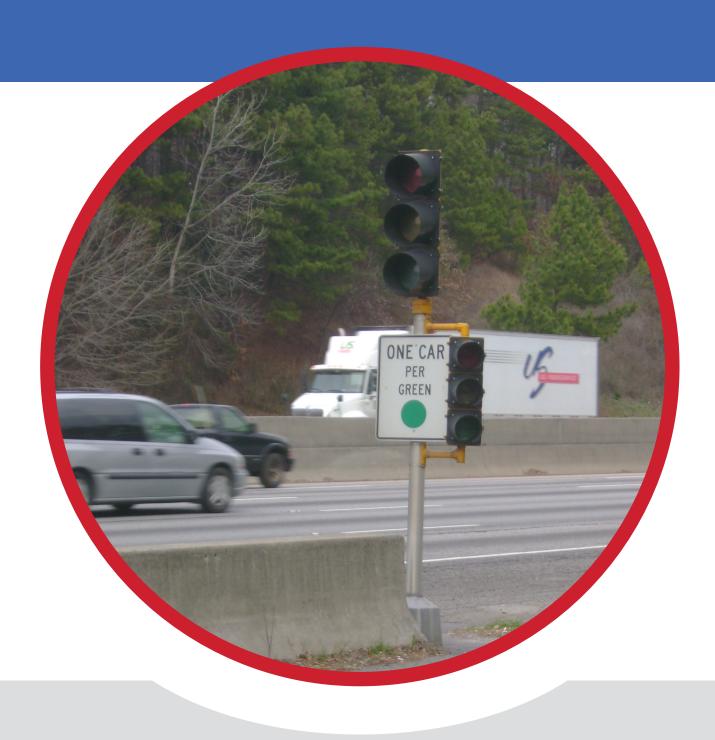
Individual Site Cost Estimates



M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell and Mecklenburg Counties

Notice

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This document has 206 pages including the cover.

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Table of Contents

Cha	apter	Pages
1	Introduction	4
2	Assumptions	5
3	Site Cost Estimates	7
3.1	Proposed One Lane Ramp Locations	8
	3.1.1 Gaston County	8
	3.1.2 Iredell County	32
	3.1.3 Mecklenburg County	48
3.2	Proposed Two Lane Ramp Locations	191
	3.2.1 Mecklenburg County	191
3.3	Proposed Two Lane Freeway to Freeway Ramp Locations	199
	3.3.1 Mecklenburg County	199

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

1 Introduction

This report addresses the estimated costs for each of the fifty-one recommended sites moving forward. The fifty-one sites are sites that have been identified as either 'feasible' or 'review in future." There are forty-three sites that are being recommended as a single lane ramp meter locations and eight that are being recommended as a two lane ramp meter locations. The cost estimates for each of the sites includes equipment and pavement markings needed for the installation of ramp metering on both the ramp and the mainline. If a site is recommended to be constructed as a two-lane ramp, then the associated construction costs are included in the estimate.

2 Assumptions

As the cost estimates for each individual site were developed, there were several assumptions made. Below are the general assumptions that were made or considered for each site and the associated category.

Signals -

Signal Heads:

- A minimum of two signal heads per lane with two sections per signal head
- A minimum of two flashers per ramp with two sections per signal head *
 (* Additional flashers may be needed based upon upstream ramp configuration and freeway to freeway (F2F locations)

Supports:

- Default is a two pedestal poles
- F2F sites will utilize mast arm supports
- Three lane sites will utilize mast arm supports

Loops -

- Each mainline lane will have two loops per lane
- Each ramp lane will have a total of five detectors per lane:
 - One loop for queue detection
 - Three loops for passage detection
 - One loop for clearance detection
- The Queue detection loop will be setback 350 feet from the ramp meters

Conduit -

- Conduit will be needed for loops
- Conduit will be needed for power to ramp meter sites (will need separate pullboxes)
- Conduit will be needed for signals and flashers
- Conduit will be needed for fiber optic communications to the CCTV's

Pullboxes -

Standard:

- Install one box every 250 feet for electrical conductors
- Install one box at every sensor location
- Install two boxes at every cabinet
- Install one on each side of each directional drilled crossing

Oversized:

- Install one box at new CCTV fiber locations
- Install one box at each splice location to existing fiber if there is not one
- Install one box on each side of each direction drilled crossing

CCTV -

- Install new CCTV at locations where there is no existing coverage
- Install broadband communications if fiber-optic communications are unavailable

Roadway -

- If guardrail is lengthened or modified in anyway and the current attenuator does not meet current standards, it will be replaced
- If ramp meter equipment is located within the clear zone, guardrail and attenuator shall be installed
- New guardrail is assumed to be 250' in advance of ramp meter equipment and 50' shall be assumed for approach attenuator

Drainage -

 New pipe/Extension of existing pipe is estimated on an as needed basis per site survey/summary

Project Development -

Default Percentages:

The following default percentages were assumed for Traffic Control, Project Contingencies, Design, and Construction Administration.

- Traffic Control = 15%
- Project Contingencies = 10%
- Design = 8%
- Construction Administration = 10%

Two of the biggest contributors that impact site costs are the ramp/loop/mainline geometrics and the existing ITS infrastructure available. Another item that affected site cost was the availability of power at the site locations. The costs will vary depending on these parameters.

3 Site Cost Estimates

Each of the sites were evaluated and cost estimates were prepared looking at the following categories. As stated previously, site costs are impacted by the ramp/loop/mainline geometrics and the existing ITS infrastructure, as well as the availability of power at each of the site locations.

Categories
Earthwork and Structure
Guardrail
Paving
Drainage
Signalization
Communications
Pavement Marking
Signing
SUBTOTAL CONSTRUCTION
Traffic Control
Contingencies
TOTAL CONSTRUCTION
Design
Construction Administration
TOTAL DESIGN AND CONSTRUCTION

3.1 Proposed One Lane Ramp Locations

3.1.1 Gaston County



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

030

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 30 Ramp: Cox Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2027	\$2.88	\$5,837.76	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUI	ВТОТА	L		\$5,837.76	
				*-,	
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUI	ВТОТА	Ĺ		\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUI	\$0.00				
O' and I'm at it and		T			
Signalization	<u> </u>		# 450.00	40.700.07	N.4 . 1.
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 30 Ramp: Cox Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	2950	\$6.90	\$20,355.00	All purposes
- Conduit (Directional Drilled)	LF	1620	\$16.10	\$26,082.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	ЗТОТА	Ĺ		\$103,431.80	
Communications					
Communications	F ^	0	04 450 00	ФО ОО	Link to OMEO
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 30 Ramp: Cox Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions		
Descriptions					Mainline/Splice		
					Enclosures		
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet		
- Fiber-optic Drop Cable	LF	0	\$1.73	\$0.00	Drop cable to		
(six strands)					controller cabinet		
- Tracer Wire	LF	0	\$14.00	\$0.00			
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00			
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00			
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height		
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00			
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00			
	SUBTOTAL						
Pavement Marking							
- Pavement Marking	LF	600	\$0.71	\$427.80	40 MPH design		
Removal					speed. 110' transitions, 100'		
					narrowed lane		
					Tianowed lane		
- Raised Pavement	EA	0	\$5.18	\$0.00			
Markers		200	#4.00	#007.75	4401 (11222)		
- White Edge Line	LF	300	\$1.09	\$327.75	110' transitions, 100' narrowed		
					lane		
					lane		
- Yellow Edge Line	LF	300	\$1.09	\$327.75	110' transitions,		
					100' narrowed		
- White Skip Line	LF	0	\$0.28	\$0.00	lane		
- 24" Stop Bar	LF	16	\$8.05	\$128.80			
•			ψυ.υυ				
SUI	\$1,212.10						

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 30 Ramp: Cox Rd

Categories								
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions			
-								
Signing								
- W3-7, Ramp Meter	EA	2	\$747.50	\$1,495.00	Sign and post			
Ahead					only			
- W3-8, Ramp Metered	EA	2	\$747.50	\$1,495.00	Sign and post			
When Flashing					only			
- R10-6R and R10-6L, Stop	EA	1	\$201.25	\$201.25	Pedestal			
Here on Red					mounted			
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal			
Green					mounted			
SUE	BTOTA	\L		\$3,392.50				
SUBTOTAL CONSTRUCTION	ON			\$131,421.66				
Traffic Control	15%			\$19,713.25				
Contingencies	10%			\$13,142.17				
TOTAL CONSTRUCTION		\$164,277.08						
Design	8%			\$13,142.17				
Construction Administration		\$16,427.71						
TOTAL DESIG	N AND	CONSTRU	CTION	\$193,846.95				



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

032

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 032 **Ramp**: S Main St. (Gaston Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure	•				
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Seeding	SY	1210	\$2.88	\$3,484.80	Seeding around trench, conduit runs, pull box, and foundation areas.
SUE	BTOTA	L		\$3,484.80	
		T	.		
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUE	ЗТОТА	L		\$0.00	
		T			
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	STOTA	L		\$0.00	
	1	Т	Γ	Т	
Signalization			* 4 = 0.00	* 0.700.07	
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	850	\$1.73	\$1,466.25	Assumed setback distance 350'

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 032 **Ramp**: S Main St. (Gaston Co.)

Categories	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Descriptions		Quantity	Unit Cost	Total Cost	Assumptions
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	1725	\$6.90	\$11,902.50	All purposes
- Conduit (Directional Drilled)	LF	340	\$16.10	\$5,474.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1000	\$5.75	\$5,750.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	540	\$3.16	\$1,707.75	
SUB	BTOTA	L		\$70,607.93	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 032 **Ramp**: S Main St. (Gaston Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Broadband Internet	LS	1	\$1,080.00	\$1,080.00	
Service			,	·	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	ТОТА	L		\$15,535.00	
Pavement Marking					
- Pavement Marking Removal	LF	640	\$0.71	\$456.32	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	320	\$1.09	\$349.60	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	320	\$1.09	\$349.60	110' transitions, 100' narrowed lane
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUB	TOTA	Ĺ		\$1,284.32	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25 \$3,392.50	Pedestal mounted
SUB					

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 032 **Ramp**: S Main St. (Gaston Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
SUBTOTAL CONSTRUCTION	\$94,304.55				
Traffic Control	15%			\$14,145.68	
Contingencies	10%			\$9,430.45	
TOTAL CONSTRUCTION				\$117,880.68	
				.	
Design	8%			\$9,430.45	
Construction Administration	10%			\$11,788.07	
TOTAL DESIGN AND CONS	TRUC	TION		\$139,099.20	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

033

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 033 **Ramp**: McAdenville Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					1
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	1694	\$2.88	\$4,878.72	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUI	ЗТОТА	L		\$4,878.72	
	1	ı		I	
Guardrail			•	•	
- Guardrail Rail	LF	300	\$20.00	\$6,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SUI	BTOTA	L		\$7,725.00	
	1	ı		I	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUI	STOTA	L		\$0.00	
	1	T		Γ	
Signalization				A	
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue,
					three passage
					and one
					clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 033 **Ramp**: McAdenville Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback
					distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	2450	\$6.90	\$16,905.00	All purposes
- Conduit (Directional	LF	1120	\$16.10	\$18,032.00	Five ramp
Drilled)					crossings,
					multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	Corragino
- Electrical Conductors	LF	1000	\$5.75	\$5,750.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
 Pedestal Pole (Type III with Foundation) 	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	BTOTA	<u>L</u>		\$89,056.80	
	ı		Γ		T
Communications	_ _		* 450.00	40.00	111111111111111111111111111111111111111
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on
					Mainline/Splice
					Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 033 **Ramp**: McAdenville Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	TOTA	<u>L</u>		\$17,547.50	
	1	I			
Pavement Marking					
- Pavement Marking Removal	LF	500	\$0.71	\$356.50	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	250	\$1.09	\$273.13	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	250	\$1.09	\$273.13	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	TOTA	L		\$1,031.55	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 033 **Ramp**: McAdenville Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUE	TOTA	L		\$3,392.50	
SUBTOTAL CONSTRUCTION	N			\$123,632.07	
Traffic Control	15%			\$18,544.81	
Contingencies	10%			\$12,363.21	
TOTAL CONSTRUCTION				\$154,540.09	
	T =				
Design	8%			\$12,363.21	
Construction Administration	10%			\$15,454.01	_
TOTAL DESIGN AND CONS	_				



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

034

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 034 **Ramp**: McAdenville Rd

Unit	Quantity	Unit Cost	Total Cost	Assumptions
				•
1 0=		* 0= 00	40.00	1
	_		<u>'</u>	
_	_			
SY	1294	\$2.88	\$3,726.72	Seeding
				around trench,
				conduit runs,
				pull box, and
				foundation
				areas.
BTOTAL	Ĺ		\$3,726.72	
LF	500	\$20.00	\$10,000.00	
EA	2	\$1,725.00	\$3,450.00	
BTOTAL	<u> </u>		\$13,450.00	
LF	0	\$60.00	\$0.00	Extend existing
BTOTAL	<u>'</u> L	•	\$0.00	
			·	
EA	6	\$453.68	\$2,722.05	Mainline
			, ,	detection two
				loops per lane
ΕA	5	\$453.68	\$2,268,38	One queue,
		4 100.00	ψ=,=σσισσ	three passage
				and one
				clearance
FA	850	\$1.73	\$1,466.25	Assumed
		Ψιιιο	ψ1,100.20	setback
				distance 350'
	SF CY CY SY BTOTAL	SF	SF	SF 0 \$85.00 \$0.00 CY 0 \$25.00 \$0.00 CY 0 \$22.00 \$0.00 SY 1294 \$2.88 \$3,726.72 LF 500 \$20.00 \$10,000.00 EA 2 \$1,725.00 \$3,450.00 BTOTAL \$13,450.00 BTOTAL \$0.00 \$0.00 BTOTAL \$0.00 \$0.00 BTOTAL \$2,722.05 \$2,722.05

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 034 **Ramp**: McAdenville Rd

Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	1850	\$6.90	\$12,765.00	All purposes
- Conduit (Directional Drilled)	LF	340	\$16.10	\$5,474.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	Conduits
- Electrical Conductors	LF	1250	\$5.75	\$7,187.50	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	540	\$3.16	\$1,707.75	
SUB	TOTAL	•	-	\$72,907.93	
			_		
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 034 **Ramp**: McAdenville Rd

- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	1			
					451 Marratina			
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height			
- CCTV Cabinet (Pole	EA	1	\$3,300.00	\$3,300.00				
Mount, Type 336)								
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00				
SUE	STOTAL		•	\$15,535.00				
	1		1	.	ı			
Pavement Marking			A =	A 1-2 22				
- Pavement Marking	LF	640	\$0.71	\$456.32	40 MPH design			
Removal					speed. 110'			
					transitions, 100'			
Deite I De conset Medico	- A		ΦE 40	# 0.00	narrowed lane			
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	4401 (
- White Edge Line	LF	320	\$1.09	\$349.60	110' transitions,			
					100' narrowed			
- Yellow Edge Line	LF	320	\$1.09	\$349.60	lane 110' transitions,			
- reliow Eage Line	LF	320	φ1.09	φ349.60	100 transitions,			
					lane			
- 24" Stop Bar	LF	16	\$8.05	\$128.80	larie			
	BTOTAL	10	ψ0.00	\$1,284.32				
	,			ψ1,20 110 <u>2</u>				
Signing								
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post			
					only			
- W3-8, Ramp Metered	EA	2	\$747.50	\$1,495.00	Sign and post			
When Flashing					only			
- R10-6R and R10-6L, Stop	EA	1	\$201.25	\$201.25	Pedestal			
Here on Red					mounted			
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal			
Green				40.000.50	mounted			
SUE	SUBTOTAL \$3,392.50							
SUBTOTAL CONSTRUCTIO	ANI			¢440 206 47				
SUBTOTAL CONSTRUCTIO	\$110,296.47	-						
Traffic Control	15%			\$16,544.47				
Contingencies	10%			\$11,029.65				

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 034 **Ramp**: McAdenville Rd

TOTAL CONSTRUCTION	\$137,870.58	
	1	
Design	8%	\$11,029.65
Construction Administration	10%	\$13,787.06
TOTAL DESIGN AND CONS	\$162,687.29	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

