1.0 0.20 0.2 0 0.0 6.70 thBound 8 T 4.0 0.9 0.20 4.18 ES thBound 8	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20 3.48 9	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 500 10 3.5 0.9 0.20 3.68 Sou 10	11 T 6.5 1.0 0.20 0.2 0.0 6.70 thBound 11 T 4.0 0.9 0.20 4.18	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9 0.20 3.48
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach	1U U EB 1U U TS PRESENT EB	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38	40 U 40 U ep 5: РО ⁻ WB	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 7.30 7.30 7.30 7.30 7.3	8 T 6.5 1.0 0.20 0.2 0.0 6.70 thBound 8 T 4.0 0.9 0.20 4.18 ES thBound	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20 3.48	10 L 7.1 1.0 0.20 0.2 0.0 7.30 7.30 500 10 L 3.5 0.9 0.20 3.68	11 T 6.5 1.0 0.20 0.2 0.0 6.70 thBound 11 T 4.0 0.9 0.20 4.18	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9 0.20 3.48
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach Movement V_C,X	1U U EB 1U U S PRESENT EB 1U	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38 	40 U 40 U 20 20 20 5: PO 40 WB	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38 FENTIAL 0 4 L 31	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 7 L 3.5 0.9 0.20 3.68 CAPACITI 7 L Nor 7 L 103	8 T 6.5 1.0 0.20 0.2 0 0.0 6.70 thBound 8 T 4.0 0.9 0.20 4.18 ES thBound 8 T 100	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20 3.48 9 R 25	10 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 500 10 3.5 0.9 0.20 3.68 500 10 L 10 10	11 T 6.5 1.0 0.20 0.2 0 0.0 6.70 ThBound 11 T 4.0 0.9 0.20 4.18 T T thBound 11 T 103	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9 0.20 3.48 12 R 12 R 47
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach Movement V_c,x t_c,x	1U U EB 1U U S PRESENT EB 1U	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38 Stel 1 L 50 4.30 2.38	40 U 40 U 20 20 20 5: PO 40 WB	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38 FENTIAL 0 4 L	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 7 L 3.5 0.9 0.20 3.68 CAPACITI L Nor 7 L	8 T 6.5 1.0 0.20 0.2 0 0.0 6.70 thBound 8 T 4.0 0.9 0.20 4.18 ES thBound 8 T	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20 3.48 9 R	10 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 500 10 3.5 0.9 0.20 3.68 South 10 L South 10 L South 10 L	11 T 6.5 1.0 0.20 0.2 0.0 6.70 ThBound 11 T 4.0 0.9 0.20 4.18 T ThBound 11 T	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9 0.20 3.48 12 R
Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach Movement V_C,X	1U U EB 1U U S PRESENT EB 1U	L 4.1 1.0 0.20 0.0 4.30 1 L 2.2 0.9 0.20 2.38 	40 U 40 U 20 20 20 5: PO 40 WB	L 4.1 1.0 0.20 0.0 4.30 4 L 2.2 0.9 0.20 2.38 FENTIAL 0 4 L 31 4.30	7 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7 L 3.5 0.9 0.20 3.68 CAPACITI Nor 7 L 103 7.30	8 T 6.5 1.0 0.20 0.2 0 0.0 6.70 thBound 8 T 4.0 0.9 0.20 4.18 ES thBound 8 T 100 6.70	R 6.2 1.0 0.20 0.1 0 0.0 6.40 9 R 3.3 0.9 0.20 3.48 9 R 25 6.40	10 L 7.1 1.0 0.20 0.2 0 0.0 7.30 7.30 500 10 S00 10 L 500 10 L 500 10 L 500 10 20 3.68	11 T 6.5 1.0 0.20 0.2 0.0 6.70 ThBound 11 T 4.0 0.9 0.20 4.18 T thBound 11 T 103 6.70	R 6.2 1.0 0.20 0.1 0 0.0 6.40 12 R 3.3 0.9 0.20 3.48 12 R 12 R 47 6.40

Pedestrian Impedance Approach _Steps 6 - 9: MOVEMENT CAPACITIES_

EB

WB

NB

SB

Appendix G Page 41 of 140 Movement		13		14		15		16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb		0		0		0		0
Major-Street Left-Turn Movements				1		4		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State	e, p*_0,	j		50 1449 1.000 1449 0.996 0.996		31 1472 1.000 1472 0.996 0.996		
Minor-Street Right-Turn Movements				9		12		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				25 1002 1.000 1002 0.994		47 973 1.000 973 0.994		
Major-Street U-Turn Movements				10		4U		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j								
Minor-Street Through Movements				8		11		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				100 757 1.000 0.991 751 0.992		103 754 1.000 0.991 748 0.992		
Minor-Street Left-Turn Movements				7		10		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor, Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	, p"			103 836 1.000 0.983 0.987 0.981 820		103 836 1.000 0.983 0.987 0.981 820		
Step 10 SHARED-LANE CAPACITY OF MINOR STREET APPROA Approach Movement Lane Configuration			TY ADJUST hBound 8 LTR	ments 9		Sou 10	thBound 11 LTR	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH		820	19 751 845	1002		820	19 748 837	973
	Step 11:	CONTROL	DELAY					
CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTS Approach EB Movement 1U 1	WB 4U	4	Nort 7	hBound 8	9	10	thBound 11	12
Flow Rate 6 Movement Capacity 1449 Lane Configuration Shared Capacity Control Delay 7.5		6 1472 7.5	6 820	6 751 LTR 845 9.4	6 1002	6 820	6 748 LTR 837 9.4	6 973
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement				EB 2		WB 5		
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, Delay to Major Left-turning Vehicles, d_MLT Major Street Through Vehicles in Shared Lar Major Street Turning Vehicles in Shared Lar Saturation Flow Rate for Major Street Throu	r ne, v_i1 ne, v_i2			1 0.996 7.5 19 19 1700		1 0.996 7.5 44 13 1700		

Appendix G Page 42 of 140		
Saturation Flow Rate for Major Street Right-Turn, s_i2	1700	1700
Delay to Rank 1 Vehicles, d_Rank1	0.0	0.0

S Approach	teps 12 - 13: EB		INTERSECT WB	FION CON	TROL	DELAY and 9 NorthBound	5% QUEU		s IthBound	
Movement Lane Configuration	10	1	4U	4	7	8 LTR	9	10	11 LTR	12
Flow Rate		6		6		19			19	
Lane Capacity		1449		1472		845			837	
v/c		0.00		0.00		0.02			0.02	
95% Queue Length		0.0		0.0		0.1			0.1	
Control Delay		7.5		7.5		9.4			9.4	
LOS		Α		А		А			Α	
Approach Delay		1.3		0.9		9.4			9.4	
Approach LOS						А			А	
Intersction Delay		3.4								

This TWSC text report was created in HCS™ TWSC Version 7.8 on 9/5/2019 2:54:16 PM

HCS7 Two-Way Stop-Control Text Report

	11037 1	wo way s	cop conc						
	TWO-WA	Y STOP C	ONTROL (TWSC) A	nalysis				
File Name:		uild_AM_	ElkCreek	ElkVal	e_TWSC.xt	W			
Analyst: Agency:	HDR HDR								
Date Performed:	7/3/20	19							
Time Analyzed:		045 Buil	d Cond.						
Jurisdiction:	Meade	County							
Analysis Year: Project Description:	2045 Southe	rn Meade	e County	Corrido	r Study				
Units:		ustomary		COTTIGO	Scudy				
Intersection Name:	Elk Cr	eek & El							
Major Street Direction:	North-								
East/West Street Name: North/South Street Name:		eek Roac le Road	l						
Analysis Time Period (hrs):	0.25	ite nouu							
Major Street:	Veh	icle Vol	umes and	l Adjusti	ments				
Approach	1	NorthE	-	2		4	South		6
Movement	1U U	1 L	2 T	3 R		40 U	4 L	5 T	6 R
	0	L	I	ĸ	I	U	L	I	ĸ
Volume		10	10	5	0 00		5	20	10
Peak Hour Factor, PHF Hourly Flow Rtae, HFR		13	13	6	0.80		6	25	13
Percent Heavy Vehicles		14	±.,	5			14	23	10
Number of Lanes	0	Ō	1	0		0	Ō	1	0
Lane Configuration			LTR		أحرب أحام مردا	مامما		LTR	
Median Type Median Storage					Undivi	ueu			
RT channelized?									
Left-Turn Lane Storage									
Upstream Signal?					Not Pr	esent			
Minor Street:									
Approach		WestBo	-				EastB		
Movement		7 L	8 T	9 R			10 L	11 T	12 R
		L	I	ĸ	I		L	I	ĸ
Volume		25	25	5			5	5	10
Peak Hour Factor, PHF		21	21	c	0.80		c	C	10
Hourly Flow Rtae, HFR Percent Heavy Vehicles		31 14	31 14	6 14			6 14	6 14	13 14
Number of Lanes		0	1	0			0	1	0
Lane Configuration			LTR					LTR	
RT channelized? Flared Approach Storage		NO	1				NO	1	
Percent Grade		NO	Ó				NO	ó	
Approach	Pedes	trian Vo	lumes an NB	d Adjus	tments SB		WB		EB
Movement			13		14		15		16
Flow (ped/hr) Lane width (ft)			0		0		0		0
Walking Speed (ft/sec)									
Pedestrian Blockage Factor, f_pb									
	_								
Approach NB	Delay, Q	ueue Ler SB	igth, and		of Servic estBound	e		astBound	
Movement 10	1	4U	4	7	8	9	10	11 11	12
Lane Configuration					LTR	-		LTR	
Flow Rate	13		6		69			25	
Lane Capacity	1499		6 1523		89 817			25 886	
v/c	0.01		0.00		0.08			0.03	
95% Queue Length	0.0		0.0		0.3			0.1	
Control Delay LOS	7.4 A		7.4 A		9.8 A			9.2 A	
Approach Delay	3.0		1.1		9.8			9.2	
Approach LOS					A			A	
Intersction Delay	6.2								
	~	top 1			TEC				
Major Street:	S	сер т. м	10VEMENT	PRIUKII.	103				
Approach	_	NorthE		-			South		
Priority	10	1	2	3		40	4	5	6
Movement	U	L	Т	R	I	U	L	Т	R
Minor Street:									

Appendix G Page 44 o Approach Priority Movement	of 140		WestBou 7 L	und 8 T	9 R			EastBc 10 L	ound 11 T	12 R
	Ste	o 2: MOVI	EMENT DEM	MAND VOL	UMES AND	FLOW RA	TES			
Major Street: Approach Movement		1U U	NorthBo 1 L		3 R		4U U	SouthB 4 L	sound 5 T	6 R
Volume, V_x Flow Rate, v_x			10 13	10 13	5 6	I 		5 6	20 25	10 13
Minor Street: Approach Movement			WestBou 7 L	und 8 T	9 R			EastBo 10 L	ound 11 T	12 R
Volume, V_x Flow Rate, v_x			25 31	25 31	5 6	I		5 6	5	10 13
		_			-	_				-
Major Street:		Ste	p 3: CONF		FLOW RA	TES				
Approach Movement		1U U	NorthBo 1 L	ound 2 T	3 R		40 U	SouthB 4 L	sound 5 T	6 R
Flow Rate, v_x Conflicting Flow, v_c,x			13 38	13	6			6 19	25	13
Minor Street: Approach Movement			WestBou 7 L	und 8 T	9 R			EastBc 10 L	ound 11 T	12 R
Flow Rate, v_x Conflicting Flow, v_c,x			31 94	31 91	6 16			6 103	6 88	13 31
	Step	4: CRIT	ICAL HEAD	DWAYS an	d FOLLOW	-ΠΡ ΗΕΔΟ	WAYS			
			-		a loceon	OF HEAD				
CRITICAL HEADWAYS Approach	NB		SB			stBound			stBound	
Approach Movement		1 L		4 L			9 R	Ea 10 L	IStBound 11 T	12 R
Approach Movement t_c,base Single Stage Stage I	NB 1U	1	SB 4U	4	We 7	stBound 8	9	10	11	
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G	NB 1U	1 L	SB 4U	4 L	We 7 L 7.1 1.0 0.14 0.2	stBound 8 T 6.5 1.0 0.14 0.2	9 R 6.2 1.0 0.14 0.1	10 L 7.1 1.0 0.14 0.2	11 T 6.5 1.0 0.14 0.2	R 6.2 1.0 0.14 0.1
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT	NB 1U	1 L 4.1 1.0	SB 4U	4 L 4.1 1.0	We 7 L 7.1 1.0 0.14	stBound 8 T 6.5 1.0 0.14	9 R 6.2 1.0 0.14	10 L 7.1 1.0 0.14	11 T 6.5 1.0 0.14	R 6.2 1.0 0.14
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G	NB 1U	1 L 4.1 1.0 0.14	SB 4U	4 4.1 1.0 0.14	We 7 L 7.1 1.0 0.14 0.2 0	stBound 8 T 6.5 1.0 0.14 0.2 0	9 R 6.2 1.0 0.14 0.1 0	10 L 7.1 1.0 0.14 0.2 0	11 T 6.5 1.0 0.14 0.2 0	R 6.2 1.0 0.14 0.1 0
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I	NB 1U	1 4.1 1.0 0.14 0.0	SB 4U	4 4.1 1.0 0.14 0.0	We 7 7.1 7.1 1.0 0.14 0.2 0 0.0 7.24	stBound 8 T 6.5 1.0 0.14 0.2 0.0	9 R 6.2 1.0 0.14 0.1 0.0	10 L 7.1 1.0 0.14 0.2 0 0.0 7.24	11 T 6.5 1.0 0.14 0.2 0 0.0	R 6.2 1.0 0.14 0.1 0.0
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach	NB 1U U NB 1U	1 4.1 1.0 0.14 0.0 4.24	4U U SB 4U SB	4 4.1 1.0 0.14 0.0 4.24	We 7 7.1 7.1 1.0 0.14 0.2 0.0 7.24 We 7	stBound 8 T 6.5 1.0 0.14 0.2 0.0 6.64 stBound 8	9 R 6.2 1.0 0.14 0.1 0.0 6.34	10 L 7.1 1.0 0.14 0.2 0 0.0 7.24 Ea 10	11 T 6.5 1.0 0.14 0.2 0 0.0 6.64	R 6.2 1.0 0.14 0.1 0.0 6.34
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f	NB U U NB U U	1 L 4.1 1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33 	4U U SB 4U SB	4 L 4.1 1.0 0.14 0.0 4.24 4 L 2.2 0.9 0.14 2.33	We 7 1.0 0.14 0.2 0 0.0 7.24 We 7 L 3.5 0.9 0.14 3.63	stBound 8 T 6.5 1.0 0.14 0.2 0 0.0 6.64 stBound 8 T 4.0 0.9 0.14 4.13	9 R 6.2 1.0 0.14 0.1 0.0 6.34 9 R 3.3 0.9 0.14	10 L 7.1 1.0 0.14 0.2 0 0.0 7.24 Ea 10 L 3.5 0.9 0.14	11 T 6.5 1.0 0.14 0.2 0 0.0 6.64 IstBound 11 T 4.0 0.9 0.14	R 6.2 1.0 0.14 0.1 0.0 6.34 12 R 3.3 0.9 0.14
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV	NB U U NB U U	1 L 4.1 1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33 	4U U SB 4U U SB	4 L 4.1 1.0 0.14 0.0 4.24 4 L 2.2 0.9 0.14 2.33	We 7 7.1 7.1 1.0 0.14 0.2 0.0 7.24 We 7 L 3.5 0.9 0.14 3.63 CAPACITI	stBound 8 T 6.5 1.0 0.14 0.2 0 0.0 6.64 stBound 8 T 4.0 0.9 0.14 4.13	9 R 6.2 1.0 0.14 0.1 0.0 6.34 9 R 3.3 0.9 0.14	10 L 7.1 1.0 0.14 0.2 0 0.0 7.24 Ea 10 L 3.5 0.9 0.14 3.63	11 T 6.5 1.0 0.14 0.2 0 0.0 6.64 IstBound 11 T 4.0 0.9 0.14	R 6.2 1.0 0.14 0.1 0.0 6.34 12 R 3.3 0.9 0.14
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach	NB 1U U NB 1U U TS PRESENT NB 1U	1 L 4.1 1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33 0.14 2.33 5to T 1 L 38 4.24 2.33 1499	40 40 40 58 40 58 40 58 40 58	4 L 4.1 1.0 0.14 0.0 4.24 4 L 2.2 0.9 0.14 2.33 FENTIAL 4 L 19 4.24 2.33 1523	We 7 1.0 0.14 0.2 0.0 7.24 We 7 L 3.5 0.9 0.14 3.63 CAPACITI We 7 L 94 7.24 3.63 862	stBound 8 T 6.5 1.0 0.14 0.2 0 0.0 6.64 stBound 8 T 4.0 0.9 0.14 4.13 ES stBound 8 T 91 6.64 4.13 777	9 R 6.2 1.0 0.14 0.1 0.0 6.34 9 R 3.3 0.9 0.14 3.43 9	10 L 7.1 1.0 0.14 0.2 0 0.0 7.24 Ea 10 L 3.5 0.9 0.14 3.63 Ea 10	11 T 6.5 1.0 0.14 0.2 0 0.0 6.64 tstBound 11 T 4.0 0.9 0.14 4.13 tstBound 11	R 6.2 1.0 0.14 0.1 0.0 6.34 12 R 3.3 0.9 0.14 3.43

Pedestrian Impedance Approach

Steps 6 - 9: MOVEMENT CAPACITIES

SB

WB

EΒ

Appendix G Page 45 of 140 Movement		13		14		15		16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb		0		0		0		0
Major-Street Left-Turn Movements				1		4		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State	e, p*_0,	j		38 1499 1.000 1499 0.992 0.992		19 1523 1.000 1523 0.996 0.996		
Minor-Street Right-Turn Movements				9		12		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				16 1030 1.000 1030 0.994		31 1009 1.000 1009 0.988		
Major-Street U-Turn Movements				10		40		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j								
Minor-Street Through Movements				8		11		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				91 777 1.000 0.987 767 0.959		88 780 1.000 0.987 771 0.992		
Minor-Street Left-Turn Movements				7		10		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor, Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	p''			94 862 1.000 0.979 0.984 0.972 838		103 850 1.000 0.947 0.960 0.954 810		
Step 10 SHARED-LANE CAPACITY OF MINOR STREET APPROA Approach Movement Lane Configuration			TY ADJUST TBound 8 LTR	ments		Ea 10	stBound 11 LTR	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH		838	69 767 817	1030		810	25 771 886	1009
S CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTS		CONTROL	. DELAY					
Approach NB	SB 4U	4	Wes 7	tBound 8	9	Ea 10	stBound 11	12
Flow Rate 13 Movement Capacity 1499 Lane Configuration Shared Capacity Control Delay 7.4		6 1523 7.4	31 838	31 767 LTR 817 9.8	6 1030	6 810	6 771 LTR 886 9.2	13 1009
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement				NB 2		SB 5		
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, Delay to Major Left-turning Vehicles, d_MLT Major Street Through Vehicles in Shared Lan Major Street Turning Vehicles in Shared Lan Saturation Flow Rate for Major Street Throu	ne, v_i1 ne, v_i2			1 0.992 7.4 13 19 1700		1 0.996 7.4 25 19 1700		

Appendix G Page 46 of 140		
Saturation Flow Rate for Major Street Right-Turn, s_i2 Delay to Rank 1 Vehicles, d_Rank1	1700 0.1	$1700 \\ 0.0$
berug eo hank i fenteres, a <u>i</u> kanki	011	0.0

Approach	_Steps 12	2 - 13: NB		INTERSEC SB	TION CON	ITROL	DELAY and 9 WestBound	5% QUEUE		S astBound	
Movement Lane Configurati	on	10	1	40	4	7	8 LTR	9	10	11 LTR	12
Flow Rate Lane Capacity V/c 95% Queue Length Control Delay LOS	1		13 1499 0.01 0.0 7.4		6 1523 0.00 0.0 7.4 A		69 817 0.08 0.3 9.8 A			25 886 0.03 0.1 9.2 A	
Approach Delay Approach LOS Intersction Dela	y		3.0 6.2		1.1		9.8 A			9.2 A	

This TWSC text report was created in HCS™ TWSC Version 7.8 on 9/5/2019 2:54:47 PM

HCS7 Two-Way Stop-Control Text Report

	TWO-WAY STOP CONTROL (TWSC) Analysis
File Name:	2045-Build_AM_ElkCreek-EricksonRaRd_TWSC.xtw
Analyst:	HDR
Agency:	HDR
Date Performed:	7/3/2019
Time Analyzed:	AM - 2045 Build Cond.
Jurisdiction:	Meade County
Analysis Year:	2045
Project Description:	Southern Meade County Corridor Study
Units:	U.S. Customary
Intersection Name:	Elk Creek & Erickson Ra R
Major Street Direction:	East-West
East/West Street Name:	Elk Creek Road
North/South Street Name:	Erickson Ranch Road
Analysis Time Period (hrs):	0.25

Notion Character	Veł	nicle Vol	umes and	l Adjustr	nents				
Major Street: Approach		EastBo	und				WestBo	ound	
Movement	1U U	1 L	2 T	3 R		4U U	4 L	5 T	6 R
Volume Peak Hour Factor, PHF		5	65	90	0.80		25	120	5
Hourly Flow Rtae, HFR Percent Heavy Vehicles		6 5	81	113	0.00		31 5	150	6
Number of Lanes Lane Configuration	0	ŏ	1 LTR	0		0	Õ	1 LTR	0
Median Type Median Storage RT channelized?			LIK		Undivi	ded		LIK	
Left-Turn Lane Storage Upstream Signal?					Not Pr	esent			
Minor Street: Approach		NorthB	ound				South	Bound	
Movement		7 L	8 T	9 R			10 L	11 T	12 R
Volume		80	10	10	0.80		5	10	15
Peak Hour Factor, PHF Hourly Flow Rtae, HFR Percent Heavy Vehicles Number of Lanes Lane Configuration RT channelized?		100 5 0	13 5 1 LTR	13 5 0	0.80		6 5 0	13 5 1 LTR	19 5 0
Flared Approach Storage Percent Grade		NO	 0				NO	 0	

F	edestrian Volumes and	d Adjustments		
Approach	EB	WB	NB	SB
Movement	13	14	15	16
Flow (ped/hr)	0	0	0	0

Lane width (ft) Walking Speed (ft/sec) Pedestrian Blockage Factor, f_pb

Approach Movement Lane Configuration	Delay, EB 1U 1	Queue Len WB 4U	gth, and 4		of Servic thBound 8 LTR	9	50 10	uthBound 11 LTR	12
Flow Rate Lane Capacity v/c 95% Queue Length Control Delay LOS Approach Delay Approach LOS Intersction Delay	6 1404 0.00 0.0 7.6 A 0.3 4.4		31 1362 0.02 0.1 7.7 A 1.4		125 559 0.22 0.9 13.3 B 13.3 B			38 652 0.06 0.2 10.9 B 10.9 B	
		_Step 1: M	OVEMENT	PRIORITI	ES				
Major Street: Approach Priority Movement	10 U	EastBo 1 L	und 2 T	3 R		4U U	WestB 4 L	ound 5 T	6 R

