# APPENDIX A – HIGHWAY CAPACITY SOFTWARE (HCS) OUTPUT

Phone: Fax: E-Mail: Directional Two-Lane Highway Segment Analysis Analyst GW Agency/Co. Stantec Agency/co.SecureDate Performed3/27/2018Analysis Time Period2018 Design Hour Highway KY 151 From/To US 127 to KY 512 Jurisdiction KYTC District 7 Analysis Year 2018 Description KY 151 Segment #1 Input Data Highway class Class 3 Shoulder width 4.0 ft % Trucks and buses 8 % Lane width 11.0 ft % Trucks crawling 0.0 % Segment length 1.8 mi Truck crawl speed 0.0 mi/hr Terrain type Level % Recreational vehicles 0 % Grade: Length - mi % No-passing zones 90 % Up/down - % Access point density 24 /mi Analysis direction volume, Vd 443 veh/h Opposing direction volume, Vo 377 veh/h \_\_\_\_\_Average Travel Speed\_\_\_\_\_ Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.2 1.3 PCE for RVs, ER 1.0 1.0 Heavy-vehicle adj. factor,(note-5) fHV 0.984 0.977 Grade adj. factor, (note-1) fg 1.00 1.00 Directional flow rate, (note-2) vi 489 pc/h 419 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 52.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 1.7 mi/h Adj. for access point density, (note-3) fA 6.0 mi/h Free-flow speed, FFSd 44.3 mi/h Adjustment for no-passing zones, fnp 2.5 mi/h mi/h mi/h Average travel speed, ATSd 34.7 Percent Free Flow Speed, PFFS 78.4 %

irection       Analysis(d)       Opposing (c)         CF for Trucks, ET       1.0       1.0         CF for RVs, ER       1.0       1.0         eavy-vehicle adjustment factor, fHV       1.00       1.00         rectional flow rate, (note-2) vi       482 pc/h       410 pc/h         ase percent time-spent-following, (note-4) BPTSFd       49.1 *					
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\_\_Percent Time-Spent-Following\_\_\_\_\_

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	481.5
Effective width of outside lane, We	15.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	6.51
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.

E-Mail: Directional Two-Lane Highway Segment Analysis Analyst GW Agency/Co. Stantec Agency/Co.ScancedDate Performed3/27/2018Analysis Time Period2018 Design Hour Highway KY 151 KY 512 to Franklin County Line KYTC District 7 From/To Jurisdiction Analysis Year 2018 Description KY 151 Segment #2 \_\_\_\_\_Input Data\_\_\_\_\_ Highway class Class 3 Shoulder width 1.5 ft % Trucks and buses 10 % Lane width 11.0 ft % Trucks crawling 0.0 % Segment length 2.8 mi Truck crawl speed 0.0 mi/hr Terrain type Level % Recreational vehicles 0 % Grade: Length - mi % No-passing zones 90 % Up/down - % Access point density 21 /mi Analysis direction volume, Vd 257 veh/h Opposing direction volume, Vo 186 veh/h \_\_\_\_\_Average Travel Speed\_\_\_\_\_ Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.4 1.5 1.0 PCE for RVs, ER 1.0 Heavy-vehicle adj. factor,(note-5) fHV 0.962 0.952 1.00 Grade adj. factor, (note-1) fg 1.00 287 pc/h Directional flow rate,(note-2) vi 210 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 4.7 mi/h Adj. for access point density, (note-3) fA 5.3 mi/h Free-flow speed, FFSd 50.0 mi/h 3.9 mi/h 42.3 mi/h Adjustment for no-passing zones, fnp Average travel speed, ATSd Percent Free Flow Speed, PFFS 84.5 %

Fax:

Phone:

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	0.990		0.99	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	279 p		202	pc/h
Base percent time-spent-following,(not	ce-4) BPTSFd	28.4	010	
Adjustment for no-passing zones, fnp		56.1		
Percent time-spent-following, PTSFd		60.9	010	
Level of Service and (	Other Perform	nance Mea	sures	
Level of service, LOS		В		
Jolume to capacity ratio, v/c		0.16		
Peak 15-min vehicle-miles of travel, N	/MT15	193	veh-mi	
Peak-hour vehicle-miles of travel, VM		720	veh-mi	
Peak 15-min total travel time, TT15		4.6	veh-h	
Capacity from ATS, CdATS		1700		
Capacity from PTSF, CdPTSF		1700		
Directional Capacity		1700		
Sirectional capacity		1700	veh/h	
Passing I	Lane Analysis	5		
otal length of analysis segment, Lt			2.8	mi
Length of two-lane highway upstream of	the passing	lane. T		mi
length of passing lane including taper		, <b>,</b>	_	mi
Average travel speed, ATSd (from above	-		42.3	mi/h
Percent time-spent-following, PTSFd (1			60.9	
Level of service, LOSd (from above)	LION ADOVC)		в	
level of service, host (from above)			D	
Average Travel Spee	ed with Pass	ing Lane	2	
Downstream length of two-lane highway	within effec	tive		
length of passing lane for average	e travel spee	ed, Lde	-	mi
Length of two-lane highway downstream	_			
length of the passing lane for ave	erage travel		ıd -	mi
Adj. factor for the effect of passing	lane			
on average speed, fpl			-	
Average travel speed including passing			-	
Percent free flow speed including pass	sing lane, PF	FSpl	0.0	010
Percent Time-Spent-Fol	llowing with	Passing	Lane	
Downstream length of two-lane highway	within effec	tive ler	ngth	
of passing lane for percent time-s			-	mi
Length of two-lane highway downstream			of	
the passing lane for percent time-			-	mi
Adj. factor for the effect of passing		,, ца		
on percent time-spent-following, f			_	
	- եղ		-	
Percent time-spent-following				0
including passing lane, PTSFpl			-	010
Level of Service and Other Perfo	ormance Measu	res with	n Passing	Lane
	ne, LOSpl	Е		
Level of service including passing lar Peak 15-min total travel time, TT15	ne, LOSpl	E -	veh-h	

\_\_Percent Time-Spent-Following\_\_\_\_\_

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	276.3
Effective width of outside lane, We	12.50
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	7.59
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.

E-Mail: Directional Two-Lane Highway Segment Analysis Analyst GW Agency/Co. Stantec Agency/Co.ScancedDate Performed3/27/2018Analysis Time Period2018 Design Hour Highway KY 151 From/To Franklin County Line to I-64 KYTC District 5 Jurisdiction Analysis Year 2018 Description KY 151 Segment #3 \_\_\_\_\_Input Data\_\_\_\_\_ Highway class Class 3 Shoulder width 5.0 ft % Trucks and buses 11 % Lane width 12.0 ft % Trucks crawling 0.0 % Segment length 2.1 mi Truck crawl speed 0.0 mi/hr Terrain type Rolling % Recreational vehicles 0 % Grade: Length - mi % No-passing zones 90 % UD/down - % Access point density 12 /mi Analysis direction volume, Vd 302 veh/h Opposing direction volume, Vo 201 veh/h \_\_\_\_\_Average Travel Speed\_\_\_\_\_ Direction Analysis(d) Opposing (o) PCE for trucks, ET 2.1 2.3 PCE for RVs, ER 1.1 1.1 Heavy-vehicle adj. factor,(note-5) fHV 0.892 0.875 0.85 Grade adj. factor, (note-1) fg 0.76 Directional flow rate, (note-2) vi 428 pc/h 325 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 3.0 mi/h Free-flow speed, FFSd 55.7 mi/h 3.3 mi/h 46.6 mi/h Adjustment for no-passing zones, fnp Average travel speed, ATSd Percent Free Flow Speed, PFFS 83.6 %