035

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 035 **Ramp**: Belmont-Mt. Holly Rd (Gaston Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	1	\$300.00	\$ 300.00	
- Seeding	SY	6294	\$2.88	\$18,126.72	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SU	BTOTA	L		\$18,426.72	
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SU	BTOTA	L		\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SU	BTOTA	L		\$0.00	
Signalization					
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 035 **Ramp**: Belmont-Mt. Holly Rd (Gaston Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
•					and one
					clearance
- Detector Lead-in Cable	EA	850	\$1.73	\$1,466.25	Assumed
					setback
De Ille and (Otal)	^	40	CO 45,00	* 4 4 4 0 0 0 0	distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	<u> </u>
- Conduit (Trenched)	LF	2090	\$6.90	\$14,421.00	All purposes
- Conduit (Directional	LF	730	\$16.10	\$11,753.00	Five ramp
Drilled)					crossings,
					multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	Coridatio
- Electrical Conductors	LF	1630	\$5.75	\$9,372.50	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and	EA	1	\$16,100.00	\$16,100.00	
Cabinet		-	ψ. ο, ι ο ο ι ο ο	Ψ. σ, ι σσισσ	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and	EA	0	\$17,250.00	\$0.00	
Foundation					
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each
					pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter
					advance
- Signal Cable	LF	540	\$3.16	\$1,707.75	signal
	I LE BTOTA		φ3.10		
308	JIOIA	<u> </u>		\$83,027.93	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction
			. ,		Drill on
					Mainline/Splic
					e Enclosures

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 035 **Ramp**: Belmont-Mt. Holly Rd (Gaston Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUB	TOTA	L		\$15,535.00	
Pavement Marking					
- Pavement Marking Removal	LF	640	\$0.71	\$456.32	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	320	\$1.09	\$349.60	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	320	\$1.09	\$349.60	110' transitions, 100' narrowed lane
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	TOTA			\$1,284.32	
Signing					

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 035 **Ramp**: Belmont-Mt. Holly Rd (Gaston Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions		
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only		
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only		
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted		
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted		
SUE	SUBTOTAL \$3,392.50						
SUBTOTAL CONSTRUCTION	. NI			\$404 GGG 47	1		
SUBTUTAL CONSTRUCTIO	'IN			\$121,666.47	_		
Traffic Control	15%			\$18,249.97	-		
Contingencies	10%			\$12,166.65			
TOTAL CONSTRUCTION				\$152,083.08			
				.	_		
Design	8%			\$12,166.65			
Construction Administration	\$15,208.31						
TOTAL DESIGN AND CONS	_						



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

037

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 37 **Ramp**: Beatty Dr / Park St

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2402	\$2.88	\$6,917.76	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SU	BTOTA	Ĺ		\$6,917.76	
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SU	BTOTA	L		\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SU	BTOTA	L		\$0.00	
Signalization					
- 6x6' loops - Mainline	EA	8	\$453.68	\$3,629.40	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 37 **Ramp**: Beatty Dr / Park St

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
•					and one
					clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed
					setback
D. III. (0(1))		4.4	#0.45.00	* 4 000 00	distance 350'
- Pullbox (Std.)	EA	14	\$345.00	\$4,830.00	
- Conduit (Trenched)	LF ·-	3500	\$6.90	\$24,150.00	All purposes
- Conduit (Directional	LF	1620	\$16.10	\$26,082.00	Five ramp
Drilled)					crossings,
					multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	Conduits
- Electrical Conductors	LF	2000	\$5.75	\$11,500.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and	EA	1	\$16,100.00	\$16,100.00	
Cabinet		I	. ,		
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each
l		_	ψοσοίσο	Ψ1,000.00	pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter
					advance
					signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	BTOTA	L		\$111,699.15	
	T				
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction
					Drill on
					Mainline/Splic
					e Enclosures

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 37 **Ramp**: Beatty Dr / Park St

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUB	BTOTA	L		\$17,547.50	
		1			
Pavement Marking			_		
- Pavement Marking Removal	LF	1000	\$0.71	\$713.00	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	500	\$1.09	\$546.25	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	500	\$1.09	\$546.25	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	\$1,934.30				
Signing					

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 37 **Ramp**: Beatty Dr / Park St

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions		
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only		
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only		
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted		
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted		
SUE	\$3,392.50						
SUBTOTAL CONSTRUCTIO	. NI			\$141,491.21			
SUBTUTAL CONSTRUCTIO	-						
Traffic Control	15%			\$21,223.68	7		
Contingencies	10%			\$14,149.12			
TOTAL CONSTRUCTION				\$176,864.01			
Design	8%			\$14,149.12			
Construction Administration	\$17,686.40						
TOTAL DESIGN AND CONS							

3.1.2 Iredell County



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

148

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 148 Ramp: Langtree Rd

Categories	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Descriptions		,			•
Earthwork and Structure		T -			T
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2019	\$2.88	\$5,814.72	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUE	TOTAL			\$5,814.72	
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUE	TOTAL			\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	TOTAL			\$0.00	
Signalization					
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 148 Ramp: Langtree Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
·					and one
			A		clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	
- Conduit (Trenched)	LF	2950	\$6.90	\$20,355.00	All purposes
- Conduit (Directional Drilled)	LF	1620	\$16.10	\$26,082.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	2000	\$5.75	\$11,500.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUB	TOTAL			\$104,709.45	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 148 Ramp: Langtree Rd

Catamarian					
Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Fiber-optic Drop Cable (six	LF	0	\$1.73	\$0.00	Drop cable to
strands)	. –		D4400	Φο οο	controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
	TOTAL		, ,	\$17,547.50	
Pavement Marking					
- Pavement Marking Removal	LF	1000	\$0.71	\$713.00	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	500	\$1.09	\$546.25	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	500	\$1.09	\$546.25	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUB	TOTAL			\$1,934.30	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 148 Ramp: Langtree Rd

Categories Descriptions	Unit	Quantity	Unit Cos	t Total Cost	Assumptions		
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal		
Green					mounted		
SUBTOTAL				\$3,392.50			
SUBTOTAL CONSTRUCTION	N			\$133,398.47			
Traffic Control	15%			\$20,009.77			
Contingencies	10%			\$13,339.85			
TOTAL CONSTRUCTION				\$166,748.09			
			·				
Design	8%			\$13,339.85			
Construction Administration	10%			\$16,674.81			
TOTAL DESIGN AND CONSTRUCTION				\$196,762.74			



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

149

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 149 Ramp: Langtree Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2952	\$2.88	\$8,501.76	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUB	TOTAL			\$8,501.76	
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUB	TOTAL			\$0.00	
	•				
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUB	TOTAL			\$0.00	
	T	T			
Signalization				• • • • • •	
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 149 Ramp: Langtree Rd

Cotogorios					
Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed
					setback distance
					350'
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	
- Conduit (Trenched)	LF	4350	\$6.90	\$30,015.00	All purposes
- Conduit (Directional	LF	1120	\$16.10	\$18,032.00	Five ramp
Drilled)					crossings,
			•		multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	4800	\$5.75	\$27,600.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
with Foundation)					
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each
					pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter
					advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUB	TOTAL			\$122,419.45	
			,		
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill
					on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
	LF	0	\$1,723.00	\$0.00	Drop cable to
- Fiber-optic Drop Cable (six strands)	LF	U	φ1./3	φυ.υυ	controller cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 149 Ramp: Langtree Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUB	TOTAL			\$17,547.50	
	Γ	T			
Pavement Marking					
- Pavement Marking Removal	LF	2000	\$0.71	\$1,426.00	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	1000	\$1.09	\$1,092.50	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	1000	\$1.09	\$1,092.50	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUB	TOTAL			\$3,739.80	
	Т	T			
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 149 Ramp: Langtree Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
SUB	TOTAL			\$3,392.50	
SUBTOTAL CONSTRUCTIO	\$155,601.01				
Traffic Control	15%			\$23,340.15	-
Contingencies	10%			\$15,560.10	
TOTAL CONSTRUCTION				\$194,501.26	
Design	8%			\$15,560.10	
Construction Administration	10%			\$19,450.13	
TOTAL DESIGN AND CONS	\$229,511.49				



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

150

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 150 **Ramp:** Williamson Rd / US 21 / Charlotte

Hwy

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	1860	\$2.88	\$5,356.80	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUB	TOTAL			\$5,356.80	
		,	<u> </u>		
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUB	TOTAL			\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUB	TOTAL			\$0.00	
	T		ı		
Signalization			<u> </u>		
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 150 Ramp: Williamson Rd / US 21 / Charlotte

Hwy

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	2700	\$6.90	\$18,630.00	All purposes
- Conduit (Directional Drilled)	LF	1370	\$16.10	\$22,057.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
 Pedestal Pole (Type III with Foundation) 	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUB	TOTAL			\$97,681.80	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
 Fiber-optic Drop Cable (six strands) 	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 150 **Ramp:** Williamson Rd / US 21 / Charlotte

Hwy

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUB	TOTAL			\$17,547.50	
	I	I		I	
Pavement Marking					
- Pavement Marking Removal	LF	750	\$0.71	\$534.75	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUB	TOTAL			\$1,482.93	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUB	TOTAL			\$3,392.50	

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 150 **Ramp:** Williamson Rd / US 21 / Charlotte

Hwy

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
SUBTOTAL CONSTRUCTION	N			\$125,461.53	
Traffic Control	15%			\$18,819.23	
Contingencies	10% \$12,546.15				
TOTAL CONSTRUCTION				\$156,826.91	
Design	8%			\$12,546.15	
Construction Administration	10%				
TOTAL DESIGN AND CONS	TRUCT	ION		\$185,055.75	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

153

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 153 **Ramp:** SR 1100 - Brawley School Road

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	1886	\$2.88	\$5,431.68	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUB	TOTAL			\$5,431.68	
			<u>'</u>		
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUB	TOTAL	ı		\$0.00	
		<u>, </u>	<u>, </u>		
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUB	TOTAL			\$0.00	
	T	1	ı .		
Signalization					
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 153 Ramp: SR 1100 - Brawley School Road

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	
- Conduit (Trenched)	LF	2750	\$6.90	\$18,975.00	All purposes
- Conduit (Directional Drilled)	LF	1420	\$16.10	\$22,862.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1600	\$5.75	\$9,200.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUB	TOTAL			\$97,809.45	
			,		_
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 153 **Ramp:** SR 1100 - Brawley School Road

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUB	TOTAL			\$17,547.50	
		,	,		
Pavement Marking					
- Pavement Marking Removal	LF	800	\$0.71	\$570.40	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	400	\$1.09	\$437.00	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	400	\$1.09	\$437.00	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUB	TOTAL			\$1,573.20	
		,	,		
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
	TOTAL	L	1	\$3,392.50	
SUBTOTAL CONSTRUCTION		\$125,754.33			

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 153 **Ramp:** SR 1100 - Brawley School Road

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Traffic Control	15%			\$18,863.15	
Contingencies	10%			\$12,575.43	
TOTAL CONSTRUCTION	\$157,192.91				
Design	8%			\$12,575.43	
Construction Administration	10%			\$15,719.29	
TOTAL DESIGN AND CONS	TRUCT	ION		\$185,487.64	

3.1.3 Mecklenburg County



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

075

Typical Design and Construction Costs Single Lane Ramp Meter

Mallard Creek Church Rd

Log No.: 075 **Ramp:** (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structi	Ire				
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	1750	\$2.88	\$5,040.00	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
S	UBTOT	AL		\$5,040.00	
Guardrail					
- Guardrail Rail	LF	350	\$20.00	\$7,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
S	UBTOT	AL		\$8,725.00	
	Г	 	T		
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
S	UBTOT	AL		\$0.00	
	Γ	T	T		
Signalization					
- 6x6' loops - Mainline	EA	8	\$453.68	\$3,629.40	Mainline detection two loops per lane

Typical Design and Construction Costs Single Lane Ramp Meter

Mallard Creek Church Rd

Log No.: 075 **Ramp:** (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	900	\$1.73	\$1,552.50	Assumed setback distance 350'
- Pullbox (Std.)	EA	14	\$345.00	\$4,830.00	
- Conduit (Trenched)	LF	2850	\$6.90	\$19,665.00	All purposes
- Conduit (Directional Drilled)	LF	1810	\$16.10	\$29,141.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	8	\$82.00	\$656.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	590	\$3.16	\$1,865.88	
S	UBTOT	AL		\$106,918.15	
Communications					
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on

Typical Design and Construction Costs Single Lane Ramp Meter

Mallard Creek Church Rd

Log No.: 075 **Ramp:** (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
					Mainline/Splice Enclosures
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	500	\$1.73	\$862.50	Drop cable to controller cabinet
- Tracer Wire	LF	500	\$14.00	\$7,000.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
S	UBTOT	AL		\$25,250.00	
	T	1			
Pavement Marking					40.14511.1
- Pavement Marking Removal	LF	900	\$0.71	\$641.70	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	425	\$1.09	\$464.31	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	425	\$1.09	\$464.31	110' transitions, 100' narrowed lane
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
S	UBTOT	AL		\$1,699.13	
	I	T	<u> </u>		
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only

Typical Design and Construction Costs Single Lane Ramp Meter

Mallard Creek Church Rd

Log No.: 075 **Ramp:** (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SI	UBTOT	\$3,392.50			

SUBTOTAL CONSTRUCTION	\$151,024.78	
Traffic Control	15%	\$22,653.72
Contingencies	10%	\$15,102.48
TOTAL CONSTRUCTION	\$188,780.97	
Design	8%	\$15,102.48
Construction		
Administration	10%	\$18,878.10
•	<u>.</u>	
TOTAL DESIGN AND CONSTRUCTION	\$222,761.54	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

099

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 99 **Ramp**: Arrowood Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					•
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2019	\$2.88	\$5,814.72	Seeding around trench, conduit runs, pull box, clear/grub area,
					and foundation areas.
SUE	BTOTAL	•		\$5,814.72	
Guardrail					
- Guardrail Rail	LF	300	\$20.00	\$6,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SUE	BTOTAL	•		\$7,725.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	BTOTAL	•		\$0.00	
Signalization					
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 99 **Ramp**: Arrowood Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	
- Conduit (Trenched)	LF	2950	\$6.90	\$20,355.00	All purposes
- Conduit (Directional Drilled)	LF	2120	\$16.10	\$34,132.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	2000	\$5.75	\$11,500.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUB	TOTAL	•		\$112,759.45	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 99 **Ramp**: Arrowood Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	0	\$4,600.00	\$0.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	0	\$3,300.00	\$0.00	
- CCTV Assembly	EA	0	\$4,600.00	\$0.00	
SUB	TOTAL	•		\$0.00	
	T				
Pavement Marking			_		
- Pavement Marking Removal	LF	750	\$0.71	\$534.75	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	TOTAL	-		\$1,482.93	
	T	<u> </u>			1
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 99 **Ramp**: Arrowood Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUE	TOTAL	•		\$3,392.50	
SUBTOTAL CONSTRUCTIO	N			\$131,174.60	
Traffic Control	15%			\$19,676.19	
Contingencies	10%			\$13,117.46	
TOTAL CONSTRUCTION				\$163,968.24	
Design	8%			\$13,117.46	
Construction Administration	10%			\$16,396.82	
TOTAL DESIGN AND CONS					



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

101

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 101 **Ramp**: Arrowood Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2077	\$2.88	\$5,981.76	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUE	BTOTAL			\$5,981.76	
Guardrail					
- Guardrail Rail	LF	350	\$20.00	\$7,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SUE	BTOTAL	-		\$8,725.00	
		<u>, </u>			_
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	BTOTAL	-		\$0.00	
	1	1			
Signalization					
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 101 **Ramp**: Arrowood Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	850	\$1.73	\$1,466.25	Assumed setback distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	3025	\$6.90	\$20,872.50	All purposes
- Conduit (Directional Drilled)	LF	1320	\$16.10	\$21,252.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	3000	\$5.75	\$17,250.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	TOTAL	•		\$107,140.55	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 101 **Ramp**: Arrowood Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	TOTAL			\$15,535.00	
	Т				T
Pavement Marking			* • • • •		
- Pavement Marking Removal	LF	1500	\$0.71	\$1,069.50	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	750	\$1.09	\$819.38	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	750	\$1.09	\$819.38	110' transitions, 100' narrowed lane
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	TOTAL	•		\$2,837.05	
	T	ı			T
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 101 **Ramp**: Arrowood Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal
Green					mounted
SUE	BTOTAL	-		\$3,392.50	
SUBTOTAL CONSTRUCTION	N			\$143,611.86	
Traffic Control	15%			\$21,541.78	
Contingencies	10%			\$14,361.19	
TOTAL CONSTRUCTION				\$179,514.83	
Design	8%			\$14,361.19	
Construction Administration	10%			\$17,951.48	
TOTAL DESIGN AND CONSTRUCTION \$211				\$211,827.49	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