Appendix G Page 48 o Approach Priority Movement	of 140		NorthBo 7 L	ound 8 T	9 R			SouthB 10 L	ound 11 T	12 R
	Step	2: MOVE	EMENT DEM	MAND VOL	UMES AND	FLOW RA	TES			
Major Street: Approach Movement		1U U	EastBou 1 L	und 2 T	3 R		4U U	WestBo 4 L	ound 5 T	6 R
Volume, V_x Flow Rate, v_x			5 6	65 81	90 113			25 31	120 150	5 6
Minor Street: Approach Movement			NorthBo 7 L	ound 8 T	9 R			SouthB 10 L	ound 11 T	12 R
Volume, V_x Flow Rate, v_x			80 100	10 13	10 13			5 6	10 13	15 19
		Ster	o 3: CONF	FLICTING	FLOW RA	TES				
Major Street: Approach Movement		1U U	EastBou 1 L	und 2 T	3 R		4U U	WestBo 4 L	ound 5 T	6 R
Flow Rate, v_x Conflicting Flow, v_c,x			6 156	81	113			31 194	150	6
Minor Street: Approach Movement			NorthBo 7 L	ound 8 T	9 R			SouthB 10 L	ound 11 T	12 R
Flow Rate, v_x Conflicting Flow, v_c,x			100 381	13 369	13 138			6 378	13 422	19 153
	Step	4: CRITI	ICAL HEAD	DWAYS an	d FOLLOW	UP HEAD	WAYS			
CRITICAL HEADWAYS Approach	EB		WB			thBound	_		IthBound	
	EB 1U U	1 L	WB 4U U	4 L	Nor 7 L	thBound 8 T	9 R	Sou 10 L	ithBound 11 T	12 R
Approach Movement t_c,base Single Stage Stage I	10		4U		7	8		10	11	
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G	10	L	4U	L	7 L 7.1 1.0 0.05 0.2	8 T 6.5 1.0 0.05 0.2	R 6.2 1.0 0.05 0.1	10 L 7.1 1.0 0.05 0.2	11 T 6.5 1.0 0.05 0.2	R 6.2 1.0 0.05 0.1
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT	10	L 4.1 1.0	4U	L 4.1 1.0	7 L 7.1 1.0 0.05	8 T 6.5 1.0 0.05	R 6.2 1.0 0.05	10 L 7.1 1.0 0.05	11 T 6.5 1.0 0.05	R 6.2 1.0 0.05
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G	10	4.1 1.0 0.05	4U	4.1 1.0 0.05	7 L 7.1 1.0 0.05 0.2 0	8 T 6.5 1.0 0.05 0.2 0	R 6.2 1.0 0.05 0.1 0	10 L 7.1 1.0 0.05 0.2 0	11 T 6.5 1.0 0.05 0.2 0	R 6.2 1.0 0.05 0.1 0
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS	10 U	4.1 1.0 0.05 0.0	4U U	4.1 1.0 0.05 0.0	7 L 7.1 1.0 0.05 0.2 0 0.0 7.15	8 T 6.5 1.0 0.05 0.2 0 0.0 6.55	R 6.2 1.0 0.05 0.1 0 0.0	10 L 7.1 1.0 0.05 0.2 0 0.0 7.15	11 T 6.5 1.0 0.05 0.2 0 0.0 6.55	R 6.2 1.0 0.05 0.1 0 0.0
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II	10	4.1 1.0 0.05 0.0	4U	4.1 1.0 0.05 0.0	7 L 7.1 1.0 0.05 0.2 0 0.0 7.15	8 T 6.5 1.0 0.05 0.2 0 0.0	R 6.2 1.0 0.05 0.1 0 0.0	10 L 7.1 1.0 0.05 0.2 0 0.0 7.15	11 T 6.5 1.0 0.05 0.2 0 0.0	R 6.2 1.0 0.05 0.1 0 0.0
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach	10 U EB 10	L 4.1 1.0 0.05 0.0 4.15	4U U WB 4U	L 4.1 1.0 0.05 0.0 4.15	7 L 7.1 1.0 0.05 0.2 0 0.0 7.15 Nor 7	8 T 6.5 1.0 0.05 0.2 0 0.0 6.55 thBound 8	R 6.2 1.0 0.05 0.1 0 0.0 6.25	10 L 7.1 1.0 0.05 0.2 0 0.0 7.15	11 T 6.5 1.0 0.05 0.2 0 0.0 6.55	R 6.2 1.0 0.05 0.1 0 0.0 6.25
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f	10 U U EB 10 U	L 4.1 1.0 0.05 0.0 4.15 1 L 2.2 0.9 0.05 2.25 Ste	4U U WB 4U	L 4.1 1.0 0.05 0.0 4.15 4 L 2.2 0.9 0.05 2.25	7 L 7.1 1.0 0.05 0.2 0 0.0 7.15 Nor 7 L 3.5 0.9 0.05 3.55	8 T 6.5 1.0 0.05 0.2 0 0.0 6.55 T T HBound 8 T 4.0 0.9 0.05 4.05	R 6.2 1.0 0.05 0.1 0 0.0 6.25 9 R 3.3 0.9 0.05	10 L 7.1 1.0 0.05 0.2 0 0.0 7.15 Sou 10 L 3.5 0.9 0.05	11 T 6.5 1.0 0.05 0.2 0 0.0 6.55 ThBound 11 T 4.0 0.9 0.05	R 6.2 1.0 0.05 0.1 0 0.0 6.25 12 R 3.3 0.9 0.05
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFEC Approach	1U U EB 1U U TS PRESENT EB	L 4.1 1.0 0.05 0.0 4.15 1 L 2.2 0.9 0.05 2.25 2.25	40 U 40 U ep 5: РОТ WB	L 4.1 1.0 0.05 0.0 4.15 4 L 2.2 0.9 0.05 2.25	7 L 7.1 1.0 0.05 0.2 0.0 7.15 Nor 7 L 3.5 0.9 0.05 3.55 CAPACITI Nor	8 T 6.5 1.0 0.05 0.2 0 0.0 6.55 thBound 8 T 4.0 0.9 0.05 4.05 ES thBound	R 6.2 1.0 0.05 0.1 0 0.0 6.25 9 R 3.3 0.9 0.05 3.35	10 L 7.1 1.0 0.05 0.2 0 0.0 7.15 Sout 10 L 3.5 0.9 0.05 3.55 Sout	11 T 6.5 1.0 0.05 0.2 0 0.0 6.55 0.1 0 0.0 6.55 0.1 0 0.0 6.55 0.1 0 0.0 5 0.0 5 0.0 0.0 5 0.0 0.0 0 0.0 5 0.0 0 0.0 5 0.0 0 0.0 5 0.0 5 0.0 5 0.0 5 0.0 0 0.0 5 0.0 0 0.0 5 0.0 0 0.0 5 0.0 5 0.0 5 0.0 0 0.0 0 0.0 5 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0.0 0 0.0 0 0.0 0.0 0 0.0 0.0 0 0.0 0 0.0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0 0 0 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	R 6.2 1.0 0.05 0.1 0 0.0 6.25 12 R 3.3 0.9 0.05 3.35
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f	1U U EB 1U U TS PRESENT	L 4.1 1.0 0.05 0.0 4.15 1 L 2.2 0.9 0.05 2.25 Ste	40 U 40 U WB 40 U ep 5: POT	L 4.1 1.0 0.05 0.0 4.15 4 L 2.2 0.9 0.05 2.25	7 L 7.1 1.0 0.05 0.2 0.0 7.15 Nor 7 L 3.5 0.9 0.05 3.55 CAPACITI	8 T 6.5 1.0 0.05 0.2 0.0 6.55 thBound 8 T 4.0 0.9 0.05 4.05 ES	R 6.2 1.0 0.05 0.1 0 0.0 6.25 9 R 3.3 0.9 0.05	10 L 7.1 1.0 0.05 0.2 0 0.0 7.15 Sou 10 L 3.5 0.9 0.05 3.55	11 T 6.5 1.0 0.05 0.2 0 0.0 6.55 0.5 0.0 6.55	R 6.2 1.0 0.05 0.1 0 0.0 6.25 12 R 3.3 0.9 0.05
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFEC Approach	1U U EB 1U U TS PRESENT EB 1U	L 4.1 1.0 0.05 0.0 4.15 1 L 2.2 0.9 0.05 2.25 2.25 5 total	40 U 40 U ep 5: POT 40 WB	L 4.1 1.0 0.05 0.0 4.15 4 L 2.2 0.9 0.05 2.25 FENTIAL 4	7 L 7.1 1.0 0.05 0.2 0.0 7.15 Nor 7 L 3.5 0.9 0.05 3.55 CAPACITI Nor 7	8 T 6.5 1.0 0.05 0.2 0.0 6.55 ThBound 8 T 4.0 0.9 0.05 4.05 ES thBound 8	R 6.2 1.0 0.05 0.1 0 0.0 6.25 9 R 3.3 0.9 0.05 3.35	10 L 7.1 1.0 0.05 0.2 0 0.0 7.15 Sou 10 L 3.5 0.9 0.05 3.55 Sou 10	11 T 6.5 1.0 0.05 0.2 0 0.0 6.55 0 0.0 6.55 0 0.0 6.55 0 0.0 5 4.05 0 0.05 4.05	R 6.2 1.0 0.05 0.1 0 0.0 6.25 12 R 3.3 0.9 0.05 3.35

Pedestrian Impedance Approach

Steps 6 - 9: MOVEMENT CAPACITIES

EB

WB

SB

NB

Appendix G Page 49 of 140 Movement		13		14		15		16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb		0		0		0		0
Major-Street Left-Turn Movements				1		4		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State	e, p*_0,	j		156 1404 1.000 1404 0.996 0.995		194 1362 1.000 1362 0.977 0.975		
Minor-Street Right-Turn Movements				9		12		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				138 903 1.000 903 0.986		153 885 1.000 885 0.979		
Major-Street U-Turn Movements				10		4U		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j								
Minor-Street Through Movements				8		11		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				369 556 1.000 0.970 539 0.977		422 519 1.000 0.970 503 0.975		
Minor-Street Left-Turn Movements				7		10		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor, Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	, p"			381 571 1.000 0.946 0.959 0.938 536		378 574 1.000 0.947 0.960 0.946 543		
		CAPACIT	TY ADJUST	MENTS				
SHARED-LANE CAPACITY OF MINOR STREET APPROA Approach Movement Lane Configuration	ACHES	Nort 7	chBound 8 LTR	9		Sou 10	thBound 11 LTR	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH		536	125 539 559	903		543	38 503 652	885
	Step 11:	CONTROL	DELAY					
CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTS Approach EB Movement 1U 1	wB 4U	4	Nort 7	thBound 8	9	Sou 10	thBound 11	12
Flow Rate 6 Movement Capacity 1404 Lane Configuration Shared Capacity Control Delay 7.6		31 1362 7.7	100 536	13 539 LTR 559 13.3	13 903	6 543	13 503 LTR 652 10.9	19 885
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement				EB 2		WB 5		
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, Delay to Major Left-turning Vehicles, d_ML1 Major Street Through Vehicles in Shared Lar Major Street Turning Vehicles in Shared Lar Saturation Flow Rate for Major Street Throu	r ne, v_i1 ne, v_i2			1 0.995 7.6 81 119 1700		1 0.975 7.7 150 38 1700		

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Saturation Flow Rate for Major Street Right-Turn, s_i2	1700	1700
Delay to Rank 1 Vehicles, d_Rank1	0.0	0.2

Approach	EB	WB	LON CONT		DELAY and 9! NorthBound	5% QUEUE		thBound	
Movement 10 Lane Configuration	1	4U	4	7	8 LTR	9	10	11 LTR	12
Flow Rate Lane Capacity V/c 95% Queue Length Control Delay LOS Approach Delay Approach LOS Intersction Delay	6 1404 0.00 0.0 7.6 A 0.3 4.4		31 1362 0.02 0.1 7.7 A 1.4		125 559 0.22 0.9 13.3 B 13.3 B			38 652 0.06 0.2 10.9 B 10.9 B	

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	HCS7 All-Wa	y Stop Control Report	
General Information		Site Information	
Analyst	HDR	Intersection	Elk Creek & Haines
Agency/Co.	HDR	Jurisdiction	Meade County
Date Performed	7/3/2019	East/West Street	Elk Creek Road
Analysis Year	2045	North/South Street	Haines Avenue
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.80
Time Analyzed	AM - 2045 Build Cond.		
Project Description	Southern Meade County Corrido	or Study	
Lawsa			

Lanes



Vehicle Volume and Adjustments

venicle volume and Adjust	tments											
Approach		Eastbound	l		Westbound	b	1	Northboun	d	9	Southboun	d
Movement	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Volume	10	15	75	20	20	5	40	10	10	5	35	10
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	125			56			75			63		
Percent Heavy Vehicles	6			6			6			6		
Departure Headway and S	ervice Ti	me					-	-				
Initial Departure Headway, hd (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.111			0.050			0.067			0.056		
Final Departure Headway, hd (s)	3.95			4.46			4.49			4.37		
Final Degree of Utilization, x	0.137			0.070			0.094			0.076		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, ts (s)	1.95			2.46			2.49			2.37		
Capacity, Delay and Level	of Servic	e		<u> </u>						<u> </u>		
Flow Rate, v (veh/h)	125			56			75			63		
Capacity	912			807			802			824		
95% Queue Length, Q ₉₅ (veh)	0.5			0.2			0.3			0.2		
Control Delay (s/veh)	7.6			7.8			8.0			7.7		
Level of Service, LOS	А			A			А			A		
Approach Delay (s/veh)	7.6 7.8 8.0					7.7						
Approach LOS	A A A A				А							
Intersection Delay, s/veh LOS			7	.7					,	A		

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Appendix G Page 52 of 140	HCS7	Two-Way	Stop-Con	trol Tex	t Report							
File Name: Analyst: Agency: Date Performed: Time Analyzed: Jurisdiction: Analysis Year: Project Description: Units: Intersection Name: Major Street Direction: East/West Street Name: North/South Street Name: Analysis Time Period (hrs):	2045-1 HDR HDR 7/3/20 AM - 2 Meade 2045 South U.S. Peace East-1 Peace	HDR 7/3/2019 AM - 2045 Build Cond. Meade County 2045 Southern Meade County Corridor Study U.S. Customary Peaceful P & Erickson RaR East-West Peaceful Pines Road Erickson Ranch Road										
Major Street:	Ve	nicle Vo	olumes an	d Adjust	ments							
Approach Movement	10	EastE 1	Bound 2	3	I	4U	WestBo 4	ound 5	6			
Hovement	U	Ĺ	Ť	R	İ	40 U	L	T	R			
Volume		25	40					20	55			
Peak Hour Factor, PHF Hourly Flow Rtae, HFR		31	50		0.80			25	69			
Percent Heavy Vehicles	0	3		0		0	0					
Number of Lanes Lane Configuration	0	1 L	1 T	0		0	0	1 T	1 R			
Median Type Median Storage					Undivi	ided						
RT channelized?									NO			
Left-Turn Lane Storage Upstream Signal?					Not Pr	resent						
Minor Street:												
Approach			Bound				South					
Movement		7 L	8 T	9 R			10 L	11 T	12 R			
Volume							165		75			
Peak Hour Factor, PHF					0.80							
Hourly Flow Rtae, HFR Percent Heavy Vehicles							206 3		94 3			
Number of Lanes		0	0	0			Õ	1	Õ			
Lane Configuration RT channelized?								LR				
Flared Approach Storage Percent Grade							NO	0				
								Ū				
Approach	Pede	strian V	olumes a/ EB	nd Adjus	stments WB		NB		 SB			
Movement			13		14		15		16			
Flow (ped/hr)			0		0				0			
Lane width (ft) Walking Speed (ft/sec)												
Pedestrian Blockage Factor, f_pb												
			nath an	لمربعا	of comin							
Approach EB		WE	3	NC	of Servio orthBound			uthBound				
Movement 10 Lane Configuration	1 L	40	4	7	8	9	10	11 LR	12			
Flow Rate Lane Capacity	31 1495							300 892				
v/c 95% Queue Length	0.02 0.1							0.34 1.5				
Control Delay	7.5							11.1				
LOS Approach Delay	A 2.9							В 11.1				
Approach LOS Intersction Delay	7.5							В				
el sector peruy												
Major Street:		Step 1:	MOVEMENT	PRIORIT	IES							
Approach	4	East	-	-		4	WestBo		<i>c</i>			
Priority Movement	1U U	1 L	2 T	3 R		40 U	4 L	5 T	6 R			
						-						

Minor Street:

Appendix G Page 53 o Approach Priority Movement	f 140		NorthBo 7 L	ound 8 T	9 R			SouthBo 10 L	ound 11 T	12 R
	Step) 2: MOVE	EMENT DEM	MAND VO	LUMES AN	ID FLOW R	ATES			
Major Street: Approach Movement		1U U	EastBou 1 L		3 R		4U U	WestBo 4 L	und 5 T	6 R
Volume, V_x Flow Rate, v_x			25 31	40 50					20 25	55 69
Minor Street: Approach Movement			NorthBo 7 L	ound 8 T	9 R			SouthBo 10 L	ound 11 T	12 R
Volume, V_x Flow Rate, v_x								165 206		75 94
		Step	o 3: CONF	FLICTIN	IG FLOW R	ATES				
Major Street: Approach Movement		1U U	EastBou 1 L	und 2 T	3 R		4U U	WestBo 4 L	und 5 T	6 R
Flow Rate, v_x Conflicting Flow, v_c,x			31 94	50					25	69
Minor Street: Approach Movement			NorthBo 7 L	ound 8 T	9 R			SouthBo 10 L	ound 11 T	12 R
Flow Rate, v_x Conflicting Flow, v_c,x								206 138		94 25
CRITICAL HEADWAYS	Step	4: CRITI	ICAL HEAD	DWAYS a	ind FOLLC	W-UP HEA	DWAYS			
Approach Movement	EB 1U U	1 L	WB 4U U	4 L	No 7 L	orthBound 8 T	9 R	Sou [.] 10 L	thBound 11 T	12 R
t_c,base Single Stage Stage I		4.1						7.1		6.2
Stage II t_c,HV P_HV t_c,G		1.0 0.03						1.0 0.03 0.2		1.0 0.03 0.1
G t_3,LT		0.0						0 0.7		0 0.0
t_c Single Stage Stage I Stage II		4.13						6.43		6.23
FOLLOW-UP HEADWAYS Approach Movement	EB 1U U	1 L	WB 4U U	4 L	No 7 L	orthBound 8 T	9 R	Sou [.] 10 L	thBound 11 T	12 R
t_f,base t_f,HV P_HV t_f		2.2 0.9 0.03 2.23						3.5 0.9 0.03 3.53		3.3 0.9 0.03 3.33
			ep 5: POT	TENTIAL	. CAPACIT	IES				
NO UPSTREAM SIGNAL EFFECT Approach Movement	S PRESENT EB 1U U	1 L	WB 4U U	4 L	No 7 L	orthBound 8 T	9 R	Sou [.] 10 L	thBound 11 T	12 R
v_c,x t_c,x t_f,x c_p,x		94 4.13 2.23 1495						138 6.43 3.53 854		25 6.23 3.33 1049
		Steps	56-9:	MOVEME	NT CAPAC	ITIES				

Steps 6 - 9: MOVEMENT CAPACITIES

EΒ

WB

SB

Appendix G Page 54 of 140 Movement			13		14		15		16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb			0		0				0
Major-Street Left-Turn Movements					1		4		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p, Movement Capacity, c_m,x Probability of Queue-free State, p Major L-Shared Probability Queue-	p_0,j	e, p*_0,	j		94 1495 1.000 1495 0.979				
Minor-Street Right-Turn Movements					9		12		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p, Movement Capacity, c_m,x Probability of Queue-free State, p							25 1049 1.000 1049 0.911		
Major-Street U-Turn Movements					10		40		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p	p_0,j								
Minor-Street Through Movements					8		11		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p, Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p									
Minor-Street Left-Turn Movements					7		10		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p, Major L, Minor T Adjusted Impedance Major L, Minor T Impedance Factor Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	ce Factor,	p"					138 854 1.000 0.979 836		
	Step 10): FINAL		Y ADJUST	MENTS				
SHARED-LANE CAPACITY OF MINOR STRI Approach Movement Lane Configuration	EET APPROA	ACHES	Nort 7	hBound 8	9		Sou 10	thBound 11 LR	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH							836	300 892	1049
CONTROL DELAY TO RANK 2 THROUGH 4		5	CONTROL						
Approach EB Movement 1U	1	WB 4U	4	Nort 7	thBound 8	9	Sou 10	thBound 11	12
Flow Rate Movement Capacity Lane Configuration Shared Capacity Control Delay	31 1495 L 7.5						206 836	LR 892 11.1	94 1049
Steps 12 - 13: AI	PPROACH/IN		ION CONT			5% QUEUE			
Approach EB Movement 1U Lane Configuration	1 L	WB 4U	4	7	thBound 8	9	10 Sou	thBound 11 LR	12
Flow Rate Lane Capacity V/c 95% Queue Length Control Delay	31 1495 0.02 0.1 7.5							300 892 0.34 1.5 11.1	

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LOS	А
Approach Delay	2.9
Approach LOS	
Intersction Delay	7.5
-	

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B 11.1 B

Appendix G Page 56 of 140	HCS7	Two-Way	Stop-Cor	ntrol Tex	xt Report				
File Name: Analyst: Agency: Date Performed: Time Analyzed: Jurisdiction: Analysis Year: Project Description: Units: Intersection Name: Major Street Direction: East/West Street Name: North/South Street Name: Analysis Time Period (hrs):	2045- HDR HDR 7/3/2 PM - Mead6 2045 South U.S. 224th East- 224th	-Build_PM 2019 2045 Bu ⁻ e County	۹_224th-1 ild Cond de County ry	L43rd_TW					
	Ve	ehicle Vo	olumes ar	nd Adjust	tments				
Major Street: Approach Movement	10 U	EastE 1 L	Bound 2 T	3 R		4U U	West 4 L	Bound 5 T	6 R
Volume Peak Hour Factor, PHF Hourly Flow Rtae, HFR		5	10 13		0.80			20 25	10 13
Percent Heavy Vehicles Number of Lanes Lane Configuration Median Type Median Storage RT channelized?	0	3 0 LT	1	0	Undiv	0 ided	0	1	0 TR
Upstream Signal?					Not P	resent			
Minor Street: Approach Movement		North 7 L	hBound 8 T	9 R			Sout 10 L	hBound 11 T	12 R
Volume							5		5

				•				
Volume					5		5	-
Peak Hour Factor, PHF				0.80				
Hourly Flow Rtae, HFR					6		6	
Percent Heavy Vehicles					3		3	
Number of Lanes	0	0	0		0	1	0	
Lane Configuration						LR		
RT channelized?								
Flared Approach Storage					NO			
Percent Grade						0		

Approach Movement	Pedestrian Volumes EB 13	and Adjustments WB 14	NB 15	SB 16
Flow (ped/hr)	0	0		0

Lane width (ft) Walking Speed (ft/sec) Pedestrian Blockage Factor, f_pb

Approach Movement Lane Configuration	Del 1U 1 L	4	WB	and Level N 7	of Servi NorthBound 8		50 10	uthBound 11 LR	12
Flow Rate Lane Capacity V/c 95% Queue Length Control Delay LOS Approach Delay Approach LOS Intersction Delay	0 0 7 A 2	566 .00 .3 .5 .2						13 990 0.01 0.0 8.7 A 8.7 A	
		Step	1: MOVEM	ENT PRIORI	TIES				
Major Street: Approach Priority Movement	1 U		astBound 2 T	3 R		4U U	WestB 4 L	ound 5 T	6 R

Appendix G Page 57 of Approach Priority Movement	140		NorthBc 7 L	ound 8 T	9 R			SouthBo 10 L	ound 11 T	12 R
	Step	2: MOVE	MENT DEM	AND VO	LUMES AN	D FLOW RA	TES			
Major Street: Approach Movement		1U U	EastBou 1 L		3 R		4U U	WestBo 4 L	und 5 T	6 R
Volume, V_X Flow Rate, V_X			5 6	10 13					20 25	10 13
Minor Street: Approach Movement			NorthBc 7 L	ound 8 T	9 R			SouthBo 10 L	ound 11 T	12 R
Volume, V_x Flow Rate, v_x								5 6		5 6
·····, · <u>·</u> ··				_		_		-		-
Major Street:		Step	3: CONF		G FLOW R	ATES				
Approach Movement		1U U	EastBou 1 L	und 2 T	3 R		4U U	WestBo 4 L	und 5 T	6 R
Flow Rate, v_x Conflicting Flow, v_c,x			6 38	13					25	13
Minor Street: Approach Movement			NorthBo 7 L	ound 8 T	9 R			SouthBo 10 L	ound 11 T	12 R
Flow Rate, v_x Conflicting Flow, v_c,x								6 56		6 31
CRITICAL HEADWAYS	Step	4: CRITI	CAL HEAD	DWAYS a	nd FOLLO	W-UP HEAD	WAYS			
Approach	EB	1	WB			rthBound	0		thBound	12
Movement	1U U	1 L	40 U	4 L	7 L	8 T	9 R	10 L	11 T	12 R
t_c,base Single Stage Stage I Stage II		4.1						7.1		6.2
t_C,ḦV P_HV t_C,G		1.0 0.03						1.0 0.03 0.2		1.0 0.03 0.1
G t_3,LT		0.0						0 0.7		0 0.0
t_c Single Stage Stage I Stage II		4.13						6.43		6.23
FOLLOW-UP HEADWAYS Approach Movement	EB 1U U	1 L	WB 4U U	4 L	No 7 L	rthBound 8 T	9 R	Sou [.] 10 L	thBound 11 T	12 R
t_f,base t_f,HV P_HV t_f		2.2 0.9 0.03 2.23						3.5 0.9 0.03 3.53		3.3 0.9 0.03 3.33
		Ste	ер 5: РОТ	FENTIAL	CAPACIT	IES				
NO UPSTREAM SIGNAL EFFECT Approach Movement	S PRESENT EB 1U U	1 L	WB 4U U	4 L	NO 7 L	rthBound 8 T	9 R	Sou [.] 10 L	thBound 11 T	12 R
v_c,x t_c,x t_f,x c_p,x		38 4.13 2.23 1566						56 6.43 3.53 949		31 6.23 3.33 1040
Dedectrian Impedance		Steps	56-9:	MOVEME	ΝΤ CAPAC	ITIES				

MOVEMENT Steps C 9 CAPACI

EB

WB

NB

SB

Appendix G Page 58 of 140 Movement	13	1	_4	15	16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb	0	C)		0
Major-Street Left-Turn Movements		1	<u></u>	4	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State	a, p*_0,j	1 1 1 0	38 566 1.000 566 0.996 0.996		
Minor-Street Right-Turn Movements		9)	12	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				31 1040 1.000 1040 0.994	
Major-Street U-Turn Movements		1	U	4U	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j					
Minor-Street Through Movements		8	3	11	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j					
Minor-Street Left-Turn Movements		7	7	10	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor, Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	p''			56 949 1.000 0.996 945	
Step 10 SHARED-LANE CAPACITY OF MINOR STREET APPROA	: FINAL CAPACI	TY ADJUSTME	NTS		
Approach Movement Lane Configuration		thBound 8 g)	SouthBound 10 11 LR	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH				945 990	1040
CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTS	tep 11: CONTRO	DL DELAY			
Approach EB Movement 10 1	₩B 4U 4	NorthE 7 8		SouthBound 10 11	12
Flow Rate 6 Movement Capacity 1566 Lane Configuration LT Shared Capacity Control Delay 7.3				6 945 LR 990 8.7	6 1040
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement		E 2	B	WB 5	
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, Delay to Major Left-turning Vehicles, d_MLT Major Street Through Vehicles in Shared Lar Major Street Turning Vehicles in Shared Lar	e, v_i1 e, v_i2	7 1 6).996 /.3 _3	1	
Saturation Flow Rate for Major Street Throu	y⊓, S_1⊥	L	1700	1700	

Appendix G Page 59 of 140 Saturation Flow Rate for Major Street Right-Turn, s_i2 Delay to Rank 1 Vehicles, d_Rank1

1700

0.0

Steps 1 Approach	L2 - 13: 4 EB	APPROACH/	INTERSEC WB	TION	CONTROL	DELAY and NorthBound			S uthBound	
Movement Lane Configuration	10	1 LT	40	4	7	8	9	10	11 LR	12
Flow Rate		6							13	
Lane Capacity v/c		$1566 \\ 0.00$							990 0.01	
95% Queue Length		0.0							0.0	
Control Delay LOS		7.3 A							8.7 A	
Approach Delay		2.5							8.7	
Approach LOS Intersction Delay		2.2							A	

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File Name: Analyst: Agency: Date Performed: Time Analyzed: Jurisdiction: Analysis Year: Project Description: Units: Intersection Name: Major Street Direction: East/West Street Name: North/South Street Name: Analysis Time Period (hrs):	TWO-WAY STOP CONTROL (TWSC) Analysis 2045-Build_PM_EastWestCorridor-143rd_TWSC.xtw HDR 7/3/2019 AM - 2045 Build Cond. Meade County 2045 Southern Meade County Corridor Study U.S. Customary E/W Corridor & 143rd Ave North-South East/West Corridor 143rd Ave 0.25 Vehicle Volumes and Adjustments										
Major Street:	Veł			d Adjust	ments						
Approach Movement	1U U	North 1 L	Bound 2 T	3 R		4U U	South 4 L	Bound 5 T	6 R		
Volume Peak Hour Factor, PHF Hourly Flow Rtae, HFR Percent Heavy Vehicles Number of Lanes Lane Configuration Median Type Median Storage RT channelized? Left-Turn Lane Storage	0	5 6 20 0	15 19 1 LTR	5 6 0	0.80 Undiv	0	5 6 20 0	15 19 1 LTR	5 6 0		
Upstream Signal?					Not Pi	resent					
Minor Street: Approach Movement		WestB 7 L	ound 8 T	9 R			EastB 10 L	ound 11 T	12 R		
Volume Peak Hour Factor, PHF Hourly Flow Rtae, HFR Percent Heavy Vehicles Number of Lanes Lane Configuration RT channelized? Flared Approach Storage Percent Grade		5 6 20 0 No	20 25 20 1 LTR 0	5 6 20 0	0.80		5 6 20 0 No	35 44 20 1 LTR 0	5 6 20 0		
	Pedes	strian V	olumes ar	nd Adjus	tments						
Approach Movement			NB 13		SB 14		WB 15		EB 16		
Flow (ped/hr) Lane Width (ft) Walking Speed (ft/sec) Pedestrian Blockage Factor, f_pb			0		0		0		0		
Approach NB	Delay, (Queue Le SB			of Servio estBound	ce	F	astBound			
Movement 10 Lane Configuration	1	40	4	7	8 LTR	9	10	11 LTR	12		
Flow Rate Lane Capacity V/c 95% Queue Length Control Delay LOS Approach Delay Approach LOS Intersction Delay	6 1480 0.00 7.4 A 1.5 6.5		6 1480 0.00 0.0 7.4 A 1.5		38 813 0.05 0.1 9.6 A 9.6 A			56 804 0.07 0.2 9.8 A 9.8 A			
Major Street:		Step 1: I	MOVEMENT	PRIORIT	IES						
Approach Priority Movement	1U U	North 1 L	Bound 2 T	3 R		4U U	South 4 L	Bound 5 T	6 R		

Minor Street:

Appendix G Page 61 o Approach Priority Movement	f 140		WestBou 7 L	und 8 T	9 R			EastBo 10 L	und 11 T	12 R
	Step	2: MOVE	EMENT DEM	MAND VOL	UMES AND	FLOW RA	TES			
Major Street: Approach	-		NorthBo	hund				SouthB	ound	
Movement		10	1	2	3		4U	4	5	6
		U	L	Т	R	I	U	L	Т	R
Volume, V_x Flow Rate, v_x			5 6	15 19	5 6			5 6	15 19	5 6
Minor Street:								F + P -		
Approach Movement			WestBou 7	8	9	1		EastBo 10	und 11	12
			L	Т	R	İ		L	Т	R
Volume, V_x			5	20	5			5	35	5
Flow Rate, v_x			6	25	6			6	44	6
		Stor	0 3: CONI			TEC				
Major Street:					FLOW KA	163				
Approach Movement		10	NorthBo 1	ound 2	3	I	4U	SouthB 4	ound 5	6
Novement		U	L	Ť	R		U	L	Т	R
Flow Rate, v_x			6	19	6			6	19	6
Conflicting Flow, v_c,x			25	15	0			25	15	0
Minor Street:										
Approach			WestBo		-			EastBo		
Movement			7 L	8 T	9 R			10 L	11 T	12 R
				-						
Flow Rate, v_x Conflicting Flow, v_c,x			6 94	25 72	6 22			6 84	44 72	6 22
			0.1					•	. =	
	Step	4: CRIT	ICAL HEAD	DWAYS an	d FOLLOW	-UP HEAD	WAYS			
CRITICAL HEADWAYS Approach	NB		SB		We	stBound		Ea	stBound	
Movement	10	1	4U	4	7	8	9	10	11	12
	U	L	U	L	L	Т	R	L	Т	R
t_c,base Single Stage		4.1		4.1	7.1	6.5	6.2	7.1	6.5	6.2
Stage I		4.1		4.1	7.1	0.5	0.2	/.1	0.5	0.2
Stage II t_c,HV		1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0
P_HV		0.20		0.20	0.20	0.20	0.20	0.20	0.20	0.20
t_c,G G					0.2 0	0.2 0	0.1 0	0.2 0	0.2 0	0.1 0
t_3,LT		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
t_c Single Stage		4.30		4.30	7.30	6.70	6.40	7.30	6.70	6.40
Stage I		4.50		4.50	7.50	0.70	0.40	7.50	0.70	0.40
Stage II										
FOLLOW-UP HEADWAYS										
Approach Movement	NB 1U	1	SB 4U	4	We 7	stBound 8	9	Ea 10	stBound 11	12
	Ū	Ē	U	Ĺ	Ĺ	Ť	R	L	T	R
t_f,base		2.2		2.2	3.5	4.0	3.3	3.5	4.0	3.3
t_f,HV		0.9		0.9	0.9	0.9	0.9	0.9	0.9	0.9
P_HV t_f		0.20 2.38		0.20 2.38	0.20 3.68	0.20 4.18	0.20 3.48	0.20 3.68	0.20 4.18	0.20 3.48
				-	-	-	-	-	-	
			ер 5: РО ⁻	TENTIAL	CAPACITI	ES				
NO UPSTREAM SIGNAL EFFECT Approach	NB		SB		We	stBound		Ea	stBound	
Movement	1U U	1	4U U	4	7	8	9	10	11	12
		L	U	L	L	Т	R	L	Т	R
v_c,x		25		25	94	72	22	84	72	22
		4.30 2.38		4.30 2.38	7.30 3.68	6.70 4.18	6.40 3.48	7.30 3.68	6.70 4.18	6.40 3.48
t_c,x		4.30		4.30	7.30	6.70	6.40	7.30	6.70	6.40

Pedestrian Impedance Approach

Steps 6 - 9: MOVEMENT CAPACITIES

NB

SB

WB

EB

Appendix G Page 62 of 140 Movement		13		14		15		16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb		0		0		0		0
Major-Street Left-Turn Movements				1		4		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State	e, p*_0,	j		25 1480 1.000 1480 0.996 0.996		25 1480 1.000 1480 0.996 0.996		
Minor-Street Right-Turn Movements				9		12		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				22 1006 1.000 1006 0.994		22 1006 1.000 1006 0.994		
Major-Street U-Turn Movements				10		40		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j								
Minor-Street Through Movements				8		11		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				72 785 1.000 0.991 779 0.968		72 785 1.000 0.991 779 0.944		
Minor-Street Left-Turn Movements				7		10		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	, p"			94 848 1.000 0.936 0.951 0.945 802		84 860 1.000 0.960 0.969 0.963 829		
Step 10 SHARED-LANE CAPACITY OF MINOR STREET APPRO Approach Movement Lane Configuration			TY ADJUST StBound 8 LTR	ments 9		Ea 10	astBound 11 LTR	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH		802	38 779 813	1006		829	56 779 804	1006
CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTS	Step 11:	CONTROL	DELAY					
Approach NB Movement 10 1	s SB 4U	4	Wes 7	stBound 8	9	Ea 10	astBound 11	12
Flow Rate 6 Movement Capacity 1480 Lane Configuration Shared Capacity Control Delay 7.4		6 1480 7.4	6 802	25 779 LTR 813 9.6	6 1006	6 829	44 779 LTR 804 9.8	6 1006
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement				NB 2		SB 5		
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, Delay to Major Left-turning Vehicles, d_ML ⁻ Major Street Through Vehicles in Shared Lan Major Street Turning Vehicles in Shared Lan Saturation Flow Rate for Major Street Throu	T ne, v_i1 ne, v_i2			1 0.996 7.4 19 13 1700		1 0.996 7.4 19 13 1700		

Appendix G Page 63 of 140		
Saturation Flow Rate for Major Street Right-Turn, s_i2	1700	1700
Delay to Rank 1 Vehicles, d_Rank1	0.0	0.0

s	steps 12	- 13: NE		INTERSEC SB	TION CON	ITROL	DELAY and WestBound			S astBound	
Movement Lane Configuration	I	10	1	4U	4	7	8 LTR	9	10	11 LTR	12
Flow Rate Lane Capacity V/c 95% Queue Length Control Delay			6 1480 0.00 0.0 7.4		6 1480 0.00 0.0 7.4		38 813 0.05 0.1 9.6			56 804 0.07 0.2 9.8	
LOS Approach Delay Approach LOS Intersction Delay			A 1.5 6.5		A 1.5		9.6 A			A 9.8 A	

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Appendix G Page 64 of 140	HCS7 Two-Way Stop-Control Text Report											
File Name: Analyst: Agency: Date Performed: Time Analyzed: Jurisdiction: Analysis Year: Project Description: Units: Intersection Name: Major Street Direction: East/West Street Name: North/South Street Name: Analysis Time Period (hrs):	2045-1 HDR HDR 7/3/20 PM - 2 Meade 2045 South U.S. 0 E/W CO North East/N	HDR 7/3/2019 PM - 2045 Build Cond. Meade County 2045 Southern Meade County Corridor Study U.S. Customary E/W Corridor & Elk Vale R North-South East/West Corridor Elk Vale Rd										
Major Street:	Ve	nicle Vo	olumes an	d Adjust	tments							
Approach	1		nBound	2		4		Bound	C			
Movement	10 U	1 L	2 T	3 R		4U U	4 L	5 T	6 R			
Volume Peak Hour Factor, PHF Hourly Flow Rtae, HFR Percent Heavy Vehicles		25 31 14	45 56		0.80			25 31	5			
Number of Lanes Lane Configuration Median Type Median Storage RT channelized? Left-Turn Lane Storage	0	0 LT	1	0	Undiv [.]	0 i ded	0	1	0 TR			
Upstream Signal?					Not Pi	resent						
Minor Street: Approach Movement		WestE 7 L	3ound 8 T	9 R			EastB 10 L	ound 11 T	12 R			
Volume					·		10		15			
Peak Hour Factor, PHF Hourly Flow Rtae, HFR Percent Heavy Vehicles Number of Lanes Lane Configuration RT channelized?		0	0	0	0.80		13 14 0	1 LR	19 14 0			
Flared Approach Storage Percent Grade			Ι				NO	 0				
	Pede	strian \	/olumes a	nd Adjus	stments							
Approach Movement			NB 13	5	SB 14		WB 15		EB 16			
Flow (ped/hr) Lane Width (ft) Walking Speed (ft/sec) Pedestrian Blockage Factor, f_pb			0		0				0			
Approach					of Servio	ce		astBound				
Approach NB Movement 1U Lane Configuration	1 LT	SE 4U	4	7	VestBound 8	9	10	LAS LBOUIIU 11 LR	12			
Flow Rate Lane Capacity v/c 95% Queue Length Control Delay LOS Approach Delay Approach LOS Intersction Delay	31 1499 0.02 0.1 7.5 A 2.8 3.4							31 908 0.03 0.1 9.1 A 9.1 A				
Major Stroot		Step 1:	MOVEMENT	PRIORI	TIES							
Major Street: Approach Priority Movement	1U U	Nortł 1 L	1Bound 2 T	3 R		4U U	South 4 L	Bound 5 T	6 R			

Minor Street:

Appendix G Page 65 Approach Priority Movement	of 140		WestBc 7 L	ound 8 T	9 R			EastBo 10 L	ound 11 T	12 R
	Step	2: MOV	EMENT DE	MAND VC	LUMES A	ND FLOW RA	TES			
Major Street: Approach			NorthB	ound				South	Round	
Movement		10	1	2	3		4U	4	5	6
		U	L	Т	R		U	L	Т	R
Volume, V_x Flow Rate, v_x			25 31	45 56					25 31	5 6
Minor Street:				1						
Approach Movement			WestBo 7	ound 8	9	1		EastBo 10	ound 11	12
			Ĺ	Ť	R	İ		L	T	R
Volume, V_x								10		15
Flow Rate, v_x								13		19
			2							
Major Street:		Ste	р 3: СОМ	IFLICTIN	IG FLOW	RATES				
Approach			NorthB		-			SouthE		
Movement		1U U	1 L	2 T	3 R		4U U	4 L	5 T	6 R
<u>-</u>		0				I	0	L		
Flow Rate, v_x Conflicting Flow, v_c,x			31 38	56					31	6
Minor Street:										
Approach Movement			WestBo 7	ound 8	9	1		EastBo 10	ouna 11	12
i lo vellierre			Ĺ	Ť	R			L	T	R
Flow Rate, v_x								13		19
Conflicting Flow, v_c,x								153		34
CRITICAL HEADWAYS	Step	4: CRIT	ICAL HEA	DWAYS a	ind FOLL	OW-UP HEAD	WAYS			
Approach	NB		SB			WestBound		Ea	astBound	
Movement	10 U	1 L	40 U	4 L	7 L	8 T	9 R	10	11 T	12 R
	U	L	0	L	L	I	K	L	I	K
t c haca										
t_c,base		11						71		6 2
Single Stage		4.1						7.1		6.2
Single Stage Stage I Stage II										
Single Stage Stage I Stage II t_c,HV		1.0						7.1 1.0 0.14		6.2 1.0 0.14
Single Stage Stage I Stage II t_c,HV P_HV t_c,G								1.0 0.14 0.2		1.0 0.14 0.1
Single Stage Stage I Stage II t_C,HV P_HV t_C,G G		1.0 0.14						1.0 0.14 0.2 0		1.0 0.14 0.1 0
Single Stage Stage I Stage II t_C,HV P_HV t_C,G G t_3,LT t_C		1.0 0.14 0.0						1.0 0.14 0.2 0 0.7		1.0 0.14 0.1 0 0.0
Single Stage Stage I Stage II t_C,HV P_HV t_C,G G t_3,LT t_C Single Stage		1.0 0.14						1.0 0.14 0.2 0		1.0 0.14 0.1 0
Single Stage Stage I Stage II t_C,HV P_HV t_C,G G t_3,LT t_C		1.0 0.14 0.0						1.0 0.14 0.2 0 0.7		1.0 0.14 0.1 0 0.0
Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II		1.0 0.14 0.0						1.0 0.14 0.2 0 0.7		1.0 0.14 0.1 0 0.0
Single Stage Stage I Stage II t_C,HV P_HV t_C,G G t_3,LT t_C Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach	NB	1.0 0.14 0.0 4.24	SB			WestBound		1.0 0.14 0.2 0.7 6.54	astBound	1.0 0.14 0.1 0.0 6.34
Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS	10	1.0 0.14 0.0 4.24	4U	4	7	8	9 P	1.0 0.14 0.2 0.7 6.54 Ea 10	11	1.0 0.14 0.0 0.0 6.34
Single Stage Stage I Stage II t_C,HV P_HV t_C,G G t_3,LT t_C Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement		1.0 0.14 0.0 4.24		4 L			9 R	1.0 0.14 0.2 0.7 6.54 Ea 10 L	astBound 11 T	1.0 0.14 0.0 6.34
Single Stage Stage I Stage II t_C,HV P_HV t_C,G G t_3,LT t_C Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base	10	1.0 0.14 0.0 4.24	4U		7	8		1.0 0.14 0.2 0.7 6.54 Ea 10 L 3.5	11	1.0 0.14 0.0 6.34
Single Stage Stage I Stage II t_C,HV P_HV t_C,G G t_3,LT t_C Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV	10	1.0 0.14 0.0 4.24	4U		7	8		1.0 0.14 0.2 0.7 6.54 Ea 10 L 3.5 0.9	11	1.0 0.14 0.0 6.34
<pre>Single Stage Stage I Stage II t_C,HV P_HV t_C,G G t_3,LT t_C Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base</pre>	10	1.0 0.14 0.0 4.24	4U		7	8		1.0 0.14 0.2 0.7 6.54 Ea 10 L 3.5	11	1.0 0.14 0.0 6.34
Single Stage Stage I Stage II t_C,HV P_HV t_C,G G t_3,LT t_C Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV	10	1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33	4U U	L	7 L	8 T		1.0 0.14 0.2 0.7 6.54 Ea 10 L 3.5 0.9 0.14	11	1.0 0.14 0.0 6.34 12 R 3.3 0.9 0.14
Single Stage Stage I Stage II t_C,HV P_HV t_C,G G t_3,LT t_C Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFEC	10 U	1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33	4U	L	7 L	8 T		1.0 0.14 0.2 0.7 6.54 Ea 10 L 3.5 0.9 0.14	11	1.0 0.14 0.0 6.34 12 R 3.3 0.9 0.14
Single Stage Stage I Stage II t_C,HV P_HV t_C,G G t_3,LT t_C Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement T_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFEC Approach	1U U CTS PRESENT NB	1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33	40 U ep 5: PC SB	L	7 L	8 T TIES	R	1.0 0.14 0.2 0 0.7 6.54 Ea 10 L 3.5 0.9 0.14 3.63	11 T astBound	1.0 0.14 0.0 6.34 12 R 3.3 0.9 0.14 3.43
Single Stage Stage I Stage II t_C,HV P_HV t_C,G G t_3,LT t_C Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFEC	1U U TS PRESENT NB 1U	1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33 Store 1	40 U ep 5: PC 40	L DTENTIAL	7 L CAPACI	8 T TIES WestBound 8	R 9	1.0 0.14 0.2 0.7 6.54 Ea 10 L 3.5 0.9 0.14 3.63 Ea 10	11 T astBound 11	1.0 0.14 0.0 6.34 12 R 3.3 0.9 0.14 3.43
Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFEC Approach Movement	1U U CTS PRESENT NB	1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33 	40 U ep 5: PC SB	L	7 L	8 T TIES	R	1.0 0.14 0.7 6.54 Ea 10 L 3.5 0.9 0.14 3.63 Ea 10 L Ea	11 T astBound	1.0 0.14 0.0 6.34 12 R 3.3 0.9 0.14 3.43 12 R
Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFEC Approach Movement V_C,X	1U U TS PRESENT NB 1U	1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33 	40 U ep 5: PC 40	L DTENTIAL	7 L CAPACI	8 T TIES WestBound 8	R 9	1.0 0.14 0.2 0 0.7 6.54 Ea 10 L 3.5 0.9 0.14 3.63 Ea 10 L Ea 10 L Ea 10 L Ea	11 T astBound 11	1.0 0.14 0.0 6.34 12 R 3.3 0.9 0.14 3.43 12 R 34
Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFEC Approach Movement	1U U TS PRESENT NB 1U	1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33 Stored 1 L 38 4.24 2.33	40 U ep 5: PC 40	L DTENTIAL	7 L CAPACI	8 T TIES WestBound 8	R 9	1.0 0.14 0.2 0 0.7 6.54 Ea 10 L 3.5 0.9 0.14 3.63 Ea 10 L Ea 10 L Ea 10 L Ea 10 L Ea 10 L Ea 10 L Ea 10 L Ea 10 2 10 14 10 10 14 10 10 14 10 10 14 10 14 10 10 14 10 10 14 10 10 14 10 10 14 10 10 14 10 10 14 10 10 14 10 10 10 10 10 10 10 10 10 10 10 10 10	11 T astBound 11	1.0 0.14 0.0 6.34 12 R 3.3 0.9 0.14 3.43 12 R 34 6.34 3.43
Single Stage Stage I Stage II t_C,HV P_HV t_C,G G t_3,LT t_C Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement T_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFEC Approach Movement V_C,X t_C,X t_C,X	1U U TS PRESENT NB 1U	1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33 	40 U ep 5: PC 40	L DTENTIAL	7 L CAPACI	8 T TIES WestBound 8	R 9	1.0 0.14 0.2 0 0.7 6.54 Ea 10 L 3.5 0.9 0.14 3.63 Ea 10 L Ea 10 L Ea 10 L Ea 10 L Ea 10 L	11 T astBound 11	1.0 0.14 0.0 6.34 12 R 3.3 0.9 0.14 3.43 12 R 34 6.34
Single Stage Stage I Stage II t_C,HV P_HV t_C,G G t_3,LT t_C Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement T_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFEC Approach Movement V_C,X t_C,X t_C,X t_f,x	1U U TS PRESENT NB 1U	1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33 Sto 1 L 38 4.24 2.33 1499	40 U ep 5: PC 40	L DTENTIAL 4 L	7 L CAPACT 7 L	8 T TIES WestBound 8 T	R 9	1.0 0.14 0.2 0 0.7 6.54 Ea 10 L 3.5 0.9 0.14 3.63 Ea 10 L Ea 10 L Ea 10 L Ea 10 L Ea 10 L Ea 10 L Ea 10 L Ea 10 2 10 14 10 10 14 10 10 14 10 10 14 10 14 10 10 14 10 10 14 10 10 14 10 10 14 10 10 14 10 10 14 10 10 14 10 10 10 10 10 10 10 10 10 10 10 10 10	11 T astBound 11	1.0 0.14 0.0 6.34 12 R 3.3 0.9 0.14 3.43 12 R 34 6.34 3.43

NB

SB

EΒ

Appendix G Page 66 of 140 Movement	13	14	15	16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb	0	0		0
Major-Street Left-Turn Movements		1	4	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State	e, p*_0,j	38 1499 1.000 1499 0.979 0.978		
Minor-Street Right-Turn Movements		9	12	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j			34 1005 1.000 1005 0.981	
Major-Street U-Turn Movements		10	40	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j				
Minor-Street Through Movements		8	11	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				
Minor-Street Left-Turn Movements		7	10	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor, Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	p"		153 811 1.000 0.978 794	
Step 10 SHARED-LANE CAPACITY OF MINOR STREET APPROA): FINAL CAPACITY AN	DJUSTMENTS		
Approach Movement Lane Configuration	WestBou 7 8	und 9 	EastBound 10 11 LR	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH			794 908	1005
	tep 11: CONTROL DE	LAY		
CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTS Approach NB Movement 1U 1	SB 4U 4 7	WestBound 8 9	EastBound 10 11	12
Flow Rate31Movement Capacity1499Lane ConfigurationLTShared Capacity7.5			13 794 408 908 9.1	19 1005
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement		NB 2	SB 5	
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, Delay to Major Left-turning Vehicles, d_ML1 Major Street Through Vehicles in Shared Lar Major Street Turning Vehicles in Shared Lar Saturation Flow Rate for Major Street Throu	ne, v_i1 ne, v_i2	1 0.978 7.5 56 31 1700	1 1700	

Appendix G Page 67 of 140 Saturation Flow Rate for Major Street Right-Turn, s_i2 Delay to Rank 1 Vehicles, d_Rank1

1700

0.2

Steps 1 Approach	2 - 13: A NB	PPROACH/	INTERSEC SB	TION	CONTROL	DELAY and S WestBound	5% QUEL		HS EastBound	
Movement Lane Configuration	10	1 LT	4U	4	7	8	9	10	11 LR	12
Flow Rate Lane Capacity V/C 95% Queue Length Control Delay LOS Approach Delay Approach LOS Intersction Delay		31 1499 0.02 0.1 7.5 A 2.8 3.4							31 908 0.03 0.1 9.1 A 9.1 A	

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Appendix G Page 68 of 140	HCS7	HCS7 Two-Way Stop-Control Text Report											
File Name: Analyst: Agency: Date Performed: Time Analyzed: Jurisdiction: Analysis Year: Project Description: Units: Intersection Name: Major Street Direction: East/West Street Name: North/South Street Name: Analysis Time Period (hrs):	2045 HDR FDR 7/3/ PM - Mead 2045 Sout U.S. E/W Nort East Eric												
Major Stroot	V	ehicle Vo	lumes and	d Adjust	ments					_			
Major Street: Approach	1		Bound	2		4		Bound	c				
Movement	1U U	1 L	2 T	3 R		4U U	4 L	5 T	6 R				
Volume			100	75			35	55		-			
Peak Hour Factor, PHF Hourly Flow Rtae, HFR			125	94	0.80		44	69					
Percent Heavy Vehicles Number of Lanes	0	0	1	0		0	5	1	0				
Lane Configuration	0	0	T	TR			LT	Ŧ	0				
Median Type Median Storage					Undivi	ided							
RT channelized? Left-Turn Lane Storage													
Upstream Signal?					Not Pi	resent							
Minor Street:										_			
Approach Movement		WestB 7	Bound 8	9	I		EastB 10	ound 11	12				
		Ĺ	Ť	R	İ		L	T	R				
Volume		10		20						-			
Peak Hour Factor, PHF Hourly Flow Rtae, HFR		13		25	0.80								
Percent Heavy Vehicles		5	1	5			0	0	0				
Number of Lanes Lane Configuration		0	1 LR	0			0	0	0				
RT channelízed? Flared Approach Storage		NO	1					I					
Percent Grade		No	ò					1					
	Ped	estrian v	olumes a	nd Adius	tments								
Approach	! си		NB 13		SB 14		WB 15		EB 16	_			
Movement									10	_			
Flow (ped/hr) Lane width (ft)			0		0		0						
Walking Speed (ft/sec) Pedestrian Blockage Factor, f	nh												
	_po												
Approach	Delay, NB	Queue Le SE			of Servio /estBound	ce		astBound		_			
Movement 10	1	4U	4	7	8	9	10	11 11	12				
Lane Configuration			LT		LR								
Flow Rate Lane Capacity			44 1333		38 773								
v/c			0.03		0.05								
95% Queue Length Control Delay			0.1 7.8		0.2 9.9								
LOS Approach Delay			A 3.2		A 9.9								
Approach LOS	2.0				A								
Intersction Delay	2.0												
Major Street:		_Step 1:	MOVEMENT	PRIORIT	IES					—			
Approach	4		Bound	2		4		Bound	C				
Priority Movement	10 U	1 L	2 T	3 R		4U U	4 L	5 T	6 R				

Appendix G Page 69 o Approach Priority Movement	f 140		WestBou 7 L	und 8 T	9 R			EastBo 10 L	und 11 T	12 R
	Sten) 2: MOVE	MENT DE	MAND VOL	UMES AND	FLOW RA	TES			
Major Street: Approach Movement		1U U	NorthBo 1 L		3 R		4U U	SouthB 4 L		6 R
Volume, V_x Flow Rate, v_x				100 125	75 94			35 44	55 69	
Minor Street: Approach Movement			WestBou 7 L	und 8 T	9 R			EastBo 10 L	und 11 T	12 R
Volume, V_x Flow Rate, v_x			10 13		20 25					
		Ster	o 3: CONI	FLICTING	FLOW RA	TES				
Major Street: Approach Movement		1U U	NorthBo 1 L		3 R		4U U	SouthB 4 L	ound 5 T	6 R
Flow Rate, v_x Conflicting Flow, v_c,x				125	94			44 219	69	
Minor Street: Approach Movement			WestBou 7 L	und 8 T	9 R			EastBo 10 L	und 11 T	12 R
Flow Rate, v_x Conflicting Flow, v_c,x			13 328		25 172					
	Step	4: CRIT	ICAL HEAD	DWAYS an	d FOLLOW	-UP HEAD	WAYS			
CRITICAL HEADWAYS Approach Movement	NB 1U U	1 L	SB 4U U	4 L	We 7 L	stBound 8 T	9 R	Ea 10 L	stBound 11 T	12 R
t_c,base Single Stage Stage I Stage II				4.1	7.1		6.2			
t_c,ĤV P_HV t_c,G				1.0 0.05	1.0 0.05 0.2		1.0 0.05 0.1			
G t_3,LT				0.0	0 0.7		0 0.0			
t_c Single Stage Stage I Stage II				4.15	6.45		6.25			
FOLLOW-UP HEADWAYS Approach Movement	NB 1U U	1 L	SB 4U U	4 L	We 7 L	stBound 8 T	9 R	Ea 10 L	stBound 11 T	12 R
t_f,base t_f,HV P_HV t_f				2.2 0.9 0.05 2.25	3.5 0.9 0.05 3.55		3.3 0.9 0.05 3.35			
			ер 5: РО	TENTIAL	CAPACITI	ES				
NO UPSTREAM SIGNAL EFFECT Approach Movement	S PRESENT NB 1U U	- 1 L	SB 4U U	4 L	We 7 L	stBound 8 T	9 R	Ea 10 L	stBound 11 T	12 R
v_c,x t_c,x t_f,x c_p,x				219 4.15 2.25 1333	328 6.45 3.55 660		172 6.25 3.35 864			
		Steps	s 6 - 9:	MOVEMEN	Τ CAPACI	TIES				

Steps 6 - 9: MOVEMENT CAPACITIES

SB

ЕΒ

Appendix G Page 70 of 140 Movement		13		14		15		16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb		0		0		0		
Major-Street Left-Turn Movements				1		4		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State,	p*_0,	j				219 133 1.0 133 0.9 0.9	3 00 3 67	
Minor-Street Right-Turn Movements				9		12		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				172 864 1.000 864 0.971				
Major-Street U-Turn Movements				10		4U		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j								
Minor-Street Through Movements				8		11		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j								
Minor-Street Left-Turn Movements				7		10		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor, Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	p''			328 660 1.000 0.966 638				
Step 10:		CAPACIT	Y ADJUS	TMENTS				
SHARED-LANE CAPACITY OF MINOR STREET APPROAC Approach Movement Lane Configuration	HES	Wes 7	tBound 8 LR	9		10	EastBound 11	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH		638	38 773	864				
St CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTS	ep 11:	CONTROL	DELAY_					
Approach NB Movement 1U 1 4	SB U	4	Wes 7	stBound 8	9	10	EastBound 11	12
Flow Rate Movement Capacity Lane Configuration Shared Capacity Control Delay		44 1333 LT 7.8	13 638	LR 773 9.9	25 864			
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement				NB 2		SB 5		
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, p Delay to Major Left-turning Vehicles, d_MLT Major Street Through Vehicles in Shared Lane Major Street Turning Vehicles in Shared Lane Saturation Flow Rate for Major Street Throug	, v_i1 , v_i2			1 1700		1 0.9 7.8 69 44 170		

Appendix G Page 71 of 140 Saturation Flow Rate for Major Street Right-Turn, s_i2 1700 Delay to Rank 1 Vehicles, d_Rank1

Approach Movement Lane Configuratio	- 13: NI 1U		/INTERSEC SB 4U	TION CON 4 LT	ITROL 7	DELAY and 9 WestBound 8 LR	5% QUE 9	HS EastBound 11	12
Flow Rate Lane Capacity v/c 95% Queue Length Control Delay LOS Approach Delay Approach LOS Intersction Delay		2.0		44 1333 0.03 0.1 7.8 A 3.2		38 773 0.05 0.2 9.9 A 9.9 A		 	

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HCS7 All-Way Stop Control Report

TICST All Way Stop Control Report								
General Information		Site Information						
Analyst	HDR	Intersection	E/W Corridor & Haines Ave					
Agency/Co.	HDR	Jurisdiction	Meade County					
Date Performed	7/11/2019	East/West Street	East/West Corridor					
Analysis Year	2045	North/South Street	Haines Avenue					
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.80					
Time Analyzed	PM - 2045 Build Conditon							
Project Description	Southern Meade County Corri	Southern Meade County Corridor Study						
Lanos								

