APPENDIX A
Existing Conditions Diagram

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LUDLOW AVE

CENTRAL PKWY

ONLY

ONLY

ONLY

MATCH LINE A

0 40 80

EXISTING CONDITIONS DIAGRAM

INTERSECTION: CENTRAL PARKWAY	TO: WHITFIELD AVENUE
COUNTY: HAMILTON (ODOT DISTRICT 8)	CR 646 (LUDLOW AVENUE) CORRIDOR STUDY

Mead & Hunt
4700 LAKEHURST CT, STE 110
COLUMBUS, OH 43016
(614) 792-5900 PHONE
(614) 792-5901 FAX

DATE: 12-16-2019

EXISTING CONDITIONS DIAGRAM

INTERSECTION: CENTRAL PARKWAY	*TO: WHITFIELD AVENUE*
COUNTY: HAMILTON (ODOT DISTRICT 8)	*CR 646 (LUDLOW AVENUE) CORRIDOR STUDY*

Mead & Hunt
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DATE: 12-16-2019

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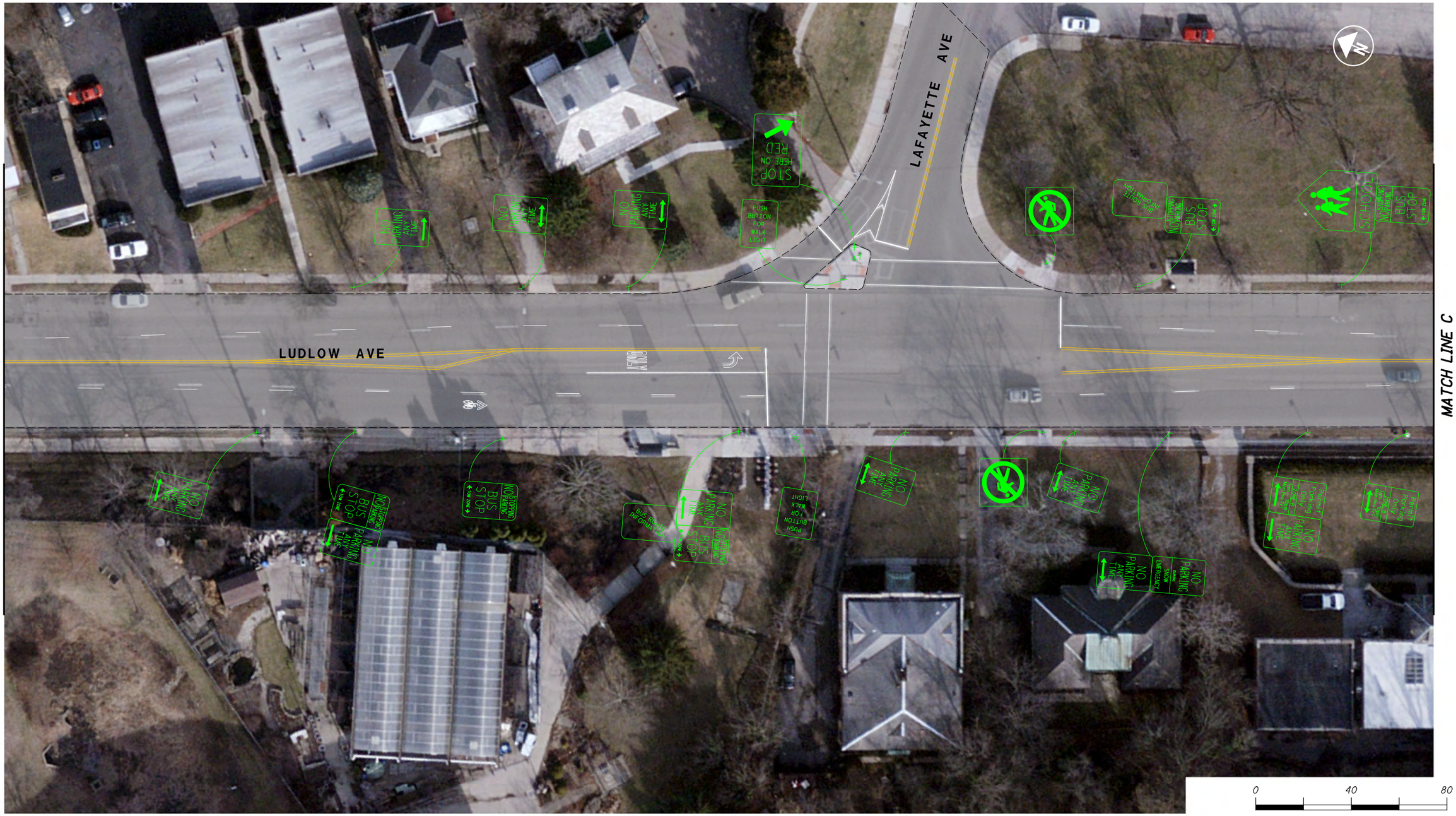

MATCH LINE B

MATCH LINE C

INTERSECTION: CENTRAL PARKWAY	TO: WHITFIELD AVENUE
COUNTY: HAMILTON (ODOT DISTRICT 8)	CR 646 (LUDLOW AVENUE) CORRIDOR STUDY

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DATE: 12-16-2019

EXISTING CONDITIONS DIAGRAM

INTERSECTION: CENTRAL PARKWAY	*TO: WHITFIELD AVENUE*
COUNTY: HAMILTON (ODOT DISTRICT 8)	*CR 646 (LUDLOW AVENUE) CORRIDOR STUDY*

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EXISTING CONDITIONS DIAGRAM

INTERSECTION: CENTRAL PARKWAY	*TO: WHITFIELD AVENUE*
COUNTY: HAMILTON (ODOT DISTRICT 8)	*CR 646 (LUDLOW AVENUE) CORRIDOR STUDY*

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DATE: 12-16-2019

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EXISTING CONDITIONS DIAGRAM

INTERSECTION: CENTRAL PARKWAY	*TO: WHITFIELD AVENUE*
COUNTY: HAMILTON (ODOT DISTRICT 8)	*CR 646 (LUDLOW AVENUE) CORRIDOR STUDY*

Mead & Hunt
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DATE: 12-16-2019

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EXISTING CONDITIONS DIAGRAM

INTERSECTION: CENTRAL PARKWAY	*TO: WHITFIELD AVENUE*
COUNTY: HAMILTON (ODOT DISTRICT 8)	*CR 646 (LUDLOW AVENUE) CORRIDOR STUDY*

Mead & Hunt
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DATE: 12-16-2019

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EXISTING CONDITIONS DIAGRAM

INTERSECTION: CENTRAL PARKWAY	*TO: WHITFIELD AVENUE*
COUNTY: HAMILTON (ODOT DISTRICT 8)	*CR 646 (LUDLOW AVENUE) CORRIDOR STUDY*

Mead & Hunt
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COLUMBUS, OH 43016
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DATE: 12-16-2019

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EXISTING CONDITIONS DIAGRAM

INTERSECTION: CENTRAL PARKWAY	*TO: WHITFIELD AVENUE*
COUNTY: HAMILTON (ODOT DISTRICT 8)	*CR 646 (LUDLOW AVENUE) CORRIDOR STUDY*

Mead & Hunt
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COLUMBUS, OH 43016
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DATE: 12-16-2019

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EXISTING CONDITIONS DIAGRAM

INTERSECTION: CENTRAL PARKWAY	*TO: WHITFIELD AVENUE*
COUNTY: HAMILTON (ODOT DISTRICT 8)	*CR 646 (LUDLOW AVENUE) CORRIDOR STUDY*

Mead & Hunt
4700 LAKEHURST CT, STE 110
COLUMBUS, OH 43016
(614) 792-5900 PHONE
(614) 792-5901 FAX

DATE: 12-16-2019

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APPENDIX B
Existing Conditions Level of Service Analyses

Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (veh/h)	102	77	1092	449	86	286
Future Volume (veh/h)	102	77	1092	449	86	286
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1885	1885	1870	1870	1811
Adj Flow Rate, veh/h	111	0	1187	0	93	311
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	1	1	2	2	6
Cap, veh/h	266		1940		443	2498
Arrive On Green	0.08	0.00	0.54	0.00	0.09	0.73
Sat Flow, veh/h	3428	1598	3676	1585	1781	3532
Grp Volume(v), veh/h	111	0	1187	0	93	311
Grp Sat Flow(s),veh/h/ln	1714	1598	1791	1585	1781	1721
Q Serve(g_s), s	1.6	0.0	11.6	0.0	0.9	1.4
Cycle Q Clear(g_c), s	1.6	0.0	11.6	0.0	0.9	1.4
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	266		1940		443	2498
V/C Ratio(X)	0.42		0.61		0.21	0.12
Avail Cap(c_a), veh/h	875		1940		674	2498
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	0.0	8.0	0.0	5.2	2.1
Incr Delay (d2), s/veh	1.0	0.0	0.6	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	3.2	0.0	0.2	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.4	0.0	8.6	0.0	5.3	2.2
LnGrp LOS	C		A		A	A
Approach Vol, veh/h	111	A	1187	A		404
Approach Delay, s/veh	23.4		8.6			2.9
Approach LOS	C		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		42.0		9.0	9.4	32.6
Change Period (Y+Rc), s		* 5		* 5	5.0	* 5
Max Green Setting (Gmax), s		* 37		* 13	11.0	* 21
Max Q Clear Time (g_c+I1), s		3.4		3.6	2.9	13.6
Green Ext Time (p_c), s		2.1		0.2	0.1	4.5

Intersection Summary	
HCM 6th Ctrl Delay	8.2
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SER] is excluded from calculations of the approach delay and intersection delay.

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	12	1051	106	13	348	1	15	0	2	10	0	9
Future Volume (veh/h)	12	1051	106	13	348	1	15	0	2	10	0	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.96		0.98	0.96		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1900	1900	1811	1811	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	13	1142	0	14	378	1	16	0	2	11	0	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	0	6	6	2	0	0	0	0	0
Cap, veh/h	674	1856		348	1839	5	361	0	182	212	34	86
Arrive On Green	0.52	0.52	0.00	0.52	0.52	0.52	0.12	0.00	0.12	0.12	0.00	0.12
Sat Flow, veh/h	1019	3554	1610	500	3521	9	1350	0	1570	515	297	738
Grp Volume(v), veh/h	13	1142	0	14	185	194	16	0	2	21	0	0
Grp Sat Flow(s),veh/h/ln	1019	1777	1610	500	1721	1809	1350	0	1570	1550	0	0
Q Serve(g_s), s	0.2	8.1	0.0	0.7	2.1	2.1	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.3	8.1	0.0	8.9	2.1	2.1	0.3	0.0	0.0	0.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.52		0.48
Lane Grp Cap(c), veh/h	674	1856		348	899	945	361	0	182	333	0	0
V/C Ratio(X)	0.02	0.62		0.04	0.21	0.21	0.04	0.00	0.01	0.06	0.00	0.00
Avail Cap(c_a), veh/h	1049	3163		532	1532	1611	768	0	655	773	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.2	6.0	0.0	9.2	4.6	4.6	14.2	0.0	14.1	14.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.5	0.0	0.1	0.4	0.4	0.1	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.2	6.4	0.0	9.2	4.7	4.7	14.2	0.0	14.1	14.3	0.0	0.0
LnGrp LOS	A	A		A	A	A	B	A	B	B	A	A
Approach Vol, veh/h		1155	A		393			18			21	
Approach Delay, s/veh		6.4			4.9			14.2			14.3	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		24.8		11.2		24.8		11.2				
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s		32.0		15.0		32.0		15.0				
Max Q Clear Time (g_c+I1), s		10.9		2.4		10.1		2.3				
Green Ext Time (p_c), s		2.2		0.0		8.6		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	6.2
HCM 6th LOS	A

Notes

Unsignalized Delay for [SER] is excluded from calculations of the approach delay and intersection delay.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	16	120	226	27	229	837
Future Volume (veh/h)	16	120	226	27	229	837
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.99	0.99	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1811	1781	1781	1885	1870
Adj Flow Rate, veh/h	17	130	246	29	249	910
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	6	8	8	1	2
Cap, veh/h	203	174	1564	182	743	1823
Arrive On Green	0.11	0.11	0.51	0.51	0.51	0.51
Sat Flow, veh/h	1781	1535	3138	356	1104	3647
Grp Volume(v), veh/h	17	130	135	140	249	910
Grp Sat Flow(s),veh/h/ln	1781	1535	1692	1712	1104	1777
Q Serve(g_s), s	0.3	2.6	1.4	1.4	5.0	5.4
Cycle Q Clear(g_c), s	0.3	2.6	1.4	1.4	6.4	5.4
Prop In Lane	1.00	1.00		0.21	1.00	
Lane Grp Cap(c), veh/h	203	174	868	878	743	1823
V/C Ratio(X)	0.08	0.75	0.16	0.16	0.34	0.50
Avail Cap(c_a), veh/h	1108	955	1474	1492	1138	3096
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.7	13.8	4.1	4.2	5.8	5.1
Incr Delay (d2), s/veh	0.2	6.2	0.1	0.1	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.0	0.2	0.2	0.6	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.9	20.0	4.2	4.2	6.1	5.3
LnGrp LOS	B	B	A	A	A	A
Approach Vol, veh/h	147		275			1159
Approach Delay, s/veh	19.2		4.2			5.5
Approach LOS	B		A			A

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		23.5		8.7		23.5
Change Period (Y+Rc), s		7.0		5.0		7.0
Max Green Setting (Gmax), s		28.0		20.0		28.0
Max Q Clear Time (g_c+I1), s		3.4		4.6		8.4
Green Ext Time (p_c), s		1.5		0.4		7.4

Intersection Summary	
HCM 6th Ctrl Delay	6.5
HCM 6th LOS	A

Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (veh/h)	381	83	412	178	116	969
Future Volume (veh/h)	381	83	412	178	116	969
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1885	1885	1870	1870	1811
Adj Flow Rate, veh/h	414	0	448	0	126	1053
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	1	1	2	2	6
Cap, veh/h	556		1714		673	2270
Arrive On Green	0.16	0.00	0.48	0.00	0.09	0.66
Sat Flow, veh/h	3428	1598	3676	1585	1781	3532
Grp Volume(v), veh/h	414	0	448	0	126	1053
Grp Sat Flow(s),veh/h/ln	1714	1598	1791	1585	1781	1721
Q Serve(g_s), s	6.5	0.0	4.2	0.0	1.7	8.4
Cycle Q Clear(g_c), s	6.5	0.0	4.2	0.0	1.7	8.4
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	556		1714		673	2270
V/C Ratio(X)	0.74		0.26		0.19	0.46
Avail Cap(c_a), veh/h	794		1714		699	2270
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	0.0	8.7	0.0	5.1	4.7
Incr Delay (d2), s/veh	2.3	0.0	0.1	0.0	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	1.3	0.0	0.4	1.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.7	0.0	8.8	0.0	5.1	5.4
LnGrp LOS	C		A		A	A
Approach Vol, veh/h	414	A	448	A		1179
Approach Delay, s/veh	24.7		8.8			5.3
Approach LOS	C		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		42.0		14.1	10.2	31.8
Change Period (Y+Rc), s		* 5		* 5	5.0	* 5
Max Green Setting (Gmax), s		* 37		* 13	6.0	* 26
Max Q Clear Time (g_c+I1), s		10.4		8.5	3.7	6.2
Green Ext Time (p_c), s		8.4		0.7	0.0	2.7

Intersection Summary	
HCM 6th Ctrl Delay	10.0
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SER] is excluded from calculations of the approach delay and intersection delay.