102

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 102 **Ramp**: Nations Ford Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2077	\$2.88	\$5,981.76	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUE	BTOTAL	-		\$5,981.76	
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUE	BTOTAL	-		\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	BTOTAL	•		\$0.00	
					1
Signalization					
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 102 **Ramp**: Nations Ford Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	850	\$1.73	\$1,466.25	Assumed setback distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	3025	\$6.90	\$20,872.50	All purposes
- Conduit (Directional Drilled)	LF	1020	\$16.10	\$16,422.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUB	TOTAL	ı		\$93,685.55	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 102 **Ramp**: Nations Ford Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	0	\$4,600.00	\$0.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	0	\$3,300.00	\$0.00	
- CCTV Assembly	EA	0	\$4,600.00	\$0.00	
SUB	TOTAL	•		\$0.00	
Pavement Marking		_	<u> </u>		
- Pavement Marking Removal	LF	750	\$0.71	\$534.75	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUB	TOTAL	<u> </u>		\$1,482.93	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 102 **Ramp**: Nations Ford Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions			
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal			
Green					mounted			
SUE	TOTAL	<u>-</u>		\$3,392.50				
SUBTOTAL CONSTRUCTIO	N			\$104,542.74				
Traffic Control	15%			\$15,681.41				
Contingencies	10%			\$10,454.27				
TOTAL CONSTRUCTION				\$130,678.42				
Design	8%			\$10,454.27				
Construction Administration	10%			\$13,067.84]			
TOTAL DESIGN AND CONS	TRUCT	ION		\$154,200.53				



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

103

Typical Design and Construction Costs Single Lane Ramp Meter

Nations Ford Rd (Mecklenburg

Log No.: 103 **Ramp:** Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Struct	Iro				
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	1250	\$2.88	\$3,600.00	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
S	UBTO1	ΓAL		\$3,600.00	
Guardrail					
- Guardrail Rail	LF	500	\$20.00	\$10,000.00	
- Guardrail Approach End Treatment	EA	2	\$1,725.00	\$3,450.00	
9	UBTO1	ÂL		\$13,450.00	
					·
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
S	SUBTO	ΓAL		\$0.00	
Signalization					
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Nations Ford Rd (Mecklenburg

Log No.: 103 **Ramp:** Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	850	\$1.73	\$1,466.25	Assumed setback distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	2225	\$6.90	\$15,352.50	All purposes
- Conduit (Directional Drilled)	LF	1020	\$16.10	\$16,422.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1200	\$5.75	\$6,900.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$517.50	\$517.50	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$1,400.00	\$2,800.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
	UBTO	ΓAL		\$80,918.05	
Communications					
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Nations Ford Rd (Mecklenburg

Log No.: 103 **Ramp:** Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Fiber-optic Drop Cable (six strands)	LF	350	\$1.73	\$603.75	Drop cable to controller cabinet
- Tracer Wire	LF	350	\$14.00	\$4,900.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
S	UBTOT	AL		\$22,891.25	
	Г	T		T	
Pavement Marking					10.11511.1.1
- Pavement Marking Removal	LF	600	\$0.71	\$427.80	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	300	\$1.09	\$327.75	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	300	\$1.09	\$327.75	110' transitions, 100' narrowed lane
- 24" Stop Bar	LF	12	\$8.05	\$96.60	
S	UBTOT	AL		\$1,179.90	
	П	T		T	T
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only

Typical Design and Construction Costs Single Lane Ramp Meter

Nations Ford Rd (Mecklenburg

Log No.: 103 **Ramp:** Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- R10-6R and R10-6L,	EA	1	\$201.25	\$201.25	Pedestal
Stop Here on Red		'	φ201.25	Ψ201.23	mounted
- R10-28, One Vehicle	EA	1	\$201.25	\$201.25	Pedestal
Per Green	EA	'	φ201.25	φ201.25	mounted
S	UBT01	ΓAL		\$3,392.50	
SUBTOTAL CONSTRU	JCTION			\$125,431.70	
Traffic Control			15%	\$18,814.76	
Contingencies			10%	\$12,543.17	
TOTAL CONSTRUCTION	ON			\$156,789.63	
Design			8%	\$12,543.17	
Construction				· · · · ·	
Administration			10%	\$15,678.96	
TOTAL DESIGN AND	CONST	\$185,011.76			



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

104

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 104 **Ramp:** Tyvola Road

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Struct	ure				
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2510	\$2.88	\$7,228.80	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
	UBTO	ΓAL		\$7,228.80	0 0
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
S	UBTO	ΓAL		\$0.00	
					_
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
S	UBTO	ΓAL		\$0.00	
	1	T		T	
Signalization					
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 104 **Ramp:** Tyvola Road

Categories	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Descriptions					Assumed
- Detector Lead-in Cable	EA	850	\$1.73	\$1,466.25	setback distance
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	3675	\$6.90	\$25,357.50	All purposes
- Conduit (Directional Drilled)	LF	2670	\$16.10	\$42,987.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	3000	\$5.75	\$17,250.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	540	\$3.16	\$1,707.75	
S	UBTO	ΓAL		\$133,075.93	
	T	T		.	
Communications					
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 104 **Ramp:** Tyvola Road

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Fiber-optic Drop Cable (six strands)	LF	750	\$1.73	\$1,293.75	Drop cable to controller cabinet
- Tracer Wire	LF	750	\$14.00	\$10,500.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
S	UBTO1	ΓAL		\$29,181.25	
	Π	I		Г	T
Pavement Marking					40 MDI I
- Pavement Marking Removal	LF	1500	\$0.71	\$1,069.50	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	750	\$1.09	\$819.38	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	750	\$1.09	\$819.38	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
S	UBTO1	ΓAL		\$2,837.05	
	Τ	T		Γ	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 104 **Ramp:** Tyvola Road

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
S	UBTO	ΓAL		\$3,392.50	
SUBTOTA	L CON	STRUCTIO	N	\$175,715.53	
Traffic Control			15%	\$26,357.33	
Contingencies			10%	\$17,571.55	
TOTAL CONSTRUCTION	ON			\$219,644.41	
Design			8%	\$17,571.55	
Construction					
Administration	10%			\$21,964.44	
TOTAL DESIGN AND CONSTRUCTION \$259,180.4					



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

105

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 105 **Ramp**: Tyvola Rd (Mecklenburg Co.)

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
	SF	1 0	405.00	\$0.00	
- Retaining Wall		0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	1877	\$2.88	\$5,405.76	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUBTOTAL				\$5,405.76	
Guardrail					
- Guardrail Rail	LF	350	\$20.00	\$7,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SUBTOTAL				\$8,725.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUBTOTAL				\$0.00	
Signalization					
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline
					detection two
					loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 105 **Ramp**: Tyvola Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
2000					and one clearance
- Detector Lead-in Cable	EA	850	\$1.73	\$1,466.25	Assumed setback distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	2725	\$6.90	\$18,802.50	All purposes
- Conduit (Directional Drilled)	LF	1020	\$16.10	\$16,422.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	2400	\$5.75	\$13,800.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	BTOTAL	-		\$96,790.55	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill on Mainline/Splice Enclosures

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 105 **Ramp**: Tyvola Rd (Mecklenburg Co.)

Categories	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Descriptions - Interconnect Center	EA				·
		0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	0	\$4,600.00	\$0.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	0	\$3,300.00	\$0.00	
- CCTV Assembly	EA	0	\$4,600.00	\$0.00	
SUE	BTOTAL	-		\$0.00	
		,		<u></u>	
Pavement Marking					
- Pavement Marking Removal	LF	750	\$0.71	\$534.75	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	15	\$5.18	\$77.63	
- White Edge Line	LF	2400	\$1.09	\$2,622.00	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	2400	\$1.09	\$2,622.00	110' transitions, 100' narrowed lane
- White Skip Line	LF	1200	\$0.28	\$331.20	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	BTOTAL			\$6,316.38	
		T	1		
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 105 **Ramp**: Tyvola Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- R10-6R and R10-6L, Stop	EA	1	\$201.25	\$201.25	Pedestal
Here on Red		-	,	*	mounted
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal
Green					mounted
SUE	BTOTAL	-		\$3,392.50	
SUBTOTAL CONSTRUCTION	N			\$120,630.19	
Traffic Control	15%			\$18,094.53	
Contingencies	10%			\$12,063.02	
TOTAL CONSTRUCTION				\$150,787.73	
	1			1	
Design	8%			\$12,063.02	
Construction Administration	10%			\$15,078.77	
TOTAL DESIGN AND CONS	TRUCT	ION		\$177,929.52	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

109

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 109 Ramp: Clanton Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2027	\$2.88	\$5,837.76	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUE	BTOTAL	-		\$5,837.76	
Guardrail					
- Guardrail Rail	LF	300	\$20.00	\$6,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SUE	BTOTAL	-		\$7,725.00	
					_
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	BTOTAL	•		\$0.00	
	_				
Signalization					
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 109 Ramp: Clanton Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	2950	\$6.90	\$20,355.00	All purposes
- Conduit (Directional Drilled)	LF	1620	\$16.10	\$26,082.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1200	\$5.75	\$6,900.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	TOTAL	•		\$101,706.80	
Communications					
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 109 Ramp: Clanton Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Fiber-optic Drop Cable (six strands)	LF	250	\$1.73	\$431.25	Drop cable to controller cabinet
- Tracer Wire	LF	250	\$14.00	\$3,500.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	BTOTAL	-		\$21,318.75	
	1				
Pavement Marking					
- Pavement Marking Removal	LF	600	\$0.71	\$427.80	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	300	\$1.09	\$327.75	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	300	\$1.09	\$327.75	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	BTOTAL	•		\$1,212.10	
	1	T			
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 109 Ramp: Clanton Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions			
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted			
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted			
SUE	BTOTAL	-		\$3,392.50				
SUBTOTAL CONSTRUCTION	N			\$141,192.91				
Traffic Control	15%			\$21,178.94				
Contingencies	10%			\$14,119.29				
TOTAL CONSTRUCTION				\$176,491.14				
Design	8%			\$14,119.29				
Construction Administration	10%			\$17,649.11				
TOTAL DESIGN AND CONS	TRUCT	ION	TOTAL DESIGN AND CONSTRUCTION \$208,259.54					



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

111

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 111 Ramp: Remount Rd (Mecklenburg Co.)

Categories		0 111		T (10)	
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2177	\$2.88	\$6,269.76	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUE	BTOTAL			\$6,269.76	0.0000
				+ - ,	
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUE	BTOTAL	•		\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	BTOTAL	-		\$0.00	
			-		
Signalization					
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	850	\$1.73	\$1,466.25	Assumed setback distance 350'

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.:111Ramp:Remount Rd (Mecklenburg Co.)Location:I-77 Southbound

2 ()					
Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	3175	\$6.90	\$21,907.50	All purposes
- Conduit (Directional Drilled)	LF	820	\$16.10	\$13,202.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	2400	\$5.75	\$13,800.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
 Pedestal Pole (Type III with Foundation) 	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	TOTAL	=		\$96,675.55	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.:111Ramp:Remount Rd (Mecklenburg Co.)Location:I-77 Southbound

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Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	0	\$4,600.00	\$0.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	0	\$3,300.00	\$0.00	
- CCTV Assembly	EA	0	\$4,600.00	\$0.00	
SUE	BTOTAL	-		\$0.00	
Pavement Marking					
- Pavement Marking Removal	LF	500	\$0.71	\$356.50	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	250	\$1.09	\$273.13	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	250	\$1.09	\$273.13	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	BTOTAL	=		\$1,031.55	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered	EA	2	\$747.50	\$1,495.00	Sign and post
When Flashing					only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal mounted
Green	I BTOTAL			\$3,392.50	mounted
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M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 111 Ramp: Remount Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
SUBTOTAL CONSTRUCTION	\$107,369.36				
Traffic Control	15%			\$16,105.40	
Contingencies	10% \$10,736.9				
TOTAL CONSTRUCTION				\$134,211.70	
Design	8%			\$10,736.94	
Construction Administration	10%			\$13,421.17	
TOTAL DESIGN AND CONS	\$158,369.81				



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

117

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 117 **Ramp**: West Trade St (Loop)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2502	\$2.88	\$7,205.76	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUI	STOTAL	_		\$7,205.76	
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUI	STOTAL	-		\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUI	BTOTAL	_		\$0.00	
Signalization					
- 6x6' loops - Mainline	EA	8	\$453.68	\$3,629.40	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 117 **Ramp**: West Trade St (Loop)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	14	\$345.00	\$4,830.00	
- Conduit (Trenched)	LF	3650	\$6.90	\$25,185.00	All purposes
- Conduit (Directional Drilled)	LF	2320	\$16.10	\$37,352.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	2400	\$5.75	\$13,800.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	TOTAL	<u>-</u>		\$126,304.15	
Communications					
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 117 **Ramp**: West Trade St (Loop)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Fiber-optic Drop Cable (six strands)	LF	500	\$1.73	\$862.50	Drop cable to controller cabinet
- Tracer Wire	LF	500	\$14.00	\$7,000.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	BTOTAL	-		\$25,250.00	
	1				
Pavement Marking					
- Pavement Marking Removal	LF	600	\$0.71	\$427.80	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	300	\$1.09	\$327.75	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	300	\$1.09	\$327.75	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	BTOTAL			\$1,212.10	
	1	 	г		
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 117 **Ramp**: West Trade St (Loop)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions		
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted		
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted		
SUE	BTOTAL	-		\$3,392.50			
SUBTOTAL CONSTRUCTION	N			\$163,364.51			
Traffic Control	15%			\$24,504.68			
Contingencies	10%			\$16,336.45			
TOTAL CONSTRUCTION				\$204,205.64			
Design	8%			\$16,336.45			
Construction Administration	10%			\$20,420.56			
TOTAL DESIGN AND CONS	TOTAL DESIGN AND CONSTRUCTION \$240,						



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

140

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 140 **Ramp**: Gilead Street

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure	•	•		•	•
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2769	\$2.88	\$7,974.72	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUBTOTAL				\$7,974.72	
				•	•
Guardrail					
- Guardrail Rail	LF	250	\$20.00	\$5,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SUBTOTAL				\$6,725.00	
0021017/2				ψο,: 20:00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUBTOTAL	1	1	1 -	\$0.00	
Signalization					
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 140 **Ramp**: Gilead Street

Catagorias					
Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	
- Conduit (Trenched)	LF	4075	\$6.90	\$28,117.50	All purposes
- Conduit (Directional Drilled)	LF	1420	\$16.10	\$22,862.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	2400	\$5.75	\$13,800.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUBTOTAL	•			\$111,551.95	
				-	
Communications					
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	500	\$1.73	\$862.50	Drop cable to controller cabinet
- Tracer Wire	LF	500	\$14.00	\$7,000.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 140 **Ramp**: Gilead Street

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUBTOTAL				\$23,237.50	
Pavement Marking					
- Pavement Marking Removal	LF	500	\$0.71	\$356.50	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	250	\$1.09	\$273.13	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	250	\$1.09	\$273.13	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUBTOTAL				\$1,031.55	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUBTOTAL			•	\$3,392.50	
SUBTOTAL CONSTRUCTION	N			\$153,913.22	

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 140 **Ramp**: Gilead Street

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Traffic Control	15%			\$23,086.98	
Contingencies	10%			\$15,391.32	
TOTAL CONSTRUCTION	\$192,391.53				
Design	8%			\$15,391.32	
Construction Administration	10%			\$19,239.15	
	•			•	1
TOTAL DESIGN AND CONS	\$227,022.00	1			



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

143

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 143 **Ramp:** NC 73 (Sam Furr Road)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure	•	•			-
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2236	\$2.88	\$6,439.68	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SU	BTOTAL	_		\$6,439.68	
Guardrail					
- Guardrail Rail	LF	500	\$20.00	\$10,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SU	BTOTAL	_		\$11,725.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SU	BTOTAL	-		\$0.00	
	T	1			T
Signalization					
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 143 **Ramp:** NC 73 (Sam Furr Road)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	
- Conduit (Trenched)	LF	3275	\$6.90	\$22,597.50	All purposes
- Conduit (Directional Drilled)	LF	1370	\$16.10	\$22,057.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	2000	\$5.75	\$11,500.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
 Pedestal Pole (Type III with Foundation) 	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	STOTAL	•		\$102,926.95	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 143 **Ramp:** NC 73 (Sam Furr Road)

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	-
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	TOTAL	-		\$15,535.00	
Pavement Marking					
- Pavement Marking Removal	LF	500	\$0.71	\$356.50	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	250	\$1.09	\$273.13	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	250	\$1.09	\$273.13	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	BTOTAL	_		\$1,031.55	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 143 **Ramp:** NC 73 (Sam Furr Road)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
SUE	BTOTAL	-		\$3,392.50	
SUBTOTAL CONSTRUCTIO	N			\$141,050.68	
Traffic Control	15%			\$21,157.60	
Contingencies	10%			\$14,105.07	
TOTAL CONSTRUCTION				\$176,313.35	
Design	8%			\$14,105.07	
Construction Administration	10%			\$17,631.34	
TOTAL DESIGN AND CONS	\$208,049.75				