Fax:

Phone:

Percent lime-spe		5		
Direction Ana	lysis(d)	(	Opposing	(0)
PCE for trucks, ET	1.6		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.938		0.929	)
Grade adjustment factor, (note-1) fg	0.86		0.81	
Directional flow rate, (note-2) vi	403 pc	r/h	287	pc/h
Base percent time-spent-following, (note-4			20 / 20 /	20/11
		47.8	0	
Adjustment for no-passing zones, fnp			0	
Percent time-spent-following, PTSFd		67.9	0/0	
Level of Service and Othe	r Performa	ance Mea	sures	
Level of service, LOS		В		
<i>Nolume to capacity ratio, v/c</i>		0.20		
Peak 15-min vehicle-miles of travel, VMT1	5	170	veh-mi	
Peak-hour vehicle-miles of travel, VMT60	5	634	veh-mi	
Peak 15-min total travel time, TT15		3.6	veh-h	
Capacity from ATS, CdATS		1646	veh/h	
Capacity from PTSF, CdPTSF				
Directional Capacity		1646	veh/h	
Passing Lane	Analysis_			
otal length of analysis segment, Lt			2.1	mi
length of two-lane highway upstream of th	e naccina	lane Lu		mi
		Iane, D	- u	mi
ength of passing lane including tapers,	грт			
verage travel speed, ATSd (from above)			46.6	mi/h
Percent time-spent-following, PTSFd (from	above)		67.9	
Level of service, LOSd (from above)			В	
Average Travel Speed	with Passi	ng Lane		
Downstream length of two-lane highway wit	hin effect	ive		
length of passing lane for average tr			_	mi
	_	i, due	_	
ength of two-lane highway downstream of			-	
length of the passing lane for averag Adj. factor for the effect of passing lan		speed, Lo	d -	mi
on average speed, fpl			_	
Average travel speed including passing la	ne Archi		_	
Percent free flow speed including passing fa		Spl	0.0	00
				-
Percent Time-Spent-Follow	ing with B	Passing 1	Lane	
Downstream length of two-lane highway wit			gth	
of passing lane for percent time-spen	t-followir	ng, Lde	-	mi
length of two-lane highway downstream of	effective	length o	of	
the passing lane for percent time-spe			-	mi
dj. factor for the effect of passing lan		2.		
	-		-	
ON DEPENDENT FIME-SDEDF-FOLLOWING FDL				
on percent time-spent-following, fpl			_	00
Percent time-spent-following				-
Percent time-spent-following including passing lane, PTSFpl	nce Messur	rea with	Dagging	Lane
Percent time-spent-following	nce Measur	res with	Passing	Lane
Percent time-spent-following including passing lane, PTSFpl Level of Service and Other Performa		res with E	Passing	Lane
Percent time-spent-following including passing lane, PTSFpl Level of Service and Other Performa Level of service including passing lane,			_	Lane
Percent time-spent-following including passing lane, PTSFpl			Passing veh-h	Lane

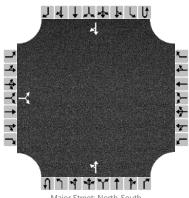
\_\_Percent Time-Spent-Following\_\_\_\_\_

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	324.7
Effective width of outside lane, We	22.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	6.45
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.

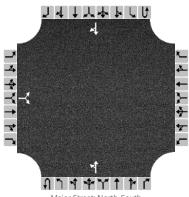
HCS7 Two-Way Stop-Control Report											
General Information		Site Information									
Analyst	GW	Intersection	KY 151 @ Alton Station Rd								
Agency/Co.	Stantec	Jurisdiction									
Date Performed	3/27/2018	East/West Street	Alton Station Rd.								
Analysis Year	2018	North/South Street	KY 151								
Time Analyzed	2018 AM Design Hour	Peak Hour Factor	0.89								
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25								
Project Description	KY 151 Scoping Study										



Major Street: North-South

Vehicle Volumes and Ad	justme	nts															
Approach		Eastb	ound			West	oound		Northbound					Southbound			
Movement	U	L	Т	R	U	U L T R				L	Т	R	U	L	Т	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0	
Configuration			LR							LT						TR	
Volume, V (veh/h)		80		170						60	310				270	10	
Percent Heavy Vehicles (%)		3		3						3							
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized		No No							Ν	lo		No					
Median Type/Storage		Undivided															
Critical and Follow-up H	eadwa	ys															
Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	
Delay, Queue Length, an	d Leve	l of S	ervice														
Flow Rate, v (veh/h)			281							67							
Capacity, c (veh/h)			792							1238							
v/c Ratio			0.35							0.05							
95% Queue Length, Q <sub>95</sub> (veh)			1.6							0.2							
Control Delay (s/veh)			12.0							8.1							
Level of Service, LOS			В							A							
Approach Delay (s/veh)		12	2.0			-		-	1.8					-	-		
Approach LOS			В														

	Site Information	
	Intersection	KY 151 @ Alton Station Rd
	Jurisdiction	
8	East/West Street	Alton Station Rd.
	North/South Street	KY 151
Design Hour	Peak Hour Factor	0.93
uth	Analysis Time Period (hrs)	0.25
coping Study		
	5	uth Analysis Time Period (hrs)



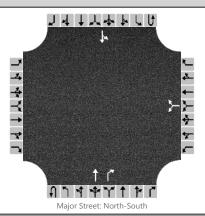
Major Street: North-South

					inajoi	bureet. Ho	un boutin										
Vehicle Volumes and Ad	justme	ents															
Approach		Eastb	ound			West	bound			North	bound			Southbound			
Movement	U	L	Т	R	U	L	Т	R	U	L	Т	R	U	UL	Т	R	
Priority		10	11	12		7	8	9	10	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0	
Configuration			LR							LT						TR	
Volume, V (veh/h)		30		120						160	340				370	110	
Percent Heavy Vehicles (%)		3		3						3							
Proportion Time Blocked																	
Percent Grade (%)			0														
Right Turn Channelized		No				Ν	lo			Ν	lo	No					
Median Type/Storage		Undivided															
Critical and Follow-up H	eadwa	ys															
Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	
Delay, Queue Length, an	d Leve	l of S	ervice		<u>.</u>				<u> </u>	<u>.</u>					<u> </u>		
Flow Rate, v (veh/h)	Τ		161							172							
Capacity, c (veh/h)			752							1044							
v/c Ratio			0.21							0.16							
95% Queue Length, Q <sub>95</sub> (veh)			0.8							0.6							
Control Delay (s/veh)			11.1							9.1							
Level of Service, LOS			В							A							
Approach Delay (s/veh)		. 1:	1.1	-						. 4	.2						
Approach LOS			В														

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HCS7<sup>™</sup> TWSC Version 7.4