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	11	449	34	14	987	15	74	0	7	8	0	8
Future Volume (veh/h)	11	449	34	14	987	15	74	0	7	8	0	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	0.98		0.98	0.97		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1900	1900	1811	1811	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	12	488	0	15	1073	16	80	0	8	9	0	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	0	6	6	2	0	0	0	0	0
Cap, veh/h	328	907		474	1683	25	422	0	258	232	41	127
Arrive On Green	0.48	0.48	0.00	0.48	0.48	0.48	0.16	0.00	0.16	0.16	0.00	0.16
Sat Flow, veh/h	526	1870	1610	921	3470	52	1371	0	1574	525	249	775
Grp Volume(v), veh/h	12	488	0	15	532	557	80	0	8	18	0	0
Grp Sat Flow(s),veh/h/ln	526	1870	1610	921	1721	1801	1371	0	1574	1549	0	0
Q Serve(g_s), s	0.6	6.7	0.0	0.4	8.5	8.5	1.5	0.0	0.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	9.2	6.7	0.0	7.2	8.5	8.5	1.8	0.0	0.2	0.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		1.00	0.50		0.50
Lane Grp Cap(c), veh/h	328	907		474	834	873	422	0	258	400	0	0
V/C Ratio(X)	0.04	0.54		0.03	0.64	0.64	0.19	0.00	0.03	0.05	0.00	0.00
Avail Cap(c_a), veh/h	528	1618		824	1488	1558	754	0	638	757	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.5	6.6	0.0	9.1	7.1	7.1	13.7	0.0	13.0	13.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.0	0.8	0.8	0.2	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.6	0.0	0.1	1.9	2.0	0.5	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.6	7.1	0.0	9.2	7.9	7.9	13.9	0.0	13.1	13.1	0.0	0.0
LnGrp LOS	B	A		A	A	A	B	A	B	B	A	A
Approach Vol, veh/h		500	A		1104			88			18	
Approach Delay, s/veh		7.2			7.9			13.8			13.1	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.9		13.1		23.9		13.1				
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s		32.0		15.0		32.0		15.0				
Max Q Clear Time (g_c+I1), s		10.5		2.3		11.2		3.8				
Green Ext Time (p_c), s		7.4		0.0		3.1		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	8.1
HCM 6th LOS	A

Notes

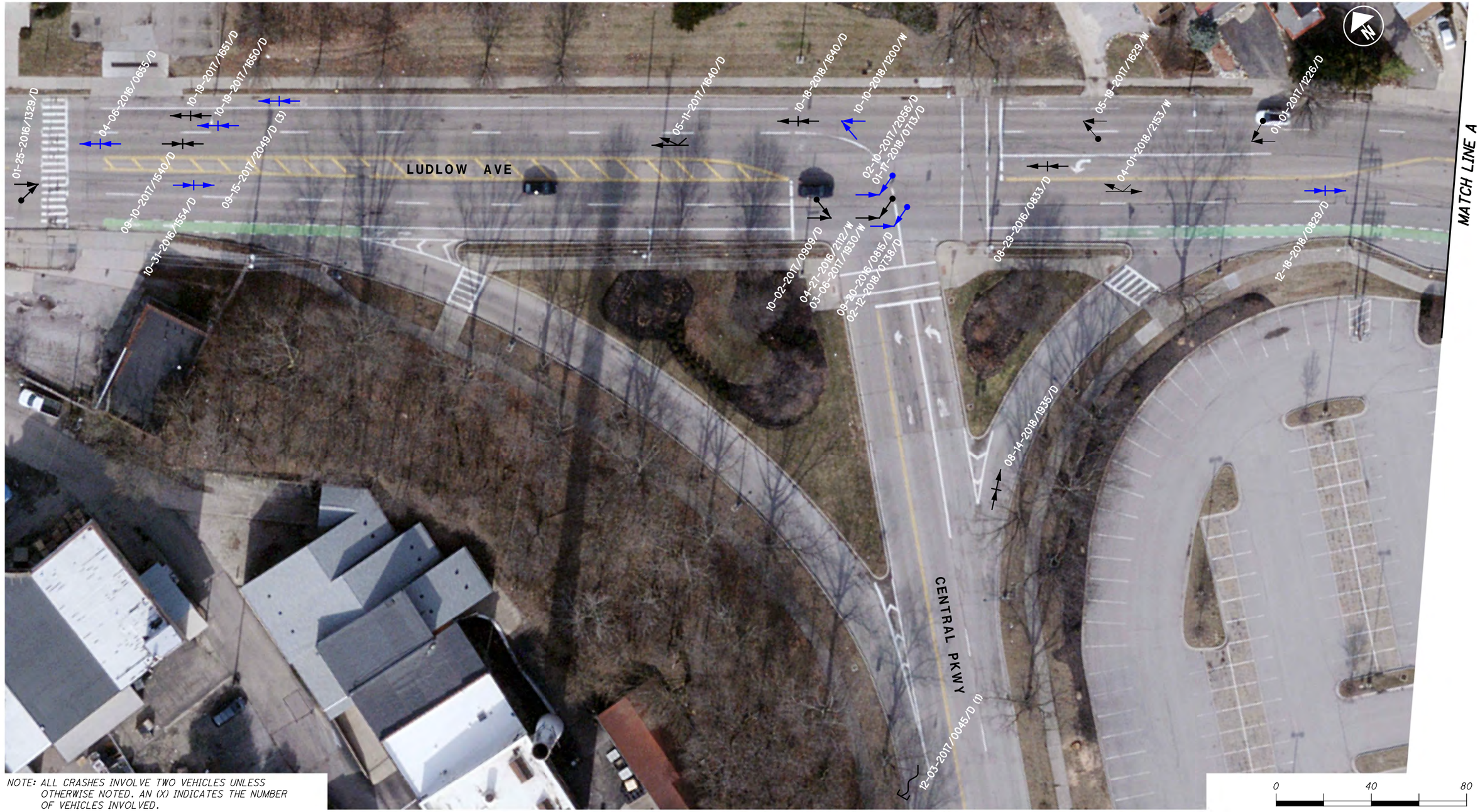
Unsignalized Delay for [SER] is excluded from calculations of the approach delay and intersection delay.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	23	308	710	32	161	315
Future Volume (veh/h)	23	308	710	32	161	315
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.99	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1811	1781	1781	1885	1870
Adj Flow Rate, veh/h	25	335	772	35	175	342
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	6	8	8	1	2
Cap, veh/h	469	404	1588	72	372	1712
Arrive On Green	0.26	0.26	0.48	0.48	0.48	0.48
Sat Flow, veh/h	1781	1535	3385	149	679	3647
Grp Volume(v), veh/h	25	335	396	411	175	342
Grp Sat Flow(s),veh/h/ln	1781	1535	1692	1753	679	1777
Q Serve(g_s), s	0.5	9.7	7.5	7.5	11.1	2.6
Cycle Q Clear(g_c), s	0.5	9.7	7.5	7.5	18.5	2.6
Prop In Lane	1.00	1.00		0.09	1.00	
Lane Grp Cap(c), veh/h	469	404	815	844	372	1712
V/C Ratio(X)	0.05	0.83	0.49	0.49	0.47	0.20
Avail Cap(c_a), veh/h	757	653	1008	1044	450	2116
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.9	16.3	8.3	8.3	14.5	7.0
Incr Delay (d2), s/veh	0.0	4.8	0.5	0.4	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	3.3	2.0	2.1	1.4	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.0	21.2	8.7	8.7	15.4	7.0
LnGrp LOS	B	C	A	A	B	A
Approach Vol, veh/h	360		807			517
Approach Delay, s/veh	20.6		8.7			9.9
Approach LOS	C		A			A

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		29.7		17.4		29.7
Change Period (Y+Rc), s		7.0		5.0		7.0
Max Green Setting (Gmax), s		28.0		20.0		28.0
Max Q Clear Time (g_c+I1), s		9.5		11.7		20.5
Green Ext Time (p_c), s		4.8		0.8		2.1

Intersection Summary	
HCM 6th Ctrl Delay	11.6
HCM 6th LOS	B

APPENDIX C
Collision Diagrams



NOTE: ALL CRASHES INVOLVE TWO VEHICLES UNLESS OTHERWISE NOTED. AN (X) INDICATES THE NUMBER OF VEHICLES INVOLVED.

CRASH TYPES			
REAR END		ANGLE	
SIDE-SWIPE PASSING		FIXED OBJECT/ PARKED CAR	
SIDE-SWIPE MEETING		HEAD ON	
BACKING VEHICLE		PEDESTRIAN/ BICYCLE	
LEFT TURN		AT FAULT DRIVER	

ROAD CONDITION	
X	NOT STATED
D	DRY
W	WET
S	SNOW
I	ICE
SEVERITY	
BLACK	PROPERTY DAMAGE ONLY
BLUE	INJURY
RED	FATAL

CRASH DESCRIPTION

1	2	3
07-20-2015/2222/D		

1 DATE MM-DD-YYYY

2 TIME OF DAY (HR 0-24)

3 ROAD CONDITION

COLLISION DIAGRAM

INTERSECTION: CENTRAL PARKWAY

TO: WHITFIELD AVENUE

COUNTY: HAMILTON (ODOT DISTRICT 8)

CR 646 (LUDLOW AVENUE) CORRIDOR STUDY

Mead & Hunt
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COLUMBUS, OH 43016
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(614) 792-5901 FAX

DATE: 12-16-2019

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NOTE: ALL CRASHES INVOLVE TWO VEHICLES UNLESS OTHERWISE NOTED. AN (X) INDICATES THE NUMBER OF VEHICLES INVOLVED.

CRASH TYPES			
REAR END		ANGLE	
SIDE-SWIPE PASSING		FIXED OBJECT/ PARKED CAR	
SIDE-SWIPE MEETING		HEAD ON	
BACKING VEHICLE		PEDESTRIAN/ BICYCLE	
LEFT TURN		AT FAULT DRIVER	

ROAD CONDITION	
X	NOT STATED
D	DRY
W	WET
S	SNOW
I	ICE
SEVERITY	
BLACK	PROPERTY DAMAGE ONLY
BLUE	INJURY
RED	FATAL

CRASH DESCRIPTION

1	2	3
07-20-2015/2222/D		

1 DATE MM-DD-YYYY
2 TIME OF DAY (HR 0-24)
3 ROAD CONDITION

COLLISION DIAGRAM

INTERSECTION: CENTRAL PARKWAY — TO: WHITFIELD AVENUE

COUNTY: HAMILTON (ODOT DISTRICT 8) — CR 646 (LUDLOW AVENUE) CORRIDOR STUDY

Mead & Hunt
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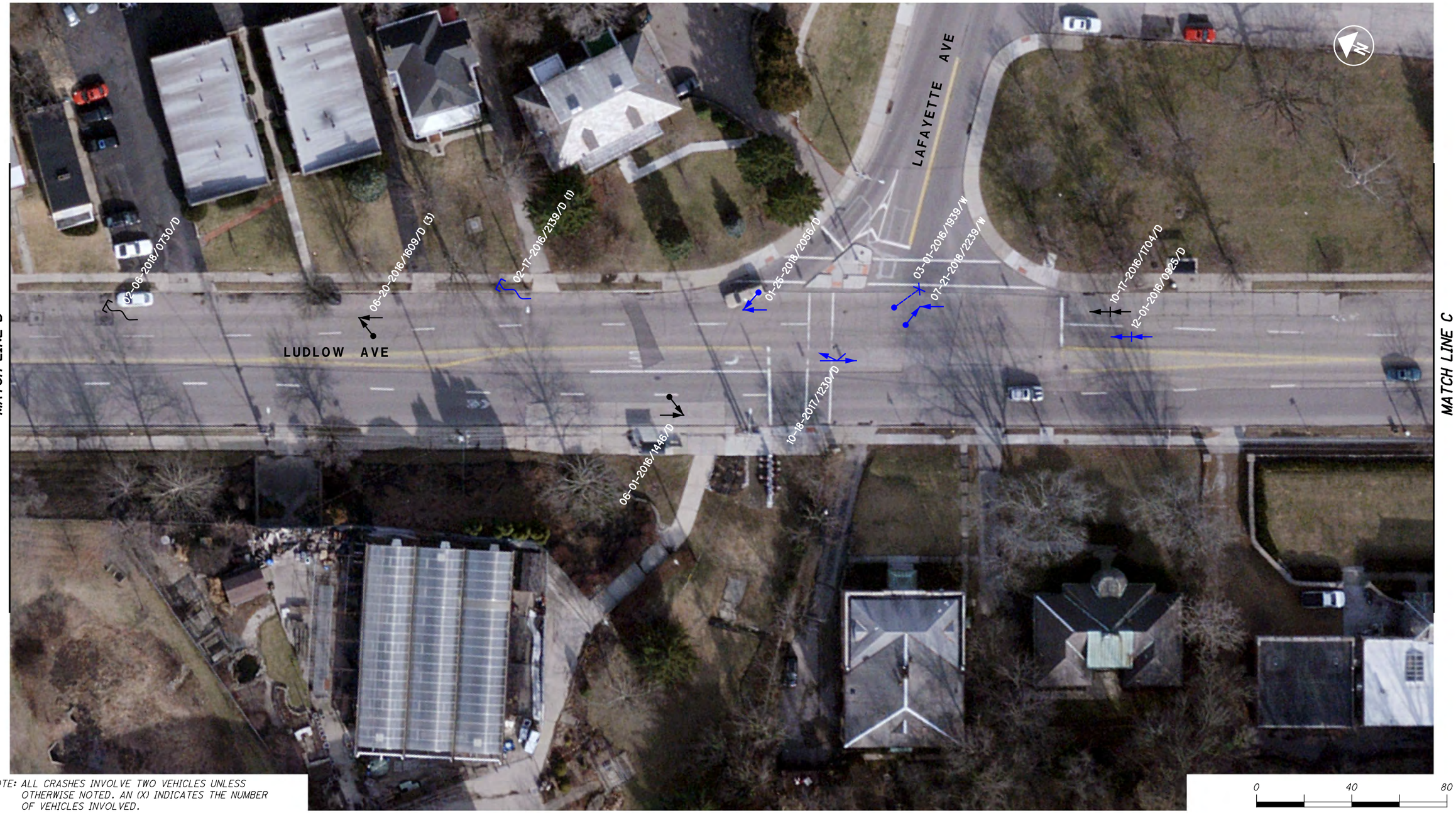

NOTE: ALL CRASHES INVOLVE TWO VEHICLES UNLESS OTHERWISE NOTED. AN (X) INDICATES THE NUMBER OF VEHICLES INVOLVED.

CRASH TYPES			
REAR END		ANGLE	
SIDE-SWIPE PASSING		FIXED OBJECT/ PARKED CAR	
SIDE-SWIPE MEETING		HEAD ON	
BACKING VEHICLE		PEDESTRIAN/ BICYCLE	
LEFT TURN		AT FAULT DRIVER	

ROAD CONDITION	
X	NOT STATED
D	DRY
W	WET
S	SNOW
I	ICE
SEVERITY	
BLACK	PROPERTY DAMAGE ONLY
BLUE	INJURY
RED	FATAL

CRASH DESCRIPTION

1	2	3
07-20-2015/2222/D		

1 DATE MM-DD-YYYY

2 TIME OF DAY (HR 0-24)

3 ROAD CONDITION

COLLISION DIAGRAM

INTERSECTION: CENTRAL PARKWAY

TO: WHITFIELD AVENUE

COUNTY: HAMILTON (ODOT DISTRICT 8)

CR 646 (LUDLOW AVENUE) CORRIDOR STUDY

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NOTE: ALL CRASHES INVOLVE TWO VEHICLES UNLESS OTHERWISE NOTED. AN (X) INDICATES THE NUMBER OF VEHICLES INVOLVED.

CRASH TYPES			
REAR END		ANGLE	
SIDE-SWIPE PASSING		FIXED OBJECT/ PARKED CAR	
SIDE-SWIPE MEETING		HEAD ON	
BACKING VEHICLE		PEDESTRIAN/ BICYCLE	
LEFT TURN		AT FAULT DRIVER	

ROAD CONDITION	
X	NOT STATED
D	DRY
W	WET
S	SNOW
I	ICE
SEVERITY	
BLACK	PROPERTY DAMAGE ONLY
BLUE	INJURY
RED	FATAL

CRASH DESCRIPTION		
1	2	3
07-20-2015/2222/D		

1 DATE MM-DD-YYYY
2 TIME OF DAY (HR 0-24)
3 ROAD CONDITION

COLLISION DIAGRAM

INTERSECTION: CENTRAL PARKWAY — TO: WHITFIELD AVENUE

COUNTY: HAMILTON (ODOT DISTRICT 8) — CR 646 (LUDLOW AVENUE) CORRIDOR STUDY

Mead & Hunt
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NOTE: ALL CRASHES INVOLVE TWO VEHICLES UNLESS OTHERWISE NOTED. AN (X) INDICATES THE NUMBER OF VEHICLES INVOLVED.