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

145

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 145 Ramp: US 21 (Catawba Avenue)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Struct	ure				
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	1500	\$2.88	\$4,320.00	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
	UBTOT	AL		\$4,320.00	
Guardrail					
- Guardrail Rail	LF	500	\$20.00	\$10,000.00	
- Guardrail Approach End Treatment	EA	2	\$1,725.00	\$3,450.00	
S	UBTOT	AL		\$13,450.00	
Drainage					
- Pipe	LF	50	\$60.00	\$3,000.00	Extend existing
S	UBTOT	AL		\$3,000.00	
	1	1		ı	
Signalization					
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 145 **Ramp:** US 21 (Catawba Avenue)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	
- Conduit (Trenched)	LF	3900	\$6.90	\$26,910.00	All purposes
- Conduit (Directional Drilled)	LF	340	\$16.10	\$5,474.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	2000	\$5.75	\$11,500.00	
- Ground Rods	EA	4	\$82.00	\$328.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	540	\$3.16	\$1,707.75	
S	UBTOT	AL		\$90,207.83	
	T	T			
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 145 Ramp: US 21 (Catawba Avenue)

Categories	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Descriptions	O			101011 0001	·
- Fiber-optic Drop	LF	0	\$1.73	\$0.00	Drop cable to
Cable (six strands)		_	'	'	controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet	LS	0	\$1,080.00	\$0.00	
Service				'	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	0	\$4,600.00	\$0.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	0	\$3,300.00	\$0.00	
- CCTV Assembly	EA	0	\$4,600.00	\$0.00	
,	UBTOT	AL	+ ,	\$0.00	
_				F 3 3 3	
Pavement Marking					
- Pavement Marking Removal	LF	500	\$0.71	\$356.50	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	250	\$1.09	\$273.13	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	250	\$1.09	\$273.13	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
S	UBTOT	UBTOTAL		\$1,031.55	
		1			
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 145 Ramp: US 21 (Catawba Avenue)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- W3-8, Ramp					
Metered When	EA	2	\$747.50	\$1,495.00	Sign and post
Flashing					only
- R10-6R and R10-6L,	EA	1	\$201.25	\$201.25	Pedestal
Stop Here on Red		•	Ψ201.20	Ψ201.20	mounted
- R10-28, One Vehicle	EA	1	\$201.25	\$201.25	Pedestal
Per Green	LA	'	Ψ201.23	Ψ201.23	mounted
S	UBTOT	AL		\$3,392.50	
				·	•
SUBTOTAL CONSTRU	JCTION			\$115,401.88	
SUBTOTAL CONSTRU	ICTION			\$115,401.88	
SUBTOTAL CONSTRU	ICTION		15%	\$115,401.88 \$17,310.28	
Traffic Control	ICTION		15% 10%	\$17,310.28	-
				,	
Traffic Control Contingencies				\$17,310.28 \$11,540.19	
Traffic Control Contingencies				\$17,310.28 \$11,540.19	
Traffic Control Contingencies TOTAL CONSTRUCTION			10%	\$17,310.28 \$11,540.19 \$144,252.34	
Traffic Control Contingencies TOTAL CONSTRUCTION Design			10%	\$17,310.28 \$11,540.19 \$144,252.34	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

146

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 146 **Ramp:** Goodrum Rd / Griffith St

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structu	ire				1
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2586	\$2.88	\$7,447.68	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
	UBTOTA	AL		\$7,447.68	
					_
Guardrail					
- Guardrail Rail	LF	500	\$20.00	\$10,000.00	
 Guardrail Approach End Treatment 	EA	2	\$1,725.00	\$3,450.00	
S	UBTOTA	AL		\$13,450.00	
	1	1			
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
S	UBTOT	<u>AL</u>		\$0.00	
Cignolization	<u> </u>				
Signalization					Mainline
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 146 **Ramp:** Goodrum Rd / Griffith St

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	
- Conduit (Trenched)	LF	3800	\$6.90	\$26,220.00	All purposes
- Conduit (Directional Drilled)	Ŀ	340	\$16.10	\$5,474.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1200	\$5.75	\$6,900.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	540	\$3.16	\$1,707.75	
S	UBTOTA	AL		\$85,081.83	
					_
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 146 **Ramp:** Goodrum Rd / Griffith St

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
S	UBTOTA	AL .		\$15,535.00	
	T	T	T		T
Pavement Marking					
- Pavement Marking Removal	LF	500	\$0.71	\$356.50	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	250	\$1.09	\$273.13	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	250	\$1.09	\$273.13	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
S	UBTOTA	AL .		\$1,031.55	
	ı	T	, ,		
Signing - W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 146 Ramp: Goodrum Rd / Griffith St

-					
Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
S	UBTOT/	AL.		\$3,392.50	
SUBTOTAL CONSTRU	\$125,938.56				
Traffic Control			15%	\$18,890.78	
				A	

SUBTOTAL CONSTRUCTION		\$125,938.56
Traffic Control	15%	\$18,890.78
Contingencies	10%	\$12,593.86
TOTAL CONSTRUCTION		\$157,423.19
Design	8%	\$12,593.86
Construction		
Administration	10%	\$15,742.32
TOTAL DESIGN AND CONSTRUCTI	\$185,759.37	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

147

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 147 **Ramp:** Goodrum Rd/Griffith St

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					•
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	1	\$300.00	\$ 300.00	
- Seeding	SY	6942	\$2.88	\$19,992.96	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUE	STOTAL	•		\$20,292.96	
					•
Guardrail					
- Guardrail Rail	LF	250	\$20.00	\$5,000.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUE	STOTAL	•		\$5,000.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	BTOTAL	-		\$0.00	
Signalization					
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 147 **Ramp:** Goodrum Rd/Griffith St

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed
					setback distance
					350'
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	
- Conduit (Trenched)	LF	3075	\$6.90	\$21,217.50	All purposes
- Conduit (Directional	LF	1270	\$16.10	\$20,447.00	Five ramp
Drilled)					crossings,
Floatrical Comica	^	4	¢4 500 00	¢4 500 00	multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and	EA	1	\$16,100.00	\$16,100.00	
Cabinet - Firmware/Calibration	EA	1	\$6.005.00	¢6 005 00	
	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation			\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
with Foundation)		_	ψ3,030.00	φ1,500.00	breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each
		_	400000	¥ 1,00000	pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter
_					advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	BTOTAL	-		\$97,061.95	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill
					on
					Mainline/Splice
	^		#4 705 00	Ф0.00	Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six	LF	0	\$1.73	\$0.00	Drop cable to
strands)					controller cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 147 **Ramp:** Goodrum Rd/Griffith St

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet	LS	1	\$1,080.00	\$1,080.00	
Service					
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	TOTAL	-		\$15,535.00	
Pavement Marking					
- Pavement Marking Removal	LF	500	\$0.71	\$356.50	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	250	\$1.09	\$273.13	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	250	\$1.09	\$273.13	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	TOTAL	-		\$1,031.55	
0:	1	T			1
Signing			A- 1		
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 147 **Ramp:** Goodrum Rd/Griffith St

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
SUE	BTOTAL	-		\$3,392.50	
SUBTOTAL CONSTRUCTIO	N			\$142,313.96	
Traffic Control	15%			\$21,347.09	
Contingencies	10%			\$14,231.40	
TOTAL CONSTRUCTION				\$177,892.45	
				,	
Design	8%			\$14,231.40	
Construction Administration	10%			\$17,789.25	
TOTAL DESIGN AND CONSTRUCTION				\$209,913.09	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

045

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 45 **Ramp**: Little Rock Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure	•				
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	1868	\$2.88	\$5,379.84	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUBTOTAL				\$5,379.84	
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUBTOTAL				\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUBTOTAL				\$0.00	
Signalization					
- 6x6' loops - Mainline	EA	8	\$453.68	\$3,629.40	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 45 **Ramp**: Little Rock Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
					and one
					clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed
					setback
Dullboy (Ctd.)	EA	14	\$2.45.00	\$4,920,00	distance 350'
- Pullbox (Std.)			\$345.00	\$4,830.00	A II
- Conduit (Trenched)	LF	2700	\$6.90	\$18,630.00	All purposes
- Conduit (Directional	LF	1370	\$16.10	\$22,057.00	Five ramp
Drilled)					crossings,
					multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	Conduits
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and	EA	1	\$16,100.00	\$16,100.00	
Cabinet	LA	ı	\$10,100.00	\$10,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and	EA	0	\$17,250.00	\$0.00	
Foundation		· ·	ψ,200.00	φοισσ	
- Pedestal Pole (Type III	EA	2	\$3,650.00	\$7,300.00	Breakaway
with Foundation)			·		pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each
					pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter
					advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	BTOTA	L		\$99,279.15	
			1		
Communications					_
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction
					Drill on
					Mainline/Splice
					Enclosures

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 45 **Ramp**: Little Rock Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	500	\$1.73	\$862.50	Drop cable to controller cabinet
- Tracer Wire	LF	500	\$14.00	\$7,000.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUB	TOTA	L		\$25,250.00	
Pavement Marking					
- Pavement Marking Removal	LF	750	\$0.71	\$534.75	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	TOTA	L		\$1,482.93	
Signing					

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 45 **Ramp**: Little Rock Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUE	BTOTA	L		\$3,392.50	
					T
SUBTOTAL CONSTRUCTION	N			\$134,784.42	
	1				
Traffic Control	15%			\$20,217.66	
Contingencies	10%			\$13,478.44	
TOTAL CONSTRUCTION				\$168,480.52	
Design	8%			\$13,478.44]
Construction Administration	10%			\$16,848.05	
	•				
TOTAL DESIGN AND CONS	TRUC	TION		\$198,807.01	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

064

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 064 **Ramp**: Graham St (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure	•				•
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0.5	\$300.00	\$ 150.00	
- Seeding	SY	3838	\$2.88	\$11,053.44	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUI	BTOTA	L		\$11,203.44	
	T	, ,		I	
Guardrail					
- Guardrail Rail	LF	350	\$20.00	\$7,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SUI	BTOTA	L		\$8,725.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUI	BTOTA	L		\$0.00	
Signalization					
- 6x6' loops - Mainline	EA	8	\$453.68	\$3,629.40	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 064 **Ramp**: Graham St (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	850	\$1.73	\$1,466.25	Assumed setback distance 350'
- Pullbox (Std.)	EA	14	\$345.00	\$4,830.00	
- Conduit (Trenched)	LF	2025	\$6.90	\$13,972.50	All purposes
- Conduit (Directional Drilled)	LF	1070	\$16.10	\$17,227.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1630	\$5.75	\$9,372.50	
- Ground Rods	EA	8	\$82.00	\$656.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	540	\$3.16	\$1,707.75	
SUE	BTOTA	L		\$89,814.78	
Communications					
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 064 **Ramp**: Graham St (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Fiber-optic Drop Cable (six strands)	LF	150	\$1.73	\$258.75	Drop cable to controller cabinet
- Tracer Wire	LF	150	\$14.00	\$2,100.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUI	ЗТОТА	L		\$19,746.25	
	_				
Pavement Marking			_	_	
- Pavement Marking Removal	LF	640	\$0.71	\$456.32	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	320	\$1.09	\$349.60	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	320	\$1.09	\$349.60	110' transitions, 100' narrowed lane
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
	ЗТОТА	L		\$1,284.32	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 064 **Ramp**: Graham St (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal
Green					mounted
SUE	BTOTA	L		\$3,392.50	
SUBTOTAL CONSTRUCTION	N			\$134,166.29	
Traffic Control	15%			\$20,124.94	
Contingencies	10%			\$13,416.63	
TOTAL CONSTRUCTION				\$167,707.86	
Design	8%			\$13,416.63	
Construction Administration	10%			\$16,770.79	
	•				
OTAL DESIGN AND CONST	RUCT	ION		\$197,895.27	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

067

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 067 **Ramp**: Sugarcreek Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure	•				
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	1585	\$2.88	\$4,564.80	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUI	BTOTA	L		\$4,564.80	
	1	, ,		I	
Guardrail					
- Guardrail Rail	LF	350	\$20.00	\$7,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SU	BTOTA	L		\$8,725.00	
					_
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUI	BTOTA	L		\$0.00	
	1	<u> </u>		.	
Signalization					
- 6x6' loops - Mainline	EA	8	\$453.68	\$3,629.40	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 067 **Ramp**: Sugarcreek Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	900	\$1.73	\$1,552.50	Assumed setback distance 350'
- Pullbox (Std.)	EA	14	\$345.00	\$4,830.00	
- Conduit (Trenched)	LF	2275	\$6.90	\$15,697.50	All purposes
- Conduit (Directional Drilled)	LF	1460	\$16.10	\$23,506.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1100	\$5.75	\$6,325.00	
- Ground Rods	EA	8	\$82.00	\$656.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	590	\$3.16	\$1,865.88	
SUE	BTOTA	L		\$95,015.65	
Communications					
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 067 **Ramp**: Sugarcreek Rd (Mecklenburg Co.)

Catagories					
Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Fiber-optic Drop Cable	LF	150	\$1.73	\$258.75	Drop cable to
(six strands)					controller
					cabinet
- Tracer Wire	LF	150	\$14.00	\$2,100.00	
- Broadband Internet	LS	0	\$1,080.00	\$0.00	
Service					
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting
					height
- CCTV Cabinet (Pole	EA	1	\$3,300.00	\$3,300.00	
Mount, Type 336)					
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	BTOTA	L		\$19,746.25	
	_				
Pavement Marking					
- Pavement Marking	LF	640	\$0.71	\$456.32	40 MPH design
Removal					speed. 110'
					transitions, 100'
				4	narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	320	\$1.09	\$349.60	110' transitions,
					100' narrowed
N. II. E. L. I.	. –	200	# 4.00	# 0.40.00	lane
- Yellow Edge Line	LF	320	\$1.09	\$349.60	110' transitions,
					100' narrowed
0.411 Otana Dan	. –	40	Φ0.05	# 400.00	lane
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	ВТОТА	L		\$1,284.32	
Signing					
Signing	- A		Φ 7.47 .50	Φ4 40 <u>5</u> 00	0
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered	EA	2	\$747.50	\$1,495.00	Sign and post
When Flashing		_	Ţ <u>.</u>	Ψ.,	only
- R10-6R and R10-6L, Stop	EA	1	\$201.25	\$201.25	Pedestal
Here on Red			, -	+ - -	mounted

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 067 **Ramp**: Sugarcreek Rd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal
Green					mounted
SUE	BTOTA	L		\$3,392.50	
SUBTOTAL CONSTRUCTION	N			\$132,728.52	
Traffic Control	15%			\$19,909.28	
Contingencies	10%			\$13,272.85	
TOTAL CONSTRUCTION				\$165,910.65	
Design	8%			\$13,272.85	
Construction Administration	10%			\$16,591.07	
	•			•	
TOTAL DESIGN AND CONS	TRUC	TION		\$195,774.57	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

069

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 69 **Ramp**: University City Blvd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2710	\$2.88	\$7,804.80	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUI	BTOTAL	•		\$7,804.80	
		1			
Guardrail	<u> </u>			40.00	
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUI	BTOTAL	-		\$0.00	
		1			
Drainage		_	*		
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUI	BTOTAL	_		\$0.00	
O'con all and the st		<u> </u>			
Signalization			* 1-2 22	*	
- 6x6' loops - Mainline	EA	10	\$453.68	\$4,536.75	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue,
					three passage
					and one
					clearance

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 69 **Ramp**: University City Blvd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	16	\$345.00	\$5,520.00	
- Conduit (Trenched)	LF	3950	\$6.90	\$27,255.00	All purposes
- Conduit (Directional Drilled)	LF	2620	\$16.10	\$42,182.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	3000	\$5.75	\$17,250.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
 Pedestal Pole (Type III with Foundation) 	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	BTOTAL	•		\$138,251.50	
					_
Communications					
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 69 **Ramp**: University City Blvd

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Fiber-optic Drop Cable	LF	500	\$1.73	\$862.50	Drop cable to
(six strands)					controller
					cabinet
- Tracer Wire	LF	500	\$14.00	\$7,000.00	
- Broadband Internet	LS	0	\$1,080.00	\$0.00	
Service					
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting
					height
- CCTV Cabinet (Pole	EA	1	\$3,300.00	\$3,300.00	
Mount, Type 336)			• • • • • • • •		
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	BTOTAL	-		\$25,250.00	
Dayway and Marel in a		1	T		T
Pavement Marking	. –	750	00.74	ΦE0.4.75	40 MPH 1 1
- Pavement Marking	LF	750	\$0.71	\$534.75	40 MPH design
Removal					speed. 110'
					transitions, 100'
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	narrowed lane
- White Edge Line	LF	375	\$1.09	\$409.69	110' transitions,
- write Eage Line	LF	3/3	φ1.09	Ф409.09	100 transitions,
					lane
- Yellow Edge Line	LF	375	\$1.09	\$409.69	110' transitions,
Tonow Lago Line		0.0	Ψ1.00	φ 100.00	100' narrowed
					lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	\$1,482.93				
			-	• •	·
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post
					only
- W3-8, Ramp Metered	EA	2	\$747.50	\$1,495.00	Sign and post
When Flashing					only

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 69 **Ramp**: University City Blvd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUE	BTOTAL	-		\$3,392.50	
					_
SUBTOTAL CONSTRUCTION	N			\$176,181.73	
Traffic Control	15%			\$26,427.26	
Contingencies	10%			\$17,618.17	
TOTAL CONSTRUCTION				\$220,227.16	
Design	8%			\$17,618.17	
Construction Administration	10%			\$22,022.72	
TOTAL DESIGN AND CONS					



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

072

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 072 **Ramp:** Harris Blvd (Mecklenburg Co.)