HCS7 Two-Way Stop-Control Report											
General Information		Site Information									
Analyst	GW	Intersection	KY 151 @ Old Frankfort Rd								
Agency/Co.	Stantec	Jurisdiction									
Date Performed	3/27/2018	East/West Street	Old Frankfort Rd.								
Analysis Year	2018	North/South Street	KY 151								
Time Analyzed	2018 AM Design Hour	Peak Hour Factor	0.84								
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25								
Project Description	KY 151 Scoping Study										
Lanos											



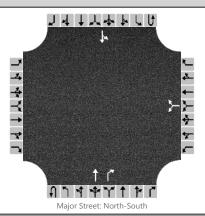
## Vehicle Volumes and Adjustments

venicle volumes and Ad	Justine	ints														
Approach		Eastb	ound			West	oound			North	bound			South	bound	
Movement	U	L	Т	R	U L T R U					L	Т	R	U	L	Т	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	1	0	0	1	0
Configuration							LR				Т	R		LT		
Volume, V (veh/h)						30		10			300	80		10	180	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)						(	C									
Right Turn Channelized		No No							Y	es		No				
Median Type/Storage		Undivided														
Critical and Follow-up H	eadwa	ys														
Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																
Delay, Queue Length, an	d Leve	l of S	ervice	•												
Flow Rate, v (veh/h)							48							12		
Capacity, c (veh/h)							502							1195		
v/c Ratio							0.09							0.01		
95% Queue Length, Q <sub>95</sub> (veh)							0.3							0.0		
Control Delay (s/veh)							12.9							8.0		
Level of Service, LOS							В							A		
Approach Delay (s/veh)						12	2.9						0.5			
Approach LOS						I	3									

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	HCS7 Two-Wa	y Stop-Control Report	
General Information		Site Information	
Analyst	GW	Intersection	KY 151 @ Old Frankfort Rd
Agency/Co.	Stantec	Jurisdiction	
Date Performed	3/27/2018	East/West Street	Old Frankfort Rd.
Analysis Year	2018	North/South Street	KY 151
Time Analyzed	2018 PM Design Hour	Peak Hour Factor	0.98
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	KY 151 Scoping Study	·	



#### Vehicle Volumes and Adjustments

venicle volumes and Ad	justme	ents															
Approach		Eastb	ound			West	oound			North	bound			South	bound		
Movement	U	L	Т	R	U	L	Т	R	U	L	Т	R	U	L	Т	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	1	0	0	0	1	1	0	0	1	0	
Configuration							LR				Т	R		LT			
Volume, V (veh/h)						150		30			300	60		20	450		
Percent Heavy Vehicles (%)						3		3						3			
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized		Ν	lo			Ν	lo		Yes				No				
Median Type/Storage				Undi	vided	ed											
Critical and Follow-up H	eadwa	ys															
Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	
Delay, Queue Length, an	d Leve	l of S	ervice	•													
Flow Rate, v (veh/h)							184							20			
Capacity, c (veh/h)							377							1248			
v/c Ratio							0.49							0.02			
95% Queue Length, Q <sub>95</sub> (veh)							2.6							0.0			
Control Delay (s/veh)							23.3							7.9			
Level of Service, LOS							С							Α			
Approach Delay (s/veh)		-	-	-		23	3.3				-	0.5					
Approach LOS						(	С										

# **HCS7 Signalized Intersection Results Summary**

	HCS	s/ Sig	nalize	d Inte	ersect	tion R	lesi	lits St	ımmar	У			_	_
General Information								Intoroo	ction Inf	formativ	20		1 석 각 석* †	b L
L	Stantec							Duratio		0.25	SU	- 1	ĴŤŤſ	
Agency	GW		Analya	ia Data	2/27/2	010								N.
Analyst	GW		-		3/27/2			Area Ty PHF	ре	0.89	Other		w‡e	<b>₹_</b>
Jurisdiction			Time F		Hour	AM Desi	gn							* ⇒ ₹
Urban Street				is Year				L	s Period	1> 7:0	00		5 t t d	
Intersection	KY 151 @ US 127		File Na	ame	Existin	ng AM K	Y 15	1 @ US	127.xus				* 1 * *	₩ <b>1</b>
Project Description	KY 151 Scoping St	udy												
Demand Information	ר ז			EB			W	/B		NB			SB	
Approach Movement			L	T	R	L		Г R	L	T	R	L	T	R
Demand ( v ), veh/h			120	130	490	40	1				90	110	320	40
			120	100	100	10		20	210	100	00	110	020	
Signal Information				5		21		2						
Cycle, s 89.2	Reference Phase	2		8	- Stř	2 TX	2×	è			<b>Y</b>	<b>P</b>	-	- <b>Q</b>
Offset, s 0	Reference Point	End	Green	8.3	0.6	20.8	34		0.0	_			3	<b>X</b> 4
Uncoordinated Yes	Simult. Gap E/W	On	Yellow		3.5	5.0	5.0				$\leq$			
Force Mode Fixed	d Simult. Gap N/S	On	Red	2.1	2.1	1.2	2.4	4 0.0	0.0		5	6	7	8
Times Description					EDT						NDT			ODT
Timer Results			EBL	·	EBT	WBI	-+-	WBT	NB		NBT	SBI		SBT
Assigned Phase				_	4		$\rightarrow$	8	5		2	1		6
Case Number				_	7.0			7.0	2.0		3.0	2.0		3.0
Phase Duration, s					42.1		42.1		20.5		33.2	13.9		27.0
Change Period, (Y+	,			_	7.4 6.2			7.4	5.6		6.2	5.6 3.9		6.2 3.4
Max Allow Headway	. ,		<u> </u>					6.2 3.9			3.4			
Queue Clearance Tin					33.3			14.7	14.		22.6 4.4	8.4 0.3		10.2
Green Extension Tim Phase Call Probabilit			<u> </u>		1.3 1.00		+	11.1	0.5					4.4 1.00
Max Out Probability	у				1.00		-+-	0.52	0.0		0.00			0.00
Max Out 1 Tobability					1.00			0.52	0.0		0.00	0.00		0.00
Movement Group R	esults		EB				WE	3		NB			SB	
Approach Movement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Movement			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (	<i>v</i> ), veh/h			281	551		169	9 292	236	843	101	124	360	45
Adjusted Saturation F	Flow Rate ( s ), veh/h/l	In		1471	1510		164	3 1547	1697	1696	1510	1682	1682	1497
Queue Service Time				6.9	31.3		0.0	) 12.7		20.6	4.5	6.4	8.2	2.1
Cycle Queue Clearar	nce Time ( <i>g c</i> ), s			12.5	31.3		5.6			20.6	4.5	6.4	8.2	2.1
Green Ratio ( g/C )				0.39	0.39		0.3			0.30	0.30	0.09	0.23	0.23
Capacity ( c ), veh/h				631	587		690		277	1027	457	157	783	349
Volume-to-Capacity F	. ,			0.445	0.938		0.24		_		0.221	0.786	0.459	0.129
	ft/In ( 50 th percentile)			110.6	368.8		57.8				38.9	75.7	81.7	18.9
	veh/ln ( 50 th percent	,		4.2	13.9		2.2	_	5.1	7.6	1.5	2.8	3.1	0.7
	(RQ) (50 th percent	tile)		0.32	1.05		0.2			0.00	0.08	0.17	0.00	0.05
Uniform Delay (d 1),				20.4	26.3		18.4		_	28.9	23.3	39.6	29.4	27.1
Incremental Delay ( d				1.1	23.4		0.4		7.2	1.3	0.2	8.3	0.3	0.1
Initial Queue Delay (	· ·			0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/				21.4 C	49.7		18.			30.1	23.4	47.9	29.7	27.2
Level of Service (LOS Approach Delay, s/ve	,		40.4		D	20.7	B	C C	D 32	C	C C	D 33.9	C	C C
Intersection Delay, s/ve			40.1		32	20.7		U	32.	۷		33.8 C	,	0
					52							<u> </u>		
Multimodal Results				EB			WE	3		NB			SB	
Pedestrian LOS Scor	e / LOS		2.42		В	2.42		B	1.9	1	В			В
									_					