0 40 80

CRASH TYPES			
REAR END		ANGLE	
SIDE-SWIPE PASSING		FIXED OBJECT/ PARKED CAR	
SIDE-SWIPE MEETING		HEAD ON	
BACKING VEHICLE		PEDESTRIAN/ BICYCLE	
LEFT TURN		AT FAULT DRIVER	

ROAD CONDITION	
X	NOT STATED
D	DRY
W	WET
S	SNOW
I	ICE
SEVERITY	
BLACK	PROPERTY DAMAGE ONLY
BLUE	INJURY
RED	FATAL

CRASH DESCRIPTION		
1	2	3
07-20-2015/2222/D		

1 DATE MM-DD-YYYY
2 TIME OF DAY (HR 0-24)
3 ROAD CONDITION

COLLISION DIAGRAM

INTERSECTION: CENTRAL PARKWAY — TO: WHITFIELD AVENUE

COUNTY: HAMILTON (ODOT DISTRICT 8) — CR 646 (LUDLOW AVENUE) CORRIDOR STUDY

Mead & Hunt
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DATE: 12-16-2019

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NOTE: ALL CRASHES INVOLVE TWO VEHICLES UNLESS OTHERWISE NOTED. AN (X) INDICATES THE NUMBER OF VEHICLES INVOLVED.

CRASH TYPES			
REAR END		ANGLE	
SIDE-SWIPE PASSING		FIXED OBJECT/ PARKED CAR	
SIDE-SWIPE MEETING		HEAD ON	
BACKING VEHICLE		PEDESTRIAN/ BICYCLE	
LEFT TURN		AT FAULT DRIVER	

ROAD CONDITION	
X	NOT STATED
D	DRY
W	WET
S	SNOW
I	ICE
SEVERITY	
BLACK	PROPERTY DAMAGE ONLY
BLUE	INJURY
RED	FATAL

CRASH DESCRIPTION

1	2	3
07-20-2015/2222/D		

1 DATE MM-DD-YYYY
2 TIME OF DAY (HR 0-24)
3 ROAD CONDITION

COLLISION DIAGRAM

INTERSECTION: CENTRAL PARKWAY — TO: WHITFIELD AVENUE

COUNTY: HAMILTON (ODOT DISTRICT 8) — CR 646 (LUDLOW AVENUE) CORRIDOR STUDY

Mead & Hunt
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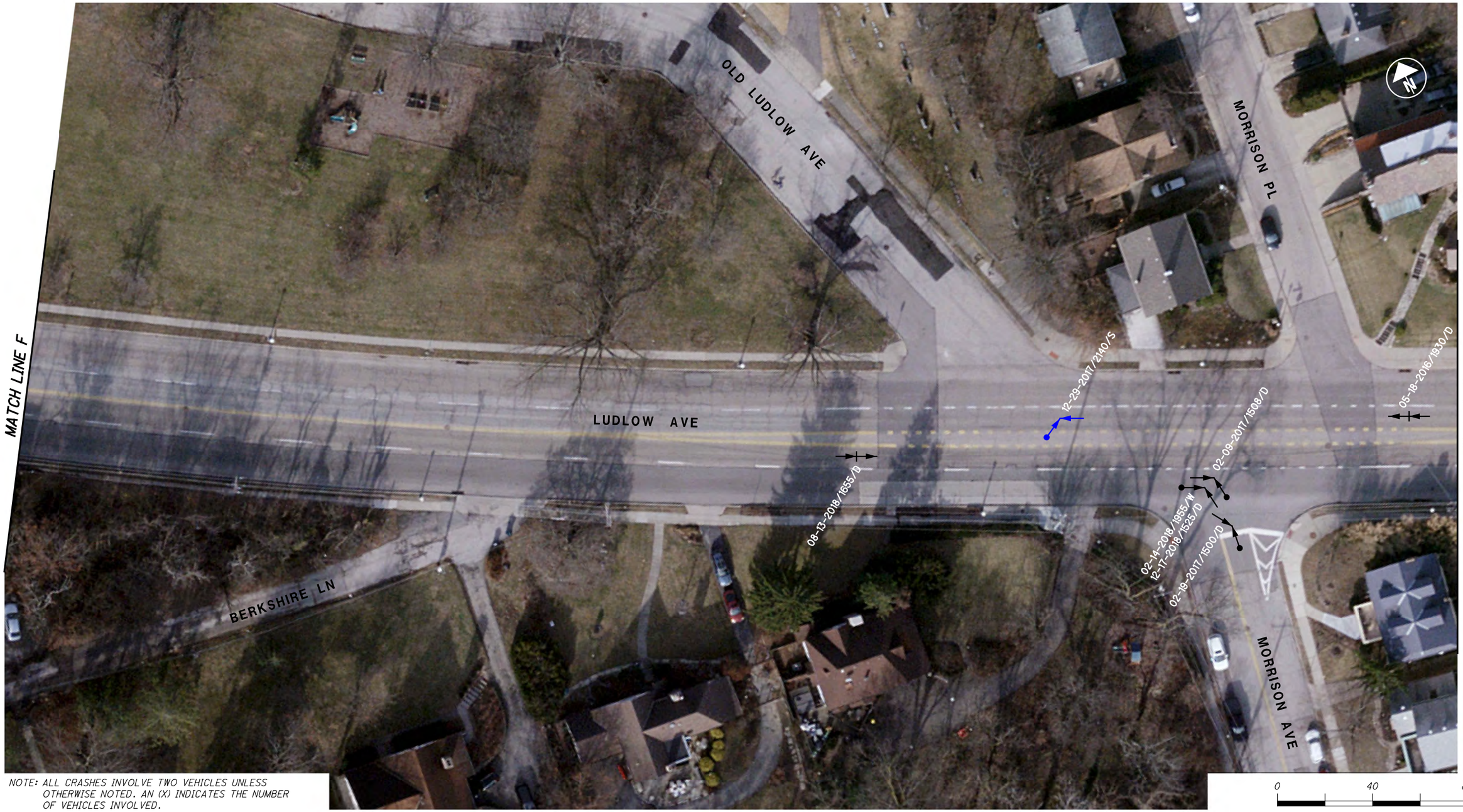
DATE: 12-16-2019



NOTE: ALL CRASHES INVOLVE TWO VEHICLES UNLESS OTHERWISE NOTED. AN (X) INDICATES THE NUMBER OF VEHICLES INVOLVED.

CRASH TYPES			
REAR END		ANGLE	
SIDE-SWIPE PASSING		FIXED OBJECT/ PARKED CAR	
SIDE-SWIPE MEETING		HEAD ON	
BACKING VEHICLE		PEDESTRIAN/ BICYCLE	
LEFT TURN		AT FAULT DRIVER	

ROAD CONDITION	
X	NOT STATED
D	DRY
W	WET
S	SNOW
I	ICE
SEVERITY	
BLACK	PROPERTY DAMAGE ONLY
BLUE	INJURY
RED	FATAL

CRASH DESCRIPTION

1	2	3
07-20-2015/2222/D		

1 DATE MM-DD-YYYY
2 TIME OF DAY (HR 0-24)
3 ROAD CONDITION

COLLISION DIAGRAM

INTERSECTION: CENTRAL PARKWAY — TO: WHITFIELD AVENUE

COUNTY: HAMILTON (ODOT DISTRICT 8) — CR 646 (LUDLOW AVENUE) CORRIDOR STUDY

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NOTE: ALL CRASHES INVOLVE TWO VEHICLES UNLESS OTHERWISE NOTED. AN (X) INDICATES THE NUMBER OF VEHICLES INVOLVED.

0 40 80

CRASH TYPES			
REAR END		ANGLE	
SIDE-SWIPE PASSING		FIXED OBJECT/ PARKED CAR	
SIDE-SWIPE MEETING		HEAD ON	
BACKING VEHICLE		PEDESTRIAN/ BICYCLE	
LEFT TURN		AT FAULT DRIVER	

ROAD CONDITION	
X	NOT STATED
D	DRY
W	WET
S	SNOW
I	ICE
SEVERITY	
BLACK	PROPERTY DAMAGE ONLY
BLUE	INJURY
RED	FATAL

CRASH DESCRIPTION		
1	2	3
07-20-2015/2222/D		

1 DATE MM-DD-YYYY
2 TIME OF DAY (HR 0-24)
3 ROAD CONDITION

COLLISION DIAGRAM

INTERSECTION: CENTRAL PARKWAY TO: WHITFIELD AVENUE

COUNTY: HAMILTON (ODOT DISTRICT 8) CR 646 (LUDLOW AVENUE) CORRIDOR STUDY

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DATE: 12-16-2019

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NOTE: ALL CRASHES INVOLVE TWO VEHICLES UNLESS OTHERWISE NOTED. AN (X) INDICATES THE NUMBER OF VEHICLES INVOLVED.

CRASH TYPES			
REAR END		ANGLE	
SIDE-SWIPE PASSING		FIXED OBJECT/ PARKED CAR	
SIDE-SWIPE MEETING		HEAD ON	
BACKING VEHICLE		PEDESTRIAN/ BICYCLE	
LEFT TURN		AT FAULT DRIVER	

ROAD CONDITION	
X	NOT STATED
D	DRY
W	WET
S	SNOW
I	ICE
SEVERITY	
BLACK	PROPERTY DAMAGE ONLY
BLUE	INJURY
RED	FATAL

CRASH DESCRIPTION

1	2	3
07-20-2015/2222/D		

1 DATE MM-DD-YYYY
2 TIME OF DAY (HR 0-24)
3 ROAD CONDITION

COLLISION DIAGRAM

INTERSECTION: CENTRAL PARKWAY — TO: WHITFIELD AVENUE

COUNTY: HAMILTON (ODOT DISTRICT 8) — CR 646 (LUDLOW AVENUE) CORRIDOR STUDY

Mead & Hunt
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DATE: 12-16-2019

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NOTE: ALL CRASHES INVOLVE TWO VEHICLES UNLESS OTHERWISE NOTED. AN (X) INDICATES THE NUMBER OF VEHICLES INVOLVED.

CRASH TYPES			
REAR END		ANGLE	
SIDE-SWIPE PASSING		FIXED OBJECT/ PARKED CAR	
SIDE-SWIPE MEETING		HEAD ON	
BACKING VEHICLE		PEDESTRIAN/ BICYCLE	
LEFT TURN		AT FAULT DRIVER	

ROAD CONDITION	
X	NOT STATED
D	DRY
W	WET
S	SNOW
I	ICE
SEVERITY	
BLACK	PROPERTY DAMAGE ONLY
BLUE	INJURY
RED	FATAL

CRASH DESCRIPTION

1	2	3
07-20-2015	2222	D

1 DATE MM-DD-YYYY

2 TIME OF DAY (HR 0-24)

3 ROAD CONDITION

COLLISION DIAGRAM

INTERSECTION: CENTRAL PARKWAY — TO: WHITFIELD AVENUE

COUNTY: HAMILTON (ODOT DISTRICT 8) — CR 646 (LUDLOW AVENUE) CORRIDOR STUDY

Mead & Hunt
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DATE: 12-16-2019

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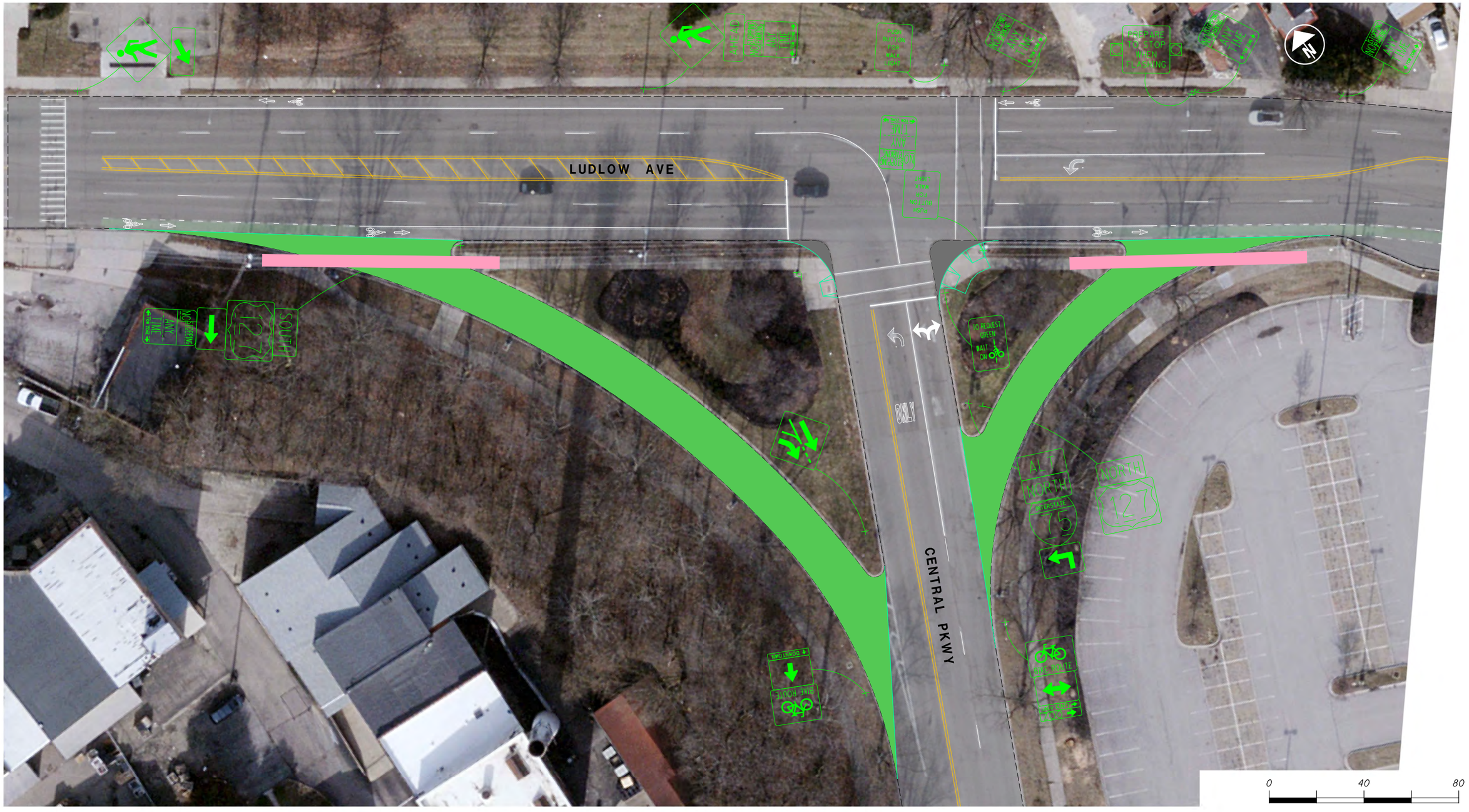
APPENDIX D
Proposed Conditions



PROPOSED CONDITIONS DIAGRAM

INTERSECTION: CENTRAL PARKWAY

COUNTY: HAMILTON (ODOT DISTRICT 8)