Categories		0 111	11.14.0	T. (1.0)	
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure			***	40.00	
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and	AC			\$ 0.00	
Grub		0	\$300.00	Ψ 0.00	
					Seeding around
					trench, conduit
					runs, pull box,
					clear/grub area,
0 "	0) (4.450	Φο οο	04.470.00	and foundation
- Seeding	SY	1450	\$2.88	\$4,176.00	areas.
SUBTOTAL				\$4,176.00	
				1	
Guardrail					
- Guardrail Rail	LF	350	\$20.00	\$7,000.00	
- Guardrail Approach					
End Treatment	EA	1	\$1,725.00	\$1,725.00	
SUBTOTAL				\$8,725.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUBTOTAL				\$0.00	
Signalization					
					Mainline
					detection two
- 6x6' loops - Mainline	EA	8	\$453.68	\$3,629.40	loops per lane
					One queue, three
					passage and one
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	clearance
- Detector Lead-in					Assumed setback
Cable	EA	900	\$1.73	\$1,552.50	distance 350'

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 072 **Ramp:** Harris Blvd (Mecklenburg Co.)

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Pullbox (Std.)	EA	14	\$345.00	\$4,830.00	
- Conduit (Trenched)	LF	2550	\$6.90	\$17,595.00	All purposes
					Five ramp
- Conduit (Directional				.	crossings,
Drilled)	LF	1560	\$16.10	\$25,116.00	multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1100	\$5.75	\$6,325.00	
- Ground Rods	EA	8	\$82.00	\$656.00	
- ATC/2070E Controller					
and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$517.50	\$517.50	
- 45' Mast Arm Poles					
and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III					
with Foundation)	EA	2	\$1,400.00	\$2,800.00	Breakaway pole
- Two Section Signal					Two each
Head	EA	4	\$500.00	\$2,000.00	pedestal pole
- One Section Signal		_	.	.	Ramp meter
Head	EA	2	\$575.00	\$1,150.00	advance signal
- Signal Cable	LF	540	\$3.16	\$1,707.75	
SUBTOTAL				\$93,842.53	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
·				`	For Direction Drill
					on
					Mainline/Splice
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable					Drop cable to
(six strands)	LF	0	\$1.73	\$0.00	controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet					
Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 072 **Ramp:** Harris Blvd (Mecklenburg Co.)

Categories	11!4	Overstitus	Unit Coot	Total Cont	Accumentions
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions 45' Mounting
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	height
- CCTV Cabinet (Pole			, ,	· ,	
Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUBTOTAL				\$17,547.50	
					_
Pavement Marking					
- Pavement Marking Removal	LF	600	\$0.71	\$427.80	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	4	\$5.18	\$20.70	
- White Edge Line	LF	300	\$1.09	\$327.75	110' transitions, 100' narrowed lane 110' transitions,
- Yellow Edge Line	LF	300	\$1.09	\$327.75	100' narrowed lane
- 24" Stop Bar	LF	8	\$8.05	\$64.40	
SUBTOTAL				\$1,168.40	
		1			
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L,		_		.	Pedestal
Stop Here on Red	EA	1	\$201.25	\$201.25	mounted
- R10-28, One Vehicle	_ ^		Ф004 ОБ	\$204.05	Pedestal
Per Green SUBTOTAL	EA	1	\$201.25	\$201.25	mounted
SUBTUTAL				\$3,392.50	1
SUBTOTAL CONSTRUC	\$128,851.93				
Traffic Control			15%	\$19,327.79	

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 072 **Ramp:** Harris Blvd (Mecklenburg Co.)

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Contingencies			10%	\$12,885.19	
TOTAL CONSTRUCTION	ı			\$161,064.91	
Design			8%	\$12,885.19	
Construction					
Administration			10%	\$16,106.49	
TOTAL DESIGN AND CO	NSTRU	\$190,056.59			



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

177

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 177 Ramp: Steele Creek Rd (LOOP)

Descriptions	Categories	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Retaining Wall	Descriptions	Oilit	Quantity	Offic Cost	Total Cost	Assumptions
Excavation CY 100 \$25.00 \$2,500.00 - Fill CY 0 \$22.00 \$0.00 - Supp Clearing and Grub AC 1 \$300.00 \$300.00 - Seeding SY 7034 \$2.88 \$20,257.92 Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas. SUBTOTAL Guardrail Rail LF 350 \$20.00 \$7,000.00 - Guardrail Approach End Treatment EA 1 \$1,725.00 \$1,725.00 Drainage LF 0 \$60.00 \$0.00 Extend existing SUBTOTAL Signalization - 6x6' loops - Mainline EA 6 \$453.68 \$2,722.05 Mainline detection two loops per lane - 6x6' loops - Ramp EA 5 \$453.68 \$2,268.38 One queue, three passage and one clearance - Detector Lead-in Cable EA 1450 \$1.73 \$2,501.25 Assumed setback distance 350'	Earthwork and Structure					
Fill	- Retaining Wall	SF	0	\$85.00	\$0.00	
- Supp Clearing and Grub	- Excavation	CY	100	\$25.00	\$2,500.00	
- Seeding SY 7034 \$2.88 \$20,257.92 Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas. SUBTOTAL \$23,057.92 Guardrail	- Fill	CY	0	\$22.00	\$0.00	
SUBTOTAL \$23,057.92	- Supp Clearing and Grub	AC	1	\$300.00	\$ 300.00	
Guardrail LF 350 \$20.00 \$7,000.00 - Guardrail Approach End Treatment EA 1 \$1,725.00 \$1,725.00 - Fige	- Seeding	SY	7034	\$2.88	\$20,257.92	trench, conduit runs, pull box, clear/grub area, and foundation
- Guardrail Rail	SUE	BTOTAL			\$23,057.92	
- Guardrail Rail						<u>.</u>
- Guardrail Approach End Treatment EA 1 \$1,725.00 \$1,725	Guardrail					
SUBTOTAL \$8,725.00	- Guardrail Rail	LF	350	\$20.00	\$7,000.00	
Drainage - Pipe LF 0 \$60.00 \$0.00 Extend existing SUBTOTAL Signalization - 6x6' loops - Mainline EA 6 \$453.68 \$2,722.05 Mainline detection two loops per lane - 6x6' loops - Ramp EA 5 \$453.68 \$2,268.38 One queue, three passage and one clearance - Detector Lead-in Cable EA 1450 \$1.73 \$2,501.25 Assumed setback distance 350'		EA	1	\$1,725.00	\$1,725.00	
SUBTOTAL \$0.00 \$0.00 Extend existing	SUE	TOTAL			\$8,725.00	
SUBTOTAL \$0.00 \$0.00 Extend existing				1	• •	1
SUBTOTAL \$0.00 \$0.00 Extend existing	Drainage					
Signalization - 6x6' loops - Mainline EA 6 \$453.68 \$2,722.05 Mainline detection two loops per lane - 6x6' loops - Ramp EA 5 \$453.68 \$2,268.38 One queue, three passage and one clearance - Detector Lead-in Cable EA 1450 \$1.73 \$2,501.25 Assumed setback distance 350'		LF	0	\$60.00	\$0.00	Extend existing
- 6x6' loops - Mainline EA 6 \$453.68 \$2,722.05 Mainline detection two loops per lane - 6x6' loops - Ramp EA 5 \$453.68 \$2,268.38 One queue, three passage and one clearance - Detector Lead-in Cable EA 1450 \$1.73 \$2,501.25 Assumed setback distance 350'	SUE	TOTAL	•		\$0.00	
- 6x6' loops - Mainline EA 6 \$453.68 \$2,722.05 Mainline detection two loops per lane - 6x6' loops - Ramp EA 5 \$453.68 \$2,268.38 One queue, three passage and one clearance - Detector Lead-in Cable EA 1450 \$1.73 \$2,501.25 Assumed setback distance 350'				1		1
- 6x6' loops - Mainline EA 6 \$453.68 \$2,722.05 Mainline detection two loops per lane - 6x6' loops - Ramp EA 5 \$453.68 \$2,268.38 One queue, three passage and one clearance - Detector Lead-in Cable EA 1450 \$1.73 \$2,501.25 Assumed setback distance 350'	Signalization					
passage and one clearance - Detector Lead-in Cable EA 1450 \$1.73 \$2,501.25 Assumed setback distance 350'		EA	6	\$453.68	\$2,722.05	two loops per
distance 350'	- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	passage and one
- Pullbox (Std.) EA 12 \$345.00 \$4,140.00	- Detector Lead-in Cable	EA	1450	\$1.73	\$2,501.25	
	- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 177 Ramp: Steele Creek Rd (LOOP)

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Conduit (Trenched)	LF	3200	\$6.90	\$22,080.00	All purposes
- Conduit (Directional	LF	1620	\$16.10	\$26,082.00	Five ramp
Drilled)					crossings,
Floatrical Comica	Ε.	1	¢4 500 00	C4 F00 00	multiple conduits
- Electrical Service	EA	-	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
 45' Mast Arm Poles and Foundation 	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUB	TOTAL			\$105,588.05	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill
					on
					Mainline/Splice
Interconnect Center	Ε.	0	¢4 705 00	CO OO	Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 177 Ramp: Steele Creek Rd (LOOP)

Categories	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Descriptions					•
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting
					height
- CCTV Cabinet (Pole	EA	1	\$3,300.00	\$3,300.00	
Mount, Type 336)					
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUB	TOTAL			\$15,535.00	
Pavement Marking					
- Pavement Marking	LF	600	\$0.71	\$427.80	40 MPH design
Removal					speed. 110'
					transitions, 100'
					narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	300	\$1.09	\$327.75	110' transitions,
					100' narrowed
					lane
- Yellow Edge Line	LF	300	\$1.09	\$327.75	110' transitions,
_					100' narrowed
					lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUB	TOTAL			\$1,212.10	
			<u>.</u>		
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post
, , , ,			,	+ ,	only
- W3-8, Ramp Metered	EA	2	\$747.50	\$1,495.00	Sign and post
When Flashing		_	V	4 1, 100100	only
- R10-6R and R10-6L, Stop	EA	1	\$201.25	\$201.25	Pedestal
Here on Red		-	+	Ŧ - · · -	mounted
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal
Green			7-0::-0	4	mounted
SUB	11100111001				
SUBTOTAL CONSTRUCTIO					
	7				

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 177 Ramp: Steele Creek Rd (LOOP)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Traffic Control	15%			\$23,626.59	
Contingencies	10%			\$15,751.06	
TOTAL CONSTRUCTION				\$196,888.21	
Design	8%			\$15,751.06	
Construction Administration	10%			\$19,688.82	
TOTAL DESIGN AND CONS					



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

179

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 179 **Ramp**: Steele Creek Rd (RAMP)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure	•				
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2327	\$2.88	\$6,701.76	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUB ⁻	TOTAL			\$6,701.76	
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
	TOTAL	<u> </u>		\$0.00	
			1	•	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUB	TOTAL			\$0.00	
					_
Signalization					
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 179 **Ramp**: Steele Creek Rd (RAMP)

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Conduit (Trenched)	LF	3400	\$6.90	\$23,460.00	All purposes
- Conduit (Directional	LF	1870	\$16.10	\$30,107.00	Five ramp
Drilled)					crossings,
Floatrical Comica	_ ^	1	Ф4 Б 00 00	\$4.500.00	multiple conduits
- Electrical Service	EA	-	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	2400	\$5.75	\$13,800.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.0 0	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.0 0	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUB	TOTAL			\$115,736.80	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill
					on
					Mainline/Splice
			* * * * * * * * * *		Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 179 **Ramp**: Steele Creek Rd (RAMP)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUB'	TOTAL			\$15,535.00	
Pavement Marking					
- Pavement Marking Removal	LF	1000	\$0.71	\$713.00	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	500	\$1.09	\$546.25	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	500	\$1.09	\$546.25	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUB	TOTAL			\$1,934.30	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUB					
SUBTOTAL CONSTRUCTIO					

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 179 **Ramp**: Steele Creek Rd (RAMP)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Traffic Control	15%			\$21,495.05	
Contingencies	10%			\$14,330.04	
TOTAL CONSTRUCTION	\$179,125.45				
Design	8%			\$14,330.04	
Construction Administration	10%			\$17,912.55	
TOTAL DESIGN AND CONS	\$211,368.03				



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

180

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 180 **Ramp:** West Blvd.

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure	•				
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2194	\$2.88	\$6,318.72	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUB	TOTAL			\$6,318.72	
Guardrail					
- Guardrail Rail	LF	300	\$20.00	\$6,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SUB	TOTAL			\$7,725.00	
		,	,		
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUB	TOTAL			\$0.00	
			T	T	T
Signalization					
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 180 Ramp: West Blvd.

Categories		0 414		T (10 (
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Conduit (Trenched)	LF	3200	\$6.90	\$22,080.00	All purposes
- Conduit (Directional	LF	1870	\$16.10	\$30,107.00	Five ramp
Drilled)					crossings,
					multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	2500	\$5.75	\$14,375.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and	EA	1	\$16,100.00	\$16,100.00	
Cabinet					
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and	EA	0	\$17,250.00	\$0.00	
Foundation					
- Pedestal Pole (Type III	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
with Foundation)		_		4	
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each
On a Continu Cinual Hand	_ ^	0	ΦΕ 7 Ε 00	Φ4.450.00	pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter
- Signal Cable	LF	630	\$3.16	\$1,992.38	advance signal
	TOTAL		φ3.10	·	
308	IOIAL	1		\$114,931.80	
Communications		<u> </u>	<u> </u>		
	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Splice Enclosure		0		•	
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill
					On Mainling/Splice
					Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six	LF	0	\$1,723.00	\$0.00	
strands)	ᄕ		φ1./3	φυ.υυ	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	CONTROLLER CADING
- Broadband Internet	LS	0	\$1,080.00	\$0.00	
Service	LO		ψ1,000.00	φυ.υυ	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
Ethornot Ownton		1	Ψ1,555.00	ψο.οο	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 180 **Ramp:** West Blvd.

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions		
- CCTV Pole (55' Wood)	EA	0	\$4,600.00	\$0.00	45' Mounting		
- 001 v 1 016 (33 vv00d)			ψ+,000.00	Ψ0.00	height		
- CCTV Cabinet (Pole	EA	0	\$3,300.00	\$0.00	Holgin		
Mount, Type 336)			ψο,σσσ.σσ	Ψ0.00			
- CCTV Assembly	EA	0	\$4,600.00	\$0.00			
	TOTAL		+ 1,000100	\$0.00			
				*			
Pavement Marking							
- Pavement Marking	LF	1000	\$0.71	\$713.00	40 MPH design		
Removal			·	·	speed. 110'		
					transitions, 100'		
					narrowed lane		
- Raised Pavement Markers	EA	0	\$5.18	\$0.00			
- White Edge Line	LF	500	\$1.09	\$546.25	110' transitions,		
_					100' narrowed		
					lane		
- Yellow Edge Line	LF	500	\$1.09	\$546.25	110' transitions,		
					100' narrowed		
					lane		
- White Skip Line	LF	0	\$0.28	\$0.00			
- 24" Stop Bar	LF	16	\$8.05	\$128.80			
SUB	TOTAL			\$1,934.30			
Signing							
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post		
					only		
- W3-8, Ramp Metered	EA	2	\$747.50	\$1,495.00	Sign and post		
When Flashing					only		
- R10-6R and R10-6L, Stop	EA	1	\$201.25	\$201.25	Pedestal		
Here on Red					mounted		
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal		
Green					mounted		
SUB	SUBTOTAL \$3,392.50						
				\$134,302.32			
SUBTOTAL CONSTRUCTIO							

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 180 Ramp: West Blvd.