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# **HCS7 Signalized Intersection Results Summary**

		псэ	7 Siy	nanze	umu	ersec		1621	ults Su	iiiiiai	у				
General Inform	nation								Interse	ction Inf	ormatio	on		비박갑학수	
Agency		Stantec							Duration		0.25			Դֈֈֈ	
Analyst		GW		Analys	is Date	3/27/2	018		Area Ty	· · · · · · · · · · · · · · · · · · ·	Other		-7 -5		۲. ۵
Jurisdiction							PM Des	ian	PHF		0.98		<b>→</b>	w∔e	* *
				Но							0.00				* * *
Urban Street				1	is Year				Analysis		1> 4:(	00		1111	
Intersection		KY 151 @ US 127		File Na	ame	Existir	ng PM K	(Y 15	1 @ US	127.xus				114Y	7 4
Project Descript	tion	KY 151 Scoping Stu	udy												
Demand Inform	nation				EB			W	/B		NB			SB	
Approach Move	ment			L	Т	R	L	-	T R	L	Т	R	L	Т	R
Demand (v), v				50	210	210	60	1	90 370	290	420	90	380	1130	50
				16			<u> </u>								
Signal Informa			-		5	215	21		, 🔚 👘		Į		<b>*</b> -		7
Cycle, s	125.2	Reference Phase	2		5		1 fi	r#3				1	2	3	€ ₄
Offset, s	0	Reference Point	End	Green		0.7	42.1		3.9 0.0	0.0					5
Uncoordinated Force Mode	Yes	Simult. Gap E/W	On On	Yellow	3.5 2.1	3.5 2.1	5.0	5. 2.				$\sum 4$			
	Fixed	Simult. Gap N/S	Un	Red	<u> </u> <u>∠</u> .	2.1	1.2	Ζ.	+ 10.0	0.0		5	6	7	8
Timer Results				EBL		EBT	WBI	L	WBT	NB	L	NBT	SBI	_	SBT
Assigned Phase	e					4			8	5		2	1		6
Case Number						7.0			7.0	2.0		3.0	2.0		3.0
Phase Duration	, S			4		41.3			41.3	29.3	3	48.3	35.6	35.6 54	
Change Period,	( Y+R	c ), S				7.4		7.4		5.6	6.2		5.6		6.2
Max Allow Head	dway( <i>I</i>	<i>MAH</i> ), s				6.2			6.2	3.9		3.4	3.9		3.4
Queue Clearan	ce Time	e ( g s ), s				21.6			31.5	23.	23.5 14.0		30.5	5	42.1
Green Extensio		(ge), s				7.2			2.4	0.2		6.4	0.0		6.3
Phase Call Prob						1.00			1.00	1.00		1.00	1.00		1.00
Max Out Proba	bility					0.62			1.00	1.00	)	0.00	1.00	)	0.00
Movement Gro	un Res	sults			EB			W	R		NB			SB	
Approach Move	-				T	R	L	T	R	L	Т	R	L	T	R
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow F		), veh/h			265	214		25	_	296	429	92	388	1153	51
-		ow Rate ( s ), veh/h/l	n		1539	1510		148	_	1697	1696	1510	1682	1682	1497
Queue Service					0.0	15.1		0.5	5 29.5	21.5	12.0	5.4	28.5	40.1	2.7
Cycle Queue C	learanc	e Time ( <i>g c</i> ), s			19.6	15.1		20.	3 29.5	21.5	12.0	5.4	28.5	40.1	2.7
Green Ratio (g					0.27	0.27		0.2	7 0.27	0.19	0.34	0.34	0.24	0.39	0.39
Capacity ( c ), v					451	409		43		321	1141	508	403	1301	579
Volume-to-Capa					0.588	0.524		0.58			0.376	0.181	0.962	0.886	0.088
		/In ( 50 th percentile)			196.3	151.6		185			125.1	50.1	408.2	418.8	24.7
		eh/In (50 th percenti			7.4	5.7		7.1		11.3	4.7	1.9	15.2	15.6	0.9
-		RQ) (50 th percent	ule)		0.56	0.43		0.7		0.57	0.00	0.10	0.94	0.00	0.06
Uniform Delay (					39.9 3.0	38.8 2.3		40. 3.0		49.9 29.3	31.6 0.2	29.4	47.1 35.1	35.8 2.3	24.4 0.0
Incremental De Initial Queue De	•				0.0	0.0		0.0		29.3	0.2	0.1	0.0	0.0	0.0
Control Delay (	• •	•			42.9	41.1		43.		79.2	31.7	29.5	82.1	38.1	24.4
Level of Service					42.3 D	-+1.1 D		-43. D		F 19.2	C	29.5 C	62.1	D	C
Approach Delay	. /			42.1		D	57.0		E	48.7		D	48.4		D
Intersection Del						49			_				D		_
	-														
Multimodal Re					EB			W	В	NB				SB	
Pedestrian LOS				2.45		В	2.45		В	1.93	3	В	1.92	2	В
Bicycle LOS Sc	ore / LC	DS		1.28		А	1.53	3	В	1.16	6	А	1.80	)	В

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E-Mail: Directional Two-Lane Highway Segment Analysis Analyst GW Agency/Co. Stantec Agency/co.SecureDate Performed3/27/2018Analysis Time Period2040 Design Hour Highway KY 151 From/To US 127 to KY 512 Jurisdiction KYTC District 7 Analysis Year 2040 Description KY 151 Segment #1 Input Data Highway class Class 3 Shoulder width 4.0 ft % Trucks and buses 8 % Lane width 11.0 ft % Trucks crawling 0.0 % Segment length 1.8 mi Truck crawl speed 0.0 mi/hr Terrain type Level % Recreational vehicles 0 % Grade: Length - mi % No-passing zones 90 % Up/down - % Access point density 24 /mi Analysis direction volume, Vd 548 veh/h Opposing direction volume, Vo 467 veh/h \_\_\_\_\_Average Travel Speed\_\_\_\_\_ Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.1 1.2 PCE for RVs, ER 1.0 1.0 Heavy-vehicle adj. factor,(note-5) fHV 0.992 0.984 1.00 Grade adj. factor, (note-1) fg 1.00 600 pc/h Directional flow rate, (note-2) vi 516 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 52.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 1.7 mi/h Adj. for access point density, (note-3) fA 6.0 mi/h Free-flow speed, FFSd 44.3 mi/h Adjustment for no-passing zones, fnp 2.1 mi/h 33.5 mi/h Average travel speed, ATSd Percent Free Flow Speed, PFFS 75.7 %

Fax:

Phone:

-			-
		1.0	
_		508	pc/h
) BPTSFd	57.2	010	
	35.5		
	76.4	00	
r Performa	ance Mea	sures	
	С		
	0.35		
5	268	veh-mi	
	986	veh-mi	
		veh-h	
	1700	veh/h	
Analysis			
Anarysis <u></u>			
	_		mi
	lane, I	u -	mi
Lpl		-	mi
		33.5	mi/h
above)		76.4	
		С	
with Pass:	ing Lane	2	
hin effect	tive		
		_	mi
_			
		d	mi
	speed, I	Ja -	111 1
e			
		-	
		-	2
lane, PFI	FSpl	0.0	00
ing with 1	Passing	Lane	
hin effect	tive ler	ngth	
		-	mi
effective	-	of	
			m <del>i</del>
nt-follow <sup>.</sup>	ing, Ld	-	mi
nt-follow: e	ing, Ld	-	111 -
nt-follow: e	ing, Ld	-	
	ing, Ld	-	1111
	ing, Ld	-	8 8
		-	રુ
e nce Measu:	res with	-	રુ
e		- - 1 Passin	રુ
e nce Measu:	res with	-	રુ
	<pre>1.0 1.0 1.00 1.00 596 pr ) BPTSFd r Performa 5 Analysis e passing Lpl above) with Pass hin effect avel speed effective e travel se ne, ATSpl lane, PF ing with fin effect t-following </pre>	<pre>1.0 1.0 1.00 1.00 596 pc/h ) BPTSFd 57.2 35.5 76.4 r Performance Mea C 0.35 5 268 986 8.0 1700 1700 1700 1700 1700 Analysis e passing lane, I Lpl above) with Passing Lane hin effective avel speed, Lde effective e travel speed, Ide effective e travel speed, I e ne, ATSpl lane, PFFSpl ing with Passing hin effective ler t-following, Lde</pre>	<pre>1.0 1.0 1.0 1.0 1.0 1.0 1.00 1.0 596 pc/h 508 ) BPTSFd 57.2 % 35.5 76.4 % r Performance Measures C 0.35 5 268 veh-mi 8.0 veh-h 1700 veh/h 1700 veh/h 1700 veh/h 1700 veh/h 1700 veh/h 1700 veh/h 1.8 e passing lane, Lu - Lpl - 33.5 above) 76.4 C with Passing Lane hin effective avel speed, Lde - effective e travel speed, Ld - e ne, ATSpl - lane, PFFSpl 0.0 ing with Passing Lane hin effective length t-following, Lde -</pre>

\_\_Percent Time-Spent-Following\_\_\_\_\_

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	595.7
Effective width of outside lane, We	15.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	6.88
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.

E-Mail: Directional Two-Lane Highway Segment Analysis Analyst GW Agency/Co. Stantec Agency/Co.ScancedDate Performed3/27/2018Analysis Time Period2040 Design Hour KY 151 Highway KY 512 to Franklin County Line KYTC District 7 From/To Jurisdiction Analysis Year 2040 Description KY 151 Segment #2 \_\_\_\_\_Input Data\_\_\_\_\_ Highway class Class 3 Shoulder width 1.5 ft % Trucks and buses 10 % Lane width 11.0 ft % Trucks crawling 0.0 % Segment length 2.8 mi Truck crawl speed 0.0 mi/hr Terrain type Level % Recreational vehicles 0 % Grade: Length - mi % No-passing zones 90 % Up/down - % Access point density 15 /mi Analysis direction volume, Vd 324 veh/h Opposing direction volume, Vo 234 veh/h \_\_\_\_\_Average Travel Speed\_\_\_\_\_ Direction Analysis(d) Opposing (o) PCE for trucks, ET 1.4 1.4 1.0 PCE for RVs, ER 1.0 Heavy-vehicle adj. factor,(note-5) fHV 0.962 0.962 1.00 Grade adj. factor, (note-1) fg 1.00 362 pc/h Directional flow rate, (note-2) vi 262 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 4.7 mi/h Adj. for access point density, (note-3) fA 3.8 mi/h Free-flow speed, FFSd 51.5 mi/h 3.6 mi/h 43.1 mi/h Adjustment for no-passing zones, fnp Average travel speed, ATSd Percent Free Flow Speed, PFFS 83.7 %

Fax:

Phone:

	Analysis(d)		Opposin	-
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.990		0.9	90
Grade adjustment factor,(note-1) fg	1.00		1.0	0
Directional flow rate,(note-2) vi	352 ]	oc/h	254	pc/h
Base percent time-spent-following, (not	e-4) BPTSFd	35.9	010	
Adjustment for no-passing zones, fnp		53.8		
Percent time-spent-following, PTSFd		67.2	010	
Level of Service and O	ther Perform	mance Mea	asures	
Level of service, LOS		В		
Volume to capacity ratio, v/c		0.20		
Peak 15-min vehicle-miles of travel, V	MT15	244	veh-mi	
Peak-hour vehicle-miles of travel, VMT	60	907	veh-mi	
Peak 15-min total travel time, TT15		5.7	veh-h	
Capacity from ATS, CdATS		1700		
Capacity from PTSF, CdPTSF		1700		
Directional Capacity		1700		
Passing L	ane Analysi:			
	-			
Cotal length of analysis segment, Lt	the set of the		2.8	mi
ength of two-lane highway upstream of		y 1ane, 1		mi
ength of passing lane including taper	_		-	mi
verage travel speed, ATSd (from above			43.1	,
Percent time-spent-following, PTSFd (f	rom above)		67.2	
level of service, LOSd (from above)			В	
Average Travel Spee	d with Pas	sing Lane	e	
Oownstream length of two-lane highway	within effe	ctive		
length of passing lane for average	travel spe	ed, Lde	-	mi
length of two-lane highway downstream				
length of the passing lane for ave	rage travel		Ld -	mi
Adj. factor for the effect of passing	lane			
on average speed, fpl		-	-	
verage travel speed including passing	-		-	2
Percent free flow speed including pass	ing lane, P	FFSpl	0.0	00
Percent Time-Spent-Fol	lowing with	Passing	Lane	
Oownstream length of two-lane highway	within effe	ctive ler	ngth	
of passing lane for percent time-s			-	mi
length of two-lane highway downstream	÷	0	of	
the passing lane for percent time-		0		mi
Adj. factor for the effect of passing		5, 24		-
on percent time-spent-following, f			_	
Percent time-spent-following	r -			
including passing lane, PTSFpl			-	010
Level of Service and Other Perfo	rmance Meas	ures with	n Passin	g Lane
evel of service including passing lan	e, LOSpl	E		
Peak 15-min total travel time, TT15		-	veh-h	
can is min cocar craver crme, iiis				

\_\_Percent Time-Spent-Following\_\_\_\_\_

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	348.4
Effective width of outside lane, We	12.50
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	7.71
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.