CR 646 (LUDLOW AVENUE) CORRIDOR STUDY

Mead & Hunt
4700 LAKEHURST CT, STE 110
COLUMBUS, OH 43016
(614) 792-5900 PHONE
(614) 792-5901 FAX

DATE: 03-17-2020

PAGE: 1 OF 1

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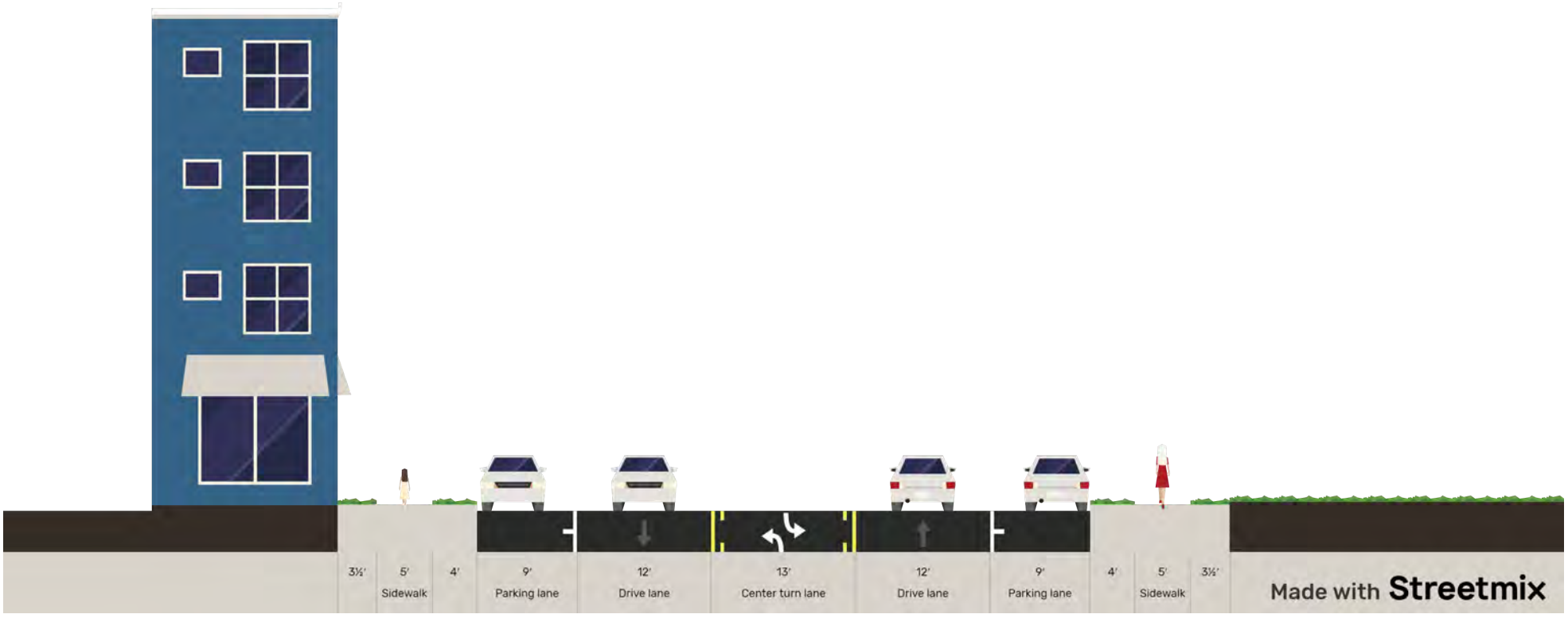
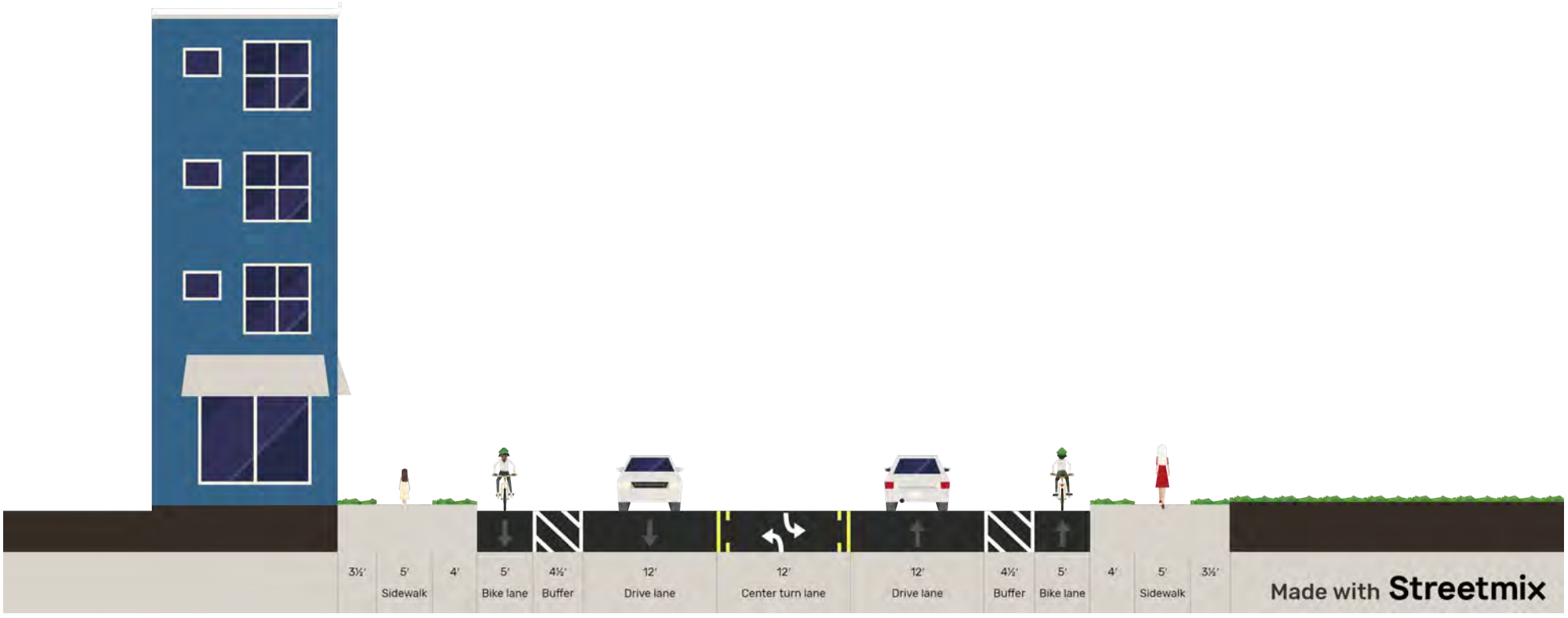
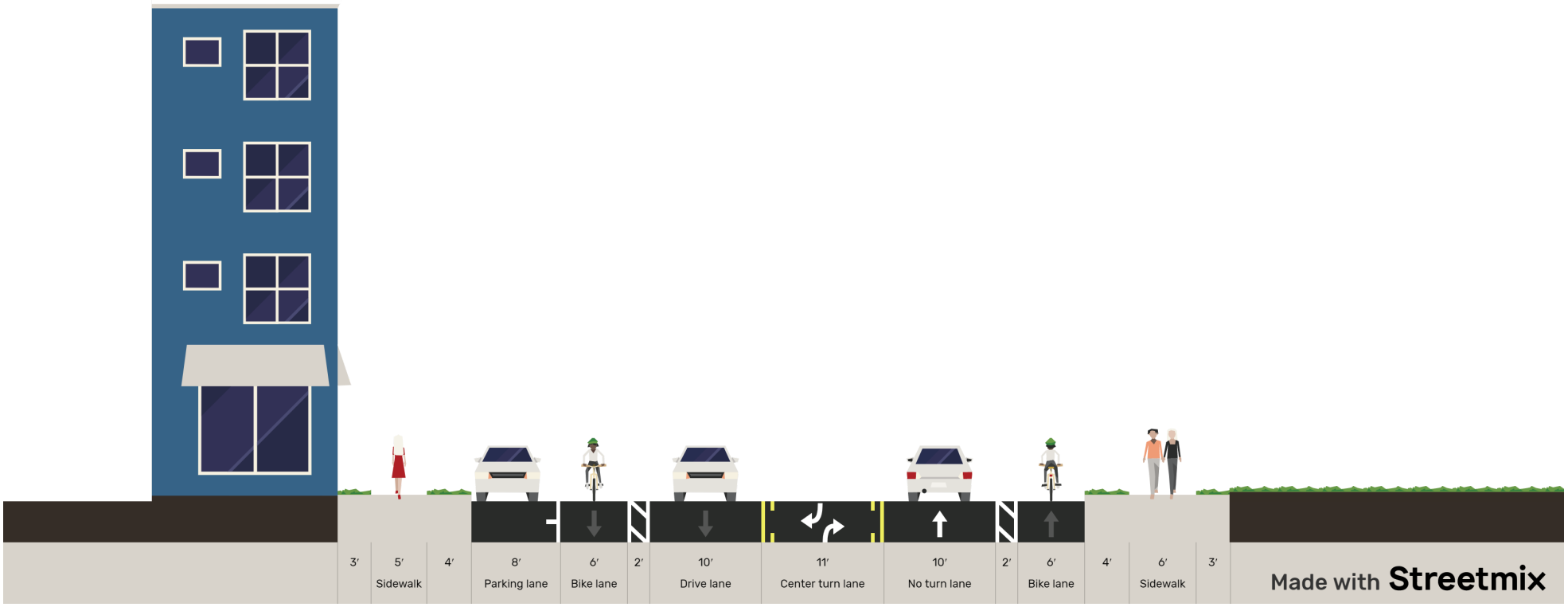
Ludlow Avenue West of Cornell Place
3 Lanes w/ Parking on two sides

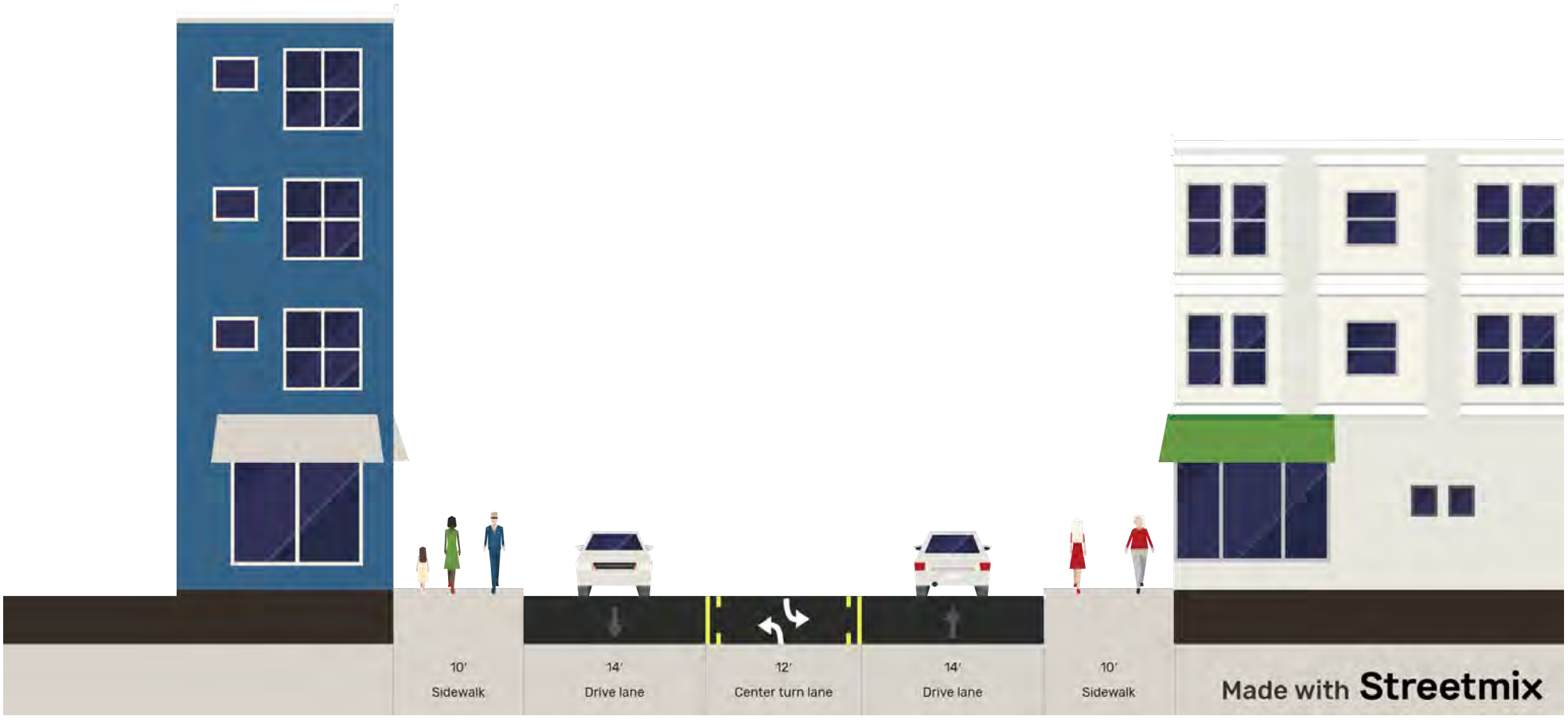


Ludlow Avenue West of Cornell Place
3-Lane w/ Bike Lane on two sides

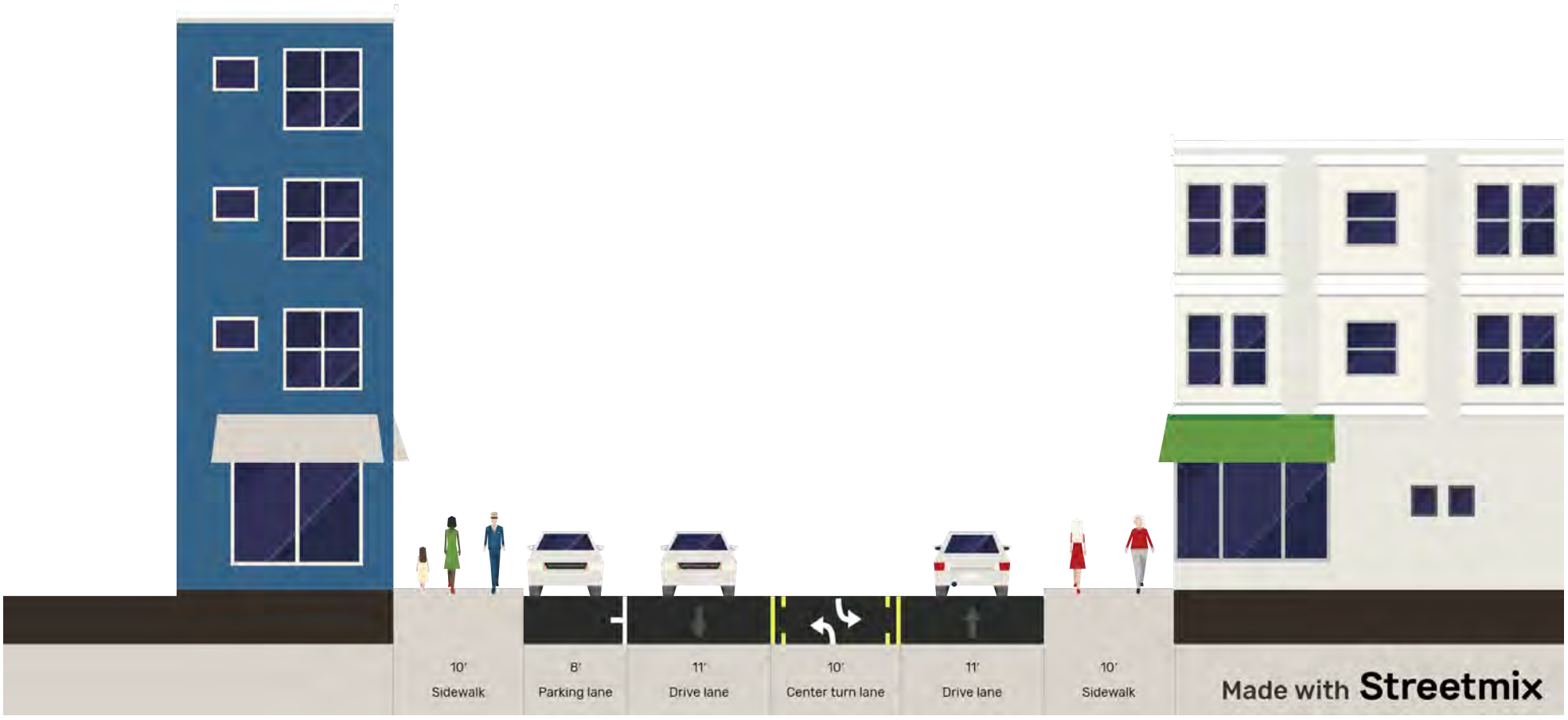



3′
5′
Sidewalk
4′
8′
Parking lane
6′
Bike lane
2′
10′
Drive lane
11′
Center turn lane
10′
No turn lane
2′
6′
Bike lane
4′
6′
Sidewalk
3′
Made with Streetmix

Ludlow Avenue East of Cornell Place
3 Lanes; No On-street Parking



Ludlow Avenue East of Cornell Place
3 Lane w/ On-street Parking on one side



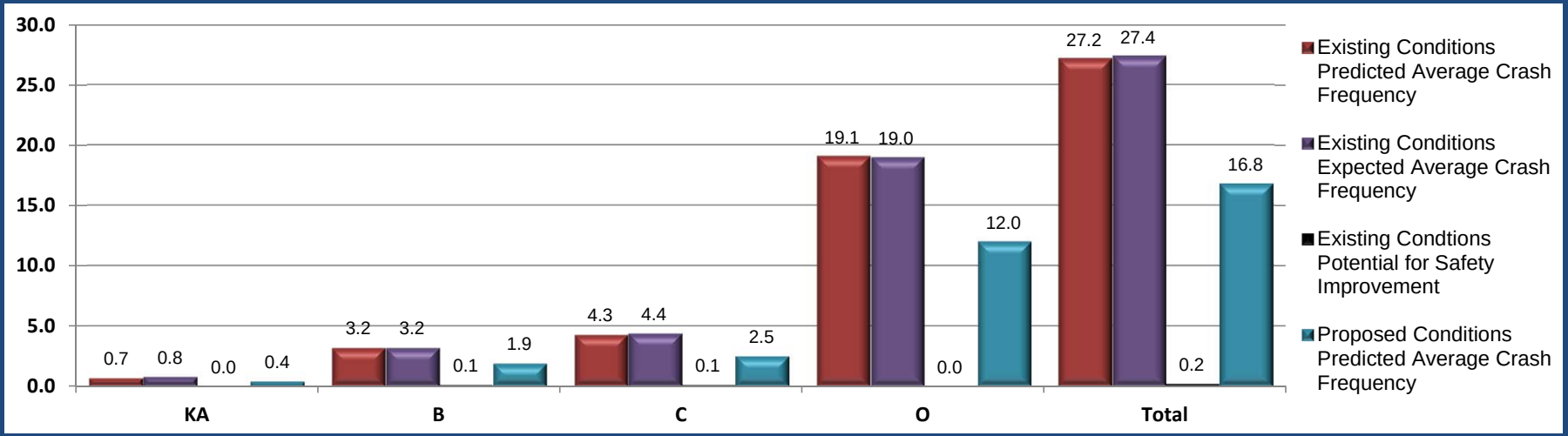
APPENDIX E
Project Safety Performance Report and Benefit/Cost Analysis

Project Safety Performance Report

General Information

Project Name	HAM-CR 646-0.00/1.04 Ludlow Ave Corridor	Contact Email	lkeyser@lawhon-assoc.com
Project Description	Ludlow Avenue between Central Parkway & Whitfield Avenue	Contact Phone	614-481-8600
Reference Number	19-0608 W02	Date Performed	3/2/2020
Analyst	Lori Keyser	Analysis Year	2018
Agency/Company	Lawhon & Associates, Inc.		