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions	
Traffic Control	15%			\$20,145.35		
Contingencies	10%			\$13,430.23	3	
TOTAL CONSTRUCTION	TOTAL CONSTRUCTION \$167,877.90					
Design	8%			\$13,430.23	3	
Construction Administration	10%			\$16,787.79)	
TOTAL DESIGN AND CONS	2					



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

181

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 181 Ramp: West Blvd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure	1				•
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0.25	\$300.00	\$ 75.00	
- Seeding	SY	3404	\$2.88	\$9,803.52	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUI	BTOTAL		1	\$9,878.52	
					•
Guardrail					
- Guardrail Rail	LF	300	\$20.00	\$6,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SUI	BTOTAL			\$7,725.00	
	1	T			T
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUI	BTOTAL			\$0.00	
		1	T		
Signalization		_			
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 181 Ramp: West Blvd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Conduit (Trenched)	LF	3200	\$6.90	\$22,080.00	All purposes
- Conduit (Directional Drilled)	LF	1370	\$16.10	\$22,057.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	2000	\$5.75	\$11,500.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
 Pedestal Pole (Type III with Foundation) 	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	BTOTAL			\$104,006.80	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 181 Ramp: West Blvd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	BTOTAL			\$15,535.00	
Pavement Marking					
- Pavement Marking Removal	LF	1000	\$0.71	\$713.00	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	500	\$1.09	\$546.25	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	500	\$1.09	\$546.25	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	BTOTAL			\$1,934.30	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUE	BTOTAL			\$3,392.50	
SUBTOTAL CONSTRUCTION	ON			\$142,472.12	

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 181 Ramp: West Blvd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Traffic Control	15%			\$21,370.82	
Contingencies	10%			\$14,247.21	
TOTAL CONSTRUCTION				\$178,090.15	
Design	8%			\$14,247.21	
Construction Administration	10%			\$17,809.02	
Administration					
TOTAL DESIGN AND CONSTRUCTION				\$210,146.38	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

182

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 182 Ramp: US 74/&S 29/Wilkinson Blvd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	3394	\$2.88	\$9,774.72	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUE	BTOTAL			\$9,774.72	
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End	EA	0	\$1,725.00	\$0.00	
Treatment					
SUE	BTOTAL			\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
	BTOTAL		400100	\$0.00	
			-	·	
Signalization					
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 182 Ramp: US 74/&S 29/Wilkinson Blvd

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Conduit (Trenched)	LF	5000	\$6.90	\$34,500.00	All purposes
- Conduit (Directional	LF	3120	\$16.10	\$50,232.00	Five ramp
Drilled)					crossings,
EL (: 10 :			\$4.500.00	04 500 00	multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	3500	\$5.75	\$20,125.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUI	BTOTAL			\$153,226.80	
Communications					
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill
					on
					Mainline/Splice
					Enclosures
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet
- Fiber-optic Drop Cable	LF	750	\$1.73	\$1,293.75	Drop cable to
(six strands)					controller cabinet
- Tracer Wire	LF	750	\$14.00	\$10,500.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 182 Ramp: US 74/&S 29/Wilkinson Blvd

Categories	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Descriptions (551)M(1)					•
- CCTV Pole (55' Wood)	EA	0	\$4,600.00	\$0.00	45' Mounting height
- CCTV Cabinet (Pole	EA	0	\$3,300.00	\$0.00	
Mount, Type 336)					
- CCTV Assembly	EA	0	\$4,600.00	\$0.00	
SUE	BTOTAL			\$14,668.75	
	Γ	T	1		1
Pavement Marking					
- Pavement Marking Removal	LF	750	\$0.71	\$534.75	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
	BTOTAL	•		\$1,482.93	
			1	•	-
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal
Green				·	mounted
	BTOTAL	•		\$3,392.50	
			<u>'</u>	· •	•
SUBTOTAL CONSTRUCTION					

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 182 Ramp: US 74/&S 29/Wilkinson Blvd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Traffic Control	15%			\$27,381.85	
Contingencies	10%			\$18,254.57	
TOTAL CONSTRUCTION				\$228,182.12	
Design	8%			\$18,254.57	
Construction Administration	10%			\$22,818.21	
	•				
TOTAL DESIGN AND CONSTRUCTION				\$269,254.90	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

229

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 229 **Ramp:** E John St

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure	•				•
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2386	\$2.88	\$6,871.68	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SU	STOTAL			\$6,871.68	
					•
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SU	STOTAL			\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SU	BTOTAL			\$0.00	
	1	T			
Signalization					
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 229 **Ramp:** E John St

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Conduit (Trenched)	LF	3500	\$6.90	\$24,150.00	All purposes
- Conduit (Directional Drilled)	LF	1620	\$16.10	\$26,082.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	2000	\$5.75	\$11,500.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	BTOTAL			\$108,504.45	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 229 Ramp: E John St

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	BTOTAL			\$17,547.50	
Pavement Marking					
- Pavement Marking Removal	LF	1000	\$0.71	\$713.00	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	500	\$1.09	\$546.25	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	500	\$1.09	\$546.25	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	BTOTAL			\$1,934.30	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUE	BTOTAL			\$3,392.50	
SUBTOTAL CONSTRUCTION	ON			\$138,250.43	

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 229 Ramp: E John St

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Traffic Control	15%			\$20,737.56	
Contingencies	10%			\$13,825.04	
TOTAL CONSTRUCTION				\$172,813.04	
Design	8%			\$13,825.04	
Construction	10%			\$17,281.30	
Administration					
TOTAL DESIGN AND CONSTRUCTION				\$203,919.38	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

230

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 230 **Ramp:** NC 16 (Providence Rd)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure	•				•
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	3686	\$2.88	\$10,615.68	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUI	STOTAL			\$10,615.68	
					_
Guardrail					
- Guardrail Rail	LF	300	\$20.00	\$6,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SUI	STOTAL			\$7,725.00	
					_
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUI	BTOTAL			\$0.00	
					_
Signalization					
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 230 Ramp: NC 16 (Providence Rd)

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Conduit (Trenched)	LF	5450	\$6.90	\$37,605.00	All purposes
- Conduit (Directional	LF	1370	\$16.10	\$22,057.00	Five ramp
Drilled)					crossings,
			-		multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller	EA	1	\$16,100.00	\$16,100.00	
and Cabinet					
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and	EA	0	\$17,250.00	\$0.00	
Foundation					
- Pedestal Pole (Type III	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
with Foundation)		_			
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each
	- •		4575.00		pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter
Signal Cable	LF	630	CO 16	¢4 000 00	advance signal
- Signal Cable			\$3.16	\$1,992.38	
501	BTOTAL			\$115,059.45	
Communications					
	ГΛ	4	\$4.4E0.00	Ф4 4EO OO	Link to CMEO
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill
					On Mainling/Caling
					Mainline/Splice Enclosures
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet
	LF	2500		<u> </u>	
- Fiber-optic Drop Cable (six strands)	LF	2500	\$1.73	\$4,312.50	Drop cable to controller cabinet
- Tracer Wire	LF	2500	\$14.00	\$35,000.00	Controller Cabillet
- Broadband Internet	LS	0	\$1,080.00	\$0.00	
Service	LS		φ1,000.00	φυ.υυ	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
Eulettiet Owiton			ψ1,333.00	ψυ.υυ	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 230 Ramp: NC 16 (Providence Rd)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- CCTV Pole (55' Wood)	EA	0	\$4,600.00	\$0.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	0	\$3,300.00	\$0.00	
- CCTV Assembly	EA	0	\$4,600.00	\$0.00	
SUE	BTOTAL			\$42,187.50	
Pavement Marking					
- Pavement Marking Removal	LF	750	\$0.71	\$534.75	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	TOTAL			\$1,482.93	
				•	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUE	BTOTAL			\$3,392.50	
SUBTOTAL CONSTRUCTION)N			\$180,463.06	

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 230 Ramp: NC 16 (Providence Rd)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Traffic Control	15%			\$27,069.46	
Contingencies	10%			\$18,046.31	
TOTAL CONSTRUCTION					
Design	8%			\$18,046.31	
Construction Administration	10%			\$22,557.88	
TOTAL DESIGN AND CONS	\$266,183.01				



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

231

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 231 Ramp: NC 16 (Providence Rd) (LOOP)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure	•				
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2786	\$2.88	\$8,023.68	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUI	STOTAL			\$8,023.68	
	_				
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUI	STOTAL			\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUI	BTOTAL			\$0.00	
	1	T			
Signalization					
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 231 Ramp: NC 16 (Providence Rd) (LOOP)

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Conduit (Trenched)	LF	4100	\$6.90	\$28,290.00	All purposes
- Conduit (Directional	LF	2120	\$16.10	\$34,132.00	Five ramp
Drilled)					crossings,
					multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1000	\$5.75	\$5,750.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller	EA	1	\$16,100.00	\$16,100.00	
and Cabinet					
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and	EA	0	\$17,250.00	\$0.00	
Foundation					
- Pedestal Pole (Type III	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
with Foundation)					
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each
	-		0 575.00	04.450.00	pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter
Cianal Cabla	LF	620	CO 4C	¢4 000 00	advance signal
- Signal Cable		630	\$3.16	\$1,992.38	
501	BTOTAL			\$114,944.45	
Communications					T
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
				<u> </u>	
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill
					On Mainling/Caling
					Mainline/Splice
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	Enclosures In cabinet
		1		<u> </u>	
- Fiber-optic Drop Cable	LF	1500	\$1.73	\$2,587.50	Drop cable to
(six strands) - Tracer Wire	LF	1500	\$14.00	\$21,000.00	controller cabinet
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- Fulciller Switch		J	φ1,300.00	φυ.υυ	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 231 Ramp: NC 16 (Providence Rd) (LOOP)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- CCTV Pole (55' Wood)	EA	0	\$4,600.00	\$0.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	0	\$3,300.00	\$0.00	
- CCTV Assembly	EA	0	\$4,600.00	\$0.00	
SUE	BTOTAL			\$26,462.50	
Pavement Marking					
- Pavement Marking Removal	LF	400	\$0.71	\$285.20	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	200	\$1.09	\$218.50	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	200	\$1.09	\$218.50	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	BTOTAL			\$851.00	
					_
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUE	BTOTAL			\$3,392.50	
SUBTOTAL CONSTRUCTION	ON			\$153,674.13	

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 231 Ramp: NC 16 (Providence Rd) (LOOP)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Traffic Control	15%			\$23,051.12	
Contingencies	10%			\$15,367.41	
TOTAL CONSTRUCTION				\$192,092.66	
Design	8%			\$15,367.41	
Construction Administration	10%			\$19,209.27	
	1				
TOTAL DESIGN AND CON	\$226,669.34				



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

232

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 232 Ramp: NC 16 (Providence Rd) (LOOP)

Categories	1.1	0	Linit On at	Tatal Oast	A
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	1786	\$2.88	\$5,143.68	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUE	BTOTAL	•		\$5,143.68	
	T	1		1	
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
	STOTAL	<u> </u>		\$0.00	
331	3101712	1		φοισσ	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	BTOTAL			\$0.00	
Signalization					
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 232 Ramp: NC 16 (Providence Rd) (LOOP)

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Conduit (Trenched)	LF	2600	\$6.90	\$17,940.00	All purposes
- Conduit (Directional Drilled)	LF	1420	\$16.10	\$22,862.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1000	\$5.75	\$5,750.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUI	BTOTAL	i		\$93,324.45	
Communications		1			
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For Direction Drill
- 1 dilbox (opecial dize)			Ψ2,012.30	ψ0.00	on Mainline/Splice
					Enclosures
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	250	\$1.73	\$431.25	Drop cable to controller cabinet
- Tracer Wire	LF	250	\$14.00	\$3,500.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 232 Ramp: NC 16 (Providence Rd) (LOOP)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- CCTV Pole (55' Wood)	EA	0	\$4,600.00	\$0.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	0	\$3,300.00	\$0.00	
- CCTV Assembly	EA	0	\$4,600.00	\$0.00	
SUE	STOTAL		•	\$6,806.25	
Pavement Marking					
- Pavement Marking Removal	LF	400	\$0.71	\$285.20	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	200	\$1.09	\$218.50	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	200	\$1.09	\$218.50	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	STOTAL	i		\$851.00	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUE	STOTAL			\$3,392.50	
SUBTOTAL CONSTRUCTION					

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 232 Ramp: NC 16 (Providence Rd) (LOOP)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Traffic Control	15%			\$16,427.68	
Contingencies	10%			\$10,951.79	
TOTAL CONSTRUCTION				\$136,897.35	
Design	8%			\$10,951.79	
Construction Administration	10%			\$13,689.74	
, tariii iotatiori					
TOTAL DESIGN AND CONSTRUCTION				\$161,538.87	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

233

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 233 **Ramp:** NC 16 (Providence Rd)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2686	\$2.88	\$7,735.68	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUE	BTOTAL			\$7,735.68	
					_
Guardrail					
- Guardrail Rail	LF	300	\$20.00	\$6,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SUE	BTOTAL			\$7,725.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	BTOTAL			\$0.00	
Signalization					
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 233 **Ramp:** NC 16 (Providence Rd)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Conduit (Trenched)	LF	3950	\$6.90	\$27,255.00	All purposes
- Conduit (Directional Drilled)	LF	1620	\$16.10	\$26,082.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	BTOTAL			\$108,734.45	
Communications					
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	1000	\$1.73	\$1,725.00	Drop cable to controller cabinet
- Tracer Wire	LF	1000	\$14.00	\$14,000.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 233 **Ramp:** NC 16 (Providence Rd)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	BTOTAL			\$33,112.50	
Pavement Marking					
- Pavement Marking Removal	LF	750	\$0.71	\$534.75	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	BTOTAL			\$1,482.93	
					•
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUE	BTOTAL			\$3,392.50	
SUBTOTAL CONSTRUCTION					

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 233 **Ramp:** NC 16 (Providence Rd)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Traffic Control	15%			\$24,327.46	
Contingencies	10%			\$16,218.31	
TOTAL CONSTRUCTION	TOTAL CONSTRUCTION				
Design	8%			\$16,218.31	
Construction	10%			\$20,272.88	
Administration					
				·	
TOTAL DESIGN AND CON	\$239,220.01				



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

234

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 234 **Ramp:** Rea Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	2019	\$2.88	\$5,814.72	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUE	BTOTAL			\$5,814.72	
Guardrail					
- Guardrail Rail	LF	300	\$20.00	\$6,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SUE	BTOTAL			\$7,725.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	BTOTAL			\$0.00	
		,			
Signalization					
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 234 Ramp: Rea Rd

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Conduit (Trenched)	LF	2950	\$6.90	\$20,355.00	All purposes
- Conduit (Directional	LF	1370	\$16.10	\$22,057.00	Five ramp
Drilled)					crossings,
					multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller	EA	1	\$16,100.00	\$16,100.00	
and Cabinet					
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and	EA	0	\$17,250.00	\$0.00	
Foundation					
- Pedestal Pole (Type III	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
with Foundation)					
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each
		_			pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter
0: 10.11	. –	000	DO 40	# 4 000 00	advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	BTOTAL	1		\$97,809.45	
	ı	T	Г		
Communications			* + + = * * * *		
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill
					on
					Mainline/Splice
	— •		1 4 705 00	A	Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable	LF	0	\$1.73	\$0.00	Drop cable to
(six strands)			* * * * * * * * * *	40.55	controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet	LS	1	\$1,080.00	\$1,080.00	
Service		_	0		
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 234 Ramp: Rea Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	BTOTAL			\$17,547.50	
Pavement Marking					
- Pavement Marking Removal	LF	750	\$0.71	\$534.75	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	BTOTAL			\$1,482.93	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUE	BTOTAL			\$3,392.50	
SUBTOTAL CONSTRUCTION					

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 234 Ramp: Rea Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Traffic Control	15%		\$20),065.81	
Contingencies	10%		\$13	3,377.21	
TOTAL CONSTRUCTION		\$16	7,215.12		
Design	8%		\$13	3,377.21	
Construction	10%	10%		5,721.51	
Administration					
TOTAL DESIGN AND CONSTRUCTION			\$19	7,313.84	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

235

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 235 **Ramp:** Rea Rd. (Loop)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions			
Earthwork and Structure								
- Retaining Wall	SF	0	\$85.00	\$0.00				
- Excavation	CY	0	\$25.00	\$0.00				
- Fill	CY	0	\$22.00	\$0.00				
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00				
- Seeding	SY	1852	\$2.88	\$5,333.76	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.			
SUE	BTOTAL			\$5,333.76				
Guardrail								
- Guardrail Rail	LF	300	\$20.00	\$6,000.00				
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00				
SUE	BTOTAL			\$7,725.00				
Drainage								
- Pipe	LF	0	\$60.00	\$0.00	Extend existing			
SUE	BTOTAL			\$0.00				
	1	1		1				
Signalization		_						
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane			
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance			
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'			
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00				
- Conduit (Trenched)	LF	2700	\$6.90	\$18,630.00	All purposes			