Lanes



Vehicle Volume and Adjustments

venicle volume and Adjust	ments											
Approach		Eastbound			Westbound	ł	1	Northboun	d	9	Southboun	d
Movement	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Volume	15	25	40	5	15	5	145	185	20	5	65	10
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	100			31			438			100		
Percent Heavy Vehicles	6			6			6			6		
Departure Headway and Service Time												
Initial Departure Headway, hd (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.089			0.028			0.389			0.089		
Final Departure Headway, hd (s)	5.06			5.36			4.53			4.79		
Final Degree of Utilization, x	0.141			0.046			0.550			0.133		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, ts (s)	3.06			3.36			2.53			2.79		
Capacity, Delay and Level o	f Servic	e										
Flow Rate, v (veh/h)	100			31			438			100		
Capacity	712			672			795			751		
95% Queue Length, Q ₉₅ (veh)	0.5			0.1			3.4			0.5		
Control Delay (s/veh)	8.9			8.6			12.9			8.5		
Level of Service, LOS	A			А			В			А		
Approach Delay (s/veh)		8.9			8.6			12.9		8.5		
Approach LOS		А			А		В			A		
Intersection Delay, s/veh LOS			11	1.5			В					

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				HCS	57 Ro	unda	abo	outs R	epc	ort							
General Information							Sit	e Info	rma	atior	ו						
Analyst	HDR					*				Inters	ection			E/W Corridor & Haines Ave			
Agency or Co.	HDR		← E/W St			' Street Name E			East/West Corridor								
Date Performed	7/11/	2019	N/S Str			treet Nar	ne		Haine	es Aver	nue						
Analysis Year	2045		↓ (w ⁺ _k) ↑ Analysis			sis Time	Period (h	rs)	0.25								
Time Analyzed	PM -	2045 Bu	uild Condition			Hour Fac	tor		0.80								
Project Description	South	nern Mea	ade County Cor Jurisdia			iction			Meac	le Cou	nty						
Volume Adjustments	and a	Site C	harac	teristic	s												
Approach		E	B	Т		W	/B		Т		N	В				SB	
Movement	U	L	Т	R	U	L	Т	R		U	L	Т	R	U	L	Т	R
Number of Lanes (N)	0	0	1	0	0	0	1	0		0	0	1	0	0	0	1	0
Lane Assignment			Ľ	ΓR				LTR				LT	R				LTR
Volume (V), veh/h	0	15	25	40	0	5	15	5		0	145	185	20	0	5	65	10
Percent Heavy Vehicles, %	6	6	6	6	6	6	6	6		6	6	6	6	6	6	6	6
Flow Rate (VPCE), pc/h	0	20	33	53	0	7	20	7		0	192	245	27	0	7	86	13
Right-Turn Bypass		No	one None None								None						
Conflicting Lanes			1				1				1			1			
Pedestrians Crossing, p/h			0			(0				C)			0		
Critical and Follow-U	Jp Hea	adway	/ Adju	stmen	t								i				
Approach				EB				WB				NB		Τ		SB	
Lane			Left	Right	Bypas	s Le	eft	Right	Вур	oass	Left	Right	Bypass	5 L	.eft	Right	Вура
Critical Headway (s)				4.9763				4.9763				4.9763		Τ		4.9763	
Follow-Up Headway (s)				2.6087		2.6087 2.6087						2.6087					
Flow Computations,	Capa	city ar	nd v/c	Ratio	5												
Approach				EB				WB				NB		Τ		SB	
Lane			Left	Right	Bypas	s Le	eft	Right	Вур	oass	Left	Right	Bypas	; L	.eft	Right	Вура
Entry Flow (ve), pc/h				106				34				464				106	
Entry Volume, veh/h				100				32				438				100	
Circulating Flow (v _c), pc/h				100				457				60				219	
Exiting Flow (vex), pc/h				67				225				272				146	
Capacity (c _{pce}), pc/h				1246				866				1298				1104	
Capacity (c), veh/h				1176				817				1225				1041	
v/c Ratio (x)				0.09				0.04				0.36				0.10	
Delay and Level of S	ervice	•		·								-					
Approach				EB				WB				NB				SB	
Lane			Left	Right	Bypas	s Le	eft	Right	Вур	bass	Left	Right	Bypass	; L	.eft	Right	Вура
Lane Control Delay (d), s/veh				3.8				4.8				6.4				4.3	
Lane LOS				A				А				A				А	
95% Queue, veh				0.3				0.1				1.6				0.3	
Approach Delay, s/veh				3.8				4.8				6.4				4.3	
Approach LOS				Α				A				A				A	
Intersection Delay, s/veh LO	~					5.6								A			

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Appendix G Page 74 of 14	D	HCS7 1	Fwo-Way S	Stop-Cont	rol Tex	t Report				
File Name: Analyst: Agency: Date Performed: Time Analyzed: Jurisdiction: Analysis Year: Project Description: Units: Intersection Name: Major Street Direction: East/West Street Name: North/South Street Name: Analysis Time Period (hrs):		2045-E HDR HDR 7/3/20 PM - 2 Meade 2045 Southe U.S. 0 E/W CO North- East/W	3uild_PM_ 2045 Bui ⁻ County ern Meade Customary orridor {	ld Cond. e County y & Haines	Corrido: Corrido	or_Haines_	TWSC.xt	:w		
		veł	nicle vo	lumes and	l Adjust	ments				
Major Street: Approach			North	Bound				South	Bound	
Movement		1U U	1 L	2 T	3 R		40 U	4 L	5 T	6 R
Volume			145	185	20		- I	5	65	10
Peak Hour Factor, PHF Hourly Flow Rtae, HFR			181	231	25	0.80		6	81	13
Percent Heavy Vehicles Number of Lanes		0	6 0	1	0		0	6 0	1	0
Lane Configuration Median Type				LTR		Undivi	ded		LTR	
Median Storage RT channelized? Left-Turn Lane Storage Upstream Signal?						Not Pr	esent			
-										
Minor Street: Approach Movement			WestBo 7 L	ound 8 T	9 R			EastE 10 L	3ound 11 T	12 R
volume			5	15	5			15	25	40
Peak Hour Factor, PHF Hourly Flow Rtae, HFR			6	19	6	0.80		19	31	50
Percent Heavy Vehicles Number of Lanes			6 0	6 1	6 0			6 0	6 1	6 0
Lane Configuration RT channelized?				LTR					LTR	
Flared Approach Storage Percent Grade			NO	l 0				NO	 0	
		Pedes	strian Vo	olumes ar	nd Adjus	tments				
Approach Movement				NB 13	_	SB 14		WB 15		EB 16
Flow (ped/hr) Lane width (ft) Walking Speed (ft/sec) Pedestrian Blockage Factor,	f_pb			0		0		0		0
	D	elav. (Queue Ler	ngth. and	l Level	of Servic	e			
Approach Movement 1	NB .U	1	SB 4U	4		estBound 8	9	E 10	astBound 11	12
Lane Configuration					,	LTR		10	LTR	Τ ζ
Flow Rate Lane Capacity		181 1476		6 1286		31 328			100 448	
v/c 95% Queue Length		0.12 0.4		0.00 0.0		0.10 0.3			0.22 0.8	
Control Delay LOS		7.8 A		7.8 A		17.1 C			15.3 C	
Approach Delay		3.9		0.5		17.1			15.3	
Approach LOS Intersction Delay		5.7				C			C	
			Step 1: M	MOVEMENT	PRIORIT	IES				
Major Street: Approach			North	Bound	_			South	Bound	_

Approach			SouthBound					
Priority	10	1	2	3		4U	4	5
Movement	U	L	Т	R		U	L	Т

6 R

Appendix G Page 75 c Approach Priority	of 140		WestBo 7	und 8	9	I		EastBo 10	und 11	12
Movement			L	Т	R	İ		L	Т	R
Major Street:	Ste	o 2: MOVI	EMENT DE	MAND VOL	UMES AND	FLOW RA	TES			
Approach Movement		10	NorthBo 1	ound 2	3	I	4U	SouthB 4	ound 5	6
Movement		U	Ĺ	T	R		40 U	Ļ	T	R
Volume, V_x Flow Rate, V_x			145 181	185 231	20 25			5 6	65 81	10 13
Minor Street: Approach			WestBo	und				EastBo	und	
Movement			7	8 T	9 R			10 L	11 T	12 R
				-		 				
Volume, V_x Flow Rate, v_x			5 6	15 19	5 6			15 19	25 31	40 50
		Stor	p 3: CONI			TEC				
Major Street: Approach		эсе	NorthB		ILOW KA	· LJ		SouthB		
Movement		10	1	2	3	ļ	4U	4	5	6
		U	L	T	R		U	L	Т	R
Flow Rate, v_x Conflicting Flow, v_c,x			181 94	231	25			6 256	81	13
Minor Street: Approach			WestBo	und				EastBo	und	
Movement			7 L	8 T	9 R			10 L	11 T	12 R
Flow Rate, v_x			6	19	6			19	31	50
Conflicting Flow, v_c,x			0 747	713	244			719	719	88
Step 4: CRITICAL HEADWAYS and FOLLOW-UP HEADWAYS										
CRITICAL HEADWAYS								Fa	stBound	
CRITICAL HEADWAYS Approach Movement	NB 1U	1	SB 4U	4	We 7	stBound 8	9	10	stBound	12
Approach Movement	NB		SB		We	stBound				12 R
Approach	NB 1U	1	SB 4U	4	We 7	stBound 8	9	10	11	
Approach Movement t_c,base Single Stage Stage I Stage II	NB 1U	1 L 4.1	SB 4U	4 L 4.1	We 7 L 7.1	stBound 8 T 6.5	9 R 6.2	10 L 7.1	11 T 6.5	R 6.2
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV	NB 1U	1 L	SB 4U	4 L	We 7 L 7.1 1.0 0.06	stBound 8 T 6.5 1.0 0.06	9 R 6.2 1.0 0.06	10 L 7.1 1.0 0.06	11 T 6.5 1.0 0.06	R 6.2 1.0 0.06
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G	NB 1U	1 L 4.1 1.0 0.06	SB 4U	4 4.1 1.0 0.06	We 7 L 7.1 1.0 0.06 0.2 0	stBound 8 T 6.5 1.0 0.06 0.2 0	9 R 6.2 1.0 0.06 0.1 0	10 L 7.1 1.0 0.06 0.2 0	11 T 6.5 1.0 0.06 0.2 0	R 6.2 1.0 0.06 0.1 0
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c	NB 1U	1 4.1 1.0 0.06 0.0	SB 4U	4.1 1.0 0.06 0.0	We 7 2 7.1 1.0 0.06 0.2 0.0	stBound 8 T 6.5 1.0 0.06 0.2 0.0	9 R 6.2 1.0 0.06 0.1 0.0	10 L 7.1 1.0 0.06 0.2 0 0.0	11 T 6.5 1.0 0.06 0.2 0 0.0	R 6.2 1.0 0.06 0.1 0 0.0
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I	NB 1U	1 L 4.1 1.0 0.06	SB 4U	4 4.1 1.0 0.06	We 7 L 7.1 1.0 0.06 0.2 0	stBound 8 T 6.5 1.0 0.06 0.2 0	9 R 6.2 1.0 0.06 0.1 0	10 L 7.1 1.0 0.06 0.2 0	11 T 6.5 1.0 0.06 0.2 0	R 6.2 1.0 0.06 0.1 0
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II	NB 1U	1 4.1 1.0 0.06 0.0	SB 4U	4.1 1.0 0.06 0.0	We 7 2 7.1 1.0 0.06 0.2 0.0	stBound 8 T 6.5 1.0 0.06 0.2 0.0	9 R 6.2 1.0 0.06 0.1 0.0	10 L 7.1 1.0 0.06 0.2 0 0.0	11 T 6.5 1.0 0.06 0.2 0 0.0	R 6.2 1.0 0.06 0.1 0 0.0
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS	NB 1U	1 4.1 1.0 0.06 0.0	SB 4U	4.1 1.0 0.06 0.0	We 7 7.1 7.1 1.0 0.06 0.2 0 0.0 7.16	stBound 8 T 6.5 1.0 0.06 0.2 0.0	9 R 6.2 1.0 0.06 0.1 0.0 6.26	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea	11 T 6.5 1.0 0.06 0.2 0 0.0	R 6.2 1.0 0.06 0.1 0 0.0 6.26
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II	NB 1U U NB 1U	1 4.1 1.0 0.06 0.0 4.16	4U U SB 4U SB	4 4.1 1.0 0.06 0.0 4.16	We 7 7.1 7.1 1.0 0.06 0.2 0.0 7.16 We 7	stBound 8 T 6.5 1.0 0.06 0.2 0.0 6.56 stBound 8	9 R 6.2 1.0 0.06 0.1 0.0 6.26 9	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 11	R 6.2 1.0 0.06 0.1 0 0.0 6.26
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement	NB 1U U NB	1 4.1 1.0 0.06 0.0 4.16	SB 4U U SB	4 4.1 1.0 0.06 0.0 4.16	We 7 L 7.1 1.0 0.06 0.2 0 0.0 7.16 We 7 L	stBound 8 T 6.5 1.0 0.06 0.2 0.0 6.56 stBound 8 T	9 R 6.2 1.0 0.06 0.1 0 0.0 6.26 9 R	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10 L	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 11 T	R 6.2 1.0 0.06 0.1 0 0.0 6.26
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV	NB 1U U NB 1U	1 4.1 4.1 1.0 0.06 0.0 4.16	4U U SB 4U SB	4 4.1 1.0 0.06 0.0 4.16 4 L	We 7 L 7.1 1.0 0.06 0.2 0 0.0 7.16 We 7 L 3.5 0.9	stBound 8 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 8 T 4.0 0.9	9 R 6.2 1.0 0.06 0.1 0 0.0 6.26 9 R 3.3 0.9	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10 L 3.5 0.9	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 11 T 4.0 0.9	R 6.2 1.0 0.06 0.1 0 0.0 6.26 12 R 3.3 0.9
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base	NB 1U U NB 1U	1 4.1 4.1 0.06 0.0 4.16	4U U SB 4U SB	4 4.1 1.0 0.06 0.0 4.16 4 L	We 7 L 7.1 1.0 0.06 0.2 0 0.0 7.16 We 7 L 3.5	stBound 8 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 8 T 4.0	9 R 6.2 1.0 0.06 0.1 0 0.0 6.26 9 R 3.3	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10 L 3.5	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 11 T 4.0	R 6.2 1.0 0.06 0.1 0 0.0 6.26 12 R 3.3
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV	NB 1U U NB 1U	1 4.1 1.0 0.06 0.0 4.16 1 L 2.2 0.9 0.06 2.25	4U U SB 4U U SB 4U U	4 L 4.1 1.0 0.06 0.0 4.16 4 L 2.2 0.9 0.06 2.25	We 7 L 7.1 1.0 0.06 0.2 0 0.0 7.16 We 7 L 3.5 0.9 0.06 3.55	stBound 8 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 8 T 4.0 0.9 0.06 4.05	9 R 6.2 1.0 0.06 0.1 0 0.0 6.26 9 R 3.3 0.9 0.06	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10 L 3.5 0.9 0.06	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 11 T 4.0 0.9 0.06	R 6.2 1.0 0.06 0.1 0 0.0 6.26 12 R 3.3 0.9 0.06
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f	NB 1U U NB 1U U S PRESEN	1 L 4.1 1.0 0.06 0.0 4.16 1 L 2.2 0.9 0.06 2.25	4U 2U 3B 4U 2U 8B 4U 2U 8D 2D 2D 2D 2D 2D 2D 2D 2D 2D 2D 2D 2D 2D	4 L 4.1 1.0 0.06 0.0 4.16 4 L 2.2 0.9 0.06 2.25	We 7 1.0 0.06 0.2 0.0 7.16 We 7 1 3.5 0.9 0.06 3.55 CAPACITI	stBound 8 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 8 T 4.0 0.9 0.06 4.05 ES	9 R 6.2 1.0 0.06 0.1 0 0.0 6.26 9 R 3.3 0.9 0.06	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10 L 3.5 0.9 0.06 3.55	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 11 T 4.0 0.9 0.06 4.05	R 6.2 1.0 0.06 0.1 0 0.0 6.26 12 R 3.3 0.9 0.06
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f	NB 1U U NB 1U U S PRESENT NB 1U	1 4.1 4.1 1.0 0.06 0.0 4.16 1 L 2.2 0.9 0.06 2.25 	4U U 4U SB 4U U EP 5: PO SB	4 4.1 1.0 0.06 0.0 4.16 4 L 2.2 0.9 0.06 2.25 TENTIAL 4	We 7 7.1 7.1 1.0 0.06 0.2 0.0 7.16 We 7 2 3.5 0.9 0.06 3.55 CAPACITI We 7	stBound 8 T 6.5 1.0 0.06 0.2 0.0 6.56 stBound 8 T 4.0 0.9 0.06 4.05 ESstBound 8	9 R 6.2 1.0 0.06 0.1 0.0 6.26 9 R 3.3 0.9 0.06 3.35	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10 L 3.5 0.9 0.06 3.55 Ea 10	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 11 T 4.0 0.9 0.06 4.05 stBound 11	R 6.2 1.0 0.06 0.1 0 0.0 6.26 12 R 3.3 0.9 0.06 3.35
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach	IU U NB IU U NB IU U S PRESENT NB	1 4.1 4.1 0.06 0.0 4.16 1 L 2.2 0.9 0.06 2.25 Sternal Sternal U 4U SB 4U U EP 5: PO ⁻ SB	4 4.1 1.0 0.06 0.0 4.16 4 1.2 0.9 0.06 2.25 TENTIAL 4 L	We 7 1 7.1 1.0 0.06 0.2 0 0.0 7.16 We 7 1 3.5 0.9 0.06 3.55 CAPACITI We 7 L	stBound 8 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 8 T 4.0 0.9 0.06 4.05 ES stBound 8 T	9 R 6.2 1.0 0.06 0.1 0 0.0 6.26 9 R 3.3 0.9 0.06 3.35 9 R	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10 L 3.5 0.9 0.06 3.55 Ea 10 L Ea	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 11 T 4.0 0.9 0.06 4.05 stBound 11 T	R 6.2 1.0 0.06 0.1 0 0.0 6.26 12 R 3.3 0.9 0.06 3.35	
Approach Movement t_c,base single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement T_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach Movement V_c,X	NB 1U U NB 1U U S PRESENT NB 1U	1 4.1 4.1 1.0 0.06 0.0 4.16 1 L 2.2 0.9 0.06 2.25 T 1 L 94	4U U 4U SB 4U U EP 5: PO SB	4 4.1 1.0 0.06 0.0 4.16 4 2.2 0.9 0.06 2.25 TENTIAL 4 L 256	We 7 1 7.1 1.0 0.06 0.2 0 0.0 7.16 We 7 L 3.5 0.9 0.06 3.55 CAPACITI We 7 L We 7 L 747	stBound 8 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 8 T 4.0 0.9 0.06 4.05 ES stBound 8 T 713	9 R 6.2 1.0 0.06 0.1 0 0.0 6.26 9 R 3.3 0.9 0.06 3.35 9 R 244	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10 L 3.5 0.9 0.06 3.55 Ea 10 L Ea 10 L Ea	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 11 T 4.0 0.9 0.06 4.05 stBound 11 T 719	R 6.2 1.0 0.06 0.1 0 0.0 6.26 12 R 3.3 0.9 0.06 3.35 12 R 88
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach Movement V_C,X t_c,X t_f,X	NB 1U U NB 1U U S PRESENT NB 1U	1 4.1 1.0 0.06 0.0 4.16 1 L 2.2 0.9 0.06 2.25 Sto 1 L 94 4.16 2.25	4U U 4U SB 4U U EP 5: PO SB	4 4.1 1.0 0.06 0.0 4.16 4 L 2.2 0.9 0.06 2.25 TENTIAL 4 L 256 4.16 2.25	We 7 1. 7.1 1.0 0.06 0.2 0 0.0 7.16 We 7 2 3.5 0.9 0.06 3.55 CAPACITI We 7 L 747 7.16 3.55	stBound 8 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 8 T 4.0 0.9 0.06 4.05 ES stBound 8 T 713 6.56 4.05	9 R 6.2 1.0 0.06 0.1 0 0.0 6.26 9 R 3.3 0.9 0.06 3.35 9 R 244 6.26 3.35	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10 L 3.5 0.9 0.06 3.55 Ea 10 L Ea 10 L Ea 2.5 5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 11 T 4.0 0.9 0.06 4.05 stBound 11 T 719 6.56 4.05	R 6.2 1.0 0.06 0.1 0 0.0 6.26 12 R 3.3 0.9 0.06 3.35 12 R 88 6.26 3.35
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach Movement V_c,x t_c,x	NB 1U U NB 1U U S PRESENT NB 1U	1 4.1 4.1 1.0 0.06 0.0 4.16 1 L 2.2 0.9 0.06 2.25 T 1 L 94 4.16	4U U 4U SB 4U U EP 5: PO SB	4 4.1 1.0 0.06 0.0 4.16 4 L 2.2 0.9 0.06 2.25 TENTIAL 4 L 256 4.16	We 7 1 7.1 1.0 0.06 0.2 0 0.0 7.16 We 7 L 3.5 0.9 0.06 3.55 CAPACITI We 7 L 747 7.16	stBound 8 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 8 T 4.0 0.9 0.06 4.05 ES stBound 8 T 713 6.56	9 R 6.2 1.0 0.06 0.1 0 0.0 6.26 9 R 3.3 0.9 0.06 3.35 9 R 9 R 244 6.26	10 L 7.1 1.0 0.06 0.2 0 0.0 7.16 Ea 10 L 3.5 0.9 0.06 3.55 Ea 10 L Ea 10 L Ea 2,5 2,5 2,5 2,5 2,5 2,5 2,5 2,5 2,5 2,5	11 T 6.5 1.0 0.06 0.2 0 0.0 6.56 stBound 11 T 4.0 0.9 0.06 4.05 stBound 11 T 719 6.56	R 6.2 1.0 0.06 0.1 0 0.0 6.26 12 R 3.3 0.9 0.06 3.35 12 R 88 6.26

Pedestrian Impedance Approach

Steps 6 - 9: MOVEMENT CAPACITIES

NB

SB

WB

EΒ

Appendix G Page 76 of 140 Movement		13		14		15		16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb		0		0		0		0
Major-Street Left-Turn Movements				1		4		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State	e, p*_0,j			94 1476 1.000 1476 0.877 0.855		256 1286 1.000 1286 0.995 0.995		
Minor-Street Right-Turn Movements				9		12		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				244 785 1.000 785 0.992		88 960 1.000 960 0.948		
Major-Street U-Turn Movements				10		40		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j								
Minor-Street Through Movements				8		11		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				713 353 1.000 0.851 300 0.937		719 350 1.000 0.851 298 0.895		
Minor-Street Left-Turn Movements				7		10		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor, Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	, p"			747 324 1.000 0.762 0.816 0.774 251		719 339 1.000 0.798 0.844 0.838 284		
Step 10 SHARED-LANE CAPACITY OF MINOR STREET APPROA): FINAL (CAPACIT	Y ADJUST	MENTS				
Approach Movement Lane Configuration		Wes [.] 7	tBound 8 LTR	9		Ea 10	StBound 11 LTR	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH		251	31 300 328	785		284	100 298 448	960
CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTS	Step 11: 0	CONTROL	DELAY					
Approach NB Movement 10 1	SB	4	Wes 7	tBound 8	9	Ea 10	stBound 11	12
Flow Rate 181 Movement Capacity 1476 Lane Configuration Shared Capacity Control Delay 7.8		6 1286 7.8	6 251	19 300 LTR 328 17.1	6 785	19 284	31 298 LTR 448 15.3	50 960
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement				NB 2		SB 5		
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, Delay to Major Left-turning Vehicles, d_MLT Major Street Through Vehicles in Shared Lar Major Street Turning Vehicles in Shared Lar Saturation Flow Rate for Major Street Throu	r ne, v_i1 ne, v_i2			1 0.855 7.8 231 206 1700		1 0.995 7.8 81 19 1700		

Appendix G Page 77 of 140		
Saturation Flow Rate for Major Street Right-Turn, s_i2	1700	1700
Delay to Rank 1 Vehicles, d_Rank1	1.1	0.0

Steps Approach	12 - 13: A NB	PPROACH/	INTERSEC SB	TION CON	TROL	DELAY and 9 WestBound	5% QUEU		S astBound	
Movement Lane Configuration	10	1	4U	4	7	8 LTR	9	10	11 LTR	12
Flow Rate Lane Capacity v/c 95% Queue Length Control Delay LOS Approach Delay Approach LOS		181 1476 0.12 0.4 7.8 A 3.9		6 1286 0.00 0.0 7.8 A 0.5		31 328 0.10 0.3 17.1 C 17.1 C			100 448 0.22 0.8 15.3 C 15.3 C	
Intersction Delay		5.7				C			C	

This TWSC text report was created in HCS™ TWSC Version 7.8 on 9/5/2019 3:13:32 PM

HCS7 Two-Way Stop-Control Text Report

File Name: Analyst: Agency: Date Performed: Time Analyzed: Jurisdiction: Analysis Year: Project Description: Units: Intersection Name: Major Street Direction: East/West Street Name: North/South Street Name: Analysis Time Period (hrs):	TWO-WAY STOP CONTROL (TWSC) Analysis 2045-Build_PM_ElkCreek-143rd_TWSC.xtw HDR 7/3/2019 PM - 2045 Build Cond. Meade County 2045 Southern Meade County Corridor Study U.S. Customary Elk Creek & 143rd Ave East-West Elk Creek Road 143rd Avenue 0.25					
·	Ve	hicle Vo	lumes an	d Adjust	tments	
Major Street: Approach Movement	10 U	EastB 1 L	ound 2 T	3 R		4U U
Volume Peak Hour Factor, PHF		5	35	5	0.80	
Hourly Flow Rtae, HFR Percent Heavy Vehicles		6 20	44	6	0.80	

Hourly Flow Rtae, HFR Hourly Flow Rtae, HFR Percent Heavy Vehicles Number of Lanes Lane Configuration Median Type Median Storage RT channelized? Left-Turn Lane Storage Upstream Signal?	0	6 20 0	44 1 LTR	6 0	0 Undivided Not Present	6 20 0	31 1 LTR	6 0
Minor Street: Approach Movement		NorthBo 7 L	ound 8 T	9 R		South 10 L	Bound 11 T	12 R
Volume		5	5	5	0.00	5	5	5
Peak Hour Factor, PHF Hourly Flow Rtae, HFR Percent Heavy Vehicles Number of Lanes Lane Configuration RT channelized?		6 20 0	6 20 1 LTR	6 20 0	0.80	6 20 0	6 20 1 LTR	6 20 0
Flared Approach Storage Percent Grade		NO	 0			No	 0	

WestBound

5 T

25

6 Ř 5

4 L

5

Approach Movement	Pedestrian Volumes EB 13	and Adjustments WB 14	NB 15	SB 16
Flow (ped/hr)	0	0	0	0

Lane Width (ft) Walking Speed (ft/sec) Pedestrian Blockage Factor, f_pb

	Delay,	Queue Le	ength, and	d Level	of Servio	ce			
Approach	EB	WE	3	NC	orthBound		So	uthBound	
Movement	10 1	4U	4	7	8	9	10	11	12
Lane Configuration					LTR			LTR	
Flow Rate	6		6		19			19	
Lane Capacity	1464		1449		830			834	
v/c	0.00		0.00		0.02			0.02	
95% Queue Length	0.0		0.0		0.1			0.1	
Control Delay	7.5		7.5		9.4			9.4	
LOS	А		Α		A			A	
Approach Delay	0.9		1.1		9.4			9.4	
Approach LOS					A			A	
Intersction Delay	3.3								
		Step 1:	MOVEMENT	PRIORIT	IES				
Major Street:									
Approach		East	Bound				WestB	ound	
Priority	10	1	2	3	1	4U	4	5	6
Movement	U	Ĺ	Ť	R	i	U	Ĺ	T	Ř