Summary of Anticipated Safety Performance of the Project (average crashes/year)



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
$N_{predicted}$ - Existing Conditions	0.7450	3.1520	4.2664	19.0687	27.2321
$N_{expected}$ - Existing Conditions	0.7502	3.2328	4.4144	19.0402	27.4376
$N_{potential\ for\ improvement}$ - Existing Conditions	**0.0052**	**0.0808**	**0.1480**	-0.0285	**0.2055**
$N_{predicted}$ - Proposed Conditions	0.4375	1.8938	2.4860	12.0147	16.8320

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Existing Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
CR646 0.00-0.13	Central Parkway-Rue De La Paix	0.006	0.0196	0.0311	0.1603	0.217
CR646 0.13-0.29	Rue De La Paix-Lafayette Ave	0.0189	0.0611	0.0965	0.5001	0.6766
CR464 0.29-0.45	Lafayette Ave-Clifton Hills Ave	0.0241	0.0787	0.1247	0.6436	0.8711
CR464 0.45-0.54	Clifton Hills Ave-Old Ludlow Ave	0.0133	0.0433	0.0685	0.354	0.4791
CR464 0.54-0.73	Old Ludlow Ave-Old Ludlow Ave	0.0287	0.0937	0.1487	0.7673	1.0384
CR464 0.73-0.75	Old Ludlow Ave-Morrison Ave	0.0078	0.022	0.03	0.162	0.2218
CR464 0.75-0.76	Morrison Ave-Morrison Pl	0.0056	0.0158	0.0214	0.1159	0.1587
CR464 0.76-0.86	Morrison Pl-Gano Ave	0.0165	0.0537	0.085	0.4393	0.5945
CR464 0.86-0.87	Gano Ave-Manorhill Dr	0.0011	0.0037	0.0059	0.0309	0.0416
CR464 0.87-0.89	Manorhill Dr-Lyleburn Pl	0.0014	0.0046	0.0073	0.0377	0.051
CR464 0.89-0.92	Lyleburn Pl-Sherlock Ave	0.0037	0.0121	0.0191	0.0986	0.1335
CR464 0.92-0.97	Sherlock Ave-Cornell St	0.0068	0.022	0.0347	0.1798	0.2433
CR464 0.97-1.03	Cornell St-Whitfield Ave	0.0089	0.0289	0.0457	0.2366	0.3201
US127 5.00-5.20	Ludlow west of Central Pkwy	0.0544	0.3474	0.2983	1.8022	2.5023
CR646 0.00	Central Parkway	0.0922	0.3752	0.4986	2.4481	3.4141
CR646 0.13	Rue De La Paix	0.1152	0.49	0.6677	3.1668	4.4397
CR464 0.29	Lafayette Ave	0.0853	0.3544	0.4772	2.2511	3.168
CR464 0.45	Clifton Hills Ave	0.0149	0.0677	0.1005	0.2728	0.4559
CR464 0.54	Old Ludlow Ave	0.0118	0.0542	0.0809	0.1911	0.338
CR464 0.73	Old Ludlow Ave	0.0118	0.0542	0.0809	0.1911	0.338
CR464 0.75	Morrison Ave	0.0118	0.0542	0.0809	0.1911	0.338
CR464 0.76	Morrison Pl	0.0118	0.0542	0.0809	0.1911	0.338
CR464 0.86	Gano Ave	0.0118	0.0542	0.0809	0.1911	0.338
CR464 0.87	Manorhill Dr	0.0118	0.0542	0.0809	0.1911	0.338
CR464 0.89	Lyleburn Pl	0.0118	0.0542	0.0809	0.1911	0.338
CR464 0.92	Sherlock Ave	0.0118	0.0542	0.0809	0.1911	0.338
CR464 0.97	Cornell St	0.0118	0.0542	0.0809	0.1911	0.338
CR464 1.03	Whitfield Ave	0.134	0.5703	0.7774	3.6817	5.1634

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Analyst	Lori Keyser	Analysis Year	2018
Agency/Company	Lawhon & Associates, Inc.		

Existing Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
CR646 0.00-0.13	Central Parkway-Rue De La Paix	0.0058	0.019	0.0299	0.142	0.1967
CR646 0.13-0.29	Rue De La Paix-Lafayette Ave	0.0186	0.0582	0.0891	0.7049	0.8708
CR464 0.29-0.45	Lafayette Ave-Clifton Hills Ave	0.0297	0.1019	0.1687	0.6289	0.9292
CR464 0.45-0.54	Clifton Hills Ave-Old Ludlow Ave	0.0125	0.0404	0.0633	0.28	0.3962
CR464 0.54-0.73	Old Ludlow Ave-Old Ludlow Ave	0.0257	0.0817	0.1264	0.4914	0.7252
CR464 0.73-0.75	Old Ludlow Ave-Morrison Ave	0.0077	0.0214	0.0289	0.1428	0.2008
CR464 0.75-0.76	Morrison Ave-Morrison Pl	0.0055	0.0155	0.0209	0.1057	0.1476
CR464 0.76-0.86	Morrison Pl-Gano Ave	0.0154	0.0494	0.0774	0.3323	0.4745
CR464 0.86-0.87	Gano Ave-Manorhill Dr	0.0011	0.0037	0.0059	0.0301	0.0408
CR464 0.87-0.89	Manorhill Dr-Lyleburn Pl	0.0014	0.0046	0.0072	0.0365	0.0497
CR464 0.89-0.92	Lyleburn Pl-Sherlock Ave	0.0036	0.0118	0.0186	0.0914	0.1254
CR464 0.92-0.97	Sherlock Ave-Cornell St	0.0066	0.0213	0.0334	0.1606	0.2219
CR464 0.97-1.03	Cornell St-Whitfield Ave	0.0087	0.0277	0.0435	0.2037	0.2836
US127 5.00-5.20	Ludlow west of Central Pkwy	0.0565	0.374	0.331	0.8961	1.6576
CR646 0.00	Central Parkway	0.1104	0.4716	0.6577	2.4477	3.6874
CR646 0.13	Rue De La Paix	0.1243	0.5401	0.7557	3.1667	4.5868
CR464 0.29	Lafayette Ave	0.0873	0.3615	0.4795	2.0425	2.9708
CR464 0.45	Clifton Hills Ave	0.0185	0.0875	0.1314	0.3098	0.5472
CR464 0.54	Old Ludlow Ave	0.0101	0.0484	0.0732	0.2568	0.3885
CR464 0.73	Old Ludlow Ave	0.0101	0.0484	0.0732	0.3259	0.4576
CR464 0.75	Morrison Ave	0.0101	0.0484	0.0732	0.2096	0.3413
CR464 0.76	Morrison Pl	0.0101	0.0484	0.0732	0.2096	0.3413
CR464 0.86	Gano Ave	0.0101	0.0484	0.0732	0.1708	0.3025
CR464 0.87	Manorhill Dr	0.0101	0.0484	0.0732	0.2484	0.3801
CR464 0.89	Lyleburn Pl	0.0101	0.0484	0.0732	0.2568	0.3885
CR464 0.92	Sherlock Ave	0.0101	0.0484	0.0732	0.2484	0.3801
CR464 0.97	Cornell St	0.0101	0.0484	0.0732	0.304	0.4357
CR464 1.03	Whitfield Ave	0.12	0.5059	0.6871	4.5968	5.9098

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Agency/Company	Lawhon & Associates, Inc.		

Existing Conditions Project Element Potential for Safety Improvement Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
CR646 0.00-0.13	Central Parkway-Rue De La Paix	-0.0002	-0.0006	-0.0012	-0.0183	-0.0203
CR646 0.13-0.29	Rue De La Paix-Lafayette Ave	-0.0003	-0.0029	-0.0074	**0.2048**	**0.1942**
CR464 0.29-0.45	Lafayette Ave-Clifton Hills Ave	**0.0056**	**0.0232**	**0.044**	-0.0147	**0.0581**
CR464 0.45-0.54	Clifton Hills Ave-Old Ludlow Ave	-0.0008	-0.0029	-0.0052	-0.074	-0.0829
CR464 0.54-0.73	Old Ludlow Ave-Old Ludlow Ave	-0.003	-0.012	-0.0223	-0.2759	-0.3132
CR464 0.73-0.75	Old Ludlow Ave-Morrison Ave	-1E-04	-0.0006	-0.0011	-0.0192	-0.021
CR464 0.75-0.76	Morrison Ave-Morrison Pl	-0.0001	-0.0003	-0.0005	-0.0102	-0.0111
CR464 0.76-0.86	Morrison Pl-Gano Ave	-0.0011	-0.0043	-0.0076	-0.107	-0.12
CR464 0.86-0.87	Gano Ave-Manorhill Dr	0	0	0	-0.0008	-0.0008
CR464 0.87-0.89	Manorhill Dr-Lyleburn Pl	0	0	-0.0001	-0.0012	-0.0013
CR464 0.89-0.92	Lyleburn Pl-Sherlock Ave	-0.0001	-0.0003	-0.0005	-0.0072	-0.0081
CR464 0.92-0.97	Sherlock Ave-Cornell St	-0.0002	-0.0007	-0.0013	-0.0192	-0.0214
CR464 0.97-1.03	Cornell St-Whitfield Ave	-0.0002	-0.0012	-0.0022	-0.0329	-0.0365
US127 5.00-5.20	Ludlow west of Central Pkwy	**0.0021**	**0.0266**	**0.0327**	-0.9061	-0.8447
CR646 0.00	Central Parkway	**0.0182**	**0.0964**	**0.1591**	-0.0004	**0.2733**
CR646 0.13	Rue De La Paix	**0.0091**	**0.0501**	**0.088**	-1E-04	**0.1471**
CR464 0.29	Lafayette Ave	**0.002**	**0.0071**	**0.0023**	-0.2086	-0.1972
CR464 0.45	Clifton Hills Ave	**0.0036**	**0.0198**	**0.0309**	**0.037**	**0.0913**
CR464 0.54	Old Ludlow Ave	-0.0017	-0.0058	-0.0077	**0.0657**	**0.0505**
CR464 0.73	Old Ludlow Ave	-0.0017	-0.0058	-0.0077	**0.1348**	**0.1196**
CR464 0.75	Morrison Ave	-0.0017	-0.0058	-0.0077	**0.0185**	**0.0033**
CR464 0.76	Morrison Pl	-0.0017	-0.0058	-0.0077	**0.0185**	**0.0033**
CR464 0.86	Gano Ave	-0.0017	-0.0058	-0.0077	-0.0203	-0.0355
CR464 0.87	Manorhill Dr	-0.0017	-0.0058	-0.0077	**0.0573**	**0.0421**
CR464 0.89	Lyleburn Pl	-0.0017	-0.0058	-0.0077	**0.0657**	**0.0505**
CR464 0.92	Sherlock Ave	-0.0017	-0.0058	-0.0077	**0.0573**	**0.0421**
CR464 0.97	Cornell St	-0.0017	-0.0058	-0.0077	**0.1129**	**0.0977**
CR464 1.03	Whitfield Ave	-0.014	-0.0644	-0.0903	**0.9151**	**0.7464**

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Proposed Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
CR646 0.00-0.13	Central Parkway-Rue De La Paix	0.006	0.0196	0.0311	0.1603	0.217
CR646 0.13-0.29	Rue De La Paix-Lafayette Ave	0.0134	0.0434	0.0685	0.3551	0.4804
CR464 0.29-0.45	Lafayette Ave-Clifton Hills Ave	0.0142	0.0468	0.0728	0.3849	0.5187
CR464 0.45-0.54	Clifton Hills Ave-Old Ludlow Ave	0.0095	0.0308	0.0486	0.2514	0.3403
CR464 0.54-0.73	Old Ludlow Ave-Old Ludlow Ave	0.0204	0.0665	0.1056	0.5448	0.7373
CR464 0.73-0.75	Old Ludlow Ave-Morrison Ave	0.0055	0.0156	0.0213	0.115	0.1574
CR464 0.75-0.76	Morrison Ave-Morrison Pl	0.004	0.0112	0.0152	0.0823	0.1127
CR464 0.76-0.86	Morrison Pl-Gano Ave	0.0117	0.0381	0.0603	0.3119	0.422
CR464 0.86-0.87	Gano Ave-Manorhill Dr	0.0008	0.0026	0.0042	0.022	0.0296
CR464 0.87-0.89	Manorhill Dr-Lyleburn Pl	0.001	0.0033	0.0052	0.0268	0.0363
CR464 0.89-0.92	Lyleburn Pl-Sherlock Ave	0.0026	0.0086	0.0136	0.07	0.0948
CR464 0.92-0.97	Sherlock Ave-Cornell St	0.0048	0.0156	0.0246	0.1276	0.1726
CR464 0.97-1.03	Cornell St-Whitfield Ave	0.0063	0.0205	0.0324	0.168	0.2272
US127 5.00-5.20	Ludlow west of Central Pkwy	0.0544	0.3474	0.2983	1.8022	2.5023
CR646 0.00	Central Parkway	0.0537	0.2217	0.2917	1.5986	2.1657
CR646 0.13	Rue De La Paix	0.0675	0.2899	0.3902	2.0641	2.8117
CR464 0.29	Lafayette Ave	0.0352	0.1487	0.1982	1.0434	1.4255
CR464 0.45	Clifton Hills Ave	0.0087	0.0396	0.0585	0.1619	0.2687
CR464 0.54	Old Ludlow Ave	0.0069	0.0316	0.047	0.1134	0.1989
CR464 0.73	Old Ludlow Ave	0.0069	0.0316	0.047	0.1134	0.1989
CR464 0.75	Morrison Ave	0.0069	0.0316	0.047	0.1134	0.1989
CR464 0.76	Morrison Pl	0.0069	0.0316	0.047	0.1134	0.1989
CR464 0.86	Gano Ave	0.0069	0.0316	0.047	0.1134	0.1989
CR464 0.87	Manorhill Dr	0.0069	0.0316	0.047	0.1134	0.1989
CR464 0.89	Lyleburn Pl	0.0069	0.0316	0.047	0.1134	0.1989
CR464 0.92	Sherlock Ave	0.0069	0.0316	0.047	0.1134	0.1989
CR464 0.97	Cornell St	0.0069	0.0316	0.047	0.1134	0.1989
CR464 1.03	Whitfield Ave	0.0557	0.2395	0.3227	1.7038	2.3217

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Analyst	Lori Keyser	Analysis Year	2018
Agency/Company	Lawhon & Associates, Inc.		