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 235 Ramp: Rea Rd. (Loop)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Conduit (Directional Drilled)	LF	1370	\$16.10	\$22,057.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	BTOTAL			\$96,084.45	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 235 Ramp: Rea Rd. (Loop)

Categories	Unit	Quantity	Unit Cost	Total Cost	Assumptions	
Descriptions		Qualitity	Offic Cost		Assumptions	
SUE	\$17,547.50					
Pavement Marking						
- Pavement Marking Removal	LF	750	\$0.71	\$534.75	40 MPH design speed. 110' transitions, 100' narrowed lane	
- Raised Pavement Markers	EA	0	\$5.18	\$0.00		
- White Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane	
- Yellow Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100' narrowed lane	
- White Skip Line	LF	0	\$0.28	\$0.00		
- 24" Stop Bar	LF	16	\$8.05	\$128.80		
SUE	BTOTAL			\$1,482.93		
Signing				I		
	EA	2	\$747.50	\$1,495.00	Sign and past only	
- W3-7, Ramp Meter Ahead	EA	2	•		Sign and post only	
- W3-8, Ramp Metered When Flashing		2	\$747.50	\$1,495.00	Sign and post only	
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted	
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted	
	BTOTAL			\$3,392.50		
SUBTOTAL CONSTRUCTION	ON			\$131,566.14		
Troffic Combrol	450/			1 1 1 1 1 1 1 1 1 1		
Traffic Control	15% 10%			\$19,734.92		
Contingencies TOTAL CONSTRUCTION	\$13,156.61					
TOTAL CONSTRUCTION	\$164,457.67					
Design	8%			\$13,156.61		
Construction Administration	10%			\$16,445.77		
Construction / tarminotration	\$10,445.77					
TOTAL DESIGN AND CONS						



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

236

Typical Design and Construction Costs Single Lane Ramp Meter

Rea Rd

Log No.: 236 **Ramp:** (LOOP)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structu	re				
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	1500	\$2.88	\$4,320.00	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
	SUBTOTA	L		\$4,320.00	
Guardrail					
- Guardrail Rail	LF	250	\$20.00	\$5,000.00	
- Guardrail Approach		250		. ,	
End Treatment	EA	1	\$1,725.00	\$1,725.00	
	SUBTOTA	Ĺ		\$6,725.00	
Drainage					
- Pipe	LF	50	\$60.00	\$3,000.00	Extend existing
	SUBTOTA	L		\$3,000.00	
	I	T			
Signalization					
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00	
- Conduit (Trenched)	LF	2950	\$6.90	\$20,355.00	All purposes
- Conduit (Directional Drilled)	LF	1370	\$16.10	\$22,057.00	Five ramp crossings, multiple conduits

Typical Design and Construction Costs Single Lane Ramp Meter

Rea Rd

Log No.: 236 **Ramp**: (LOOP)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
	SUBTOTA	L		\$98,716.80	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
5	SUBTOTA	<u>L</u>		\$17,547.50	

Typical Design and Construction Costs Single Lane Ramp Meter

Rea Rd

Log No.: 236 Ramp: (LOOP)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Pavement Marking					
- Pavement Marking Removal	LF	600	\$0.71	\$427.80	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	300	\$1.09	\$327.75	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	300	\$1.09	\$327.75	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
S	UBTOTA	L		\$1,212.10	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
S	UBTOTA	L		\$3,392.50	
SUBTOTAL CONSTRUC	CTION			\$134,913.90	
OODIOTAL OOMOTRO	J.1.011			Ψ10-1,010.00	
Traffic Control			15%	\$20,237.09	1
Contingencies			10%	\$13,491.39	1
TOTAL CONSTRUCTIO	N		\$168,642.38	1	
Design			8%	\$13,491.39	-
Construction Administration			10%	\$16,864.24	
TOTAL DESIGN AND CONSTRUCTION				\$198,998.00	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

237

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 237 Ramp: Rea Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions				
Earthwork and Structure									
- Retaining Wall	SF	0	\$85.00	\$0.00					
- Excavation	CY	0	\$25.00	\$0.00					
- Fill	CY	0	\$22.00	\$0.00					
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00					
- Seeding	SY	2052	\$2.88	\$5,909.76	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.				
SUB	TOTAL			\$5,909.76					
Guardrail									
- Guardrail Rail	LF	150	\$20.00	\$3,000.00					
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00					
SUB	TOTAL			\$3,000.00					
Drainage									
- Pipe	LF	0	\$60.00	\$0.00	Extend existing				
SUB	TOTAL			\$0.00					
Signalization									
- 6x6' loops - Mainline	EA	4	\$453.68	\$1,814.70	Mainline detection two loops per lane				
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance				
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'				
- Pullbox (Std.)	EA	10	\$345.00	\$3,450.00					

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 237 Ramp: Rea Rd

Categories	Unit	Quantity	Unit Cost	Total Cost	Accumptions
Descriptions		Quantity	Unit Cost	Total Cost	Assumptions
- Conduit (Trenched)	LF	3000	\$6.90	\$20,700.00	All purposes
- Conduit (Directional Drilled)	LF	1620	\$16.10	\$26,082.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1600	\$5.75	\$9,200.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUB	TOTAL			\$102,754.45	
Communications					
	_ ^	0	C4 450 00	ФО ОО	Links CMEO
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 237 Ramp: Rea Rd

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- CCTV Cabinet (Pole	EA	1	\$3,300.00	\$3,300.00	
Mount, Type 336)			. ,	, ,	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUB	TOTAL			\$17,547.50	
Developed Moulting					
Pavement Marking		750	Φ0.74	ΦE04.75	40 MDU de sieve
- Pavement Marking Removal	LF	750	\$0.71	\$534.75	40 MPH design
Removal					speed. 110' transitions, 100'
					narrowed lane
- Raised Pavement	EA	0	\$5.18	\$0.00	Harrowed lane
Markers	LA	U	ψ5.10	ψ0.00	
- White Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100'
l me		0.0	ψ.100	V 100100	narrowed lane
- Yellow Edge Line	LF	375	\$1.09	\$409.69	110' transitions, 100'
			•	· ·	narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUB	TOTAL	ı		\$1,482.93	
Cianina				T	
Signing	— A		47.47.5 0	# 4 405 00	
- W3-7, Ramp Meter	EA	2	\$747.50	\$1,495.00	Sign and post only
Ahead Watered	EA	2	Ф 7 47 БО	¢4 40E 00	Cian and nest only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop	EA	1	\$201.25	\$201.25	Pedestal mounted
Here on Red	LA	'	Ψ201.23	Ψ201.23	i edesiai modified
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal mounted
Green			,	4 -55	
SUB					
				\$3,392.50 \$134,087.14	
SUBTOTAL CONSTRUCTION	_				
Traffic Control	15%			\$20,113.07	_
Contingencies	10%			\$13,408.71	-
TOTAL CONSTRUCTION	1 .070			\$167,608.92	-
	1				

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 237 Ramp: Rea Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Design	8%			\$13,408.71	
Construction Administration	10%			\$16,760.89	
TOTAL DESIGN AND CONSTRUCTION \$197,778.					



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

238

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 238 Ramp: US 521 (Johnston Rd)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	3027	\$2.88	\$8,717.76	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUE	BTOTAL	i		\$8,717.76	
Guardrail					
- Guardrail Rail	LF	300	\$20.00	\$6,000.00	
- Guardrail Approach End	EA	1	\$1,725.00	\$1,725.00	
Treatment			. ,	, ,	
SUE	BTOTAL			\$7,725.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	BTOTAL			\$0.00	
Signalization					
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection
			<u> </u>		two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	4450	\$6.90	\$30,705.00	All purposes
- Conduit (Directional Drilled)	LF	3120	\$16.10	\$50,232.00	Five ramp crossings, multiple conduits

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 238 Ramp: US 521 (Johnston Rd)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	5000	\$5.75	\$28,750.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	BTOTAL			\$158,056.80	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	BTOTAL			\$17,547.50	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 238 Ramp: US 521 (Johnston Rd)

Categories	Unit	Quantity	Unit Cost	Total Cost	Assumptions	
Descriptions Descriptions					•	
Pavement Marking - Pavement Marking	LF	1000	\$0.71	\$713.00	40 MPH design	
Removal	LI	1000	φ0.7 1	φ/13.00	speed. 110'	
Removal					transitions, 100'	
					narrowed lane	
- Raised Pavement	EA	0	\$5.18	\$0.00	Tidirowod idrio	
Markers	_, 、		Ψοιτο	Ψοίσο		
- White Edge Line	LF	500	\$1.09	\$546.25	110' transitions, 100'	
			•	*	narrowed lane	
- Yellow Edge Line	LF	500	\$1.09	\$546.25	110' transitions, 100'	
			-		narrowed lane	
- White Skip Line	LF	0	\$0.28	\$0.00		
- 24" Stop Bar	LF	16	\$8.05	\$128.80		
SUE	BTOTAL			\$1,934.30		
0:		1			1	
Signing				•		
- W3-7, Ramp Meter	EA	2	\$747.50	\$1,495.00	Sign and post only	
Ahead			A-1-	A. 10=00		
- W3-8, Ramp Metered	EA	2	\$747.50	\$1,495.00	Sign and post only	
When Flashing	- ^		#	\$ 004.05	D 1 (1	
- R10-6R and R10-6L,	EA	1	\$201.25	\$201.25	Pedestal mounted	
Stop Here on Red	- ^	4	# 004.05	\$004.05	D. I. dal	
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal mounted	
Green	TOTAL			f2 202 E0		
506	BTOTAL	1		\$3,392.50		
SUBTOTAL CONSTRUCTI	ON			\$197,373.86		
Traffic Control	15%			\$29,606.08		
Contingencies	10%			\$19,737.39		
TOTAL CONSTRUCTION		\$246,717.33	_			
Design	8%			\$19,737.39		
Construction Administration				\$24,671.73	†	
	ΨΣΨ,071.70					
TOTAL DESIGN AND CONSTRUCTION \$291,1						



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

239

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 239 **Ramp:** US 521/Johnston Rd.

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	1960	\$2.88	\$5,644.80	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUE	BTOTAL			\$5,644.80	
Guardrail					
- Guardrail Rail	LF	150	\$20.00	\$3,000.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUE	BTOTAL			\$3,000.00	
	1	T			
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	BTOTAL			\$0.00	
	T	1			
Signalization			<u> </u>	<u> </u>	
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	2850	\$6.90	\$19,665.00	All purposes

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 239 Ramp: US 521/Johnston Rd.

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Conduit (Directional Drilled)	LF	1620	\$16.10	\$26,082.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	BTOTAL			\$102,741.80	
		Γ	· · · · · · · · · · · · · · · · · · ·		T
Communications			* 4 - 2 - 2 - 2		
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 239 **Ramp:** US 521/Johnston Rd.

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
•	BTOTAL			\$17,547.50	
Pavement Marking					
- Pavement Marking	LF	600	\$0.71	\$427.80	40 MPH design
Removal					speed. 110'
					transitions, 100'
					narrowed lane
- Raised Pavement	EA	0	\$5.18	\$0.00	
Markers			4		
- White Edge Line	LF	300	\$1.09	\$327.75	110' transitions, 100'
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		000	* 4 . 0 0	*	narrowed lane
- Yellow Edge Line	LF	300	\$1.09	\$327.75	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	BTOTAL	ı		\$1,212.10	
Signing					
- W3-7, Ramp Meter	EA	2	\$747.50	\$1,495.00	Sign and post only
Ahead	_, 、	_	φσσ	Ψ1,100.00	oight and poot only
- W3-8, Ramp Metered	EA	2	\$747.50	\$1,495.00	Sign and post only
When Flashing			•	, ,	
- R10-6R and R10-6L,	EA	1	\$201.25	\$201.25	Pedestal mounted
Stop Here on Red					
- R10-28, One Vehicle Per	EA	1	\$201.25	\$201.25	Pedestal mounted
Green					
SUE	BTOTAL	ı		\$3,392.50	
SUBTOTAL CONSTRUCTI	ON			\$133,538.70	
	T -				
Traffic Control	15%			\$20,030.81	_
Contingencies 10%				\$13,353.87	_
TOTAL CONSTRUCTION		\$166,923.38	-		
Design	8%			\$13,353.87	-
Construction Administration	10%			\$16,692.34	
TOTAL DESIGN AND CON	STRUC	TION		\$196,969.58	-
. CIME DESIGN AND CON					



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

250

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 250 **Ramp:** Briar Creek Rd

Location: US 74 - Independence Blvd WB

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	
- Seeding	SY	1960	\$2.88	\$5,644.80	Seeding around trench, conduit runs, pull box, clear/grub area, and foundation areas.
SUE	BTOTAL			\$5,644.80	
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUE	BTOTAL			\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	BTOTAL			\$0.00	
O'ma l'agrica	1				
Signalization Mainline	EA		Ф4 Г О СО	ФО 7 00 ОГ	Mainline detection
- 6x6' loops - Mainline		6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	5	\$453.68	\$2,268.38	One queue, three passage and one clearance
- Detector Lead-in Cable	EA	1200	\$1.73	\$2,070.00	Assumed setback distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	2850	\$6.90	\$19,665.00	All purposes
- Conduit (Directional Drilled)	LF	1620	\$16.10	\$26,082.00	Five ramp crossings, multiple conduits

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 250 Ramp: Briar Creek Rd

Location: US 74 - Independence Blvd WB

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	630	\$3.16	\$1,992.38	
SUE	BTOTAL			\$102,741.80	
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For Direction Drill on Mainline/Splice Enclosures
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	0	\$1.73	\$0.00	Drop cable to controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet Service	LS	1	\$1,080.00	\$1,080.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	45' Mounting height
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	BTOTAL			\$17,547.50	
Pavement Marking					

Typical Design and Construction Costs Single Lane Ramp Meter

Log No.: 250 Ramp: Briar Creek Rd

Location: US 74 - Independence Blvd WB

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Pavement Marking Removal	LF	900	\$0.71	\$641.70	40 MPH design speed. 110' transitions, 100' narrowed lane
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	
- White Edge Line	LF	450	\$1.09	\$491.63	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	450	\$1.09	\$491.63	110' transitions, 100' narrowed lane
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	16	\$8.05	\$128.80	
SUE	BTOTAL	1		\$1,753.75	
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	1	\$201.25	\$201.25	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	1	\$201.25	\$201.25	Pedestal mounted
SUE	BTOTAL			\$3,392.50	
SUBTOTAL CONSTRUCTI	ON			\$131,080.35	
GOBIGIAL GONOTROOT	<u> </u>			Ψ101,000.00	
Traffic Control	15%			\$19,662.05	
Contingencies	10%			\$13,108.04	
TOTAL CONSTRUCTION				\$163,850.44	
Design	8%			\$13,108.04	\dashv
Construction Administration	10%			\$16,385.04	
TOTAL DESIGN AND CON	STRUC	TION		\$193,343.52	

3.2 Proposed Two Lane Ramp Locations

3.2.1 Mecklenburg County



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

093

Typical Design and Construction Costs Two Lane Ramp Meter

Log No.: 093 **Ramp:** Westinghouse Blvd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	Assumed 6'x1300
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	Assumed 12'x1000'x6'
- Supp Clearing and Grub	AC	0	\$300.00	\$ 0.00	Assumed 25'x1000'
- Seeding	SY	1755	\$2.88	\$5,054.40	Seeding around trench, conduit runs, pull box, and foundation areas.
SU	BTOTAL	_		\$5,054.40	
		Ţ	,		
Guardrail					
- Guardrail Rail	LF	350	\$20.00	\$7,000.00	
- Guardrail Approach End Treatment	EA	1	\$1,725.00	\$1,725.00	
SU	BTOTAL	=		\$8,725.00	
Paving					
- Ramp Widening	SY	3140	\$62.50	\$196,250.00	includes both asphalt and binder
- Pavement Resurfacing	SY	4225	\$13.50	\$57,037.50	
SU	\$253,287.50				
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SU	BTOTAL			\$0.00	
	<u></u>				

Typical Design and Construction Costs Two Lane Ramp Meter

Log No.: 093 **Ramp:** Westinghouse Blvd (Mecklenburg Co.)

Categories	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Descriptions	O i ii c	Quantity	Oint Goot	10101 0001	Accumptions
Signalization					
- 6x6' loops - Mainline	EA	8	\$453.68	\$3,629.40	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	10	\$453.68	\$4,536.75	Two queue, six passage and two clearance
- Detector Lead-in Cable	EA	900	\$1.73	\$1,552.50	Assumed setback distance 350'
- Pullbox (Std.)	EA	19	\$345.00	\$6,555.00	
- Conduit (Trenched)	LF	2500	\$6.90	\$17,250.00	All purposes
- Conduit (Directional Drilled)	LF	1360	\$16.10	\$21,896.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1500	\$5.75	\$8,625.00	
- Ground Rods	EA	8	\$82.00	\$656.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	4	\$500.00	\$2,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	540	\$3.16	\$1,707.75	
SUI	BTOTAL	•		\$102,093.40	
				•	l
Communications					
- Splice Enclosure	EA	0	\$1,150.00	\$0.00	Link to SMFO
- Pullbox (Special Size)	EA	0	\$2,012.50	\$0.00	For splice enclosure
- Interconnect Center	EA	0	\$1,725.00	\$0.00	In cabinet

Typical Design and Construction Costs Two Lane Ramp Meter

Log No.: 093 **Ramp:** Westinghouse Blvd (Mecklenburg Co.)