E-Mail: Directional Two-Lane Highway Segment Analysis Analyst GW Agency/Co. Stantec Agency/Co.ScancedDate Performed3/27/2018Analysis Time Period2040 Design Hour Highway KY 151 From/To Franklin County Line to I-64 KYTC District 5 Jurisdiction Analysis Year 2040 Description KY 151 Segment #3 \_\_\_\_\_Input Data\_\_\_\_\_ Highway class Class 3Peak nour factorShoulder width5.0ft% Trucks and buses11Lane width12.0ft% Trucks crawling0.0Segment length2.1miTruck crawl speed0.0Terrain typeRolling% Recreational vehicles0Grade:Length-mi% No-passing zones90Up/down-%Access point density12/mi Analysis direction volume, Vd 372 veh/h Opposing direction volume, Vo 248 veh/h \_\_\_\_\_Average Travel Speed\_\_\_\_\_ Direction Analysis(d) Opposing (o) PCE for trucks, ET 2.0 2.2 PCE for RVs, ER 1.1 1.1 Heavy-vehicle adj. factor,(note-5) fHV 0.901 0.883 0.90 Grade adj. factor, (note-1) fg 0.80 Directional flow rate, (note-2) vi 493 pc/h 378 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 3.0 mi/h Free-flow speed, FFSd 55.7 mi/h 3.0 mi/h 46.0 mi/h Adjustment for no-passing zones, fnp Average travel speed, ATSd Percent Free Flow Speed, PFFS 82.6 %

Fax:

Phone:

	Analysis(d)		Opposing	l (0)
CE for trucks, ET	1.6		1.7	
CE for RVs, ER	1.0		1.0	
eavy-vehicle adjustment factor, fHV	0.938		0.92	9
rade adjustment factor,(note-1) fg	0.90		0.83	
irectional flow rate,(note-2) vi	474 p	bc/h	346	pc/h
ase percent time-spent-following, (no	te-4) BPTSFd	47.2	00	-
djustment for no-passing zones, fnp		40.1		
ercent time-spent-following, PTSFd		70.4	olo	
Level of Service and	Other Perform	nance Mea	asures	
evel of service, LOS		С		
olume to capacity ratio, v/c		0.24		
eak 15-min vehicle-miles of travel,		210	veh-mi	
eak-hour vehicle-miles of travel, VM	160	781	veh-mi	
eak 15-min total travel time, TT15		4.6		
apacity from ATS, CdATS		1646		
apacity from PTSF, CdPTSF		1700		
irectional Capacity		1646	veh/h	
Passing	Lane Analysis	3		
otal length of analysis segment, Lt			2.1	mi
ength of two-lane highway upstream o	f the passing	Iane T		mi
ength of passing lane including tape		j ranc, r	_	mi
	-			
verage travel speed, ATSd (from abov			46.0	mi/h
ercent time-spent-following, PTSFd (	from above)		70.4	
evel of service, LOSd (from above)			С	
Average Travel Spe	ed with Pass	ing Lane	2	
ownstream length of two-lane highway	within effec	ctive		
length of passing lane for averag	e travel spee	ed, Lde	-	mi
ength of two-lane highway downstream				
length of the passing lane for av			d -	mi
		speed, I	Ju -	111 1
dj. factor for the effect of passing	lane			
on average speed, fpl			-	
verage travel speed including passin			-	
ercent free flow speed including pas	sing lane, PF	FSpl	0.0	010
Percent Time-Spent-Fo	llowing with	Passing	Lane	
ownstream length of two-lane highway	within effec	tive ler	ngth	
of passing lane for percent time-			-	mi
ength of two-lane highway downstream			of	
the passing lane for percent time				mi
		, тид, та	-	mi
dj. factor for the effect of passing				
on percent time-spent-following,	tpl		-	
ercent time-spent-following				
including passing lane, PTSFpl			-	0/0
Level of Service and Other Perf	ormance Measu	res with	n Passing	J Lane
	ne, LOSpl	Е		
evel of service including passing la eak 15-min total travel time, TT15	ne, LOSpl	E -	veh-h	

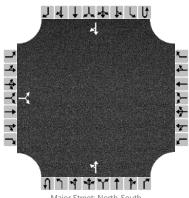
\_\_Percent Time-Spent-Following\_\_\_\_\_

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	400.0
Effective width of outside lane, We	22.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	6.56
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.

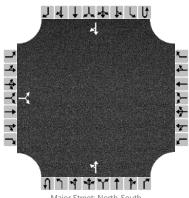
	port							
eneral Information	Site Information							
nalyst	KY 151 @ Alton Station Rd							
gency/Co.								
ate Performed	Alton Station Rd.							
nalysis Year	KY 151							
ime Analyzed	0.89							
ntersection Orientation	d (hrs) 0.25							
roject Description								
	0.20							



Major Street: North-South

					major	bureet. Ho	un boutin											
Vehicle Volumes and Ad	justme	ents																
Approach		Eastb	ound			West	bound			North	bound		Southbound					
Movement	U	L	Т	R	U	L	Т	R	U	L	Т	R	U	L	Т	R		
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6		
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0		
Configuration			LR							LT						TR		
Volume, V (veh/h)		100		210						80	380				330	20		
Percent Heavy Vehicles (%)		3		3						3								
Proportion Time Blocked																		
Percent Grade (%)			0															
Right Turn Channelized		Ν	10			Ν	lo		No				No					
Median Type/Storage				Undi	vided													
Critical and Follow-up H	eadwa	ys																
Base Critical Headway (sec)																		
Critical Headway (sec)																		
Base Follow-Up Headway (sec)																		
Follow-Up Headway (sec)																		
Delay, Queue Length, an	d Leve	l of S	ervice		<u>.</u>										<u> </u>			
Flow Rate, v (veh/h)			348							90								
Capacity, c (veh/h)			606							1159								
v/c Ratio			0.57							0.08								
95% Queue Length, Q <sub>95</sub> (veh)			3.6							0.3								
Control Delay (s/veh)			18.6							8.4								
Level of Service, LOS			С							A								
Approach Delay (s/veh)		. 18	3.6							. 2	.2							
Approach LOS			С															

GW	Site Information	
GW	Intersection	
	Intersection	KY 151 @ Alton Station Rd
Stantec	Jurisdiction	
3/27/2018	East/West Street	Alton Station Rd.
2040	North/South Street	KY 151
2040 PM Design Hour	Peak Hour Factor	0.93
North-South	Analysis Time Period (hrs)	0.25
KY 151 Scoping Study		
	3/27/2018 2040 2040 PM Design Hour North-South	3/27/2018East/West Street2040North/South Street2040 PM Design HourPeak Hour FactorNorth-SouthAnalysis Time Period (hrs)

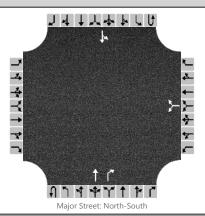


Major Street: North-South

					major	bureet. Ho	un boutin										
Vehicle Volumes and Ad	justme	ents															
Approach		Eastb	ound			West	bound			North	bound			South	bound		
Movement	U	L	Т	R	U	L	Т	R	U	L	Т	R	U	L	Т	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0	
Configuration			LR							LT						TR	
Volume, V (veh/h)		40		160						210	410				420	130	
Percent Heavy Vehicles (%)		3		3						3							
Proportion Time Blocked																	
Percent Grade (%)			0														
Right Turn Channelized		Ν	10			N	lo			Ν	lo		No				
Median Type/Storage				Undi	vided												
Critical and Follow-up H	eadwa	ys															
Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	
Delay, Queue Length, an	d Leve	l of S	ervice		<u>.</u>										<u> </u>		
Flow Rate, v (veh/h)	Τ		215							226							
Capacity, c (veh/h)			448							979							
v/c Ratio			0.48							0.23							
95% Queue Length, Q <sub>95</sub> (veh)			2.5							0.9							
Control Delay (s/veh)			20.2							9.8							
Level of Service, LOS			С							A							
Approach Delay (s/veh)		. 20	0.2	-						. 5	.3						
Approach LOS			с														