Summary by Crash Type

Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Predicted Crash Frequency
Unknown	0.0277	0.0242	-0.0035	0.0217
Head On	0.1636	0.1702	**0.0066**	0.0936
Rear End	12.7587	12.9213	**0.1626**	7.8158
Backing	0.6444	0.6553	**0.0109**	0.4515
Sideswipe - Meeting	0.4295	0.4342	**0.0048**	0.2632
Sideswipe - Passing	3.5454	3.4784	-0.0669	2.2406
Angle	4.0686	4.2592	**0.1906**	2.3327
Parked Vehicle	0.6629	0.6931	**0.0302**	0.4736
Pedestrian	0.3965	0.3479	-0.0486	0.1712
Animal	1.1501	0.6704	-0.4797	1.0781
Train	0.0015	0.0015	0.0000	0.0010
Pedalcycles	0.5753	0.5439	-0.0314	0.3597
Other Non-Vehicle	0.0002	0.0002	0.0000	0.0001
Fixed Object	1.4252	1.3002	-0.1251	1.1220
Other Object	0.0837	0.0651	-0.0186	0.0702
Overturning	0.0767	0.0699	-0.0068	0.0619
Other Non-Collision	0.1612	0.1405	-0.0208	0.1267
Left Turn	2.2098	2.3327	**0.1229**	1.2253
Right Turn	0.0000	0.0000	0.0000	0.0000

APPENDIX F
Proposed Conditions Level of Service Analyses

Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (veh/h)	102	77	1092	449	86	286
Future Volume (veh/h)	102	77	1092	449	86	286
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1900	1885	1885	1870	1811
Adj Flow Rate, veh/h	98	98	1187	488	93	311
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	0	1	1	2	6
Cap, veh/h	170	155	1345	533	312	2462
Arrive On Green	0.10	0.10	0.54	0.54	0.08	0.72
Sat Flow, veh/h	1767	1610	2598	993	1781	3532
Grp Volume(v), veh/h	98	98	837	838	93	311
Grp Sat Flow(s),veh/h/ln	1767	1610	1791	1706	1781	1721
Q Serve(g_s), s	2.8	3.1	21.6	23.8	1.0	1.5
Cycle Q Clear(g_c), s	2.8	3.1	21.6	23.8	1.0	1.5
Prop In Lane	1.00	1.00		0.58	1.00	
Lane Grp Cap(c), veh/h	170	155	962	916	312	2462
V/C Ratio(X)	0.58	0.63	0.87	0.91	0.30	0.13
Avail Cap(c_a), veh/h	399	364	962	916	363	2462
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.0	23.1	10.7	11.2	11.3	2.4
Incr Delay (d2), s/veh	3.1	4.2	8.7	13.5	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.2	8.1	9.6	0.5	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.0	27.3	19.3	24.7	11.5	2.5
LnGrp LOS	C	C	B	C	B	A
Approach Vol, veh/h	196		1675			404
Approach Delay, s/veh	26.7		22.0			4.6
Approach LOS	C		C			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		43.0		10.1	9.5	33.5
Change Period (Y+Rc), s		* 5		* 5	5.0	* 5
Max Green Setting (Gmax), s		* 38		* 12	6.0	* 27
Max Q Clear Time (g_c+I1), s		3.5		5.1	3.0	25.8
Green Ext Time (p_c), s		2.1		0.3	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	12	1051	106	13	348	1	15	0	2	10	0	9
Future Volume (veh/h)	12	1051	106	13	348	1	15	0	2	10	0	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.93		0.97	0.96		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1900	1900	1811	1811	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	13	1142	115	14	378	1	16	0	2	11	0	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	0	6	6	2	0	0	0	0	0
Cap, veh/h	691	1187	1021	171	1146	3	287	0	167	166	28	77
Arrive On Green	0.63	0.63	0.63	0.63	0.63	0.63	0.11	0.00	0.11	0.11	0.00	0.11
Sat Flow, veh/h	1019	1870	1608	449	1805	5	1307	0	1555	534	259	721
Grp Volume(v), veh/h	13	1142	115	14	0	379	16	0	2	21	0	0
Grp Sat Flow(s),veh/h/ln	1019	1870	1608	449	0	1810	1307	0	1555	1514	0	0
Q Serve(g_s), s	0.3	28.9	1.4	1.5	0.0	4.9	0.0	0.0	0.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.2	28.9	1.4	30.4	0.0	4.9	0.4	0.0	0.1	0.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	0.52		0.48
Lane Grp Cap(c), veh/h	691	1187	1021	171	0	1149	287	0	167	271	0	0
V/C Ratio(X)	0.02	0.96	0.11	0.08	0.00	0.33	0.06	0.00	0.01	0.08	0.00	0.00
Avail Cap(c_a), veh/h	691	1187	1021	171	0	1149	536	0	463	545	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.4	8.6	3.6	22.9	0.0	4.3	20.3	0.0	20.1	20.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	17.7	0.0	0.2	0.0	0.2	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.8	0.3	0.2	0.0	1.0	0.2	0.0	0.0	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.5	26.3	3.7	23.1	0.0	4.4	20.4	0.0	20.1	20.5	0.0	0.0
LnGrp LOS	A	C	A	C	A	A	C	A	C	C	A	A
Approach Vol, veh/h		1270			393			18			21	
Approach Delay, s/veh		24.1			5.1			20.3			20.5	
Approach LOS		C			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.0		12.4		38.0		12.4				
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s		32.0		15.0		32.0		15.0				
Max Q Clear Time (g_c+I1), s		32.4		2.6		30.9		2.4				
Green Ext Time (p_c), s		0.0		0.0		0.9		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			19.6									
HCM 6th LOS			B									

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	16	120	226	27	229	837
Future Volume (veh/h)	16	120	226	27	229	837
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.99	0.99	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1811	1781	1781	1885	1870
Adj Flow Rate, veh/h	17	130	246	29	249	910
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	6	8	8	1	2
Cap, veh/h	202	174	911	107	741	1091
Arrive On Green	0.11	0.11	0.58	0.58	0.58	0.58
Sat Flow, veh/h	1781	1535	1562	184	1106	1870
Grp Volume(v), veh/h	17	130	0	275	249	910
Grp Sat Flow(s),veh/h/ln	1781	1535	0	1746	1106	1870
Q Serve(g_s), s	0.3	3.2	0.0	3.1	5.7	15.6
Cycle Q Clear(g_c), s	0.3	3.2	0.0	3.1	8.8	15.6
Prop In Lane	1.00	1.00		0.11	1.00	
Lane Grp Cap(c), veh/h	202	174	0	1019	741	1091
V/C Ratio(X)	0.08	0.75	0.00	0.27	0.34	0.83
Avail Cap(c_a), veh/h	900	776	0	1235	878	1323
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.7	17.0	0.0	4.1	6.2	6.7
Incr Delay (d2), s/veh	0.2	6.3	0.0	0.1	0.3	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.2	0.0	0.5	0.8	3.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.9	23.3	0.0	4.2	6.5	10.7
LnGrp LOS	B	C	A	A	A	B
Approach Vol, veh/h	147		275			1159
Approach Delay, s/veh	22.4		4.2			9.8
Approach LOS	C		A			A

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		30.1		9.5		30.1
Change Period (Y+Rc), s		7.0		5.0		7.0
Max Green Setting (Gmax), s		28.0		20.0		28.0
Max Q Clear Time (g_c+I1), s		5.1		5.2		17.6
Green Ext Time (p_c), s		1.5		0.3		5.5

Intersection Summary	
HCM 6th Ctrl Delay	10.0
HCM 6th LOS	A

Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (veh/h)	381	83	412	178	116	969
Future Volume (veh/h)	381	83	412	178	116	969
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1900	1885	1885	1870	1811
Adj Flow Rate, veh/h	498	0	448	193	126	1053
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	0	1	1	2	6
Cap, veh/h	638	291	1142	488	560	2220
Arrive On Green	0.18	0.00	0.47	0.47	0.09	0.65
Sat Flow, veh/h	3534	1610	2538	1044	1781	3532
Grp Volume(v), veh/h	498	0	327	314	126	1053
Grp Sat Flow(s),veh/h/ln	1767	1610	1791	1697	1781	1721
Q Serve(g_s), s	7.7	0.0	6.8	6.9	1.8	9.0
Cycle Q Clear(g_c), s	7.7	0.0	6.8	6.9	1.8	9.0
Prop In Lane	1.00	1.00		0.62	1.00	
Lane Grp Cap(c), veh/h	638	291	837	793	560	2220
V/C Ratio(X)	0.78	0.00	0.39	0.40	0.22	0.47
Avail Cap(c_a), veh/h	801	365	837	793	585	2220
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	0.0	10.0	10.0	5.9	5.2
Incr Delay (d2), s/veh	3.9	0.0	0.3	0.3	0.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	2.2	2.1	0.5	2.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.3	0.0	10.3	10.3	6.0	5.9
LnGrp LOS	C	A	B	B	A	A
Approach Vol, veh/h	498		641			1179
Approach Delay, s/veh	26.3		10.3			5.9
Approach LOS	C		B			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		42.0		15.4	10.2	31.8
Change Period (Y+Rc), s		* 5		* 5	5.0	* 5
Max Green Setting (Gmax), s		* 37		* 13	6.0	* 26
Max Q Clear Time (g_c+I1), s		11.0		9.7	3.8	8.9
Green Ext Time (p_c), s		8.3		0.6	0.0	3.6

Intersection Summary	
HCM 6th Ctrl Delay	11.5
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	11	449	34	14	987	15	74	0	7	8	0	8
Future Volume (veh/h)	11	449	34	14	987	15	74	0	7	8	0	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.95		0.97	0.97		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1900	1900	1811	1811	1870	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	12	488	37	15	1073	16	80	0	8	9	0	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	0	6	6	2	0	0	0	0	0
Cap, veh/h	150	1145	982	561	1089	16	327	0	217	179	30	105
Arrive On Green	0.61	0.61	0.61	0.61	0.61	0.61	0.14	0.00	0.14	0.14	0.00	0.14
Sat Flow, veh/h	526	1870	1604	891	1780	27	1339	0	1562	544	214	758
Grp Volume(v), veh/h	12	488	37	15	0	1089	80	0	8	18	0	0
Grp Sat Flow(s),veh/h/ln	526	1870	1604	891	0	1806	1339	0	1562	1516	0	0
Q Serve(g_s), s	1.2	7.2	0.5	0.5	0.0	30.8	2.2	0.0	0.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	32.0	7.2	0.5	7.6	0.0	30.8	2.7	0.0	0.2	0.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.50		0.50
Lane Grp Cap(c), veh/h	150	1145	982	561	0	1106	327	0	217	314	0	0
V/C Ratio(X)	0.08	0.43	0.04	0.03	0.00	0.98	0.24	0.00	0.04	0.06	0.00	0.00
Avail Cap(c_a), veh/h	150	1145	982	561	0	1106	525	0	448	529	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	25.5	5.3	4.0	7.3	0.0	9.9	20.5	0.0	19.5	19.6	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.3	0.0	0.0	0.0	23.4	0.4	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.7	0.1	0.1	0.0	14.1	0.8	0.0	0.1	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	5.6	4.0	7.3	0.0	33.3	20.9	0.0	19.5	19.7	0.0	0.0
LnGrp LOS	C	A	A	A	A	C	C	A	B	B	A	A
Approach Vol, veh/h		537			1104			88			18	
Approach Delay, s/veh		5.9			32.9			20.8			19.7	
Approach LOS		A			C			C			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.0		14.3		38.0		14.3				
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0				
Max Green Setting (Gmax), s		32.0		15.0		32.0		15.0				
Max Q Clear Time (g_c+I1), s		32.8		2.5		34.0		4.7				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.1				

Intersection Summary												
HCM 6th Ctrl Delay			23.9									
HCM 6th LOS			C									

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	23	308	710	32	161	315
Future Volume (veh/h)	23	308	710	32	161	315
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.99	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1811	1781	1781	1885	1870
Adj Flow Rate, veh/h	25	335	772	35	175	342
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	6	8	8	1	2
Cap, veh/h	458	394	879	40	213	973
Arrive On Green	0.26	0.26	0.52	0.52	0.52	0.52
Sat Flow, veh/h	1781	1535	1690	77	680	1870
Grp Volume(v), veh/h	25	335	0	807	175	342
Grp Sat Flow(s),veh/h/ln	1781	1535	0	1767	680	1870
Q Serve(g_s), s	0.6	11.2	0.0	21.7	6.3	5.8
Cycle Q Clear(g_c), s	0.6	11.2	0.0	21.7	28.0	5.8
Prop In Lane	1.00	1.00		0.04	1.00	
Lane Grp Cap(c), veh/h	458	394	0	919	213	973
V/C Ratio(X)	0.05	0.85	0.00	0.88	0.82	0.35
Avail Cap(c_a), veh/h	662	570	0	919	213	973
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.1	19.0	0.0	11.4	25.5	7.6
Incr Delay (d2), s/veh	0.0	8.1	0.0	9.7	21.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	4.3	0.0	8.5	3.4	1.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.1	27.1	0.0	21.1	47.3	7.8
LnGrp LOS	B	C	A	C	D	A
Approach Vol, veh/h	360		807			517
Approach Delay, s/veh	26.3		21.1			21.2
Approach LOS	C		C			C

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	35.0	18.8	35.0
Change Period (Y+Rc), s	7.0	5.0	7.0
Max Green Setting (Gmax), s	28.0	20.0	28.0
Max Q Clear Time (g_c+I1), s	23.7	13.2	30.0
Green Ext Time (p_c), s	2.1	0.7	0.0

Intersection Summary	
HCM 6th Ctrl Delay	22.2
HCM 6th LOS	C

APPENDIX G
Benefit Cost Analysis

Safety Benefit - Cost Analysis

General Information

Project Name	HAM-CR 646-0.00/1.04 Ludlow Ave Corridor City of Cincinnati	Contact Email	lkeyser@lawhon-assoc.com
Project Description	Ludlow Avenue between Central Parkway & Whitfield Avenue	Contact Phone	614-481-8600
Reference Number	19-0608 W02	Date Performed	3/2/2020
Analyst	Lori Keyser	Analysis Year	2018
Agency/Company	Lawhon & Associates, Inc.		

Select Site Types to be used in Benefit-Cost Analysis:

All Sites

Comments:
Pavement marking costs split $10K to croswalks & $15k to restriping for Road Diet. Curb extensions & refuge islands added to pavement markings for Road Diet. Site Characteristic Improvements = Remove slip ramps

Countermeasure Service Lives, Costs, and Safety Benefits

Countermeasures	Service Life (Years)	Initial Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value	Net Present Cost of Countermeasure	Total Cost of Countermeasures	Summary of Annual Crash Modifications	Net Present Value of Safety Benefits
Site Characteristic Improvements (i.e. Lane widening)		$78,000.00			$0.00	$78,000.00	0.000	$0
Site Characteristic Improvements (i.e. Lighting)		$0.00			$0.00	$0.00		
Site Characteristic Improvements (i.e. Signal Phasing)		$0.00			$0.00	$0.00		
Site Characteristic Improvements (i.e. Added Right Turn Lane)		$0.00			$0.00	$0.00		
CMF 1 - Convert 4-lane road to 2-lane plus turn lane (Road Diet)	20	$27,300.00			$27,300.00	$27,300.00	-4.830	$2,185,568
CMF 2 - Install rectangular rapid flashing beacon (RRFB)	20	$9,750.00	$1,000.00	$750.00	$28,000.00	$39,075.86	-0.002	$5,092
CMF 3 - Install high-visibility crosswalk	10	$13,000.00			$26,000.00	$32,243.18	-2.919	$1,308,368
CMF 4 - Improve Signal visibility	10	$39,000.00	$1,000.00	$3,000.00	$91,000.00	$121,125.36	-2.649	$1,327,873
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
Totals		**$167,050.00**	**$2,000.00**	**$3,750.00**	**$172,300.00**	**$297,744.39**	**-10.400**	**$4,826,901**

Safety Benefit - Cost Analysis

General Information

Project Name	HAM-CR 646-0.00/1.04 Ludlow Ave Corridor City of Cincinnati	Contact Email	lkeyser@lawhon-assoc.com
Project Description	Ludlow Avenue between Central Parkway & Whitfield Avenue	Contact Phone	614-481-8600
Reference Number	19-0608 W02	Date Performed	3/2/2020
Analyst	Lori Keyser	Analysis Year	2018
Agency/Company	Lawhon & Associates, Inc.		

