



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

Croft Road Corridor Study
Analysis & Recommendations Report

Appendix 4: D: ODOT Turn Lane Calculations



Road Name: Croft Road
 Road Name # 1: Old Columbus Road
 Road Name # 2: Croft Road
 PID # NA
 DLZ Project # 1321-1005-02
 Prepared By: DGL
 Date: 6/4/2014
 Checked By:
 Date:

Input Cells
Length from Figure 401-10E
Total Calculated Length
Condition
Turn Lane Length to Use

Intersection Name: Croft & Old Columbus

Approach Street: Croft - Southbound

Free Flow Approach (Y or N): N

Design Speed MPH: 40

Turn Volume: 90

Total Approach Volume (Includes Turns): 268

Turn %: 34

Figure 401-9E (L&D Vol. 1)

Design Speed	30-35			40-45			50-60		
	High	Low*	High	High	Low*	High	Low*	High	Low*
Turn Demand Volume	FALSE	FALSE	A	A	A	FALSE	FALSE	FALSE	FALSE
Unsignalized Stopped Crossroad	FALSE	FALSE	C	C	B	FALSE	FALSE	FALSE	FALSE
Unsignalized Through Road	FALSE	FALSE				FALSE	FALSE	FALSE	FALSE

* Low is considered 10% or less of approach traffic volume

** Whichever is greater

Road Name: Croft Road
 Road Name # 1: Croft Road
 Road Name # 2: Robert Eastman
 PID # NA
 DLZ Project # 1321-1005-02
 Prepared By: DGL
 Date: 6/2/2014
 Checked By:
 Date:



Input Cells
Length from Figure 401-10E
Total Calculated Length
Condition
Turn Lane Length to Use

Intersection Name: Croft & Robert Eastman

Approach Street: Croft - Southbound

Free Flow Approach (Y or N): Y

Design Speed MPH: 40

Turn Volume: 134

Total Approach Volume (Includes Turns): 390

Turn %: 34

Figure 401-9E (L&D Vol. 1)							
Design Speed	30-35			40-45		50-60	
	High	Low*	High	Low*	High	Low*	
Turn Demand Volume	FALSE	FALSE	A	A	FALSE	FALSE	
Unsignalized Stopped Crossroad	FALSE	FALSE	C	B	FALSE	FALSE	
Unsignalized Through Road	FALSE	FALSE			FALSE	FALSE	

* Low is considered 10% or less of approach traffic volume

** Whichever is greater

Condition A Storage Only	
Length = 50' (diverging taper) + Storage Length (Figure 401-10E)	
Unsignalized Through Road	Stopped Crossroad
Required Length from Figure 401-10E	Required Length from Figure 401-10E
Total Length	Total Length

Condition B High Speed Deceleration	
Design Speed	Length*
40	125
45	175
50	225
55	285
60	345

*(Including 50' Diverging Taper)

Required Length	FALSE
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Condition C Moderate Speed Deceleration & Storage	
Design Speed	Length*
40	111 + Storage Length
45	125 + Storage Length
50	143 + Storage Length
55	164 + Storage Length
60	181 + Storage Length

*(Including 50' Diverging Taper)

Design Speed Length	111
Storage Length (401-10E)	150
Required Length	261

Total Turn Lane Length	261
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TURN LANE CALCULATIONS FOR SIGNALIZED INTERSECTIONS

INTERSECTION: Croft & SR 4

Roadway:	SR 4	
Approach:	Northbound	
Movement:	Left-Turn	
Design Speed:	40	
Volume (veh/hr):	30	
Seconds/Cycle	60	
Cycles/Hour	60	
Avg. Vehicle/Cycle	1	
Condition:	B or C (whichever is greater)	
Condition A	NO	
Diverging Taper Length:	-	
Storage Length (Fig. 1):	-	
Number of Lanes	-	
Total Lane Length =	-	
Condition B	125	
Condition C	YES	
Deceleration Length:	111	
Storage Length (Fig. 1):	50	
Number of Lanes	1	
Total Lane Length =	161	

Traffic Data			
Configuration	Left	Through	Right
# of Lanes	1	2	1
DHV's	30	224	35

Queue Storage Check	
Through Volume (veh/hr)	224
Right Volume (veh/hr)	35
Shared Lane?	Yes
Total Volume =	259
Avg. Vehicle/Cycle	5
Lane Storage (Fig. 1)	200
Storage/Lane	100
Total Lane Length =	161

VERIFY VALUES WITH THIS CHART			
Storage Length (Fig. 1) - Chart 401-10E (10/04)			
Avg. Vehicle/Cycle	Required Length (ft)	Avg. Vehicle/Cycle	Required Length (ft)
1	50	17	600
2	100	18	625
3	150	19	650
4	175	20	675
5	200	21	725
6	250	22	750
7	275	23	775
8	325	24	800
9	350	25	825
10	375	30	975
11	400	35	1125
12	450	40	1250
13	475	45	1400
14	500	50	1550
15	525	55	1700
16	550	60	1850

All charts and figures related to these calculations can be found in the L&D Volume 1, Section 400 Intersection Design