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HCS7 Two-Way Stop-Control Report												
General Information		Site Information										
Analyst	GW	Intersection	KY 151 @ Old Frankfort Rd									
Agency/Co.	Stantec	Jurisdiction										
Date Performed	3/27/2018	East/West Street	Old Frankfort Rd.									
Analysis Year	2040	North/South Street	KY 151									
Time Analyzed	2040 AM Design Hour	Peak Hour Factor	0.84									
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25									
Project Description	KY 151 Scoping Study											
Lanos												

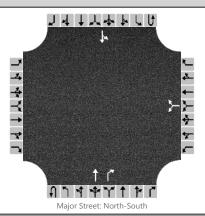


#### Vehicle Volumes and Adjustments

venicle volumes and Ad	justme	ents														
Approach		Eastb	ound			West	bound			North	bound			South	bound	
Movement	U	L	Т	R	U	L	Т	R	U	L	Т	R	U	L	Т	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	1	0	0	1	0
Configuration							LR				Т	R		LT		
Volume, V (veh/h)						40		20			370	100		20	220	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized		Ν	lo			Ν	lo			Y	es			Ν	lo	
Median Type/Storage				Undi	vided											
Critical and Follow-up H	eadwa	ys														
Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																
Delay, Queue Length, an	d Leve	l of S	ervice	•												
Flow Rate, v (veh/h)							71							24		
Capacity, c (veh/h)							426							1113		
v/c Ratio							0.17							0.02		
95% Queue Length, Q <sub>95</sub> (veh)							0.6							0.1		
Control Delay (s/veh)							15.1							8.3		
Level of Service, LOS							С							A		
Approach Delay (s/veh)	15.1									0	.9					
Approach LOS						(	С									

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HCS7 Two-Way Stop-Control Report												
	Site Information											
GW	Intersection	KY 151 @ Old Frankfort Rd										
Stantec	Jurisdiction											
3/27/2018	East/West Street	Old Frankfort Rd.										
2040	North/South Street	KY 151										
2040 PM Design Hour	Peak Hour Factor	0.98										
North-South	Analysis Time Period (hrs)	0.25										
KY 151 Scoping Study												
	GW           Stantec           3/27/2018           2040           2040 PM Design Hour           North-South	Site Information         GW       Intersection         Stantec       Jurisdiction         3/27/2018       East/West Street         2040       North/South Street         2040 PM Design Hour       Peak Hour Factor         North-South       Analysis Time Period (hrs)										



### Vehicle Volumes and Adjustments

venicle volumes and Ad	Justine	ints							-								
Approach		Eastb	ound			West	oound			North	bound			South	bound		
Movement	U	L	Т	R	U	L	Т	R	U	L	Т	R	U	L	Т	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	1	0	0	0	1	1	0	0	1	0	
Configuration							LR				Т	R		LT			
Volume, V (veh/h)						120		20			240	50		10	360		
Percent Heavy Vehicles (%)						3		3						3			
Proportion Time Blocked																	
Percent Grade (%)	0																
Right Turn Channelized		Ν	lo			N	lo	Yes					No				
Median Type/Storage				Undi	vided												
Critical and Follow-up H	eadwa	ys															
Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	
Delay, Queue Length, an	d Leve	l of S	ervice	•													
Flow Rate, v (veh/h)							143							10			
Capacity, c (veh/h)							468							1314			
v/c Ratio							0.31							0.01			
95% Queue Length, Q <sub>95</sub> (veh)							1.3							0.0			
Control Delay (s/veh)							16.0							7.8			
Level of Service, LOS							С							A			
Approach Delay (s/veh)						16	5.0						0.3				
Approach LOS						(	С										

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## **HCS7 Signalized Intersection Results Summary**

		HCS	7 Sig	nalize	d Inte	ersec	tion R	lesi	ults Su	mmar	у				_		
General Inform	ation								Intersec	tion Inf	ormatic			474+	4 L		
	ation	Stantec							Duration		0.25	n	- 1	îttr			
Agency		GW		Analys	ia Data	2/27/2	010		Area Typ	•					K.		
Analyst		GW		1		3/27/2	AM Design PHF			be	Other			w <sup>N</sup> ∈	×_2		
Jurisdiction				Time F		Hour					0.89		14 IA *	"T= 8	*		
Urban Street				1	is Year				Analysis								
Intersection		KY 151 @ US 127		File Na	ame	2040	AM KY ´	151 @	@ US 127.xus								
Project Descript	ion	KY 151 Scoping Stu	Jdy														
Demand Inform	nation				EB			W	/B		NB			SB			
Approach Move	ment			L	Т	R	L	-	r r	L	Т	R	L	Т	R		
Demand (v), ve	eh/h			160	160	620	60	14	40 320	270	930	120	140	400	50		
Signal Informa	tion				1				5		- 1						
Cycle, s	103.4	Reference Phase	2	-	2		21	z₿	- E				12		Χ		
Offset, s	0	Reference Point	End		5	- Stř						1	2	3			
Uncoordinated	Yes	Simult. Gap E/W	On	Green		3.2	28.7	35		0.0	_				<b>A</b>		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow Red	3.5 2.1	3.5 2.1	5.0 1.2	5. 2.4		0.0	^	<b>)</b> ॑⊾₁	•	7			
Force Mode	Fixeu	Simult. Gap 14/5	OII	Reu	2.1	2.1	1.2	Z.4	4 0.0	0.0		5	8	1			
Timer Results				EBL	-	EBT	WB	L	WBT	NB	-	NBT	SBL	-	SBT		
Assigned Phase	;					4			8	5		2	1		6		
Case Number						7.0			7.0	2.0		3.0	2.0		3.0		
Phase Duration	, S					42.4			42.4	26.1	I .	43.6	17.3		34.9		
Change Period,	( Y+R	c ), S				7.4			7.4	5.6		6.2	5.6		6.2		
Max Allow Head	lway ( <i>I</i>	<i>MAH</i> ), s				6.2			6.2	3.9		3.4	3.9		3.4		
Queue Clearance Time ( $g_s$ ), s						37.0			22.7	20.0	)	31.4		;	13.5		
Green Extension Time ( $g e$ ), s						0.0			9.5	0.4		6.1	0.4		6.1		
Phase Call Probability						1.00			1.00	1.00	)	1.00	0.99	)	1.00		
Max Out Probat	oility					1.00			0.86	0.55	5	0.00	0.00	)	0.00		
Movement Gro	un Boo	ulto.			EB			W	ר ר		NB			SB			
Approach Move	-	Suits		L	T	R	L	T	R		T	R		T	R		
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16		
Adjusted Flow F		) yoh/h		- /	4 360	697	3	22!		303	2 1045	135	157	449	56		
-		ow Rate ( s ), veh/h/l	n		1310	1510		150		1697	1696	1510	1682	1682	1497		
Queue Service					15.4	35.0		0.0		18.0	29.4	6.5	9.5	11.5	2.9		
Cycle Queue Cl					26.8	35.0		11.3		18.0	29.4	6.5	9.5	11.5	2.9		
Green Ratio ( g/		e fille ( <i>g c</i> ), s			0.34	0.34		0.3		0.20	0.36	0.36	0.11	0.28	0.28		
Capacity ( c ), v	,				496	511		554		337	1228	0.30 547	191	933	415		
Volume-to-Capa		tio (X)			0.725	1.363		0.40		0.901	0.851	0.247	0.823	0.482	0.135		
· · ·		/In ( 50 th percentile)			229.1	980.6		108		236.5	293.5	57.1	111.9	117.6	26.6		
		eh/In ( 50 th percenti			8.6	36.9		4.2		8.9	11.0	2.1	4.2	4.4	1.0		
		RQ) ( 50 th percent			0.65	2.80		0.4		0.45	0.00	0.11	0.26	0.00	0.06		
Uniform Delay (		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			32.2	34.2		26.		40.4	30.4	23.1	44.8	31.2	28.0		
Incremental Del					6.4	175.7		1.0		19.9	1.3	0.2	8.6	0.3	0.1		
		·			0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0		
	Initial Queue Delay ( <i>d</i> ₃ ), s/veh Control Delay ( <i>d</i> ), s/veh							27.		60.4	31.7	23.3	53.4	31.4	28.2		
Level of Service					38.6 D	209.9 F		27. C	C	E	C	C	D	C	C		
Approach Delay	. ,			151.0	1	F	31.5		C	36.8		D	36.4	<u> </u>	D		
Intersection Del			_	101.		. 67			0	00.0			E				
Multimodal Res					EB			W			NB			SB			
Pedestrian LOS				2.44		В	2.44		В	1.92		В	1.93		В		
Bicycle LOS Sc	ore / LC	DS		2.23		В	1.45	5	А	1.71		В	1.03	3	Α		