Appendix G Page 79 o Approach Priority Movement	ıf 140		NorthBo 7 L	ound 8 T	9 R			SouthB 10 L	ound 11 T	12 R
	Ste	2: MOV	EMENT DE	MAND VOL	UMES AND	FLOW RA	TES			
Major Street: Approach			EastBo	und				WestBo	und	
Movement		10	1	2	3	ļ	4U	4	5	6
		U	L	Т	R	I	U	L	Т	R
Volume, V_x Flow Rate, v_x			5 6	35 44	5 6			5 6	25 31	5 6
Minor Street:										
Approach Movement			NorthBo 7	ound 8	9	1		SouthB 10	ound 11	12
			Ĺ	T	R	İ		L	T	R
Volume, V_x			5	5	5			5	5	5
Flow Rate, v_x			6	6	6			6	6	6
		C to a				-				
Major Street:		Ste	p 3: CON	FLICIING	FLOW RA	IES				
Approach		1	EastBo		2		4	WestBo		C
Movement		1U U	1 L	2 T	3 R		4U U	4 L	5 T	6 R
						•				
Flow Rate, v_x Conflicting Flow, v_c,x			6 38	44	6			6 50	31	6
Minor Street:										
Approach			NorthBo	ound				SouthB	ound	
Movement			7	8	9			10 L	11 T	12
			L	Т	R	I		L	I	R
Flow Rate, v_x Conflicting Flow, v_c,x			6 113	6 109	6 47			6 113	6 109	6 34
confirenting Flow, v_c,x			112	109	47			112	109	54
	Step	4: CRIT	ICAL HEAI	DWAYS an	d FOLLOW	-UP HEAD	WAYS			
CRITICAL HEADWAYS Approach	EB		WB		Nor	thBound		Sou	thBound	
Movement	10	1	4U	4	7	8	9	10	11	12
	U	L	U	L	L	Т	R	L	Т	R
t_c,base										
Single Stage Stage I		4.1		4.1	7.1	6.5	6.2	7.1	6.5	6.2
Stage II		1.0			1.0	1.0	1.0		1.0	1.0
t_c,HV P_HV		1.0 0.20		1.0 0.20	1.0 0.20	1.0 0.20	1.0 0.20	1.0 0.20	1.0 0.20	1.0 0.20
t_c,G		0.20		0.20	0.2	0.2	0.1	0.2	0.2	0.1
G t_3,LT		0.0		0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0
t_c										
Single Stage Stage I		4.30		4.30	7.30	6.70	6.40	7.30	6.70	6.40
Stage II										
FOLLOW-UP HEADWAYS										
Approach	EB	1	WB	4	Nor	thBound	0		thBound	10
Movement	1U U	1 L	40 U	4 L	7 L	8 T	9 R	10 L	11 T	12 R
t_f,base		2.2		2.2	3.5	4.0	3.3	3.5	4.0	3.3
				2.2	0.9	4.0 0.9	0.9	0.9	4.0 0.9	0.9
t_f,HV		0.9		0.9	0.9	0.5	0.5			
t_f,HV P_HV		0.9 0.20		0.9 0.20 2.38	0.20	0.20	0.20	0.20	0.20	0.20
t_f,HV		0.9		0.9 0.20 2.38			0.20 3.48	0.20 3.68		0.20 3.48
t_f,HV P_HV t_f		0.9 0.20 2.38	ер 5: РО ⁻	0.20 2.38	0.20 3.68	0.20 4.18	0.20	0.20	0.20	
t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT		0.9 0.20 2.38	-	0.20 2.38	0.20 3.68 CAPACITI	0.20 4.18 ES	0.20	0.20 3.68	0.20 4.18	
t_f,HV P_HV t_f	EB 1U	0.9 0.20 2.38 St T 1	WB 4U	0.20 2.38 TENTIAL 4	0.20 3.68 CAPACITI Nor 7	0.20 4.18 ES thBound 8	0.20 3.48 9	0.20 3.68 	0.20 4.18 thBound 11	3.48
t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach	EB	0.9 0.20 2.38 St	WB	0.20 2.38 TENTIAL	0.20 3.68 CAPACITI Nor	0.20 4.18 ES thBound	0.20 3.48	0.20 3.68 	0.20 4.18 thBound	3.48
t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach Movement 	EB 1U	0.9 0.20 2.38 St T 1 L 38	WB 4U	0.20 2.38 TENTIAL 4 L 50	0.20 3.68 CAPACITI Nor 7 L 113	0.20 4.18 ES thBound 8 T 109	0.20 3.48 9 R 47	0.20 3.68 	0.20 4.18 thBound 11 T 109	3.48 12 R 34
t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach Movement V_c,x t_c,x	EB 1U	0.9 0.20 2.38 St T 1 L 38 4.30	WB 4U	0.20 2.38 TENTIAL 4 L 50 4.30	0.20 3.68 CAPACITI 7 L 113 7.30	0.20 4.18 ES thBound 8 T 109 6.70	0.20 3.48 9 R 47 6.40	0.20 3.68 Sou 10 L 113 7.30	0.20 4.18 thBound 11 T 109 6.70	3.48 12 R 34 6.40
t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach Movement 	EB 1U	0.9 0.20 2.38 St T 1 L 38	WB 4U	0.20 2.38 TENTIAL 4 L 50	0.20 3.68 CAPACITI Nor 7 L 113	0.20 4.18 ES thBound 8 T 109	0.20 3.48 9 R 47	0.20 3.68 	0.20 4.18 thBound 11 T 109	3.48 12 R 34

Pedestrian Impedance Approach _Steps 6 - 9: MOVEMENT CAPACITIES_

EB

NB

SB

Appendix G Page 80 of 140 Movement		13		14		15		16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb		0		0		0		0
Major-Street Left-Turn Movements				1		4		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State	e, p*_0,	j		38 1464 1.000 1464 0.996 0.996		50 1449 1.000 1449 0.996 0.996		
Minor-Street Right-Turn Movements				9		12		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				47 973 1.000 973 0.994		34 989 1.000 989 0.994		
Major-Street U-Turn Movements				10		40		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j								
Minor-Street Through Movements				8		11		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				109 748 1.000 0.991 742 0.992		109 748 1.000 0.991 742 0.992		
Minor-Street Left-Turn Movements				7		10		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor, Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	, p"			113 824 1.000 0.983 0.987 0.981 808		113 824 1.000 0.983 0.987 0.981 808		
		CAPACI	TY ADJUST	MENTS				
Approach Movement Lane Configuration		Nort 7	thBound 8 LTR	9		Sou 10	IthBound 11 LTR	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH		808	19 742 830	973		808	19 742 834	989
CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTS	Step 11:	CONTROL	_ DELAY					
Approach EB Movement 10 1	s WB 4U	4	Nort 7	thBound 8	9	Sou 10	thBound 11	12
Flow Rate 6 Movement Capacity 1464 Lane Configuration Shared Capacity Control Delay 7.5		6 1449 7.5	6 808	6 742 LTR 830 9.4	6 973	6 808	6 742 LTR 834 9.4	6 989
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement				EB 2		WB 5		
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, Delay to Major Left-turning Vehicles, d_MLT Major Street Through Vehicles in Shared Lar Major Street Turning Vehicles in Shared Lar Saturation Flow Rate for Major Street Throu	r ne, v_i1 ne, v_i2			1 0.996 7.5 44 13 1700		1 0.996 7.5 31 13 1700		

Appendix G Page 81 of 140		
Saturation Flow Rate for Major Street Right-Turn, s_i2	1700	1700
Delay to Rank 1 Vehicles, d_Rank1	0.0	0.0
•		

Approach	_Steps 12	- 13: EB		INTERSEC WB	TION CO	NTROL	DELAY and NorthBou		UE LENGTHS Sou	thBound	
Movement Lane Configurati	on	10	1	40	4	7	8 LTR	9	10	11 LTR	12
Flow Rate		· · · · · · · · · · · · · · · · · · ·	6		6		19			19	
Lane Capacity			1464		1449		830			834	
v/c			0.00		0.00		0.02	2		0.02	
95% Queue Length	l i i i i i i i i i i i i i i i i i i i		0.0		0.0		0.1			0.1	
Control Delay			7.5		7.5		9.4			9.4	
LOS			А		А		А			Α	
Approach Delay			0.9		1.1		9.4			9.4	
Approach LOS Intersction Dela	y		3.3				A			A	

This TWSC text report was created in HCS™ TWSC Version 7.8 on 9/5/2019 3:15:00 PM

HCS7 Two-Way Stop-Control Text Report

$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$		HCS7	Two-Way	Stop-Con	trol Tex	t Report				
Major Street: Approach MovementNo 1Northbound 1Southbound 4Southbound 4Southbound 4Southbound 4Southbound 4Southbound 4Southbound 5Southbound 4Southbound 5Southbound 4Southbound 5Southbound 4Southbound 5Southbound 4Southbound 5Southbound 4Southbound 5Southbound 6Southbound <td>Analyst: Agency: Date Performed: Time Analyzed: Jurisdiction: Analysis Year: Project Description: Units: Intersection Name: Major Street Direction: East/West Street Name: North/South Street Name:</td> <td>2045- HDR HDR 3/7/2 PM - Meade 2045 South U.S. Elk C North Elk C</td> <td>Build_PM 2019 2045 Bui County Customar Creek & E South Creek Roa</td> <td>1_ElkCree ld Cond. le County lk Vale</td> <td>k-ElkVal</td> <td>e_TWSC.x</td> <td>tw</td> <td></td> <td></td> <td></td>	Analyst: Agency: Date Performed: Time Analyzed: Jurisdiction: Analysis Year: Project Description: Units: Intersection Name: Major Street Direction: East/West Street Name: North/South Street Name:	2045- HDR HDR 3/7/2 PM - Meade 2045 South U.S. Elk C North Elk C	Build_PM 2019 2045 Bui County Customar Creek & E South Creek Roa	1_ElkCree ld Cond. le County lk Vale	k-ElkVal	e_TWSC.x	tw			
Approach WovementNorthBound USouthBound LSouthBound TSouthBound KVolume Peak Hour Factor, PHF Hourly Flow Rtae, HFR Hourly Flow Rtae, HFR Hourly Flow Rtae, HFR Hourly Flow Rtae, HFR Channel 12ed?15250.8051010Lane Configuration Median Type ape RT channel 12ed? Left-Turn Lane Storage Upstream Signal?010010010Minor Street: Approach MovementWestBound T8910111212Volume Peak Hour Factor, PHF Hourly Flow Rtae, HFR Connel 12ed?51050.80102015Peak Hour Factor, PHF Hourly Flow Rtae, HFR R configuration RT channel 12ed?51050.80132519Volume Peak Hour Factor, PHF Hourly Flow Rtae, HFR R configuration RT channel 12ed?0114	Major Street.	Ve	hicle Vo	lumes an	d Adjust	ments				
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Hourly Flow Rtae; HFR 19 19 31 6 13 13 Number of Lanes 0 1 0 0 1 11 12 0 1 11 12 0 10 10 10 10 10 10 10 10 10 11 12 0 10 10 11 12 13 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14			15	15	25	0.80		5	10	10
Number of Lañes 0 0 1 0 0 1 0 Median Type LTR Undivided LTR Undivided LTR Undivided Median Storage RT channelized? LTR Undivided LTR Undivided Left-Turn Lake Storage Upstream Signal? Not Present Not Present Interview Approach R 9 10 11 12 Approach T R 9 10 11 12 Volume Factor, PHF 6 13 6 13 25 19 Percent Heavy Vehicles 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 14 15 16 Percent Heavy Vehicles No 1 10 1 10 1 10 1 10 1 10 1 10 1 10 1 10 1<	Hourly Flow Rtae, HFR			19	31	0.00			13	13
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Flow (ped/hr) Lane width (ft) Walking Speed (ft/sec) Pedestrian Blockage Factor, f_pb0000Delay, Queue Length, and Level of Service SB Movement Lane ConfigurationDelay, Queue Length, and Level of Service WestBound TREastBound 9101112Flow Rate Lane Configuration1962556Flow Rate Lane Configuration1962556Flow Rate Lane Capacity1962556Control Delay7.47.49.69.6Approach Main Rate Lane Capacity1962556Control Delay7.47.49.69.6Approach Bay Approach LOS Intersction Delay2.11.59.69.6Step 1: MOVEMENT PRIORITIESMajor Street: Approach Priority5.44U4U456		reue		NB	nu Aujus	SB				
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Minor Street:

Appendix G Page 83 c Approach Priority Movement	of 140		WestBo 7 L	und 8 T	9 R			EastBo 10 L	und 11 T	12 R
	Cto		_				TEC	-	·	i.
Major Street: Approach Movement	Ste	1U U	EMENT DEN NorthBo 1 L		3 R	FLOW RA	4U U	SouthB 4 L	ound 5 T	6 R
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Minor Street: Approach Movement			WestBou 7 L	und 8 T	9 R			EastBo 10 L	und 11 T	12 R
Volume, V_x Flow Rate, v_x			5 6	10 13	5 6			10 13	20 25	15 19
		Ste	p 3: CONI	FLICTING	FLOW RA	TES				
Major Street: Approach Movement		1U U	NorthBo 1 L	ound 2 T	3 R		4U U	SouthB 4 L	ound 5 T	6 R
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Minor Street: Approach Movement			WestBo 7 L	und 8 T	9 R			EastBo 10 L	und 11 T	12 R
Flow Rate, v_x Conflicting Flow, v_c,x			6 125	13 109	6 34			13 113	25 119	19 19
	Ston	4. CDTT								
	step	4. CRII.	ICAL HEAD	DWAYS an	d FOLLOW	-UP HEAD	WAYS			
CRITICAL HEADWAYS Approach Movement	Step NB 1U U	4. CR11. 1 L	SB 4U U	4 L		StBound 8 T	9 R	Ea 10 L	stBound 11 T	12 R
Approach	NB 1U	1	SB 4U	4	We 7	stBound 8	9	10	11	
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Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach	U U NB NB 1U	1 4.1 1.0 0.14 0.0 4.24	4U U SB 4U SB	4 4.1 1.0 0.14 0.0 4.24	We 7 7.1 7.1 1.0 0.14 0.2 0.0 7.24 We 7	stBound 8 T 6.5 1.0 0.14 0.2 0.0 6.64 stBound 8	9 R 6.2 1.0 0.14 0.1 0.0 6.34	10 L 7.1 1.0 0.14 0.2 0 0.0 7.24 Ea 10	11 T 6.5 1.0 0.14 0.2 0 0.0 6.64 stBound 11	R 6.2 1.0 0.14 0.1 0.0 6.34
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f	NB U U NB U U	1 L 4.1 1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33 	4U U SB 4U SB	4 L 4.1 1.0 0.14 0.0 4.24 4 L 2.2 0.9 0.14 2.33	We 7 L 7.1 1.0 0.14 0.2 0 0.0 7.24 We 7 L 3.5 0.9 0.14 3.63	stBound 8 T 6.5 1.0 0.14 0.2 0 0.0 6.64 stBound 8 T 4.0 0.9 0.14 4.13	9 R 6.2 1.0 0.14 0.1 0.0 6.34 9 R 3.3 0.9 0.14	10 L 7.1 1.0 0.14 0.2 0 0.0 7.24 Ea 10 L 3.5 0.9 0.14	11 T 6.5 1.0 0.14 0.2 0 0.0 6.64 stBound 11 T 4.0 0.9 0.14	R 6.2 1.0 0.14 0.1 0.0 6.34 12 R 3.3 0.9 0.14
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV	NB U U NB U U	1 L 4.1 1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33 	4U U SB SB 4U U SB	4 L 4.1 1.0 0.14 0.0 4.24 4 L 2.2 0.9 0.14 2.33	We 7 7.1 7.1 1.0 0.14 0.2 0 0.0 7.24 We 7 L 3.5 0.9 0.14 3.63 CAPACITI	stBound 8 T 6.5 1.0 0.14 0.2 0 0.0 6.64 stBound 8 T 4.0 0.9 0.14 4.13	9 R 6.2 1.0 0.14 0.1 0.0 6.34 9 R 3.3 0.9 0.14	10 L 7.1 1.0 0.14 0.2 0.0 7.24 Ea 10 L 3.5 0.9 0.14 3.63	11 T 6.5 1.0 0.14 0.2 0 0.0 6.64 stBound 11 T 4.0 0.9 0.14	R 6.2 1.0 0.14 0.1 0.0 6.34 12 R 3.3 0.9 0.14
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFECT Approach	NB 1U U NB 1U U S PRESENT NB 1U	1 4.1 1.0 0.14 0.0 4.24 1 L 2.2 0.9 0.14 2.33 	4U U 4U SB 4U U EP 5: PO ⁻ 4U SB	4 4.1 1.0 0.14 0.0 4.24 4 2.2 0.9 0.14 2.33 TENTIAL 4	We 7 7.1 7.1 1.0 0.14 0.2 0.0 7.24 We 7 L 3.5 0.9 0.14 3.63 CAPACITI We 7	stBound 8 T 6.5 1.0 0.14 0.2 0.0 6.64 stBound 8 T 4.0 0.9 0.14 4.13 ES stBound 8	9 R 6.2 1.0 0.14 0.1 0.0 6.34 9 R 3.3 0.9 0.14 3.43 9	10 L 7.1 1.0 0.14 0.2 0 0.0 7.24 Ea 10 L 3.5 0.9 0.14 3.63 Ea 10	11 T 6.5 1.0 0.14 0.2 0.0 6.64 stBound 11 T 4.0 0.9 0.14 4.13 stBound 11	R 6.2 1.0 0.14 0.1 0 0.0 6.34 12 R 3.3 0.9 0.14 3.43

Pedestrian Impedance Approach

Steps 6 - 9: MOVEMENT CAPACITIES

SB

WB

EΒ

Appendix G Page 84 of 140 Movement		13		14		15		16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb		0		0		0		0
Major-Street Left-Turn Movements				1		4		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State	e, p*_0,	j		25 1515 1.000 1515 0.988 0.987		50 1483 1.000 1483 0.996 0.996		
Minor-Street Right-Turn Movements				9		12		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				34 1005 1.000 1005 0.994		19 1026 1.000 1026 0.982		
Major-Street U-Turn Movements				10		40		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j								
Minor-Street Through Movements				8		11		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				109 759 1.000 0.983 746 0.983		119 750 1.000 0.983 737 0.966		
Minor-Street Left-Turn Movements				7		10		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	, p"			125 822 1.000 0.950 0.962 0.944 776		113 838 1.000 0.967 0.974 0.968 811		
Step 1 SHARED-LANE CAPACITY OF MINOR STREET APPRO Approach Movement Lane Configuration	0: FINAL ACHES		TY ADJUST StBound 8 LTR	ments		Ea 10	astBound 11 LTR	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH		776	25 746 806	1005		811	56 737 832	1026
	Step 11:	CONTROL	DELAY					
CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENT: Approach NB Movement 1U 1	s SB 4U	4	Wes 7	stBound 8	9	Ea 10	astBound 11	12
Flow Rate 19 Movement Capacity 1515 Lane Configuration Shared Capacity Control Delay 7.4		6 1483 7.4	6 776	13 746 LTR 806 9.6	6 1005	13 811	25 737 LTR 832 9.6	19 1026
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement				NB 2		SB 5		
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, Delay to Major Left-turning Vehicles, d_ML Major Street Through Vehicles in Shared La Major Street Turning Vehicles in Shared La Saturation Flow Rate for Major Street Thron	T ne, v_i1 ne, v_i2			1 0.987 7.4 19 50 1700		1 0.996 7.4 13 19 1700		

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Saturation Flow Rate for Major Street Right-Turn, s_i2	1700	1700
Delay to Rank 1 Vehicles, d_Rank1	0.1	0.0

Approach	_Steps 12	2 - 13: NB		INTERSEC SB	TION CON	ITROL	DELAY and 9 WestBound			S astBound	
Movement Lane Configurati	on	10	1	40	4	7	8 LTR	9	10	11 LTR	12
Flow Rate Lane Capacity V/c 95% Queue Length Control Delay			19 1515 0.01 0.0 7.4		6 1483 0.00 0.0 7.4		25 806 0.03 0.1 9.6			56 832 0.07 0.2 9.6	
LOS Approach Delay Approach LOS Intersction Dela	У		A 2.1 5.4		A 1.5		A 9.6 A			A 9.6 A	

This TWSC text report was created in HCS™ TWSC Version 7.8 on 9/5/2019 3:15:26 PM

HCS7 Two-Way Stop-Control Text Report

	TWO-WAY STOP CONTROL (TWSC) Analysis
File Name:	2045-Build_PM_ElkCreek-EricksonRaRd_TWSC.xtw
Analyst:	HDR
Agency:	HDR
Date Performed:	7/3/2019
Time Analyzed:	PM – 2045 Build Cond.
Jurisdiction:	Meade County
Analysis Year:	2045
Project Description:	Southern Meade County Corridor Study
Units:	U.S. Customary
Intersection Name:	Elk Creek & Erickson Ra R
Major Street Direction:	East-West
East/West Street Name:	Elk Creek Road
North/South Street Name:	Erickson Ranch Road
Analysis Time Period (hrs):	0.25

	Ve	ehicle Vo	lumes an	d Adjust	ments				
Major Street:		EastB	ound				WestB	ound	
Approach Movement	1U U	L L L	2 T	3 R		40 U	4 L	5 T	6 R
Volume		10	70	75	0.80		20	95	10
Peak Hour Factor, PHF Hourly Flow Rtae, HFR Percent Heavy Vehicles		13 5	88	94	0.80		25 5	119	13
Number of Lanes Lane Configuration	0	0	1 LTR	0		0	Ŏ	1 LTR	0
Median Type Median Storage RT channelized?			LIK		Undivi	ded		LIK	
Left-Turn Lane Storage Upstream Signal?					Not Pr	esent			
Minor Street: Approach		North	Bound				South	Bound	
Movement		7 L	8 T	9 R			10 L	11 T	12 R
Volume Peak Hour Factor, PHF		65	10	30	0.80		10	5	10
Hourly Flow Rtae, HFR Percent Heavy Vehicles Number of Lanes Lane Configuration RT channelized?		81 5 0	13 5 1 LTR	38 5 0	0.00		13 5 0	6 5 1 LTR	13 5 0
Flared Approach Storage Percent Grade		NO	l 0				NO	 0	

	Pedestrian Volumes	and Adjustments		
Approach	EB	WB	NB	SB
Movement	13	14	15	16
Flow (ped/hr)	0	0	0	0

Lane Width (ft) Walking Speed (ft/sec) Pedestrian Blockage Factor, f_pb

Approach Movement Lane Configuration	EB 1U	Delay, 1	Queue Le WB 4U			of Servio orthBound 8 LTR	9	50 10	uthBound 11 LTR	12
Flow Rate Lane Capacity v/c 95% Queue Length Control Delay LOS Approach Delay Approach LOS Intersction Delay		13 1434 0.01 0.0 7.5 A 0.6 4.4		25 1376 0.02 0.1 7.7 A 1.4		131 643 0.20 0.8 12.0 B 12.0 B			31 646 0.05 0.2 10.9 B 10.9 B	
			Step 1:	MOVEMENT	PRIORIT	IES				
Major Street: Approach Priority Movement		1U U	EastB 1 L	ound 2 T	3 R		4U U	WestB 4 L	ound 5 T	6 R