TURN LANE CALCULATIONS FOR SIGNALIZED INTERSECTIONS

INTERSECTION: Croft & SR 4

Roadway:	SR 4	
Approach:	Southbound	
Movement:	Left-Turn	
Design Speed:	45	
Volume (veh/hr):	210	
Seconds/Cycle	60	
Cycles/Hour	60	
Avg. Vehicle/Cycle	4	
Condition:	B or C (whichever is greater)	
Condition A	NO	
Diverging Taper Length:	-	
Storage Length (Fig. 1):	-	
Number of Lanes	-	
Total Lane Length =	-	
Condition B	175	
Condition C	YES	
Deceleration Length:	125	
Storage Length (Fig. 1):	175	
Number of Lanes	1	
Total Lane Length =	300	

Traffic Data			
Configuration	Left	Through	Right
# of Lanes	1	2	1
DHV's	210	238	49

Queue Storage Check	
Through Volume (veh/hr)	238
Right Volume (veh/hr)	49
Shared Lane?	Yes
Total Volume =	287
Avg. Vehicle/Cycle	5
Lane Storage (Fig. 1)	200
Storage/Lane	100
Total Lane Length =	300

VERIFY VALUES WITH THIS CHART

Storage Length (Fig. 1) - Chart 401-10E (10/04)			
Avg. Vehicle/Cycle	Required Length (ft)	Avg. Vehicle/Cycle	Required Length (ft)
1	50	17	600
2	100	18	625
3	150	19	650
4	175	20	675
5	200	21	725
6	250	22	750
7	275	23	775
8	325	24	800
9	350	25	825
10	375	30	975
11	400	35	1125
12	450	40	1250
13	475	45	1400
14	500	50	1550
15	525	55	1700
16	550	60	1850

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TURN LANE CALCULATIONS FOR SIGNALIZED INTERSECTIONS

INTERSECTION: Croft & SR 4

Roadway:	Home Road	
Approach:	Eastbound	
Movement:	Left-Turn	
Design Speed:	40	
Volume (veh/hr):	62	
Seconds/Cycle	60	
Cycles/Hour	60	
Avg. Vehicle/Cycle	2	
Condition:	B or C (whichever is greater)	
Condition A	NO	
Diverging Taper Length:	-	
Storage Length (Fig. 1):	-	
Number of Lanes	-	
Total Lane Length =	-	
Condition B	125	
Condition C	YES	
Deceleration Length:	111	
Storage Length (Fig. 1):	100	
Number of Lanes	1	
Total Lane Length =	211	

Traffic Data			
Configuration	Left	Through	Right
# of Lanes	1	1	1
DHV's	62	184	25

Queue Storage Check	
Through Volume (veh/hr)	184
Right Volume (veh/hr)	25
Shared Lane?	Yes
Total Volume =	209
Avg. Vehicle/Cycle	4
Lane Storage (Fig. 1)	175
Storage/Lane	175
Total Lane Length =	211

VERIFY VALUES WITH THIS CHART

Storage Length (Fig. 1) - Chart 401-10E (10/04)			
Avg. Vehicle/Cycle	Required Length (ft)	Avg. Vehicle/Cycle	Required Length (ft)
1	50	17	600
2	100	18	625
3	150	19	650
4	175	20	675
5	200	21	725
6	250	22	750
7	275	23	775
8	325	24	800
9	350	25	825
10	375	30	975
11	400	35	1125
12	450	40	1250
13	475	45	1400
14	500	50	1550
15	525	55	1700
16	550	60	1850

All charts and figures related to these calculations can be found in the L&D Volume 1, Section 400 Intersection Design

TURN LANE CALCULATIONS FOR SIGNALIZED INTERSECTIONS

INTERSECTION: Croft & SR 4

Roadway:	Croft	
Approach:	Westbound	
Movement:	Left-Turn	
Design Speed:	55	
Volume (veh/hr):	30	
Seconds/Cycle	60	
Cycles/Hour	60	
Avg. Vehicle/Cycle	1	
Condition:	B or C (whichever is greater)	
Condition A	NO	
Diverging Taper Length:	-	
Storage Length (Fig. 1):	-	
Number of Lanes	-	
Total Lane Length =	-	
Condition B	285	
Condition C	YES	
Deceleration Length:	164	
Storage Length (Fig. 1):	50	
Number of Lanes	1	
Total Lane Length =	214	

Traffic Data			
Configuration	Left	Through	Right
# of Lanes	1	1	1
DHV's	30	203	320

Queue Storage Check		
Through Volume (veh/hr)	203	
Right Volume (veh/hr)	320	
Shared Lane?	Yes	
Total Volume =	523	
Avg. Vehicle/Cycle	9	
Lane Storage (Fig. 1)	350	
Storage/Lane	350	
Total Lane Length =	350	

VERIFY VALUES WITH THIS CHART			
Storage Length (Fig. 1) - Chart 401-10E (10/04)			
Avg. Vehicle/Cycle	Required Length (ft)	Avg. Vehicle/Cycle	Required Length (ft)
1	50	17	600
2	100	18	625
3	150	19	650
4	175	20	675
5	200	21	725
6	250	22	750
7	275	23	775
8	325	24	800
9	350	25	825
10	375	30	975
11	400	35	1125
12	450	40	1250
13	475	45	1400
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15	525	55	1700
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