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# **HCS7 Signalized Intersection Results Summary**

		HCS	7 Sig	nalize	d Inte	ersect	tion R	kesu	lts Sur	nmar	У						
General Inform	action				Intersection Information									┙┥┙╸╷	5 L		
	hation	Ctantas									1/	n	-	ΊŤŤſ			
Agency		Stantec		Analys	ia Data	2/27/2	010		Duration	-	0.25		-		R.		
Analyst		GW		л. <del>-</del>		3/27/2			Area Typ	e	Other		<b>→</b>	N w↑r	<u>د</u>		
Jurisdiction				Time F		Hour	PM Des		PHF		0.98		1 4 PP	8 8	* *		
Urban Street				Analys	is Year			I	Analysis		1> 4:0	00		5 t t d			
Intersection		KY 151 @ US 127		File Na	ame	2040 F	PM KY <sup>·</sup>	151 @	US 127.	xus		4149					
Project Descrip	tion	KY 151 Scoping Stu	udy														
Demand Inform	Demand Information							W	3		NB			SB			
Approach Move	proach Movement				Т	R	L	Т	R	L	Т	R	L	Т	R		
Demand (v), v				L 60	250	250	80	23	_	330	530	110	470	1400	80		
								<u> </u>		<u> </u>		_	_	<u>i an a</u>			
Signal Informa	í .					215	21	3	S.		l		<b>*</b> -		-		
Cycle, s	147.3	Reference Phase	2		5		1 m	z₿	e			1	2	3	- +		
Offset, s	0	Reference Point	End	Green	25.0	5.0	63.1	35.	0 0.0	0.0							
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	5.0	5.0		0.0		5 4			Z		
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.1	0.0	1.2	2.4	0.0	0.0		5	6	7	8		
Timer Results				EBL	-	EBT	WB	L	WBT	NBI	_	NBT	SBL		SBT		
Assigned Phase	e					4			8	5		2	1		6		
Case Number						7.0			7.0	2.0		3.0	2.0		3.0		
Phase Duration	I, S					42.4			42.4	30.6	6	69.3	35.6		74.3		
Change Period	, ( Y+R	c ), S		7		7.4	7.4		5.6		6.2	5.6		6.2			
Max Allow Head	dway ( /	MAH ), s				6.2	6.2		6.2	3.9		3.4	3.9		3.4		
Queue Clearan	ce Time	e (gs), s				37.0			37.0	27.0	)	18.0	32.0	<u>ر</u>	60.5		
Green Extensio	n Time	(ge), s				0.0			0.0	0.0		9.4	0.0		7.7		
Phase Call Pro	bability					1.00			1.00	1.00	)	1.00	1.00	)	1.00		
Max Out Proba	bility					1.00			1.00	1.00	)	0.00	1.00	)	0.19		
Movement Gro		aulte			EB			WB			NB			SB			
Approach Move		SuitS		L	T	R	L	T	R	1	T	R	L	T	R		
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16		
Adjusted Flow F		) veh/h		-	316	255	5	316	469	337	541	112	480	1429	82		
-		ow Rate ( s ), veh/h/l	n		1264	1510		1024		1697	1696	1510	1682	1682	1497		
Queue Service					0.0	22.8		0.0	35.0	25.0	16.0	6.8	30.0	58.5	4.6		
		e Time ( <i>g</i> <sub>c</sub> ), s			35.0	22.8		35.0	_	25.0	16.0	6.8	30.0	58.5	4.6		
Green Ratio ( g		• • • • • • • • • • • • • • • • • • •			0.24	0.24		0.24	_	0.17	0.43	0.43	0.20	0.46	0.46		
Capacity ( c ), v	,				329	359		274	368	288	1454	647	343	1556	692		
Volume-to-Cap		atio (X)			0.961	0.711		1.154		1.170	0.372	0.173	1.400	0.918	0.118		
•		/In ( 50 th percentile)	)		405.9	247		469.1	-	504.2	166.5	63	831.4	639.5	41.9		
Back of Queue	(Q), ve	eh/In ( 50 th percenti	ile)		15.3	9.3		18.0	28.1	19.0	6.3	2.4	31.0	23.9	1.6		
Queue Storage	Ratio (	RQ) (50 th percent	tile)		1.16	0.71		1.95	3.04	0.95	0.00	0.12	1.91	0.00	0.10		
Uniform Delay	( d 1 ), s	/veh			56.2	51.5		57.3	56.2	61.2	28.6	26.0	58.7	37.0	22.5		
Incremental De	lay ( <i>d</i> 2	e), s/veh			39.5	8.0		102.6	6 144.2	107.1	0.1	0.1	196.8	6.9	0.1		
Initial Queue De	elay ( <i>d</i>	з ), s/veh			0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Control Delay (	d ), s/ve	eh			95.7	59.6		159.9		168.3	28.7	26.1	255.5	43.9	22.6		
Level of Service	e (LOS)				F	E		F	F	F	С	С	F	D	С		
Approach Delay	y, s/veh	/ LOS		79.6	;	E	184.	1	F	75.9	)	E	94.1		F		
Intersection De	lay, s/ve	eh / LOS				104	4.3						F				
Mall									NID								
Multimodal Re		0.40	EB		0.40	WB		4.00	NB	D	4.00	SB	B				
Pedestrian LOS				2.46		B	2.46		B	1.93		B	1.92		B		
Bicycle LOS Sc	ore / LC	20		1.43		A	1.78		В	1.30	)	A	2.13	<b>,</b>	В		

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