Appendix G Page 87 o Approach Priority Movement	of 140		NorthBo 7 L	ound 8 T	9 R			SouthB 10 L	ound 11 T	12 R
	Step	2: MOVI	EMENT DEM	MAND VOL	UMES AND	FLOW RA	TES			
Major Street: Approach Movement		1U U	EastBou 1 L	und 2 T	3 R		4U U	WestBc 4 L	ound 5 T	6 R
Volume, V_x Flow Rate, v_x			10 13	70 88	75 94			20 25	95 119	10 13
Minor Street: Approach Movement			NorthBo 7 L	ound 8 T	9 R			SouthB 10 L	ound 11 T	12 R
Volume, V_x Flow Rate, v_x			65 81	10 13	30 38			10 13	5 6	10 13
		Stei	o 3: CONF	FLICTING	FLOW RA	TES				
Major Street: Approach Movement		1U U	EastBou 1 L	und 2 T	3 R		4U U	WestBc 4 L	ound 5 T	6 R
Flow Rate, v_x Conflicting Flow, v_c,x			13 131	88	94			25 181	119	13
Minor Street: Approach Movement			NorthBo 7 L	ound 8 T	9 R			SouthB 10 L	ound 11 T	12 R
Flow Rate, v_x Conflicting Flow, v_c,x			81 344	13 341	38 134			13 359	6 381	13 125
	Step	4: CRIT	ICAL HEAD	DWAYS an	d FOLLOW	-UP HEAD	WAYS			
CRITICAL HEADWAYS Approach	EB		WB		Nor	thBound			thBound	10
	EB 1U U	1 L	WB 4U U	4 L		thBound 8 T	9 R	Sou 10 L	thBound 11 T	12 R
Approach Movement t_c,base Single Stage Stage I	10		4U		Nor 7	8		10	11	
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G	10	L	4U	L	Nor 7 L 7.1 1.0 0.05 0.2	8 T 6.5 1.0 0.05 0.2	R 6.2 1.0 0.05 0.1	10 L 7.1 1.0 0.05 0.2	11 T 6.5 1.0 0.05 0.2	R 6.2 1.0 0.05 0.1
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT	10	L 4.1 1.0	4U	L 4.1 1.0	Nor 7 L 7.1 1.0 0.05	8 T 6.5 1.0 0.05	R 6.2 1.0 0.05	10 L 7.1 1.0 0.05	11 T 6.5 1.0 0.05	R 6.2 1.0 0.05
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G	10	4.1 1.0 0.05	4U	L 4.1 1.0 0.05	Nor 7 L 7.1 1.0 0.05 0.2 0	8 T 6.5 1.0 0.05 0.2 0	R 6.2 1.0 0.05 0.1 0	10 L 7.1 1.0 0.05 0.2 0	11 T 6.5 1.0 0.05 0.2 0	R 6.2 1.0 0.05 0.1 0
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS	10 U	L 4.1 1.0 0.05 0.0	4U U	4.1 1.0 0.05 0.0	Nor 7 1 7.1 1.0 0.05 0.2 0 0.0 7.15	8 T 6.5 1.0 0.05 0.2 0 0.0 6.55	R 6.2 1.0 0.05 0.1 0 0.0	10 L 7.1 1.0 0.05 0.2 0 0.0 7.15	11 T 6.5 1.0 0.05 0.2 0 0.0 6.55	R 6.2 1.0 0.05 0.1 0 0.0
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II	10	L 4.1 1.0 0.05 0.0	4U	4.1 1.0 0.05 0.0	Nor 7 1 7.1 1.0 0.05 0.2 0 0.0 7.15	8 T 6.5 1.0 0.05 0.2 0 0.0	R 6.2 1.0 0.05 0.1 0 0.0	10 L 7.1 1.0 0.05 0.2 0 0.0 7.15	11 T 6.5 1.0 0.05 0.2 0 0.0	R 6.2 1.0 0.05 0.1 0 0.0
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach	10 U EB 10	L 4.1 1.0 0.05 0.0 4.15	4U U WB 4U	L 4.1 1.0 0.05 0.0 4.15	Nor 7 1.0 0.05 0.2 0.0 7.15 Nor 7	8 T 6.5 1.0 0.05 0.2 0.0 6.55	R 6.2 1.0 0.05 0.1 0 0.0 6.25	10 L 7.1 1.0 0.05 0.2 0 0.0 7.15	11 T 6.5 1.0 0.05 0.2 0 0.0 6.55	R 6.2 1.0 0.05 0.1 0 0.0 6.25
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f	10 U U EB 10 U	L 4.1 1.0 0.05 0.0 4.15 1 L 2.2 0.9 0.05 2.25 Steel	4U U WB 4U	L 4.1 1.0 0.05 0.0 4.15 4 L 2.2 0.9 0.05 2.25	Nor 7 1 7.1 1.0 0.05 0.2 0 0.0 7.15 Nor 7 L 3.5 0.9 0.05 3.55	8 T 6.5 1.0 0.05 0.2 0 0.0 6.55 T T HBound 8 T 4.0 0.9 0.05 4.05	R 6.2 1.0 0.05 0.1 0 0.0 6.25 9 R 3.3 0.9 0.05	10 L 7.1 1.0 0.05 0.2 0 0.0 7.15 Sou 10 L 3.5 0.9 0.05	11 T 6.5 1.0 0.05 0.2 0 0.0 6.55 thBound 11 T 4.0 0.9 0.05	R 6.2 1.0 0.05 0.1 0 0.0 6.25 12 R 3.3 0.9 0.05
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFEC Approach	1U U EB 1U U TS PRESENT EB	L 4.1 1.0 0.05 0.0 4.15 1 L 2.2 0.9 0.05 2.25 2.25	40 U 40 U ep 5: РОТ WB	L 4.1 1.0 0.05 0.0 4.15 4 L 2.2 0.9 0.05 2.25 TENTIAL	Nor 7 1.0 0.05 0.2 0.0 7.15 7.15 Nor 7 1 3.5 0.9 0.05 3.55 CAPACITI Nor	8 T 6.5 1.0 0.05 0.2 0.0 6.55 ThBound 8 T 4.0 0.9 0.05 4.05 ES	R 6.2 1.0 0.05 0.1 0 0.0 6.25 9 R 3.3 0.9 0.05 3.35	10 L 7.1 1.0 0.05 0.2 0 0.0 7.15 Sout 10 L 3.5 0.9 0.05 3.55 Sout	11 T 6.5 1.0 0.05 0.2 0 0.0 6.55 thBound 11 T 4.0 0.9 0.05 4.05	R 6.2 1.0 0.05 0.1 0 0.0 6.25 12 R 3.3 0.9 0.05 3.35
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f	1U U EB 1U U TS PRESENT	L 4.1 1.0 0.05 0.0 4.15 1 L 2.2 0.9 0.05 2.25 Steel	40 U 40 U WB 40 U ep 5: POT	L 4.1 1.0 0.05 0.0 4.15 4 L 2.2 0.9 0.05 2.25	Nor 7 1.0 0.05 0.2 0.0 7.15 Nor 7 1 3.5 0.9 0.05 3.55 CAPACITI	8 T 6.5 1.0 0.05 0.2 0 0.0 6.55 ThBound 8 T 4.0 0.9 0.05 4.05	R 6.2 1.0 0.05 0.1 0 0.0 6.25 9 R 3.3 0.9 0.05	10 L 7.1 1.0 0.05 0.2 0 0.0 7.15 Sou 10 L 3.5 0.9 0.05 3.55	11 T 6.5 1.0 0.05 0.2 0 0.0 6.55 thBound 11 T 4.0 0.9 0.05 4.05	R 6.2 1.0 0.05 0.1 0 0.0 6.25 12 R 3.3 0.9 0.05
Approach Movement t_c,base Single Stage Stage I Stage II t_c,HV P_HV t_c,G G t_3,LT t_c Single Stage Stage I Stage II FOLLOW-UP HEADWAYS Approach Movement t_f,base t_f,HV P_HV t_f NO UPSTREAM SIGNAL EFFEC Approach	1U U EB 1U U TS PRESENT EB 1U	L 4.1 1.0 0.05 0.0 4.15 1 L 2.2 0.9 0.05 2.25 2.25 5to	40 U 40 U ep 5: POT 40 WB	L 4.1 1.0 0.05 0.0 4.15 4 L 2.2 0.9 0.05 2.25 TENTIAL 4	Nor 7 7.1 7.1 1.0 0.05 0.2 0.0 7.15 7.15 Nor 7 3.5 0.9 0.05 3.55 CAPACITI Nor 7	8 T 6.5 1.0 0.05 0.2 0.0 6.55 T T HBound 8 T 4.0 0.9 0.05 4.05 ES T T HBound 8	R 6.2 1.0 0.05 0.1 0 0.0 6.25 9 R 3.3 0.9 0.05 3.35 9	10 L 7.1 1.0 0.05 0.2 0 0.0 7.15 Sou 10 L 3.5 0.9 0.05 3.55 Sou 10	11 T 6.5 1.0 0.05 0.2 0 0.0 6.55 thBound 11 T 4.0 0.9 0.05 4.05	R 6.2 1.0 0.05 0.1 0 0.0 6.25 12 R 3.3 0.9 0.05 3.35

Pedestrian Impedance Approach

Steps 6 - 9: MOVEMENT CAPACITIES

WB

NB

SB

Appendix G Page 88 of 140 Movement		13		14		15		16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb		0		0		0		0
Major-Street Left-Turn Movements				1		4		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State,	, p*_0,	j		131 1434 1.000 1434 0.991 0.990		181 1376 1.000 1376 0.982 0.980		
Minor-Street Right-Turn Movements				9		12		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				134 907 1.000 907 0.959		125 918 1.000 918 0.986		
Major-Street U-Turn Movements				10		40		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j								
Minor-Street Through Movements				8		11		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				341 576 1.000 0.971 559 0.978		381 547 1.000 0.971 531 0.988		
Minor-Street Left-Turn Movements				7		10		
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Factor, Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	p''			344 605 1.000 0.959 0.969 0.956 578		359 591 1.000 0.949 0.961 0.921 544		
Step 10: SHARED-LANE CAPACITY OF MINOR STREET APPROAC		CAPACIT	Y ADJUST	MENTS				
Approach Movement Lane Configuration		Nort 7	hBound 8 LTR	9		Sou 10	thBound 11 LTR	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH		578	131 559 643	907		544	31 531 646	918
S1 CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMENTS	tep 11:	CONTROL	DELAY					
Approach EB	WB 4U	4	Nort 7	:hBound 8	9	Sou 10	thBound 11	12
Flow Rate 13 Movement Capacity 1434 Lane Configuration Shared Capacity Control Delay 7.5		25 1376 7.7	81 578	13 559 LTR 643 12.0	38 907	13 544	6 531 LTR 646 10.9	13 918
CONTROL DELAY TO RANK 1 MOVEMENTS Approach Movement				EB 2		WB 5		
Number of Major Street Through Lanes, N Proportion of Rank 1 vehicles not blocked, p Delay to Major Left-turning Vehicles, d_MLT Major Street Through Vehicles in Shared Lane Major Street Turning Vehicles in Shared Lane Saturation Flow Rate for Major Street Throug	e, v_i1 e, v_i2	1		1 0.990 7.5 88 106 1700		1 0.980 7.7 119 38 1700		

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Saturation Flow Rate for Major Street Right-Turn, s_i2	1700	1700
Delay to Rank 1 Vehicles, d_Rank1	0.1	0.2
•		

Ste	ps 12 - 13: A EB	PPROACH/	INTERSECT WB	FION CON	TROL	DELAY and 95 NorthBound	5% QUEU		thBound	
Movement Lane Configuration	10	1	40	4	7	8 LTR	9	10	11 LTR	12
Flow Rate Lane Capacity v/c 95% Queue Length Control Delay		13 1434 0.01 0.0 7.5		25 1376 0.02 0.1 7.7		131 643 0.20 0.8 12.0			31 646 0.05 0.2 10.9	
LOS Approach Delay Approach LOS Intersction Delay		A 0.6 4.4		A 1.4		B 12.0 B			В 10.9 В	

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HCS7 All-Way Stop Control Report								
General Information Site Information								
Analyst	HDR	Intersection	Elk Creek & Haines					
Agency/Co.	HDR	Jurisdiction	Meade County					
Date Performed	3/7/2019	East/West Street	Elk Creek Road					
Analysis Year	2045	North/South Street	Haines Avenue					
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.80					
Time Analyzed	PM - 2045 Build Cond.							
Project Description Southern Meade County Corridor Study								
Lanos								

Lanes



Vehicle Volume and Adjustments

venicle volume and Adjust	ments											
Approach		Eastbound			Westbound	ł	1	Northboun	d	Southbound		
Movement	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Volume	10	25	35	10	20	5	90	25	20	5	10	5
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	88			44			169			25		
Percent Heavy Vehicles	6			6			6			6		
Departure Headway and S	ervice Ti	me										
Initial Departure Headway, hd (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.078			0.039			0.150			0.022		
Final Departure Headway, hd (s)	4.23			4.51			4.38			4.38		
Final Degree of Utilization, x	0.103			0.055			0.205			0.030		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, ts (s)	2.23			2.51			2.38			2.38		
Capacity, Delay and Level of	of Servic	e		<u> </u>								
Flow Rate, v (veh/h)	88			44			169			25		
Capacity	852			798			823			821		
95% Queue Length, Q ₉₅ (veh)	0.3			0.2			0.8			0.1		
Control Delay (s/veh)	7.7			7.8			8.5			7.5		
Level of Service, LOS	A			A			A			А		
Approach Delay (s/veh)		7.7	-		7.8			8.5			7.5	
Approach LOS		А			А		A A					
Intersection Delay, s/veh LOS			8	.1					/	4		

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Appendix G Page 91 of 140	HCS7	Two-Way	Stop-Con	trol Te>	kt Report				
File Name: Analyst: Agency: Date Performed: Time Analyzed: Jurisdiction: Analysis Year: Project Description: Units: Intersection Name: Major Street Direction: East/West Street Name: North/South Street Name: Analysis Time Period (hrs):	TWO-WAY STOP CONTROL (TWSC) Analysis 2045-Build_PM_PeacefulPines-EricksonRaRd_TWSC.xtw HDR 3/7/2019 PM - 2045 Build Cond. Meade County 2045 Southern Meade County Corridor Study U.S. Customary Peaceful P & Erickson RaR East-West Peaceful Pines Road Erickson Ranch Road 0.25								
Maion Street.	Ve	hicle Vo	olumes an	d Adjust	ments				
Major Street: Approach		EastE	-	2		4	WestB		<i>c</i>
Movement	1U U	1 L	2 T	3 R		40 U	4 L	5 T	6 R
Volume		60	20					40	115
Peak Hour Factor, PHF					0.80				
Hourly Flow Rtae, HFR Percent Heavy Vehicles		75 3	25					50	144
Number of Lanes Lane Configuration	0	1	1 T	0		0	0	1 T	1 R
Median Type		E	·		Undiv	ided		•	K
Median Storage RT channelized?									NO
Left-Turn Lane Storage Upstream Signal?					Not P	resent			
·									
Minor Street: Approach		North	Bound				South	Bound	
Movement		7	8 T	9 R			10 L	11 T	12 R
		L	1	<u>к</u>	I			1	
Volume Peak Hour Factor, PHF					0.80		30		35
Hourly Flow Rtae, HFR Percent Heavy Vehicles							38 3		44 3
Number of Lanes		0	0	0			0	1	õ
Lane Configuration RT channelized?								LR	
Flared Approach Storage Percent Grade			I				NO	 0	
Percent Grade								0	
	Pede	strian V	/olumes a	nd Adjus					
Approach Movement			EB 13		WB 14		NB 15		SB 16
Flow (ped/hr)			0		0				0
Lane Width (ft)			Ũ		Ū				Ŭ
Walking Speed (ft/sec) Pedestrian Blockage Factor, f_pb									
		_		· · · -	c - ·				
Approach EB	_Delay,	Queue Le WE			of Servi orthBound	ce	So	uthBound	
Movement 1U Lane Configuration	1 L	40	4	7	8	9	10	11	12
	_							LR	
Flow Rate Lane Capacity	75 1374							81 854	
v/c	0.05 0.2							$0.10 \\ 0.3$	
95% Queue Length Control Delay	7.8							9.7	
LOS Approach Delay	A 5.8							А 9.7	
Approach LOS Intersction Delay	3.6							А	
Intersection Deray	5.0								
Major Street.		Step 1:	MOVEMENT	PRIORIT	TIES				
Major Street: Approach	-	EastE		-			WestB		
Priority Movement	1U U	1 L	2 T	3 R		4U U	4 L	5 T	6 R
		<u> </u>	•			~	-	•	

Minor Street:

Appendix G Page 92 c Approach Priority Movement	of 140		NorthBo 7 L	ound 8 T	9 R			SouthE 10 L	Bound 11 T	12 R
	Step	0 2: MOVE	EMENT DEM	MAND VO	LUMES AN	ID FLOW R	ATES			
Major Street: Approach Movement		10 U	EastBou 1 L		3 R		4U U	WestBo 4 L	ound 5 T	6 R
Volume, V_x Flow Rate, v_x			60 75	20 25					40 50	115 144
Minor Street: Approach Movement			NorthBo 7 L	ound 8 T	9 R			SouthE 10 L	Bound 11 T	12 R
Volume, V_x Flow Rate, v_x								30 38		35 44
		Ster	o 3: CONF	ΕΙ ΤΟΤΤΝ	G FLOW R	ATES				
Major Street: Approach Movement		10 U	EastBou 1 L		3 R		4U U	WestBo 4 L	ound 5 T	6 R
Flow Rate, v_x Conflicting Flow, v_c,x			75 194	25					50	144
Minor Street: Approach Movement			NorthBo 7 L	ound 8 T	9 R			Southe 10 L	Bound 11 T	12 R
Flow Rate, v_x Conflicting Flow, v_c,x								38 225		44 50
CRITICAL HEADWAYS	Step	4: CRITI	ICAL HEAD	DWAYS a	nd FOLLC	W-UP HEA	DWAYS			
Approach Movement	EB 1U U	1 L	WB 4U U	4 L	No 7 L	orthBound 8 T	9 R	Sou 10 L	IthBound 11 T	12 R
t_c,base Single Stage Stage I_		4.1						7.1		6.2
Stage II t_c,HV P_HV t_c,G G		1.0 0.03						1.0 0.03 0.2 0		1.0 0.03 0.1 0
t_3,LT		0.0						0.7		0.0
t_c Single Stage Stage I Stage II		4.13						6.43		6.23
FOLLOW-UP HEADWAYS Approach Movement	EB 1U U	1 L	WB 4U U	4 L	NC 7 L	orthBound 8 T	9 R	Sou 10 L	IthBound 11 T	12 R
t_f,base t_f,HV P_HV t_f		2.2 0.9 0.03 2.23						3.5 0.9 0.03 3.53		3.3 0.9 0.03 3.33
			ep 5: PO	FENTIAL	CAPACIT	IES				
NO UPSTREAM SIGNAL EFFECT Approach Movement	S PRESENT EB 1U U	1 L	WB 4U U	4 L	No 7 L	orthBound 8 T	9 R	Sou 10 L	ithBound 11 T	12 R
v_c,x t_c,x t_f,x c_p,x		194 4.13 2.23 1374						225 6.43 3.53 761		50 6.23 3.33 1016

Steps 6 - 9: MOVEMENT CAPACITIES

EΒ

WB

NB

SB

Appendix G Page 93 of 140 Movement	13		14	15	16
Pedestrian Flow Rate v_x Lane Width, w Walking Speed, S_p Pedestrian Blockage Factor, f_pb	0		0		0
Major-Street Left-Turn Movements			1	4	,
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j Major L-Shared Probability Queue-free State	tate, p*_0,j		194 1374 1.000 1374 0.945		
Minor-Street Right-Turn Movements			9	12	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j				50 1016 1.000 1016 0.957	
Major-Street U-Turn Movements			10	40	
Conflicting Flow, v_c,x Potential Capacity, c_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Shared L/U Capacity, c_SH Probability of Queue-free State, p_0,j					
Minor-Street Through Movements			8	11	<u>.</u>
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Capacity Adjustment Factor, f_x Movement Capacity, c_m,x Probability of Queue-free State, p_0,j					
Minor-Street Left-Turn Movements			7	10	······
Conflicting Flow, v_c,x Potential Capacity, c_p,x Pedestrian Impedance Factor, p_p,x Major L, Minor T Adjusted Impedance Fact Major L, Minor T Impedance Factor, p' Capacity Adjustment Factor, f_x Movement Capacity, c_m,x	tor, p"			225 761 1.000 0.945 720	
Step	0 10: FINAL CAP	PACITY ADJUST	MENTS		
Approach Movement Lane Configuration	7	NorthBound 8	9	SouthBound 10 11 LR	12
Shared Flow Rate, v_y Movement Capacity, c_m,x Shared Capacity, c_SH				81 720 854	1016
		NTROL DELAY			
CONTROL DELAY TO RANK 2 THROUGH 4 MOVEMI Approach EB Movement 1U 1	WB 4U 4	Nort 7	hBound 8 9	SouthBound 10 11	12
Flow Rate 75 Movement Capacity 1374 Lane Configuration L Shared Capacity Control Delay 7.8				38 720 LR 854 9.7	44 1016
Steps 12 - 13: APPROACE					
Approach EB Movement 1U 1 Lane Configuration L	₩B 4∪ 4	Nort 7	hBound 8 9	SouthBound 10 11 LR	12
Flow Rate 75 Lane Capacity 1374 v/c 0.05				81 854 0.10	
95% Queue Length 0.2 Control Delay 7.8				0.3 9.7	

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LOS	А						
Approach Delay	5.8						
Approach LOS							
Intersction Delay	3.6						
-							

This TWSC text report was created in HCS™ TWSC Version 7.8 on 9/5/2019 3:16:37 PM

A 9.7 A HCS7: Two-Lane Highways Release 7.2

Phone: Fax: E-Mail: _____Directional Two-Lane Highway Segment Analysis______ HDR Analyst Agency/Co. HDR Date Performed7/5/2019Analysis Time Period2045 - AM Build Eastbound East/West Corridor Highway Erickson Ranch to Haines From/To Jurisdiction Meade County Analysis Year 2045 Description Southern Meade County Corridor _____Input Data_____ Highway class Class 2 Peak hour factor, PHF 0.80 4.0ft% Trucks and back12.0ft% Trucks crawling0.02.3miTruck crawl speed0.0Level% Recreational vehicles0 Shoulder width 4.0 8 Lane width Ŷ mi/hr Segment length Terrain type 00 % No-passing zones 40 Access point density 1 Grade: Length 00 _ Up/down 00 /mi Analysis direction volume, Vd 180 veh/h Opposing direction volume, Vo 80 veh/h _____Average Travel Speed____ Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.5 1.9 1.0 PCE for RVs, ER 1.0 Heavy-vehicle adj. factor, (note-5) fHV 0.971 0.949 Grade adj. factor, (note-1) fg 1.00 1.00 Directional flow rate, (note-2) vi 232 pc/h 105 pc/h Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM mi/h Observed total demand, (note-3) V veh/h Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS 60.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 1.3 mi/h Adj. for access point density, (note-3) fA 0.3 mi/h Free-flow speed, FFSd 58.5 mi/h Adjustment for no-passing zones, fnp 2.4* mi/h mi/h Average travel speed, ATSd 53.4 Percent Free Flow Speed, PFFS 91.4 00

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_____Percent Time-Spent-Following__ Analysis(d) Opposing (o) Direction PCE for trucks, ET 1.1 1.1 1.0 PCE for RVs, ER 1.0 Heavy-vehicle adjustment factor, fHV 0.994 0.994 Grade adjustment factor, (note-1) fg 1.00 1.00 226 pc/h Directional flow rate, (note-2) vi 101 pc/h Base percent time-spent-following, (note-4) BPTSFd 23.9 00 Adjustment for no-passing zones, fnp 38.8 Percent time-spent-following, PTSFd 50.7 00 _____Level of Service and Other Performance Measures____ Level of service, LOS В Volume to capacity ratio, v/c 0.53 Peak 15-min vehicle-miles of travel, VMT15 129 veh-mi Peak-hour vehicle-miles of travel, VMT60 414 veh-mi Peak 15-min total travel time, TT15 2.4 veh-h 1700 Capacity from ATS, CdATS veh/h Capacity from PTSF, CdPTSF 1700 veh/h Directional Capacity 1700 veh/h _____Passing Lane Analysis_____ 2.3 Total length of analysis segment, Lt mi Length of two-lane highway upstream of the passing lane, Lu mi Length of passing lane including tapers, Lpl _ mi Average travel speed, ATSd (from above) 53.4 mi/h Percent time-spent-following, PTSFd (from above) 50.7 Level of service, LOSd (from above) В _____Average Travel Speed with Passing Lane___ Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde mi Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld mi Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, ATSpl _ 9 Percent free flow speed including passing lane, PFFSpl 0.0 _____Percent Time-Spent-Following with Passing Lane_____ Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde mi Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld mi Adj. factor for the effect of passing lane on percent time-spent-following, fpl Percent time-spent-following including passing lane, PTSFpl 8 __Level of Service and Other Performance Measures with Passing Lane _____ Level of service including passing lane, LOSpl А Peak 15-min total travel time, TT15 veh-h _____ Bicycle Level of Service _____

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Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	225.0
Effective width of outside lane, We	16.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	5.53
Bicycle LOS	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 dewngrade segments are treated as level terrain.
- 2. If vi (vd or vo) >= 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. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.
- * These items have been entered or edited to override calculated value

Phone: Fax: E-Mail: _____Directional Two-Lane Highway Segment Analysis______ HDR Analyst Agency/Co. HDR Date Performed 7/5/2019 Analysis Time Period 2045 - AM Build Eastbound Elk Creek Road Highway Erickson Ranch to Haines From/To Jurisdiction Meade County Analysis Year 2045 Description Southern Meade County Corridor _____Input Data_____ Highway class Class 2 Peak hour factor, PHF 0.80 Shoulder width 0.0 % Trucks and buses ft 6 8 12.0ft% Trucks crawling0.03.0miTruck crawl speed0.0Level% Recreational vehicles0 Lane width 8 mi/hr Segment length Terrain type 8 % No-passing zones 14 Access point density 6 Grade: Length 00 _ mi _ Up/down 00 /mi Analysis direction volume, Vd 100 veh/h Opposing direction volume, Vo 70 veh/h _____Average Travel Speed____ Direction Analysis(d) Opposing (o) 1.9* PCE for trucks, ET 1.9 1.0 1.0 PCE for RVs, ER Heavy-vehicle adj. factor, (note-5) fHV 0.949 0.949 Grade adj. factor, (note-1) fg 1.00 1.00 Directional flow rate, (note-2) vi 132 pc/h 92 pc/h Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM mi/h Observed total demand, (note-3) V veh/h Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS 60.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 4.2 mi/h Adj. for access point density, (note-3) fA 1.5 mi/h Free-flow speed, FFSd 54.3 mi/h Adjustment for no-passing zones, fnp 2.4* mi/h mi/h Average travel speed, ATSd 50.2 Percent Free Flow Speed, PFFS 92.4 00

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_____Percent Time-Spent-Following__ Analysis(d) Opposing (o) Direction PCE for trucks, ET 1.1 1.1 1.0 PCE for RVs, ER 1.0 Heavy-vehicle adjustment factor, fHV 0.994 0.994 Grade adjustment factor, (note-1) fg 1.00 1.00 126 pc/h Directional flow rate, (note-2) vi 88 pc/h Base percent time-spent-following, (note-4) BPTSFd 14.3 00 Adjustment for no-passing zones, fnp 24.9 Percent time-spent-following, PTSFd 29.0 00 _____Level of Service and Other Performance Measures____ Level of service, LOS Α Volume to capacity ratio, v/c 0.53 Peak 15-min vehicle-miles of travel, VMT15 94 veh-mi Peak-hour vehicle-miles of travel, VMT60 300 veh-mi Peak 15-min total travel time, TT15 1.9 veh-h 1700 Capacity from ATS, CdATS veh/h Capacity from PTSF, CdPTSF 1700 veh/h Directional Capacity 1700 veh/h _____Passing Lane Analysis_____ Total length of analysis segment, Lt 3.0 mi Length of two-lane highway upstream of the passing lane, Lu mi Length of passing lane including tapers, Lpl mi Average travel speed, ATSd (from above) 50.2 mi/h Percent time-spent-following, PTSFd (from above) 29.0 Level of service, LOSd (from above) А _____Average Travel Speed with Passing Lane___ Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde mi Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld mi Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, ATSpl _ 9 Percent free flow speed including passing lane, PFFSpl 0.0 _____Percent Time-Spent-Following with Passing Lane_____ Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde mi Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld mi Adj. factor for the effect of passing lane on percent time-spent-following, fpl Percent time-spent-following including passing lane, PTSFpl 8 __Level of Service and Other Performance Measures with Passing Lane _____ Level of service including passing lane, LOSpl А Peak 15-min total travel time, TT15 veh-h _____ Bicycle Level of Service _____

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Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	125.0
Effective width of outside lane, We	18.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	4.90
Bicycle LOS	Е

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 dewngrade segments are treated as level terrain.
- 2. If vi (vd or vo) >= 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. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.
- * These items have been entered or edited to override calculated value

Phone: Fax: E-Mail: _____Directional Two-Lane Highway Segment Analysis______ HDR Analyst Agency/Co. HDR Date Performed7/5/2019Analysis Time Period2045 - AM Build Southbound Erickson Ranch Road Highway From/To East/West Co to Westridge Rd Jurisdiction Meade County Analysis Year 2045 Description Southern Meade County Corridor _____Input Data_____ Highway class Class 2 Peak hour factor, PHF 0.80 2.0ft% Trucks and back12.0ft% Trucks crawling0.01.6miTruck crawl speed0.0Level% Recreational vehicles0 Shoulder width 2.0 8 Lane width Ŷ mi/hr Segment length Terrain type 8 % No-passing zones 100 Access point density 4 Grade: Length 00 _ Up/down 9 /mi Analysis direction volume, Vd 190 veh/h Opposing direction volume, Vo 90 veh/h _____Average Travel Speed____ Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.5 1.9 1.0 PCE for RVs, ER 1.0 Heavy-vehicle adj. factor, (note-5) fHV 0.976 0.957 Grade adj. factor, (note-1) fg 1.00 1.00 Directional flow rate, (note-2) vi 243 pc/h 118 pc/h Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM mi/h Observed total demand, (note-3) V veh/h Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS 60.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 2.6 mi/h Adj. for access point density, (note-3) fA 1.0 mi/h Free-flow speed, FFSd 56.4 mi/h Adjustment for no-passing zones, fnp 3.0 mi/h mi/h Average travel speed, ATSd 50.6 Percent Free Flow Speed, PFFS 89.7 00