Benefit - Cost Calculator

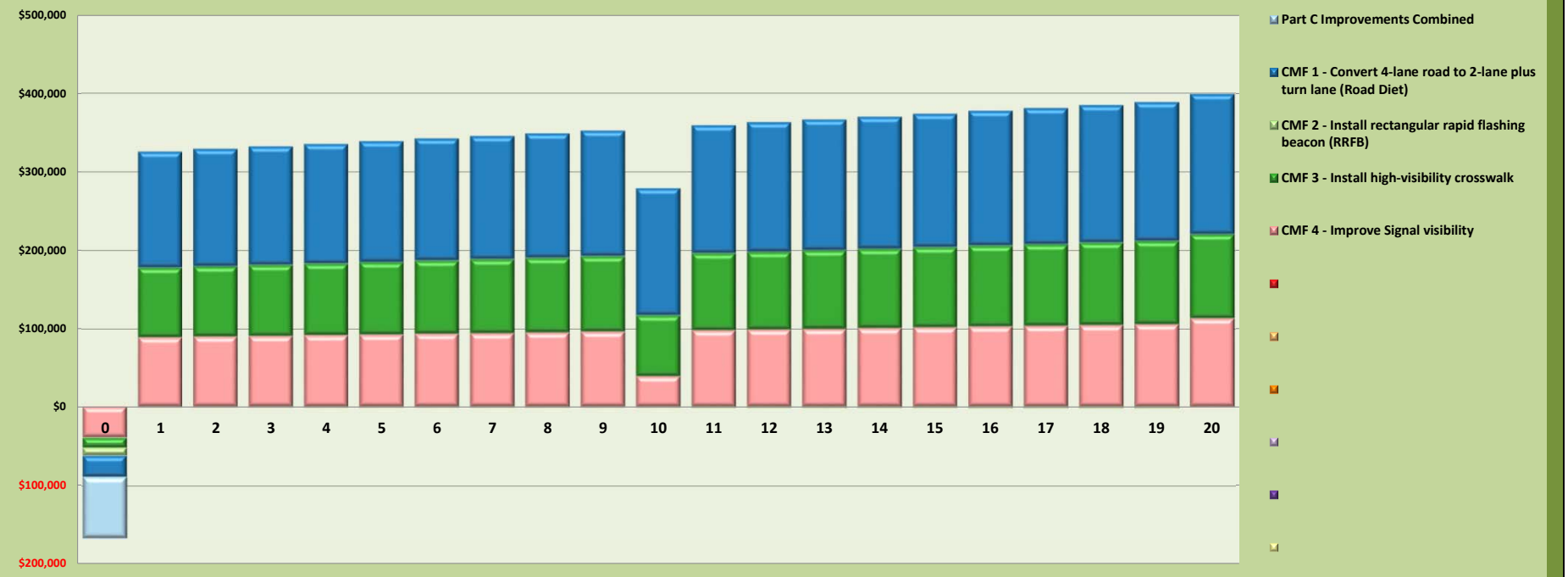
Net Present Value of Project	$172,300.00
Net Present Value of Safety Benefits	$4,826,900.64
Net Benefit	$4,654,600.64
Benefit / Cost Ratio	28.01

Expected Annual Crash Adjustment

Number of Fatal & Incapacitating Injury Crashes	-0.308
Number of Injury Crashes	-3.346
Number of Total Crashes	-10.400

Comments:

Safety Benefits and Project Costs Combined Cash Flows By Countermeasure Per Year

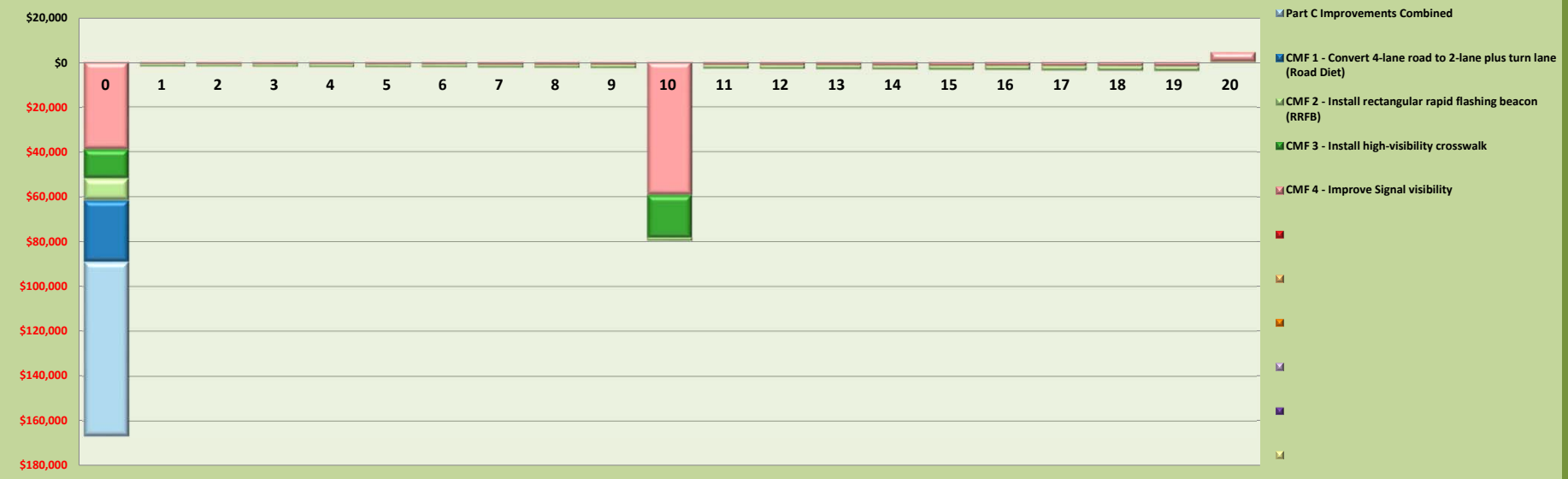


Safety Benefit - Cost Analysis

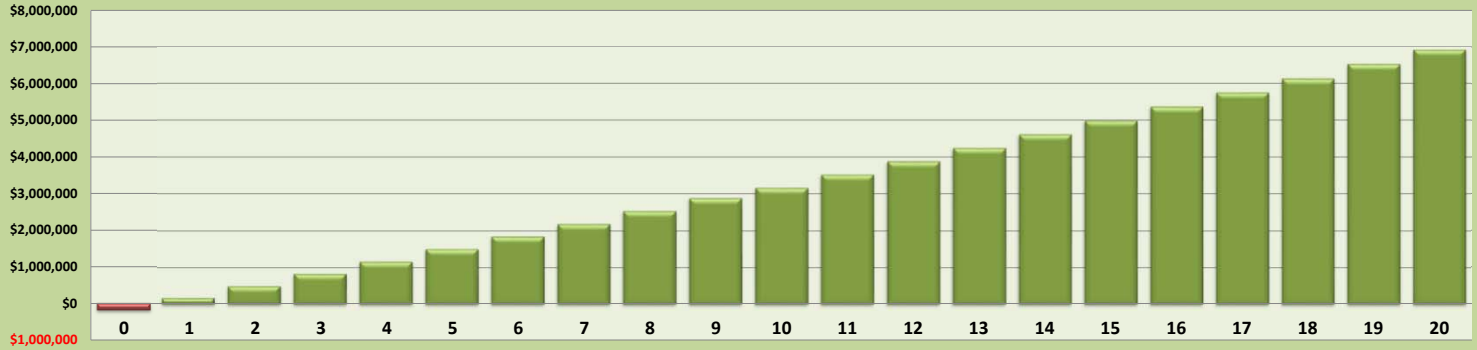
General Information

Project Name	HAM-CR 646-0.00/1.04 Ludlow Ave Corridor City of Cincinnati	Contact Email	lkeyser@lawhon-assoc.com
Project Description	Ludlow Avenue between Central Parkway & Whitfield Avenue	Contact Phone	614-481-8600
Reference Number	19-0608 W02	Date Performed	3/2/2020
Analyst	Lori Keyser	Analysis Year	2018
Agency/Company	Lawhon & Associates, Inc.		

Project Costs Only Cash Flows By Countermeasure Per Year



Return on Investment (Safety Benefits and Project Investments)



First year to observe a positive return on investiment: 2019 (1 years)

Percentage of Service Life to observe a continuous Positive Return on Investment: 100.00%

APPENDIX H
Volume Counts

Study Name	Ludlow Ave. & Central Pkwy.
Project	Mead & Hunt: 19-60-MH Safety Studies Task 3
Project Code	
Legs and Movements	All Processed Legs & Movements
Bin Size	15 minutes
Time Zone	America/New_York
Start Time	2019-11-07 06:00:00
End Time	2019-11-07 19:00:00
Location	Ludlow Ave. & Central Pkwy.
Latitude and Longitude	39.153089,-84.536199
AM Peak	7:30 AM - 8:30 AM (0.967)
PM Peak (Overall Peak Hour)	4:30 PM - 5:30 PM (0.978)

Leg	Ludlow Ave.						Ludlow Ave.						Central Pkwy.						
Direction	Southbound						Northbound						Eastbound						
Start Time	Right	Thru	U-Turn	**App Total**	Peds CW	Peds CCW	Thru	Left	U-Turn	**App Total**	Peds CW	Peds CCW	Right	Left	U-Turn	**App Total**	Peds CW	Peds CCW	**Int Total**
2019-11-07 06:00:00	12	83	0	**95**	0	0	16	5	0	**21**	0	0	1	6	0	**7**	0	0	**123**
2019-11-07 06:15:00	24	121	0	**145**	0	0	21	4	0	**25**	0	0	7	7	0	**14**	0	0	**184**
2019-11-07 06:30:00	39	164	0	**203**	0	0	24	9	0	**33**	0	0	10	8	0	**18**	1	0	**254**
2019-11-07 06:45:00	53	214	0	**267**	0	0	42	5	0	**47**	0	0	4	13	0	**17**	0	0	**331**
2019-11-07 07:00:00	69	188	0	**257**	0	0	20	16	0	**36**	0	0	8	26	0	**34**	0	0	**327**
2019-11-07 07:15:00	95	242	0	**337**	0	0	56	18	1	**75**	0	0	12	34	0	**46**	0	0	**458**
2019-11-07 07:30:00	99	298	0	**397**	0	0	72	23	0	**95**	0	0	19	30	0	**49**	0	0	**541**
2019-11-07 07:45:00	130	265	0	**395**	0	0	71	21	0	**92**	1	0	22	28	0	**50**	0	0	**537**
2019-11-07 08:00:00	114	289	0	**403**	0	0	74	18	0	**92**	0	0	19	24	0	**43**	0	0	**538**
2019-11-07 08:15:00	106	240	0	**346**	0	0	69	24	0	**93**	0	0	17	20	0	**37**	0	0	**476**
2019-11-07 08:30:00	74	213	0	**287**	0	0	69	27	0	**96**	0	0	32	34	0	**66**	0	0	**449**
2019-11-07 08:45:00	92	245	0	**337**	0	0	70	25	0	**95**	0	0	27	24	0	**51**	0	0	**483**
2019-11-07 09:00:00	72	203	0	**275**	0	0	75	43	0	**118**	0	0	38	20	0	**58**	0	0	**451**
2019-11-07 09:15:00	66	166	0	**232**	0	0	68	19	0	**87**	0	0	14	28	0	**42**	0	0	**361**
2019-11-07 09:30:00	51	150	0	**201**	0	0	66	29	0	**95**	0	0	30	23	0	**53**	0	0	**349**
2019-11-07 09:45:00	36	161	0	**197**	0	0	87	29	0	**116**	0	0	38	34	0	**72**	0	0	**385**
2019-11-07 15:00:00	35	86	0	**121**	0	0	154	30	0	**184**	0	0	24	44	0	**68**	0	0	**373**
2019-11-07 15:15:00	44	88	0	**132**	0	0	165	21	0	**186**	0	0	21	49	0	**70**	0	0	**388**
2019-11-07 15:30:00	56	98	0	**154**	0	0	207	32	0	**239**	0	0	24	64	0	**88**	0	0	**481**
2019-11-07 15:45:00	41	81	0	**122**	0	0	249	39	0	**288**	0	0	14	73	0	**87**	0	0	**497**
2019-11-07 16:00:00	48	90	0	**138**	0	0	232	28	0	**260**	0	0	14	88	0	**102**	0	0	**500**
2019-11-07 16:15:00	47	70	0	**117**	0	0	234	35	0	**269**	0	0	24	98	0	**122**	0	0	**508**
2019-11-07 16:30:00	44	99	0	**143**	0	0	235	34	0	**269**	0	0	20	94	0	**114**	0	0	**526**
2019-11-07 16:45:00	39	92	0	**131**	0	0	260	24	0	**284**	0	0	18	95	0	**113**	0	0	**528**
2019-11-07 17:00:00	39	120	0	**159**	0	0	235	32	0	**267**	0	0	18	94	0	**112**	0	1	**538**
2019-11-07 17:15:00	56	101	0	**157**	0	0	239	26	0	**265**	0	1	27	98	0	**125**	0	0	**547**
2019-11-07 17:30:00	33	116	0	**149**	0	0	199	26	0	**225**	0	0	16	61	0	**77**	0	0	**451**
2019-11-07 17:45:00	58	115	0	**173**	0	0	159	31	1	**191**	0	0	28	75	0	**103**	0	0	**467**
2019-11-07 18:00:00	29	87	0	**116**	0	0	132	25	0	**157**	0	0	18	45	0	**63**	0	0	**336**
2019-11-07 18:15:00	36	92	0	**128**	0	0	125	20	0	**145**	0	0	10	54	0	**64**	0	0	**337**
2019-11-07 18:30:00	32	92	0	**124**	0	0	115	19	0	**134**	0	0	7	30	0	**37**	0	0	**295**
2019-11-07 18:45:00	33	75	0	**108**	0	0	101	19	0	**120**	0	0	13	35	0	**48**	0	0	**276**
Grand Total	1802	4744	0	**6546**	0	0	3941	756	2	**4699**	1	1	594	1456	0	**2050**	1	1	**13295**
% Approach	27.5%	72.5%	0.0%				83.9%	16.1%	0.0%				29.0%	71.0%	0.0%				
% Total	13.6%	35.7%	0.0%	**49.2%**			29.6%	5.7%	0.0%	**35.3%**			4.5%	11.0%	0.0%	**15.4%**			
Lights	1784	4623	0	**6407**			3831	743	2	**4576**			580	1432	0	**2012**			**12995**
% Lights	99.0%	97.4%	0.0%	**97.9%**			97.2%	98.3%	100.0%	**97.4%**			97.6%	98.4%	0.0%	**98.1%**			**97.7%**
Articulated Trucks	0	0	0	**0**			2	0	0	**2**			1	1	0	**2**			**4**
% Articulated Trucks	0.0%	0.0%	0.0%	**0.0%**			0.1%	0.0%	0.0%	**0.0%**			0.2%	0.1%	0.0%	**0.1%**			**0.0%**
Buses and Single-Unit Trucks	18	121	0	**139**			108	13	0	**121**			13	23	0	**36**			**296**
% Buses and Single-Unit Trucks	1.0%	2.6%	0.0%	**2.1%**			2.7%	1.7%	0.0%	**2.6%**			2.2%	1.6%	0.0%	**1.8%**			**2.2%**
Pedestrians					0	0					1	1					1	1	
% Pedestrians					0.0%	0.0%					100.0%	100.0%					100.0%	100.0%	