Direction Analysis ((d)	Opposinc	(o)
PCE for trucks, ET 1.1	~ /	Opposing (o) 1.1	
PCE for RVs, ER 1.0		1.0	
Heavy-vehicle adjustment factor, fHV 0.995	5	0.99	5
Grade adjustment factor, (note-1) fg 1.00		1.00	
Directional flow rate, (note-2) vi 239		113	
Base percent time-spent-following, (note-4) BPTS	-	90	1 - /
Adjustment for no-passing zones, fnp	50.3		
Percent time-spent-following, PTSFd	59.3	00	
Level of Service and Other Perf	formance M	easures	
Level of service, LOS	С		
Volume to capacity ratio, v/c	0.53		
Peak 15-min vehicle-miles of travel, VMT15	95	veh-mi	
Peak-hour vehicle-miles of travel, VMT60	304	veh-mi	
Peak 15-min total travel time, TT15	1.9	veh-h	
Capacity from ATS, CdATS	1700	veh/h	
Capacity from PTSF, CdPTSF	1700	veh/h	
Directional Capacity	1700	veh/h	
Passing Lane Analy	vsis		
Total length of analysis segment, Lt		1.6	mi
Length of two-lane highway upstream of the pass	sing lane.		mi
Length of passing lane including tapers, Lpl			mi
			=
Average travel speed, ATSd (from above)		50.6	mi/h
	e)	50.6 59.3	mi/h
Percent time-spent-following, PTSFd (from above	e)		mi/h
Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above)		59.3 C	
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from above)Average Travel Speed with P	assing La	59.3 C	
Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with F Downstream length of two-lane highway within ef	Passing La	59.3 C	
Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with P Downstream length of two-lane highway within ef length of passing lane for average travel s	Passing La fective speed, Lde	59.3 C	
Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with P Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect	Passing La Efective speed, Lde tive	59.3 C ne	mi
Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with P Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect length of the passing lane for average trave	Passing La Efective speed, Lde tive	59.3 C ne	
Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with P Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect length of the passing lane for average trave Adj. factor for the effect of passing lane	Passing La Efective speed, Lde tive	59.3 C ne	mi
Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with F Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect length of the passing lane for average trave Adj. factor for the effect of passing lane on average speed, fpl	Passing La Efective speed, Lde tive vel speed,	59.3 C ne	mi
Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with F Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect length of the passing lane for average trave Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, AT	Passing La Efective speed, Lde tive vel speed, CSpl	59.3 C Ld	mi mi
Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with P Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect length of the passing lane for average trave Adj. factor for the effect of passing lane	Passing La Efective speed, Lde tive vel speed, CSpl	59.3 C ne	mi
Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with F Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect length of the passing lane for average trave Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, AT	Passing La Efective speed, Lde tive vel speed, CSpl PFFSpl	59.3 C ne Ld - _ _ 0.0	mi mi %
Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with P Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect length of the passing lane for average trave Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, AT Percent free flow speed including passing lane,	Passing La Efective speed, Lde tive vel speed, CSpl PFFSpl th Passing	59.3 C Ld – – 0.0 g Lane	mi mi %
Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with P Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect length of the passing lane for average trave Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, AT Percent free flow speed including passing lane,	Passing La Efective speed, Lde vel speed, CSpl PFFSpl th Passing Efective 10	59.3 C ne Ld - _ _ 0.0 g Lane ength	mi mi %
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Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with F Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect length of the passing lane for average trave Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, AT Percent free flow speed including passing lane, Percent Time-Spent-Following wi Downstream length of two-lane highway within ef of passing lane for percent time-spent-foll	Passing La Efective speed, Lde vel speed, CSpl PFFSpl th Passing Efective lo owing, Lde sive lengt	59.3 C ne Ld - 0.0 g Lane ength e h of	mi mi %
Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with F Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect length of the passing lane for average trave Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, AT Percent free flow speed including passing lane, Percent Time-Spent-Following wi Downstream length of two-lane highway within ef of passing lane for percent time-spent-foll Length of two-lane highway downstream of effect the passing lane for percent time-spent-foll	Passing La Efective speed, Lde vel speed, CSpl PFFSpl th Passing Efective lo owing, Lde sive lengt	59.3 C ne Ld - 0.0 g Lane ength e h of	mi mi % mi
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<pre>Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with F Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect length of the passing lane for average trave Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, AT Percent free flow speed including passing lane, Percent Time-Spent-Following wi Downstream length of two-lane highway within ef of passing lane for percent time-spent-foll Length of two-lane highway downstream of effect the passing lane for percent time-spent-fol Adj. factor for the effect of passing lane</pre>	Passing La Efective speed, Lde vel speed, CSpl PFFSpl th Passing Efective lo owing, Lde sive lengt	59.3 C ne Ld - 0.0 g Lane ength e h of	mi mi % mi
<pre>Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with F Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect length of the passing lane for average trave Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, AT Percent free flow speed including passing lane, AT Downstream length of two-lane highway within ef of passing lane for percent time-spent-foll Length of two-lane highway downstream of effect the passing lane for percent time-spent-foll Adj. factor for the effect of passing lane on percent time-spent-following, fpl Percent time-spent-following</pre>	Passing La Efective speed, Lde vel speed, CSpl PFFSpl th Passing Efective lo owing, Lde ive lengt lowing, Lo	59.3 C ne Ld - 0.0 g Lane ength e _ h of d _ _ _ _	mi mi % mi mi
<pre>Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with F Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect length of the passing lane for average trave Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, AT Percent free flow speed including passing lane, Percent Time-Spent-Following wi Downstream length of two-lane highway within ef of passing lane for percent time-spent-foll Length of two-lane highway downstream of effect the passing lane for percent time-spent-fol Adj. factor for the effect of passing lane on percent time-spent-following, fpl Percent time-spent-following including passing lane, PTSFpl Level of Service and Other Performance Me</pre>	Passing La fective speed, Lde vel speed, CSpl PFFSpl th Passing fective le owing, Lde ive lengt lowing, Lde	59.3 C ne Ld - 0.0 g Lane ength e _ h of d _ _ _ _	mi mi % mi mi
Percent time-spent-following, PTSFd (from above Level of service, LOSd (from above) Average Travel Speed with F Downstream length of two-lane highway within ef length of passing lane for average travel s Length of two-lane highway downstream of effect length of the passing lane for average trave Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, AT Percent free flow speed including passing lane, Percent Time-Spent-Following wi Downstream length of two-lane highway within ef of passing lane for percent time-spent-foll Length of two-lane highway downstream of effect the passing lane for percent time-spent-fol Adj. factor for the effect of passing lane on percent time-spent-following, fpl Percent time-spent-following including passing lane, PTSFpl	Passing La Efective speed, Lde vel speed, CSpl PFFSpl th Passing Efective lo owing, Lde ive lengt lowing, Lo	59.3 C ne Ld - 0.0 g Lane ength e _ h of d _ _ _ _	mi mi % mi mi

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Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	237.5
Effective width of outside lane, We	14.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	5.55
Bicycle LOS	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 dewngrade segments are treated as level terrain.
- 2. If vi (vd or vo) >= 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. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax: E-Mail: _____Directional Two-Lane Highway Segment Analysis______ HDR Analyst Agency/Co. HDR Date Performed 7/5/2019 Date Performed7/5/2019Analysis Time Period2045 - AM Build Southbound Erickson Ranch Road Highway From/To Westridge to Elk Creek Jurisdiction Meade County Analysis Year 2045 Description Southern Meade County Corridor _____Input Data_____ Peak hour factor, PHF 0.80 Highway class Class 2 Shoulder width 0.0 % Trucks and buses ft 5 8 12.0 ft 2.8 mi ft% Trucks crawling0.0miTruck crawl speed0.0 Lane width 8 mi/hr Segment length Terrain type Level % Recreational vehicles 0 00 % No-passing zones 60 Access point density 8 Grade: Length 00 _ mi _ Up/down 00 /mi Analysis direction volume, Vd 125 veh/h Opposing direction volume, Vo 100 veh/h _____Average Travel Speed____ Direction Analysis(d) Opposing (o) 1.5* PCE for trucks, ET 1.9* 1.0 PCE for RVs, ER 1.0 Heavy-vehicle adj. factor, (note-5) fHV 0.976 0.957 Grade adj. factor, (note-1) fg 1.00 1.00 Directional flow rate, (note-2) vi 160 pc/h 131 pc/h Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM mi/h Observed total demand, (note-3) V veh/h Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS 60.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 4.2 mi/h Adj. for access point density, (note-3) fA 2.0 mi/h Free-flow speed, FFSd 53.8 mi/h 2.5 Adjustment for no-passing zones, fnp mi/h mi/h Average travel speed, ATSd 49.0 Percent Free Flow Speed, PFFS 91.1 00

Direction Analysi	.s(d)	Opposing	(0)
PCE for trucks, ET		1.1	· - /
PCE for RVs, ER 1.0		1.0	
	95	0.99	5
Grade adjustment factor, (note-1) fg 1.0		1.00	
	pc/h	126	
Base percent time-spent-following, (note-4) BP	-	00	<u>r</u> ,
Adjustment for no-passing zones, fnp	53.2		
Percent time-spent-following, PTSFd	46.9	00	
Level of Service and Other Pe	erformance M	easures	
Level of service, LOS	В		
Volume to capacity ratio, v/c	0.53		
Peak 15-min vehicle-miles of travel, VMT15	109	veh-mi	
Peak-hour vehicle-miles of travel, VMT60	350	veh-mi	
Peak 15-min total travel time, TT15	2.2	veh-h	
Capacity from ATS, CdATS	1700	-	
Capacity from PTSF, CdPTSF	1700	veh/h	
Directional Capacity	1700	veh/h	
Passing Lane Ana	lysis		
Total length of analysis segment, Lt		2.8	mi
Length of two-lane highway upstream of the pa	ssing lane.		mi
		~ ~ ~	
Length of passing lane including tapers. Upl			mi
Length of passing lane including tapers, Lpl Average travel speed, ATSd (from above)		-	mi mi/h
Average travel speed, ATSd (from above)	ove)	- 49.0	mi mi/h
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from abo	ove)	-	
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from abo Level of service, LOSd (from above)		- 49.0 46.9 B	mi/h
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from abo Level of service, LOSd (from above) Average Travel Speed with	Passing La	- 49.0 46.9 B	mi/h
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from abo Level of service, LOSd (from above) Average Travel Speed with Downstream length of two-lane highway within	Passing La effective	- 49.0 46.9 B	mi/h
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from abo Level of service, LOSd (from above) Average Travel Speed with Downstream length of two-lane highway within length of passing lane for average travel	Passing La effective speed, Lde	- 49.0 46.9 B	mi/h
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from abo Level of service, LOSd (from above) Average Travel Speed with Downstream length of two-lane highway within	Passing La effective speed, Lde	- 49.0 46.9 B	mi/h
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from above) Average Travel Speed with Downstream length of two-lane highway within length of passing lane for average travel Length of two-lane highway downstream of effe length of the passing lane for average tr	Passing La effective speed, Lde ective	- 49.0 46.9 B ne	mi/h
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from above) Average Travel Speed with Downstream length of two-lane highway within length of passing lane for average travel Length of two-lane highway downstream of effe length of the passing lane for average tr Adj. factor for the effect of passing lane	Passing La effective speed, Lde ective	- 49.0 46.9 B ne	mi/h
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from above) Average Travel Speed with Downstream length of two-lane highway within length of passing lane for average travel Length of two-lane highway downstream of effe length of the passing lane for average tr Adj. factor for the effect of passing lane on average speed, fpl	Passing La effective speed, Lde ective avel speed,	- 49.0 46.9 B ne	mi/h
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Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from above) Average Travel Speed with Downstream length of two-lane highway within length of passing lane for average travel Length of two-lane highway downstream of effer length of the passing lane for average tr Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, Percent free flow speed including passing lane Percent Time-Spent-Following Downstream length of two-lane highway within of passing lane for percent time-spent-fo	A Passing La effective speed, Lde ective cavel speed, ATSpl me, PFFSpl with Passin effective l ollowing, Ld ective lengt	- 49.0 46.9 B ne Ld - - - 0.0 g Lane ength e - h of	mi/h mi %
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Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	156.3
Effective width of outside lane, We	16.50
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	4.95
Bicycle LOS	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 dewngrade segments are treated as level terrain.
- 2. If vi (vd or vo) >= 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. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.
- * These items have been entered or edited to override calculated value

Phone: Fax: E-Mail: _____Directional Two-Lane Highway Segment Analysis______ HDR Analyst Agency/Co. HDR Date Performed7/5/2019Analysis Time Period2045 - AM Build Southbound Erickson Ranch Road Highway Peaceful Pines to East/West Co From/To Jurisdiction Meade County Analysis Year 2045 Description Southern Meade County Corridor _____Input Data_____ Highway class Class 2 Peak hour factor, PHF 0.80 2.0ft% Trucks and and12.0ft% Trucks crawling0.01.0miTruck crawl speed0.0Level% Recreational vehicles0100100100 Shoulder width 2.0 8 Lane width Ŷ mi/hr Segment length Terrain type 8 % No-passing zones Grade: Length 00 Access point density _ Up/down 00 12 /mi Analysis direction volume, Vd 240 veh/h Opposing direction volume, Vo 85 veh/h _____Average Travel Speed____ Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.4 1.9 1.0 1.0 PCE for RVs, ER Heavy-vehicle adj. factor, (note-5) fHV 0.988 0.974 Grade adj. factor, (note-1) fg 1.00 1.00 304 pc/h Directional flow rate, (note-2) vi 109 pc/h Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM mi/h Observed total demand, (note-3) V veh/h Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS 60.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 2.6 mi/h Adj. for access point density, (note-3) fA 3.0 mi/h Free-flow speed, FFSd 54.4 mi/h 2.8 Adjustment for no-passing zones, fnp mi/h Average travel speed, ATSd 48.4 mi/h Percent Free Flow Speed, PFFS 89.0 00
Direction	Analysis(d)	1	On	posing	(0)
PCE for trucks, ET	1.1		~P]	1.1	
PCE for RVs, ER	1.0			1.0	
Heavy-vehicle adjustment factor,				0.99	7
Grade adjustment factor, (note-1)				1.00	,
Directional flow rate, (note-2)	-	pc/h		107	pc/h
Base percent time-spent-following		-	00	107	pc/11
Adjustment for no-passing zones,	-	46.9	0		
Percent time-spent-following, P	-	64.9	00		
	e and Other Perfo	rmance Me	easu	res	
		G			
Level of service, LOS		С			
Volume to capacity ratio, v/c		0.53		. 1 !	
Peak 15-min vehicle-miles of tra		75		eh-mi	
Peak-hour vehicle-miles of trave	-	240		eh-mi	
Peak 15-min total travel time, 1	TT15	1.5		eh-h	
Capacity from ATS, CdATS		1700		eh/h	
Capacity from PTSF, CdPTSF		1700		eh/h	
Directional Capacity		1700	V	eh/h	
Pa:	ssing Lane Analysi	is			
Total length of analysis segment	t, Lt			1.0	mi
Length of two-lane highway upst:		ng lane.	Lu		mi
		, _~,			
Length of passing lane including	g tapers, Lpl			_	mi
Length of passing lane including Average travel speed, ATSd (from					
Average travel speed, ATSd (from	m above)			48.4	mi mi/h
Average travel speed, ATSd (from Percent time-spent-following, P	m above) ISFd (from above)				
Average travel speed, ATSd (from	m above) ISFd (from above)			48.4 64.9	
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Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	300.0
Effective width of outside lane, We	14.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	5.10
Bicycle LOS	Е

- 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 dewngrade segments are treated as level terrain.
- 2. If vi (vd or vo) >= 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. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax: E-Mail: _____Directional Two-Lane Highway Segment Analysis______ HDR Analyst Agency/Co. HDR Date Performed7/5/2019Analysis Time Period2045 - AM Build Southbound Highway Haines Avenue East/West Cor. to Elk Creek Rd From/To Jurisdiction Meade County Analysis Year 2045 Description Southern Meade County Corridor _____Input Data_____ Highway class Class 2 Shoulder width 0.0 ft % Trucks and Duses Lane width 12.0 ft % Trucks crawling 0.0 Segment length 4.0 mi Truck crawl speed 0.0 Level % Recreational vehicles 0 A 8 Ŷ mi/hr 8 mi % No-passing zones 40 % Access point density 4 00 _ Up/down /mi Analysis direction volume, Vd 225 veh/h Opposing direction volume, Vo 55 veh/h _____Average Travel Speed____ Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.4 1.9 1.0 PCE for RVs, ER 1.0 Heavy-vehicle adj. factor,(note-5) fHV 0.977 0.949 Grade adj. factor, (note-1) fg 1.00 1.00 Directional flow rate, (note-2) vi 288 pc/h 72 pc/h Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM mi/h Observed total demand, (note-3) V veh/h Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS 55.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 4.2 mi/h Adj. for access point density, (note-3) fA 1.0 mi/h Free-flow speed, FFSd 49.8 mi/h Adjustment for no-passing zones, fnp 2.4* mi/h 44.6 mi/h Average travel speed, ATSd Percent Free Flow Speed, PFFS 89.6 8

Direction Analysis(d	1)	Onn	osing	(0)
PCE for trucks, ET 1.1	- /	~PP	1.1	(~)
PCE for RVs, ER 1.0			1.0	
Heavy-vehicle adjustment factor, fHV 0.994			0.994	1
Grade adjustment factor, (note-1) fg 1.00			1.00	-
Directional flow rate, (note-2) vi 283	pc/h		69	pc/h
Base percent time-spent-following, (note-4) BPTSF	-	00		1 - /
Adjustment for no-passing zones, fnp	34.9			
Percent time-spent-following, PTSFd	56.9	olo		
Level of Service and Other Perfo	ormance M	easur	es	
Level of service, LOS	С			
Volume to capacity ratio, v/c	0.53			
Peak 15-min vehicle-miles of travel, VMT15	281	ve	h-mi	
Peak-hour vehicle-miles of travel, VMT60	900	ve	h-mi	
Peak 15-min total travel time, TT15	6.3	ve	h-h	
Capacity from ATS, CdATS	1700	ve	h/h	
Capacity from PTSF, CdPTSF	1700	ve	h/h	
Directional Capacity	1700	ve	h/h	
Passing Lane Analys	is			
Total length of analysis segment, Lt			4.0	mi
Length of two-lane highway upstream of the passi	ng lane.	Lu	-	mi
Length of passing lane including tapers, Lpl			_	mi
or becored rang rustaarud cabero' abt				
Average travel speed, ATSd (from above)			44.6	mi/h
			44.6 56.9	
Percent time-spent-following, PTSFd (from above)				
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above)			56.9 C	mi/h
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Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	281.3
Effective width of outside lane, We	12.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	6.21
Bicycle LOS	F

- 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 dewngrade segments are treated as level terrain.
- 2. If vi (vd or vo) >= 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. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.
- * These items have been entered or edited to override calculated value

Phone: Fax: E-Mail: _____Directional Two-Lane Highway Segment Analysis______ HDR Analyst Agency/Co. HDR Date Performed7/5/2019Analysis Time Period2045 - AM Build Southbound Highway Haines Avenue Pennington Co to E/W Corridor From/To Jurisdiction Meade County Analysis Year 2045 Description Southern Meade County Corridor _____Input Data_____ Highway class Class 2 Shoulder width 2.0 ft % Trucks and Duses Lane width 12.0 ft % Trucks crawling 0.0 Segment length 2.0 mi Truck crawl speed 0.0 Level % Recreational vehicles 0 2.0 mi Segment vehic 00 Ŷ mi/hr 8 mi % No-passing zones 27 % Access point density 5 00 _ Up/down /mi Analysis direction volume, Vd 430 veh/h Opposing direction volume, Vo 60 veh/h _____Average Travel Speed_____ Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.2 1.9 1.0 PCE for RVs, ER 1.0 Heavy-vehicle adj. factor, (note-5) fHV 0.992 0.965 Grade adj. factor, (note-1) fg 1.00 1.00 542 pc/h Directional flow rate, (note-2) vi 78 pc/h Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM mi/h Observed total demand, (note-3) V veh/h Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS 60.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 2.6 mi/h Adj. for access point density, (note-3) fA 1.3 mi/h Free-flow speed, FFSd 56.2 mi/h Adjustment for no-passing zones, fnp 2.4* mi/h mi/h Average travel speed, ATSd 48.9 Percent Free Flow Speed, PFFS 87.2 8

Direction Analys	is(d)	raO	posing	(0)
PCE for trucks, ET 1.		11	1.1	
PCE for RVs, ER 1.	0		1.0	
	000		0.99	6
Grade adjustment factor, (note-1) fg 1.	00		1.00	
Directional flow rate, (note-2) vi 53	7 pc/h		75	pc/h
Base percent time-spent-following,(note-4) B	PTSFd 47.0	00		
Adjustment for no-passing zones, fnp	20.5			
Percent time-spent-following, PTSFd	65.0	olo		
Level of Service and Other P	erformance N	leasu	res	
Level of service, LOS	С			
Volume to capacity ratio, v/c	0.53			
Peak 15-min vehicle-miles of travel, VMT15	269	ve	eh-mi	
Peak-hour vehicle-miles of travel, VMT60	860	ve	eh-mi	
Peak 15-min total travel time, TT15	5.5		eh-h	
Capacity from ATS, CdATS	1700		eh/h	
Capacity from PTSF, CdPTSF	1700		eh/h	
Directional Capacity	1700	ve	eh/h	
Passing Lane An	alysis			
Total length of analysis segment, Lt			2.0	mi
Length of two-lane highway upstream of the p	assing lane.	Lu	_	mi
Length of passing lane including tapers, Lpl			_	mi
Average travel speed, ATSd (from above)			48.9	mi/h
Percent time-spent-following, PTSFd (from ab			65.0	
rerectie erme bpene rorrowrig, ribra (rrom ab	ove)			
	ove)		C	
Level of service, LOSd (from above)		ne	С	
Level of service, LOSd (from above)Average Travel Speed wit	h Passing La	ine	С	
Level of service, LOSd (from above) Average Travel Speed wit Downstream length of two-lane highway within	h Passing La effective		С	
Level of service, LOSd (from above) Average Travel Speed wit Downstream length of two-lane highway within length of passing lane for average trave	h Passing La effective l speed, Lde		С	mi
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Level of service, LOSd (from above) Average Travel Speed wit Downstream length of two-lane highway within length of passing lane for average trave Length of two-lane highway downstream of eff length of the passing lane for average t Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, Percent free flow speed including passing lane Percent Time-Spent-Following Downstream length of two-lane highway within of passing lane for percent time-spent-f Length of two-lane highway downstream of eff the passing lane for percent time-spent- Adj. factor for the effect of passing lane on percent time-spent-following, fpl Percent time-spent-following	h Passing La effective l speed, Lde ective ravel speed, ATSpl ne, PFFSpl with Passir effective l ollowing, Lo ective lengt	Ed Id Ig Lar Length le Sh of	C - - 0.0	mi mi % mi mi
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Level of service, LOSd (from above) Average Travel Speed wit Downstream length of two-lane highway within length of passing lane for average trave Length of two-lane highway downstream of eff length of the passing lane for average t Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, Percent free flow speed including passing lane, Percent Time-Spent-Following Downstream length of two-lane highway within of passing lane for percent time-spent-f Length of two-lane highway downstream of eff the passing lane for percent time-spent- Adj. factor for the effect of passing lane on percent time-spent-following, fpl Percent time-spent-following including passing lane, PTSFpl	h Passing La effective l speed, Lde ective ravel speed, ATSpl ne, PFFSpl with Passir effective l ollowing, Lo ective lengt following, I	Ld Ig Lar ength le h of d	C 	mi mi % mi %

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Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	537.5
Effective width of outside lane, We	14.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	5.67
Bicycle LOS	F

- 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 dewngrade segments are treated as level terrain.
- 2. If vi (vd or vo) >= 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. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.
- * These items have been entered or edited to override calculated value

Phone: Fax: E-Mail: _____Directional Two-Lane Highway Segment Analysis______ HDR Analyst Agency/Co. HDR Date Performed7/5/2019Analysis Time Period2045 - PM Build Northbound Erickson Ranch Road Highway From/To E/W Corridor to Westridge Rd Jurisdiction Meade County Analysis Year 2045 Description Southern Meade County Corridor _____Input Data_____ Highway class Class 2 Peak hour factor, PHF 0.80 Shoulder width 2.0 % Trucks and buses ft 5 8 12.0ft% Trucks crawling0.01.6miTruck crawl speed0.0Level% Recreational vehicles0 Lane width 8 mi/hr Segment length Terrain type 00 % No-passing zones 100 Access point density 4 Grade: Length 00 _ mi _ Up/down 00 /mi Analysis direction volume, Vd 120 veh/h Opposing direction volume, Vo 90 veh/h _____Average Travel Speed____ Direction Analysis(d) Opposing (o) 1.5* PCE for trucks, ET 1.9 1.0 PCE for RVs, ER 1.0 0.976 Heavy-vehicle adj. factor, (note-5) fHV 0.957 Grade adj. factor, (note-1) fg 1.00 1.00 Directional flow rate, (note-2) vi 154 pc/h 118 pc/h Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM mi/h Observed total demand, (note-3) V veh/h Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS 60.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 2.6 mi/h Adj. for access point density, (note-3) fA 1.0 mi/h Free-flow speed, FFSd 56.4 mi/h Adjustment for no-passing zones, fnp 2.4* mi/h 51.9 mi/h Average travel speed, ATSd Percent Free Flow Speed, PFFS 92.0 8

Direction	Analysis(d)		Opposing	(0)
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV			0.99	5
Grade adjustment factor, (note-1) fg			1.00	
Directional flow rate, (note-2) vi	151	pc/h	113	
Base percent time-spent-following, (not		-	00	1 - /
Adjustment for no-passing zones, fnp	,	55.1		
Percent time-spent-following, PTSFd		48.4	00	
Level of Service and (Other Perfor	mance Me	asures	
		П		
Level of service, LOS		в 0.53		
Volume to capacity ratio, v/c	7MT 1 E		rrah mi	
Peak 15-min vehicle-miles of travel, V		60	veh-mi	
Peak-hour vehicle-miles of travel, VM	ΠQΠ	192	veh-mi	
Peak 15-min total travel time, TT15		1.2	veh-h	
Capacity from ATS, CdATS		1700		
Capacity from PTSF, CdPTSF		1700	veh/h	
Directional Capacity		1700	veh/h	
Passing 3	Lane Analysi	.S		
Total length of analysis segment, Lt			1.6	mi
Length of two-lane highway upstream of	f the passin	g lane.		mi
Length of passing lane including tape:	-	ig fano,	_	mi
Average travel speed, ATSd (from above	-		51.9	mi/h
Percent time-spent-following, PTSFd (:			48.4	
Level of service, LOSd (from above)			B	
Average Travel Spec	ad with Dag	aina Ion		
AVELAUE LAVEL SUE	eu will Pas	Sing Lan	e	
Downstream length of two-lane highway	within effe			
Downstream length of two-lane highway length of passing lane for average	within effe e travel spe	ed, Lde	_	mi
Downstream length of two-lane highway length of passing lane for average Length of two-lane highway downstream	within effe e travel spe of effectiv	ed, Lde re		mi
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Downstream length of two-lane highway length of passing lane for average Length of two-lane highway downstream length of the passing lane for ave Adj. factor for the effect of passing	within effe e travel spe of effectiv erage travel	ed, Lde re		
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Downstream length of two-lane highway length of passing lane for average Length of two-lane highway downstream length of the passing lane for ave Adj. factor for the effect of passing on average speed, fpl	within effe e travel spe of effectiv erage travel lane g lane, ATSp	ed, Lde re speed,		
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Downstream length of two-lane highway length of passing lane for average Length of two-lane highway downstream length of the passing lane for average Adj. factor for the effect of passing on average speed, fpl Average travel speed including passing Percent free flow speed including pass 	within effe e travel spe of effectiv erage travel lane g lane, ATSp sing lane, P llowing with within effe spent-follow	eed, Lde e speed, ol PFFSpl Passing ective le ying, Lde	Ld - - 0.0 Lane	mi %
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Downstream length of two-lane highway length of passing lane for average Length of two-lane highway downstream length of the passing lane for average Adj. factor for the effect of passing on average speed, fpl Average travel speed including passing Percent free flow speed including passing Downstream length of two-lane highway of passing lane for percent time- Length of two-lane highway downstream the passing lane for percent time- Adj. factor for the effect of passing on percent time-spent-following, speed Percent time-spent-following, speed	within effe e travel spe of effectiv erage travel lane g lane, ATSp sing lane, P llowing with within effe spent-follow of effectiv -spent-follo lane fpl	eed, Lde e speed, ol PFFSpl Passing ective le ving, Lde re length owing, Ld	Ld - - 0.0 Lane ngth - of - -	mi %
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Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	150.0
Effective width of outside lane, We	19.60
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	4.37
Bicycle LOS	D