Study Name	Ludlow Ave. & Rue De La Paix
Project	Mead & Hunt: 19-60-MH Safety Studies Task 3
Project Code	
Legs and Movements	All Processed Legs & Movements
Bin Size	15 minutes
Time Zone	America/New_York
Start Time	2019-11-07 06:00:00
End Time	2019-11-07 19:00:00
Location	Ludlow Ave. & Rue De La Paix
Latitude and Longitude	39.152519,-84.535281
AM Peak	7:30 AM - 8:30 AM (0.962)
PM Peak (Overall Peak Hour)	4:30 PM - 5:30 PM (0.990)

Leg	Ludlow Ave.							Rue De La Paix							Ludlow Ave.							Rue De La Paix							
Direction	Southbound							Westbound							Northbound							Eastbound							
Start Time	Right	Thru	Left	U-Turn	**App Total**	Peds CW	Peds CCW	Right	Thru	Left	U-Turn	**App Total**	Peds CW	Peds CCW	Right	Thru	Left	U-Turn	**App Total**	Peds CW	Peds CCW	Right	Thru	Left	U-Turn	**App Total**	Peds CW	Peds CCW	**Int Total**
2019-11-07 06:00:00	1	86	0	0	**87**	0	0	1	0	0	0	**1**	0	0	0	17	0	0	**17**	0	0	0	0	1	0	**1**	0	0	**106**
2019-11-07 06:15:00	2	117	1	0	**120**	0	0	0	0	0	0	**0**	0	0	0	24	0	0	**24**	0	0	0	0	0	0	**0**	0	0	**144**
2019-11-07 06:30:00	3	178	0	0	**181**	0	0	1	0	0	0	**1**	0	0	2	34	2	0	**38**	0	0	0	0	0	0	**0**	1	0	**220**
2019-11-07 06:45:00	8	211	1	0	**220**	0	0	2	0	1	0	**3**	0	0	0	44	1	0	**45**	0	0	0	0	1	0	**1**	0	0	**269**
2019-11-07 07:00:00	5	185	2	0	**192**	0	0	0	0	3	0	**3**	0	0	1	33	1	0	**35**	0	0	0	0	2	0	**2**	0	0	**232**
2019-11-07 07:15:00	11	246	1	0	**258**	0	0	3	0	2	0	**5**	0	0	0	69	1	0	**70**	1	0	0	0	1	0	**1**	0	0	**334**
2019-11-07 07:30:00	23	288	0	0	**311**	0	0	0	0	1	0	**1**	1	0	0	91	1	0	**92**	4	0	0	0	3	0	**3**	0	0	**407**
2019-11-07 07:45:00	24	268	3	0	**295**	0	0	4	0	3	0	**7**	0	0	1	81	6	0	**88**	4	0	0	0	6	0	**6**	1	0	**396**
2019-11-07 08:00:00	33	268	6	0	**307**	1	0	3	0	3	0	**6**	0	0	0	85	5	0	**90**	4	0	1	0	4	0	**5**	0	0	**408**
2019-11-07 08:15:00	26	227	3	0	**256**	0	0	2	0	3	0	**5**	1	0	0	91	4	0	**95**	4	0	1	0	2	0	**3**	1	0	**359**
2019-11-07 08:30:00	29	217	5	0	**251**	0	1	1	0	2	0	**3**	1	0	2	84	7	0	**93**	5	0	1	0	10	0	**11**	0	0	**358**
2019-11-07 08:45:00	43	228	7	0	**278**	0	0	3	0	2	0	**5**	0	1	3	90	3	0	**96**	10	1	0	0	3	0	**3**	1	0	**382**
2019-11-07 09:00:00	28	199	8	0	**235**	0	0	4	0	4	0	**8**	0	0	4	103	4	1	**112**	7	0	6	0	9	0	**15**	0	0	**370**
2019-11-07 09:15:00	23	138	7	0	**168**	0	0	6	0	0	0	**6**	0	0	3	78	2	0	**83**	5	0	4	0	3	0	**7**	2	1	**264**
2019-11-07 09:30:00	40	144	5	0	**189**	0	0	7	0	1	0	**8**	0	0	2	79	5	1	**87**	2	0	1	0	9	0	**10**	0	0	**294**
2019-11-07 09:45:00	52	119	7	0	**178**	0	0	5	0	5	0	**10**	0	0	6	94	9	0	**109**	5	1	4	0	16	0	**20**	0	0	**317**
2019-11-07 15:00:00	2	105	5	0	**112**	0	0	10	0	2	0	**12**	1	0	4	167	1	0	**172**	2	2	2	0	13	0	**15**	0	0	**311**
2019-11-07 15:15:00	9	99	3	0	**111**	0	0	7	0	1	0	**8**	0	3	1	163	5	0	**169**	4	1	2	0	15	0	**17**	1	0	**305**
2019-11-07 15:30:00	16	99	8	0	**123**	0	0	2	1	3	0	**6**	0	0	2	207	3	0	**212**	1	1	3	0	34	0	**37**	0	0	**378**
2019-11-07 15:45:00	6	89	4	0	**99**	0	0	3	0	3	0	**6**	0	1	1	254	2	0	**257**	2	6	4	0	32	0	**36**	0	0	**398**
2019-11-07 16:00:00	7	85	3	0	**95**	0	0	2	0	4	0	**6**	0	0	3	233	2	0	**238**	1	0	5	0	19	0	**24**	0	0	**363**
2019-11-07 16:15:00	10	74	11	0	**95**	0	0	8	0	3	0	**11**	0	0	2	232	5	0	**239**	2	3	4	0	26	0	**30**	0	0	**375**
2019-11-07 16:30:00	6	115	3	0	**124**	0	0	1	0	3	0	**4**	0	2	4	253	0	0	**257**	2	0	1	0	16	0	**17**	0	0	**402**
2019-11-07 16:45:00	6	102	2	0	**110**	0	0	1	0	3	0	**4**	0	0	5	257	2	0	**264**	2	0	0	0	24	0	**24**	0	0	**402**
2019-11-07 17:00:00	12	117	6	0	**135**	0	0	4	0	1	0	**5**	1	1	2	240	1	0	**243**	4	2	4	0	19	0	**23**	0	2	**406**
2019-11-07 17:15:00	10	115	0	0	**125**	0	0	2	0	1	0	**3**	0	1	4	237	11	0	**252**	0	4	2	0	15	0	**17**	0	0	**397**
2019-11-07 17:30:00	27	106	2	0	**135**	0	0	2	0	3	0	**5**	0	0	5	204	8	0	**217**	0	0	5	0	24	0	**29**	0	0	**386**
2019-11-07 17:45:00	29	114	3	0	**146**	0	0	6	0	2	0	**8**	0	1	5	175	4	0	**184**	3	2	5	0	11	0	**16**	0	0	**354**
2019-11-07 18:00:00	7	85	1	0	**93**	0	0	4	0	1	0	**5**	0	0	4	146	0	0	**150**	0	0	3	0	10	0	**13**	0	0	**261**
2019-11-07 18:15:00	10	90	3	0	**103**	0	0	3	0	3	0	**6**	1	0	2	127	2	0	**131**	0	2	0	0	7	0	**7**	0	0	**247**
2019-11-07 18:30:00	3	89	5	0	**97**	0	0	1	0	2	0	**3**	1	0	5	120	2	0	**127**	0	1	1	0	10	0	**11**	0	0	**238**
2019-11-07 18:45:00	1	83	2	0	**86**	0	0	4	0	2	0	**6**	0	1	5	116	1	0	**122**	0	2	0	0	8	0	**8**	0	0	**222**
Grand Total	512	4686	117	0	**5315**	1	1	102	1	67	0	**170**	7	11	78	4228	100	2	**4408**	74	28	59	0	353	0	**412**	7	3	**10305**
% Approach	9.6%	88.2%	2.2%	0.0%				60.0%	0.6%	39.4%	0.0%				1.8%	95.9%	2.3%	0.0%				14.3%	0.0%	85.7%	0.0%				
% Total	5.0%	45.5%	1.1%	0.0%	**51.6%**			1.0%	0.0%	0.7%	0.0%	**1.6%**			0.8%	41.0%	1.0%	0.0%	**42.8%**			0.6%	0.0%	3.4%	0.0%	**4.0%**			
Lights	512	4554	116	0	**5182**			101	1	67	0	**169**			77	4098	100	2	**4277**			59	0	353	0	**412**			**10040**
% Lights	100.0%	97.2%	99.1%	0.0%	**97.5%**			99.0%	100.0%	100.0%	0.0%	**99.4%**			98.7%	96.9%	100.0%	100.0%	**97.0%**			100.0%	0.0%	100.0%	0.0%	**100.0%**			**97.4%**
Articulated Trucks	0	1	0	0	**1**			0	0	0	0	**0**			0	1	0	0	**1**			0	0	0	0	**0**			**2**
% Articulated Trucks	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%**
Buses and Single-Unit Trucks	0	131	1	0	**132**			1	0	0	0	**1**			1	129	0	0	**130**			0	0	0	0	**0**			**263**
% Buses and Single-Unit Trucks	0.0%	2.8%	0.9%	0.0%	**2.5%**			1.0%	0.0%	0.0%	0.0%	**0.6%**			1.3%	3.1%	0.0%	0.0%	**2.9%**			0.0%	0.0%	0.0%	0.0%	**0.0%**			**2.6%**
Pedestrians						1	1						7	11						74	28						7	3	
% Pedestrians						100.0%	100.0%						100.0%	100.0%						100.0%	100.0%						100.0%	100.0%	

Study Name	Ludlow Ave. & Lafayette Ave.
Project	Mead & Hunt: 19-60-MH Safety Studies Task 3
Project Code	
Legs and Movements	All Processed Legs & Movements
Bin Size	15 minutes
Time Zone	America/New_York
Start Time	2019-11-07 06:00:00
End Time	2019-11-07 19:00:00
Location	Ludlow Ave. & Lafayette Ave.
Latitude and Longitude	39.15044,-84.533829
AM Peak	7:15 AM - 8:15 AM (0.905)
PM Peak (Overall Peak Hour)	4:30 PM - 5:30 PM (0.966)

Leg	Ludlow Ave.						Lafayette Ave.						Ludlow Ave.						
Direction	Southbound						Westbound						Northbound						
Start Time	Thru	Left	U-Turn	**App Total**	Peds CW	Peds CCW	Right	Left	U-Turn	**App Total**	Peds CW	Peds CCW	Right	Thru	U-Turn	**App Total**	Peds CW	Peds CCW	**Int Total**
2019-11-07 06:00:00	69	12	0	**81**	0	0	4	1	0	**5**	0	0	0	13	0	**13**	0	0	**99**
2019-11-07 06:15:00	105	21	0	**126**	0	0	6	2	0	**8**	0	0	1	20	0	**21**	0	0	**155**
2019-11-07 06:30:00	143	33	0	**176**	0	1	20	2	0	**22**	0	0	4	22	0	**26**	0	0	**224**
2019-11-07 06:45:00	165	49	0	**214**	0	2	17	3	0	**20**	0	0	3	24	0	**27**	0	0	**261**
2019-11-07 07:00:00	143	43	0	**186**	0	1	19	5	0	**24**	0	0	7	21	0	**28**	0	0	**238**
2019-11-07 07:15:00	192	53	0	**245**	0	1	29	4	0	**33**	0	1	8	45	0	**53**	0	0	**331**
2019-11-07 07:30:00	234	61	0	**295**	0	3	33	6	0	**39**	0	1	9	59	0	**68**	0	0	**402**
2019-11-07 07:45:00	198	54	0	**252**	1	1	27	1	0	**28**	1	6	4	61	0	**65**	0	0	**345**
2019-11-07 08:00:00	213	61	0	**274**	0	5	31	5	0	**36**	0	3	6	61	0	**67**	0	0	**377**
2019-11-07 08:15:00	182	42	0	**224**	0	3	29	5	0	**34**	0	1	5	58	0	**63**	0	0	**321**
2019-11-07 08:30:00	164	44	0	**208**	1	6	29	5	0	**34**	1	3	2	74	0	**76**	0	0	**318**
2019-11-07 08:45:00	172	51	0	**223**	0	8	32	3	0	**35**	0	14	5	62	0	**67**	0	0	**325**
2019-11-07 09:00:00	131	70	0	**201**	1	1	48	4	0	**52**	0	0	4	57	0	**61**	0	0	**314**
2019-11-07 09:15:00	122	22	0	**144**	0	3	31	4	0	**35**	0	2	2	52	0	**54**	0	0	**233**
2019-11-07 09:30:00	96	32	0	**128**	1	2	23	1	0	**24**	1	2	5	66	0	**71**	0	0	**223**
2019-11-07 09:45:00	97	35	0	**132**	3	2	30	3	0	**33**	3	0	2	72	0	**74**	0	0	**239**
2019-11-07 15:00:00	77	36	0	**113**	3	1	49	3	0	**52**	2	2	11	109	0	**120**	0	0	**285**
2019-11-07 15:15:00	68	46	0	**114**	1	1	42	6	0	**48**	4	2	5	125	0	**130**	0	0	**292**
2019-11-07 15:30:00	70	36	0	**106**	3	0	55	3	0	**58**	2	0	7	158	0	**165**	0	0	**329**
2019-11-07 15:45:00	67	39	0	**106**	2	1	82	7	0	**89**	2	1	5	161	0	**166**	0	0	**361**
2019-11-07 16:00:00	76	29	0	**105**	0	2	64	6	0	**70**	1	1	22	176	0	**198**	0	0	**373**
2019-11-07 16:15:00	58	28	0	**86**	0	1	82	9	0	**91**	0	2	17	151	0	**168**	0	0	**345**
2019-11-07 16:30:00	90	40	0	**130**	2	1	92	8	0	**100**	1	1	8	163	0	**171**	0	1	**401**
2019-11-07 16:45:00	75	29	1	**105**	1	2	67	3	0	**70**	1	1	5	200	0	**205**	0	0	**380**
2019-11-07 17:00:00	75	43	0	**118**	2	0	77	11	0	**88**	3	0	7	164	0	**171**	0	0	**377**
2019-11-07 17:15:00	75	49	0	**124**	0	2	72	1	0	**73**	0	1	12	183	0	**195**	0	0	**392**
2019-11-07 17:30:00	79	27	0	**106**	0	2	71	4	0	**75**	1	3	7	142	0	**149**	0	0	**330**
2019-11-07 17:45:00	72	38	0	**110**	0	2	50	7	0	**57**	0	0	7	131	0	**138**	0	0	**305**
2019-11-07 18:00:00	76	31	0	**107**	2	3	39	5	0	**44**	3	3	4	113	0	**117**	0	0	**268**
2019-11-07 18:15:00	62	29	0	**91**	1	0	37	9	0	**46**	0	0	6	99	0	**105**	0	0	**242**
2019-11-07 18:30:00	78	20	0	**98**	0	0	34	6	0	**40**	1	0	5	92	0	**97**	0	0	**235**
2019-11-07 18:45:00	65	25	1	**91**	7	0	26	3	0	**29**	8	1	5	90	0	**95**	0	0	**215**
Grand Total	3589	1228	2	**4819**	31	57	1347	145	0	**1492**	35	51	200	3024	0	**3224**	0	1	**9535**
% Approach	74.5%	25.5%	0.0%				90.3%	9.7%	0.0%				6.2%	93.8%	0.0%				
% Total	37.6%	12.9%	0.0%	**50.5%**			14.1%	1.5%	0.0%	**15.6%**			2.1%	31.7%	0.0%	**33.8%**			
Lights	3486	1195	2	**4683**			1327	139	0	**1466**			186	2922	0	**3108**			**9257**
% Lights	97.1%	97.3%	100.0%	**97.2%**			98.5%	95.9%	0.0%	**98.3%**			93.0%	96.6%	0.0%	**96.4%**			**97.1%**
Articulated Trucks	1	1	0	**2**			0	0	0	**0**			0	1	0	**1**			**3**
% Articulated Trucks	0.0%	0.1%	0.0%	**0.0%**			0.0%	0.0%	0.0%	**0.0%**			0.0%	0.0%	0.0%	**0.0%**			**0.0%**
Buses and Single-Unit Trucks	102	32	0	**134**			20	6	0	**26**			14	101	0	**115**			**275**
% Buses and Single-Unit Trucks	2.8%	2.6%	0.0%	**2.8%**			1.5%	4.1%	0.0%	**1.7%**			7.0%	3.3%	0.0%	**3.6%**			**2.9%**
Pedestrians					31	57					35	51					0	1	
% Pedestrians					100.0%	100.0%					100.0%	100.0%					0.0%	100.0%	