- 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 dewngrade segments are treated as level terrain.
- 2. If vi (vd or vo) >= 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. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.
- * These items have been entered or edited to override calculated value

Phone: Fax: E-Mail: _____Directional Two-Lane Highway Segment Analysis______ HDR Analyst Agency/Co. HDR Date Performed 7/5/2019 Date Performed7/5/2019Analysis Time Period2045 - PM Build Northbound Erickson Ranch Road Highway From/To Westridge to Elk Creek Jurisdiction Meade County Analysis Year 2045 Description Southern Meade County Corridor _____Input Data_____ Highway class Class 2 Peak hour factor, PHF 0.80 Shoulder width 0.0 % Trucks and buses ft 5 8 12.0 ft 2.8 mi ft % Trucks crawling 0.0 mi Truck crawl speed 0.0 % Recreational vehicles 0 Lane width 00 mi/hr Segment length Terrain type Level % Recreational vehicles 0 00 % No-passing zones 56 Access point density 8 Grade: Length 00 _ mi _ Up/down 00 /mi Analysis direction volume, Vd 105 veh/h Opposing direction volume, Vo 100 veh/h _____Average Travel Speed____ Direction Analysis(d) Opposing (o) 1.5* PCE for trucks, ET 1.9* 1.0 PCE for RVs, ER 1.0 0.976 Heavy-vehicle adj. factor, (note-5) fHV 0.957 Grade adj. factor, (note-1) fg 1.00 1.00 Directional flow rate, (note-2) vi 134 pc/h 131 pc/h Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM mi/h Observed total demand, (note-3) V veh/h Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS 60.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 4.2 mi/h Adj. for access point density, (note-3) fA 2.0 mi/h Free-flow speed, FFSd 53.8 mi/h Adjustment for no-passing zones, fnp 2.3 mi/h mi/h Average travel speed, ATSd 49.4 Percent Free Flow Speed, PFFS 91.9 8

Direction Anal	ysis(d)		ıa0	posing	(0)
	1.1		~P]	1.1	()
	1.0			1.0	
	0.995			0.99	5
· · ·	1.00			1.00	5
	132 p	oc/h		126	pc/h
Base percent time-spent-following, (note-4)	-	-	00		F - ,
Adjustment for no-passing zones, fnp		51.4			
Percent time-spent-following, PTSFd		41.3	010		
Level of Service and Other	Perfor	mance M	easu	res	
Level of service, LOS		В			
Volume to capacity ratio, v/c		0.53			
Peak 15-min vehicle-miles of travel, VMT15		92	v	eh-mi	
Peak-hour vehicle-miles of travel, VMT60		294	v	eh-mi	
Peak 15-min total travel time, TT15		1.9	v	eh-h	
Capacity from ATS, CdATS		1700	v	eh/h	
Capacity from PTSF, CdPTSF		1700		eh/h	
Directional Capacity		1700	V	eh/h	
Passing Lane 2	Analysis	5			
Total length of analysis segment, Lt				2.8	mi
Length of two-lane highway upstream of the	passing	g lane.	L11	_	mi
Length of passing lane including tapers, L		unc <i>i</i>			
	רמ			_	mi
	pl			- 49.4	mi mi∕h
Average travel speed, ATSd (from above)	-			49.4	mi mi/h
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Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from Level of service, LOSd (from above)	above)			49.4 41.3 B	mi/h
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Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from Level of service, LOSd (from above) Average Travel Speed w Downstream length of two-lane highway with	above) ith Pass in effec	ctive		49.4 41.3 B	mi/h
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from Level of service, LOSd (from above) Average Travel Speed w Downstream length of two-lane highway with length of passing lane for average travel	above) ith Pass in effec vel spec	ctive ed, Lde		49.4 41.3 B	mi/h
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from Level of service, LOSd (from above) Average Travel Speed w Downstream length of two-lane highway with	above) ith Pass in effec vel spec	ctive ed, Lde		49.4 41.3 B	mi/h
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from Level of service, LOSd (from above) Average Travel Speed w Downstream length of two-lane highway with length of passing lane for average travel Length of two-lane highway downstream of e length of the passing lane for average	above) ith Pass in effec vel spec ffective travel	ctive ed, Lde e		49.4 41.3 B	mi/h
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Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	131.3
Effective width of outside lane, We	17.70
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	4.66
Bicycle LOS	Е

- 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 dewngrade segments are treated as level terrain.
- 2. If vi (vd or vo) >= 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. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.
- * These items have been entered or edited to override calculated value

Phone: Fax: E-Mail: _____Directional Two-Lane Highway Segment Analysis______ HDR Analyst Agency/Co. HDR Date Performed7/5/2019Analysis Time Period2045 - PM Build Northbound Erickson Ranch Road Highway Peaceful Pines to E/W Corridor From/To Jurisdiction Meade County Analysis Year 2045 Description Southern Meade County Corridor _____Input Data_____ Highway class Class 2 Peak hour factor, PHF 0.80 2.0ft% Trucks and and12.0ft% Trucks crawling0.01.0miTruck crawl speed0.0Level% Recreational vehicles0 Shoulder width 2.0 8 Lane width Ŷ mi/hr Segment length mi % No-passing zones 100 % Access point database Terrain type 8 Grade: Length 00 Access point density 12 _ Up/down /mi Analysis direction volume, Vd 175 veh/h Opposing direction volume, Vo 65 veh/h _____Average Travel Speed____ Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.5 1.9 1.0 PCE for RVs, ER 1.0 Heavy-vehicle adj. factor, (note-5) fHV 0.985 0.974 Grade adj. factor, (note-1) fg 1.00 1.00 Directional flow rate, (note-2) vi 222 pc/h 83 pc/h Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM mi/h Observed total demand, (note-3) V veh/h Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS 60.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 2.6 mi/h Adj. for access point density, (note-3) fA 3.0 mi/h Free-flow speed, FFSd 54.4 mi/h Adjustment for no-passing zones, fnp 2.4* mi/h mi/h Average travel speed, ATSd 49.6 Percent Free Flow Speed, PFFS 91.2 8

Direction Analy	sis(d)	0	pposing	(0)
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	.997		0.99	7
	.00		1.00	
	19 pc,	′h	81	pc/h
Base percent time-spent-following, (note-4)	BPTSFd ²	23.3 %		-
Adjustment for no-passing zones, fnp		18.1		
Percent time-spent-following, PTSFd	Į	58.4 %		
Level of Service and Other	Performan	nce Meas	ures	
Level of service, LOS	(2		
Volume to capacity ratio, v/c	(.53		
Peak 15-min vehicle-miles of travel, VMT15	1	55	veh-mi	
Peak-hour vehicle-miles of travel, VMT60	-	.75	veh-mi	
Peak 15-min total travel time, TT15			veh-h	
Capacity from ATS, CdATS			veh/h	
Capacity from PTSF, CdPTSF			veh/h	
Directional Capacity			veh/h	
Passing Lane A	nalysis			
Total length of analysis segment, Lt			1.0	mi
Length of two-lane highway upstream of the	passing -	ane, Lu		mi
Length of passing lane including tapers, Lp			_	mi
Average travel speed, ATSd (from above)	-		49.6	mi/h
Percent time-spent-following, PTSFd (from a	bove)		58.4	
Level of service, LOSd (from above)	,		C	
Average Travel Speed wi	th Passir	ng Lane_		
Downstream length of two-lane highway withi	n offort			
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Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	218.8
Effective width of outside lane, We	14.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	4.94
Bicycle LOS	Е

- 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 dewngrade segments are treated as level terrain.
- 2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
- 3. For the analysis direction only and for v>200 veh/h.
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- 5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.
- * These items have been entered or edited to override calculated value

Phone: Fax: E-Mail: _____Directional Two-Lane Highway Segment Analysis______ HDR Analyst Agency/Co. HDR Date Performed7/5/2019Analysis Time Period2045 - PM Build Northbound Highway Haines Avenue E/W Corridor to Elk Creek Rd From/To Jurisdiction Meade County Analysis Year 2045 Description Southern Meade County Corridor _____Input Data_____ Highway class Class 2 Shoulder width 0.0 ft % Trucks and Duses Lane width 12.0 ft % Trucks crawling 0.0 Segment length 4.0 mi Truck crawl speed 0.0 Level % Recreational vehicles 0 2 Macrossing zones 28 8 Ŷ mi/hr 8 mi % No-passing zones 28 % Access point density 4 00 _ Up/down /mi Analysis direction volume, Vd 205 veh/h Opposing direction volume, Vo 80 veh/h _____Average Travel Speed____ Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.4 1.9 1.0 PCE for RVs, ER 1.0 Heavy-vehicle adj. factor, (note-5) fHV 0.977 0.949 Grade adj. factor, (note-1) fg 1.00 1.00 Directional flow rate, (note-2) vi 262 pc/h 105 pc/h Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM mi/h Observed total demand, (note-3) V veh/h Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS 55.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 4.2 mi/h Adj. for access point density, (note-3) fA 1.0 mi/h Free-flow speed, FFSd 49.8 mi/h Adjustment for no-passing zones, fnp 2.4* mi/h 44.6 mi/h Average travel speed, ATSd Percent Free Flow Speed, PFFS 89.5 00

Direction Analysis(d)		ıαO	posing	(0)	
PCE for trucks, ET 1.1	1.1				
PCE for RVs, ER 1.0			1.0		
Heavy-vehicle adjustment factor, fHV 0.994	•		0.994		
Grade adjustment factor, (note-1) fg 1.00			1.00		
Directional flow rate, (note-2) vi 258 p	oc/h		101	pc/h	
Base percent time-spent-following, (note-4) BPTSFd		olo		1	
Adjustment for no-passing zones, fnp	32.6				
Percent time-spent-following, PTSFd	50.1	olo			
Level of Service and Other Perform	nance Me	easu	res		
Level of service, LOS	В				
Volume to capacity ratio, v/c	0.53				
Peak 15-min vehicle-miles of travel, VMT15	256	V	∋h−mi		
Peak-hour vehicle-miles of travel, VMT60	820	V	eh-mi		
Peak 15-min total travel time, TT15	5.7	V	∋h-h		
Capacity from ATS, CdATS	1700	V	eh/h		
Capacity from PTSF, CdPTSF	1700		eh/h		
Directional Capacity	1700		eh/h		
Passing Lane Analysis	8				
Total length of analysis segment, Lt			4.0	mi	
Length of two-lane highway upstream of the passing	r lano	T.11	4.0 -	mi	
Length of passing lane including tapers, Lpl	, <i>tane</i> ,	шu	_	mi	
henden of bassing rane functioning rabers, the				111 上	
Average travel speed ATSd (from above)			44 6	mi/h	
Average travel speed, ATSd (from above) Percent time-spent-following, PTSEd (from above)			44.6 50.1	mi/h	
Percent time-spent-following, PTSFd (from above)			50.1	mi/h	
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above)				mi/h	
Percent time-spent-following, PTSFd (from above)	sing Lar	ne	50.1 B		
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pass		ne	50.1 B		
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pass Downstream length of two-lane highway within effect	ctive		50.1 B		
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pass Downstream length of two-lane highway within effec length of passing lane for average travel spee	ctive ed, Lde		50.1 B		
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pass Downstream length of two-lane highway within effec length of passing lane for average travel spee Length of two-lane highway downstream of effective	ctive ed, Lde		50.1 B	mi	
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pass Downstream length of two-lane highway within effect length of passing lane for average travel spee Length of two-lane highway downstream of effective length of the passing lane for average travel	ctive ed, Lde		50.1 B		
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Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	256.3
Effective width of outside lane, We	12.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	6.16
Bicycle LOS	F

- 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 dewngrade segments are treated as level terrain.
- 2. If vi (vd or vo) >= 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. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.
- * These items have been entered or edited to override calculated value

Phone: Fax: E-Mail: _____Directional Two-Lane Highway Segment Analysis______ HDR Analyst Agency/Co. HDR Date Performed 7/5/2019 Date Performed7/5/2019Analysis Time Period2045 - PM Build Northbound Highway Haines Avenue Pennington Co to E/W Corridor From/To Jurisdiction Meade County Analysis Year 2045 Description Southern Meade County Corridor _____Input Data_____ Highway class Class 2 Peak hour factor, PHF 0.80 Shoulder width 0.0 % Trucks and buses ft 7 8 12.0ft% Trucks crawling0.02.0miTruck crawl speed0.0Level% Recreational vehicles0 Lane width 8 mi/hr Segment length Terrain type 8 % No-passing zones 23 Access point density 5 Grade: Length 00 _ mi _ Up/down 00 /mi Analysis direction volume, Vd 400 veh/h Opposing direction volume, Vo 125 veh/h _____Average Travel Speed____ Direction Analysis(d) Opposing (o) 1.3* PCE for trucks, ET 1.5* 1.0 PCE for RVs, ER 1.0 Heavy-vehicle adj. factor, (note-5) fHV 0.979 0.966 Grade adj. factor, (note-1) fg 1.00 1.00 Directional flow rate, (note-2) vi 511 pc/h 162 pc/h Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM mi/h Observed total demand, (note-3) V veh/h Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS 60.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 4.2 mi/h Adj. for access point density, (note-3) fA 1.3 mi/h Free-flow speed, FFSd 54.5 mi/h 2.4* Adjustment for no-passing zones, fnp mi/h mi/h Average travel speed, ATSd 46.9 Percent Free Flow Speed, PFFS 86.0 00

Direction Analysis(d)	Analysis(d) Opposing		(0)			
PCE for trucks, ET 1.0	1.1			. ~ /		
PCE for RVs, ER 1.0			1.0			
				0.993		
rade adjustment factor, (note-1) fg 1.00			1.00			
Directional flow rate, (note-2) vi 500	pc/h		157			
Base percent time-spent-following, (note-4) BPTSFd	-	00	107	P0/11		
Adjustment for no-passing zones, fnp	26.0	0				
Percent time-spent-following, PTSFd	64.5	00				
Level of Service and Other Perform			res			
		Jubu	100			
Level of service, LOS	С					
Volume to capacity ratio, v/c	0.53					
Peak 15-min vehicle-miles of travel, VMT15	250	-	eh-mi			
Peak-hour vehicle-miles of travel, VMT60	800		eh-mi			
Peak 15-min total travel time, TT15	5.3		eh-h			
Capacity from ATS, CdATS	1700		eh/h			
Capacity from PTSF, CdPTSF	1700		eh/h			
Directional Capacity	1700	v	eh/h			
Passing Lane Analysis	S					
Total length of analysis segment, Lt			2.0	mi		
Length of two-lane highway upstream of the passing	g lane.	Lu		mi		
Length of passing lane including tapers, Lpl	, _a,		_	mi		
Average travel speed, ATSd (from above)			46.9	mi/h		
Percent time-spent-following, PTSFd (from above)			64.5	,		
Level of service, LOSd (from above)			С			
Level of service, LOSd (from above)			-			
Average Travel Speed with Pass		ne	-			
Average Travel Speed with Pass	ctive		-			
Average Travel Speed with Pass Downstream length of two-lane highway within effect length of passing lane for average travel spec	ctive ed, Lde		-			
Average Travel Speed with Pass Downstream length of two-lane highway within effec length of passing lane for average travel spec Length of two-lane highway downstream of effective	ctive ed, Lde e		_			
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Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	500.0
Effective width of outside lane, We	12.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	6.83
Bicycle LOS	F

- 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 dewngrade segments are treated as level terrain.
- 2. If vi (vd or vo) >= 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. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.
- * These items have been entered or edited to override calculated value

Phone: Fax: E-Mail: _____Directional Two-Lane Highway Segment Analysis______ HDR Analyst Agency/Co. HDR Date Performed7/5/2019Analysis Time Period2045 - PM Build Westbound East/West Corridor Highway Erickson Ranch to Haines From/To Jurisdiction Meade County Analysis Year 2045 Description Southern Meade County Corridor _____Input Data_____ Highway classCLass 2Shoulder width4.0ft% Trucks and secondLane width12.0ft% Trucks crawling0.0Segment length2.3miTruck crawl speed0.0Level% Recreational vehicles0 8 Ŷ mi/hr 00 mi % No-passing zones 40 % Access point density 1 00 _ Up/down /mi Analysis direction volume, Vd 170 veh/h Opposing direction volume, Vo 80 veh/h _____Average Travel Speed____ Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.5 1.9 1.0 PCE for RVs, ER 1.0 Heavy-vehicle adj. factor, (note-5) fHV 0.971 0.949 Grade adj. factor, (note-1) fg 1.00 1.00 219 pc/h Directional flow rate, (note-2) vi 105 pc/h Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM mi/h Observed total demand, (note-3) V veh/h Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS 60.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 1.3 mi/h Adj. for access point density,(note-3) fA 0.3 mi/h Free-flow speed, FFSd 58.5 mi/h Adjustment for no-passing zones, fnp 2.4* mi/h mi/h Average travel speed, ATSd 53.5 Percent Free Flow Speed, PFFS 91.6 00

Direction Analysis(d)		rqO	posing	(0)		
PCE for trucks, ET 1.1	1.1					
PCE for RVs, ER 1.0			1.0			
Heavy-vehicle adjustment factor, fHV 0.994	•		0.994	0.994		
Grade adjustment factor, (note-1) fg 1.00			1.00			
Directional flow rate, (note-2) vi 214	pc/h		101	pc/h		
Base percent time-spent-following, (note-4) BPTSFd	-	00		1		
Adjustment for no-passing zones, fnp	39.3					
Percent time-spent-following, PTSFd	49.5	olo				
Level of Service and Other Perfor	mance M	easui	res			
Level of service, LOS	В					
Volume to capacity ratio, v/c	0.53					
Peak 15-min vehicle-miles of travel, VMT15	122	ve	eh-mi			
Peak-hour vehicle-miles of travel, VMT60	391	ve	eh-mi			
Peak 15-min total travel time, TT15	2.3	ve	eh-h			
Capacity from ATS, CdATS	1700	ve	eh/h			
Capacity from PTSF, CdPTSF	1700		eh/h			
Directional Capacity	1700		eh/h			
Passing Lane Analysi	.S					
Total length of analysis segment, Lt			2.3	mi		
Length of two-lane highway upstream of the passin	ng lane	Tui	2.J -	mi		
Length of passing lane including tapers, Lpl	-y _unc,		_	mi		
-current of bacorula rand fuctorating caberol The						
Average travel speed. ATSd (from above)						
			53.5	mi/h		
Percent time-spent-following, PTSFd (from above)						
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above)			53.5 49.5 B	mi/h		
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas		ne	53.5 49.5 B	mi/h		
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effe	ective		53.5 49.5 B	mi/h		
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effe length of passing lane for average travel spe	ective eed, Lde		53.5 49.5 B	mi/h		
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Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effe length of passing lane for average travel spe Length of two-lane highway downstream of effectiv length of the passing lane for average travel Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, ATSp	ective eed, Lde ve speed,		53.5 49.5 B - -	mi/h mi mi		
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effe length of passing lane for average travel spe Length of two-lane highway downstream of effectiv length of the passing lane for average travel Adj. factor for the effect of passing lane on average speed, fpl	ective eed, Lde ve speed,		53.5 49.5 B	mi/h mi		
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effe length of passing lane for average travel spe Length of two-lane highway downstream of effectiv length of the passing lane for average travel Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, ATSp	ective eed, Lde speed, speed,	Ld	53.5 49.5 B - - - 0.0	mi/h mi mi %		
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Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effe length of passing lane for average travel spe Length of two-lane highway downstream of effectiv length of the passing lane for average travel Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, ATSp Percent free flow speed including passing lane, P Percent Time-Spent-Following with Downstream length of two-lane highway within effe of passing lane for percent time-spent-follow Length of two-lane highway downstream of effectiv the passing lane for percent time-spent-follow	ective eed, Lde ve speed, PFFSpl PFFSpl Passin ective l ving, Ld ve lengt	Ld g Lar ength e h of	53.5 49.5 B - - 0.0	mi/h mi mi % mi		
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Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effe length of passing lane for average travel spe Length of two-lane highway downstream of effectiv length of the passing lane for average travel Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, ATSp Percent free flow speed including passing lane, P Percent Time-Spent-Following with Downstream length of two-lane highway within effe of passing lane for percent time-spent-follow Length of two-lane highway downstream of effectiv the passing lane for percent time-spent-follow Adj. factor for the effect of passing lane on percent time-spent-following, fpl	ective eed, Lde ve speed, PFFSpl PFFSpl Passin ective l ving, Ld ve lengt	Ld g Lar ength e h of	53.5 49.5 B - - 0.0	mi/h mi mi % mi		
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Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) 	ective eed, Lde re . speed, 	Ld g Lar ength e h of d	53.5 49.5 B 0.0 ne - - - - - - - - - - - - - - -	mi/h mi mi % mi %		
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effe length of passing lane for average travel spe Length of two-lane highway downstream of effectiv length of the passing lane for average travel Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, ATSp Percent free flow speed including passing lane, P Percent Time-Spent-Following with Downstream length of two-lane highway within effe of passing lane for percent time-spent-follow Length of two-lane highway downstream of effectiv the passing lane for percent time-spent-follow Adj. factor for the effect of passing lane on percent time-spent-following, fpl Percent time-spent-following, fpl Percent time-spent-following including passing lane, PTSFpl	ective eed, Lde eed, Lde e PFFSpl PFFSpl Passin ective l ving, Ld ve lengt owing, L	Ld g Lar ength h of d th Pa	53.5 49.5 B 0.0 ne - - - - - - - - - - - - - - -	mi/h mi mi % mi %		

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Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	212.5
Effective width of outside lane, We	16.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	5.51
Bicycle LOS	F

- 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 dewngrade segments are treated as level terrain.
- 2. If vi (vd or vo) >= 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. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.
- * These items have been entered or edited to override calculated value

Phone: Fax: E-Mail: _____Directional Two-Lane Highway Segment Analysis______ HDR Analyst Agency/Co. HDR Date Performed 7/5/2019 Analysis Time Period 2045 - PM Build Westbound Elk Creek Road Highway Erickson Ranch to Haines From/To Jurisdiction Meade County Analysis Year 2045 Description Southern Meade County Corridor _____Input Data_____ Highway class Class 2 Peak hour factor, PHF 0.80 Shoulder width 0.0 % Trucks and buses ft 7 8 12.0ft% Trucks crawlingU.U3.0miTruck crawl speed0.0Level% Recreational vehicles0 Lane width 8 mi/hr Segment length mi % No-passing zones % Access point Terrain type 8 Grade: Length 7 00 _ Access point density 6 _ Up/down /mi Analysis direction volume, Vd 125 veh/h Opposing direction volume, Vo 110 veh/h _____Average Travel Speed____ Direction Analysis(d) Opposing (o) 1.5* PCE for trucks, ET 1.5* 1.0 1.0 PCE for RVs, ER 0.966 Heavy-vehicle adj. factor, (note-5) fHV 0.966 Grade adj. factor, (note-1) fg 1.00 1.00 Directional flow rate, (note-2) vi 162 pc/h 142 pc/h Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM mi/h Observed total demand, (note-3) V veh/h Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS 60.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 4.2 mi/h Adj. for access point density, (note-3) fA 1.5 mi/h Free-flow speed, FFSd 54.3 mi/h Adjustment for no-passing zones, fnp 0.9 mi/h mi/h Average travel speed, ATSd 51.1 Percent Free Flow Speed, PFFS 94.0 00

Direction Analysis(d)	d) Opposing (o)		(0)		
PCE for trucks, ET 1.1		1.1			
PCE for RVs, ER 1.0		1.0			
Heavy-vehicle adjustment factor, fHV 0.993	•		0.993		
Grade adjustment factor, (note-1) fg 1.00	1.00				
Directional flow rate, (note-2) vi 157	pc/h		138	pc/h	
Base percent time-spent-following, (note-4) BPTSFc	-	olo		1	
Adjustment for no-passing zones, fnp	20.1				
Percent time-spent-following, PTSFd	28.1	olo			
Level of Service and Other Perfor	rmance Me	easu	res		
Level of service, LOS	A				
Volume to capacity ratio, v/c	0.53				
Peak 15-min vehicle-miles of travel, VMT15	117	V	eh-mi		
Peak-hour vehicle-miles of travel, VMT60	375	V	eh-mi		
Peak 15-min total travel time, TT15	2.3		∋h−h		
Capacity from ATS, CdATS	1700		eh/h		
Capacity from PTSF, CdPTSF	1700		eh/h		
Directional Capacity	1700		eh/h		
Passing Lane Analysi	is				
Total length of analysis segment, Lt			3.0	mi	
Length of two-lane highway upstream of the passir	ng lane.	T.11	-	mi	
Length of passing lane including tapers, Lpl			_	mi	
				111 -	
Average travel speed, ATSd (from above)			51.1	mi/h	
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from above)			51.1 28.1	mi/h	
Percent time-spent-following, PTSFd (from above)			51.1 28.1 A	mi/h	
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above)			28.1 A		
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas		ne	28.1 A		
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effe	ective		28.1 A		
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Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effe length of passing lane for average travel spe Length of two-lane highway downstream of effectiv length of the passing lane for average travel	ective eed, Lde ve		28.1 A		
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effe length of passing lane for average travel spe Length of two-lane highway downstream of effectiv length of the passing lane for average travel Adj. factor for the effect of passing lane	ective eed, Lde ve		28.1 A	mi	
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effe length of passing lane for average travel spe Length of two-lane highway downstream of effective length of the passing lane for average travel Adj. factor for the effect of passing lane on average speed, fpl	ective eed, Lde ve l speed,		28.1 A	mi	
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effe length of passing lane for average travel spe Length of two-lane highway downstream of effective length of the passing lane for average travel Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, ATSp	ective eed, Lde ve 1 speed, pl		28.1 A - - -	mi mi	
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effe length of passing lane for average travel spe Length of two-lane highway downstream of effective length of the passing lane for average travel Adj. factor for the effect of passing lane on average speed, fpl	ective eed, Lde ve 1 speed, pl		28.1 A	mi	
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Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pas Downstream length of two-lane highway within effective length of passing lane for average travel spect Length of two-lane highway downstream of effective length of the passing lane for average travel Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, ATSp Percent free flow speed including passing lane, F	ective eed, Lde ve 1 speed, pl PFFSpl h Passind ective 10	Ld g Lar engtl	28.1 A - - 0.0	mi mi %	
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<pre>Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above)</pre>	ective eed, Lde ve 1 speed, of PFFSp1 h Passind ective 10 wing, Ldd ve lengt1 owing, Ldd sures wit	Ld g Lan engtl e h of d	28.1 A - - 0.0 ne - - - - - - - - - - - - - - - - -	mi mi % mi %	
Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above) Average Travel Speed with Pass Downstream length of two-lane highway within effective length of passing lane for average travel spective Length of two-lane highway downstream of effective length of the passing lane for average travel Adj. factor for the effect of passing lane on average speed, fpl Average travel speed including passing lane, ATSF Percent free flow speed including passing lane, F Percent Time-Spent-Following with Downstream length of two-lane highway within effect of passing lane for percent time-spent-follow Length of two-lane highway downstream of effective the passing lane for percent time-spent-follow Adj. factor for the effect of passing lane on percent time-spent-following, fpl Percent time-spent-following including passing lane, PTSFpl	ective eed, Lde ve 1 speed, of PFFSp1 h Passing ective 10 wing, Ldo ve lengt1 owing, Ldo	Ld g Lan engtl en of d	28.1 A - - 0.0 ne - - - - - - - - - - - - - - - - -	mi mi % mi %	

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Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	156.3
Effective width of outside lane, We	16.50
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	5.60
Bicycle LOS	F

- 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 dewngrade segments are treated as level terrain.
- 2. If vi (vd or vo) >= 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. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.
- * These items have been entered or edited to override calculated value



Appendix B – 2045 Turn Lane Volume Warrant Review















Proposed East/West Corridor and 143rd Avenue

All forecasted turning movements estimated at 5 vehicles per hour, and thus do not meet volume warrants.