Categories				_	
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Fiber-optic Drop Cable	LF	0	\$1.73	\$0.00	Drop cable to
(six strands)	LF	U	φ1./3	φυ.υυ	controller cabinet
- Tracer Wire	LF	0	\$14.00	\$0.00	
- Broadband Internet	LS	1	\$1,080.00	\$1,080.00	
Service			. ,	. ,	4=1-1-1
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	45' Mounting height
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	
- CCTV Cabinet (Pole	EA	1	\$3,300.00	\$3,300.00	
Mount, Type 336) - CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
	BTOTAL		\$4,000.00	\$15,535.00	
301	BIOIAL			ψ13,333.00	
Pavement Marking					40 MPH design speed. 110' transitions, 100' narrowed lane
- Pavement Marking Removal	LF	2000	\$0.71	\$1,426.00	Along skip line only
- Raised Pavement Markers	EA	12	\$5.18	\$62.10	110' transitions, 100' narrowed lane
- White Edge Line	LF	1000	\$1.09	\$1,092.50	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	1000	\$1.09	\$1,092.50	
- White Skip Line	LF	900	\$0.28	\$248.40	
- 24" Stop Bar	LF	24	\$8.05	\$193.20	
SUI	BTOTAL	-		\$4,114.70	
		1		T	
Signing					Sign and post only
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Pedestal mounted
- R10-6R and R10-6L, Stop Here on Red	EA	2	\$201.25	\$402.50	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	2	\$201.25	\$402.50	

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Two Lane Ramp Meter

Log No.: 093 **Ramp:** Westinghouse Blvd (Mecklenburg Co.)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- W4-1L, Merge Left	EA	1	\$747.50	\$747.50	
SUE	STOTAL	-		\$4,542.50	
SUBTOTAL CONSTRUCTION	ON			\$393,352.50	
Traffic Control	15%			\$59,002.88	
Contingencies	10%			\$39,335.25	
TOTAL CONSTRUCTION				\$491,690.63	
Design	8%			\$39,335.25	
Construction Administration	10%			\$49,169.06	
TOTAL DESIGN AND CON	\$580,194.94				



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

175

Typical Design and Construction Costs Two Lane Ramp Meter

Log No.: 175 **Ramp:** Arrowood Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure			<u> </u>		
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Seeding	SY	2314	\$2.88	\$6,664.32	Seeding around trench, conduit runs, pull box, and foundation areas.
SUE	BTOTAL			\$6,664.32	
	T	1		T	T
Guardrail					
- Guardrail Rail	LF	0	\$20.00	\$0.00	
- Guardrail Approach End Treatment	EA	0	\$1,725.00	\$0.00	
SUE	BTOTAL			\$0.00	
Paving					
- Ramp Widening	SY	3140	\$62.50	\$196,250.00	includes both asphalt and binder
- Pavement Resurfacing	SY	4225	\$13.50	\$57,037.50	
SUE	BTOTAL			\$253,287.50	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SUE	BTOTAL			\$0.00	
	T	,			
Signalization					
- 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection two loops per lane
- 6x6' loops - Ramp	EA	10	\$453.68	\$4,536.75	Two queue, six passage and two clearance

Typical Design and Construction Costs Two Lane Ramp Meter

Log No.: 175 **Ramp:** Arrowood Rd

Categories	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Descriptions	Offic	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	850	\$1.73	\$1,466.25	Assumed setback distance 350'
- Pullbox (Std.)	EA	17	\$345.00	\$5,865.00	alotarros oso
- Conduit (Trenched)	LF	3350	\$6.90	\$23,115.00	All purposes
- Conduit (Directional Drilled)	LF	2370	\$16.10	\$38,157.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	0	\$5.75	\$0.00	
- Ground Rods	EA	6	\$82.00	\$492.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.0 0	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
 45' Mast Arm Poles and Foundation 	EA	0	\$17,250.0 0	\$0.00	
 Pedestal Pole (Type III with Foundation) 	EA	2	\$3,650.00	\$7,300.00	Breakaway pole
- Two Section Signal Head	EA	4	\$500.00	\$2,000.00	Two each pedestal pole
- One Section Signal Head	EA	2	\$575.00	\$1,150.00	Ramp meter advance signal
- Signal Cable	LF	190	\$3.16	\$600.88	
SUE	BTOTAL			\$112,639.93	
Communications					
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For splice enclosure
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet
 Fiber-optic Drop Cable (six strands) 	LF	750	\$1.73	\$1,293.75	Drop cable to controller cabinet
- Tracer Wire	LF	750	\$14.00	\$10,500.00	
- Broadband Internet Service	LS	0	\$1,080.00	\$0.00	
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	45' Mounting height

Typical Design and Construction Costs Two Lane Ramp Meter

Log No.: 175 **Ramp:** Arrowood Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	
- CCTV Cabinet (Pole Mount, Type 336)	EA	1	\$3,300.00	\$3,300.00	
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SUE	BTOTAL			\$29,181.25	
Pavement Marking					40 MPH design speed. 110' transitions, 100' narrowed lane
- Pavement Marking Removal	LF	1000	\$0.71	\$713.00	Along skip line only
- Raised Pavement Markers	EA	0	\$5.18	\$0.00	110' transitions, 100' narrowed lane
- White Edge Line	LF	500	\$1.09	\$546.25	110' transitions, 100' narrowed lane
- Yellow Edge Line	LF	500	\$1.09	\$546.25	
- White Skip Line	LF	0	\$0.28	\$0.00	
- 24" Stop Bar	LF	24	\$8.05	\$193.20	
SUE	TOTAL			\$1,998.70	
Signing					Sign and post only
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Pedestal mounted
- R10-6R and R10-6L, Stop Here on Red	EA	2	\$201.25	\$402.50	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	2	\$201.25	\$402.50	
- W4-1L, Merge Left	EA	1	\$747.50	\$747.50	
SUE	BTOTAL			\$4,542.50	
OUDTOTAL	ONOTO	HOTION		#400 044 00	
SUBTOTAL (JUN2 I K	OCTION		\$408,314.20	
Traffic Control	15%			\$61,247.13	
Contingencies	10%			\$40,831.42	
TOTAL CONSTRUCTION	•			\$510,392.74	

M-0468 Ramp Metering Feasibility Study for Cabarrus, Gaston, Iredell, and Mecklenburg Counties

Final Individual Site Cost Estimate Report

Typical Design and Construction Costs Two Lane Ramp Meter

Log No.: 175 **Ramp:** Arrowood Rd

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Design	8%			\$40,831.42	
Construction Administration	10%			\$51,039.27	
TOTAL DESIGN AND CON					

3.3 Proposed Two Lane Freeway to Freeway Ramp Locations

3.3.1 Mecklenburg County



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

097

Typical Design and Construction Costs Two Lane Freeway to Freeway Ramp Meter

Log No.: 97 **Ramp:** I-485 (F2F)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Seeding	SY	3160	\$2.88	\$9,100.80	Seeding around trench, conduit runs, pull box, and foundation areas.
SU	BTOTAL			\$9,100.80	
	T	T			_
Guardrail					
- Guardrail Rail	LF	300	\$20.00	\$6,000.00	
- Guardrail Approach End	EA	1	\$1,725.00	\$1,725.00	
Treatment					
SU	BTOTAL			\$7,725.00	
Paving					1
- Ramp Widening	SY	0	\$62.50	\$0.00	includes both asphalt
- Kamp Widening		U		φυ.υυ	and binder
- Pavement Resurfacing	SY	0	\$13.50	\$0.00	
SUBTOTAL				\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SU	BTOTAL	•		\$0.00	
			,		
Signalization					

Typical Design and Construction Costs Two Lane Freeway to Freeway Ramp Meter

Log No.: 97 **Ramp:** I-485 (F2F)

Categories	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Descriptions - 6x6' loops - Mainline	EA	6	\$453.68	\$2,722.05	Mainline detection
- 6x6' loops - Ramp	EA	10	\$453.68	\$4,536.75	two queue, six passage and two clearance
- Detector Lead-in Cable	EA	390	\$1.73	\$672.75	Assumed setback distance 350'
- Pullbox (Std.)	EA	17	\$345.00	\$5,865.00	
- Conduit (Trenched)	LF	4625	\$6.90	\$31,912.50	All purposes
- Conduit (Directional Drilled)	LF	3620	\$16.10	\$58,282.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1000	\$5.75	\$5,750.00	
- Ground Rods	EA	5	\$82.00	\$410.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.0 0	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	1	\$17,250.0 0	\$17,250.00	
- Pedestal Pole (Type III with Foundation)	EA	0	\$3,650.00	\$0.00	
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	
- One Section Signal Head	EA	6	\$575.00	\$3,450.00	Ramp meter advance signal
- Signal Cable	LF	190	\$3.16	\$600.88	
	BTOTAL	1		\$157,686.93	
Communications					
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For splice enclosure
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	500	\$1.73	\$862.50	Drop cable to controller cabinet
- Tracer Wire	LF	500	\$14.00	\$7,000.00	

Typical Design and Construction Costs Two Lane Freeway to Freeway Ramp Meter

Log No.: 97 **Ramp:** I-485 (F2F)

Categories	11.14	0 414		T . 10	
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Broadband Internet	LS	0	\$500.00	\$0.00	
Service					
- Ethernet Switch	EA	0	\$1,955.00	\$0.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	
- CCTV Cabinet (Pole	EA	1	\$3,300.00	\$3,300.00	
Mount, Type 336)					
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SU	BTOTAL			\$25,250.00	
Pavement Marking					
- Pavement Marking	LF	2000	\$0.71	\$1,426.00	To narrow lanes, 50
Removal					PMH design speed,
					maintain one
					edgeline, pave over
Daised Daysers and			ФГ 4O	045.50	other edgeline
- Raised Pavement	EA	3	\$5.18	\$15.53	Along skip line only
Markers	LF	400	\$1.09	\$437.00	200' transitions 100'
- White Edge Line	LF	400	Φ1.09	\$437.00	200' transitions, 100' narrowed lane, 50
					MPH
- Yellow Edge Line	LF	600	\$1.09	\$655.50	200' transitions, 100'
Tellow Lage Line			Ψ1.05	ψ000.00	narrowed lane, 50
					MPH
- White Skip Line	LF	200	\$0.28	\$55.20	
- 24" Stop Bar	LF	24	\$8.05	\$193.20	
	BTOTAL		·	\$2,782.43	
Signing					
- W3-7, Ramp Meter	EA	2	\$747.50	\$1,495.00	Sign and post only
Ahead					
- W3-8, Ramp Metered	EA	2	\$747.50	\$1,495.00	Sign and post only
When Flashing					
- R10-6R and R10-6L,	EA	2	\$201.25	\$402.50	Pedestal mounted
Stop Here on Red					
- R10-28, One Vehicle Per	EA	2	\$201.25	\$402.50	Pedestal mounted
Green					
- W4-1L, Merge Left	EA	2	\$747.50	\$1,495.00	

Typical Design and Construction Costs Two Lane Freeway to Freeway Ramp Meter

Log No.: 97 **Ramp:** I-485 (F2F)

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Sign Structure (Cantilever)	EA	2	\$57,500.00	\$115,000.00	
- Ramp Meter On Sign (Message A)	EA	1	\$5,750.00	\$5,750.00	
- Ramp Meter On Sign (Message B)	EA	1	\$5,750.00	\$5,750.00	
SUB	TOTAL			\$131,790.00	
SUBTOTAL CONSTRUCTION	N			\$334,335.15	
Traffic Control	15%			\$50,150.27	
Traffic Control Contingencies	15% 10%			\$50,150.27 \$33,433.52	
	_			<u> </u>	
Contingencies TOTAL CONSTRUCTION	10%			\$33,433.52 \$417,918.94	
Contingencies TOTAL CONSTRUCTION Design	10%			\$33,433.52 \$417,918.94 \$33,433.52	
Contingencies TOTAL CONSTRUCTION	10%			\$33,433.52 \$417,918.94	



NCDOT Ramp Metering Feasibility Study Individual Site Cost Estimate

129

Typical Design and Construction Costs Two Lane Freeway to Freeway Ramp Meter

Log No.: 129 Ramp: I-85 Southbound

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
Earthwork and Structure					
- Retaining Wall	SF	0	\$85.00	\$0.00	
- Excavation	CY	0	\$25.00	\$0.00	
- Fill	CY	0	\$22.00	\$0.00	
- Seeding	SY	2409	\$2.88	\$6,937.92	Seeding around trench, conduit runs, pull box, and foundation areas.
SU	BTOTAL			\$6,937.92	
	T	1			
Guardrail					
- Guardrail Rail	LF	500	\$20.00	\$10,000.00	
- Guardrail Approach End Treatment	EA	2	\$1,725.00	\$3,450.00	
SU	BTOTAL			\$13,450.00	
Paving					
- Ramp Widening	SY	0	\$62.50	\$0.00	includes both asphalt and binder
- Pavement Resurfacing	SY	0	\$13.50	\$0.00	
SUBTOTAL				\$0.00	
Drainage					
- Pipe	LF	0	\$60.00	\$0.00	Extend existing
SU	BTOTAL			\$0.00	
	T	1		T	
Signalization			A 1-2-2-2		
- 6x6' loops - Mainline	EA	10	\$453.68	\$4,536.75	Mainline detection
- 6x6' loops - Ramp	EA	10	\$453.68	\$4,536.75	two queue, six passage and two clearance

Typical Design and Construction Costs Two Lane Freeway to Freeway Ramp Meter

Log No.: 129 Ramp: I-85 Southbound

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Detector Lead-in Cable	EA	390	\$1.73	\$672.75	Assumed setback distance 350'
- Pullbox (Std.)	EA	12	\$345.00	\$4,140.00	
- Conduit (Trenched)	LF	3535	\$6.90	\$24,391.50	All purposes
- Conduit (Directional Drilled)	LF	340	\$16.10	\$5,474.00	Five ramp crossings, multiple conduits
- Electrical Service	EA	1	\$1,500.00	\$1,500.00	
- Electrical Conductors	LF	1000	\$5.75	\$5,750.00	
- Ground Rods	EA	4	\$82.00	\$328.00	
- ATC/2070E Controller and Cabinet	EA	1	\$16,100.00	\$16,100.00	
- Firmware/Calibration	EA	1	\$6,095.00	\$6,095.00	
- Cabinet Foundation	EA	1	\$1,540.00	\$1,540.00	
- 45' Mast Arm Poles and Foundation	EA	0	\$17,250.00	\$0.00	
- Pedestal Pole (Type III with Foundation)	EA	0	\$3,650.00	\$0.00	
- Two Section Signal Head	EA	2	\$500.00	\$1,000.00	
- One Section Signal Head	EA	6	\$575.00	\$3,450.00	Ramp meter advance signal
- Signal Cable	LF	190	\$3.16	\$600.88	
SU	BTOTAL			\$80,115.63	
					•
Communications					
- Splice Enclosure	EA	1	\$1,150.00	\$1,150.00	Link to SMFO
- Pullbox (Special Size)	EA	1	\$2,012.50	\$2,012.50	For splice enclosure
- Interconnect Center	EA	1	\$1,725.00	\$1,725.00	In cabinet
- Fiber-optic Drop Cable (six strands)	LF	500	\$1.73	\$862.50	Drop cable to controller cabinet
- Tracer Wire	LF	500	\$14.00	\$7,000.00	
- Broadband Internet Service	LS	0	\$500.00	\$0.00	
- Ethernet Switch	EA	1	\$1,955.00	\$1,955.00	
- CCTV Pole (55' Wood)	EA	1	\$4,600.00	\$4,600.00	

Typical Design and Construction Costs Two Lane Freeway to Freeway Ramp Meter

Log No.: 129 Ramp: I-85 Southbound

Categories					
Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- CCTV Cabinet (Pole	EA	1	\$3,300.00	\$3,300.00	
Mount, Type 336)					
- CCTV Assembly	EA	1	\$4,600.00	\$4,600.00	
SU	\$27,205.00				
Pavement Marking					
- Pavement Marking Removal	LF	0	\$0.71	\$0.00	To narrow lanes, 50 PMH design speed, maintain one edgeline, pave over other edgeline
- Raised Pavement Markers	EA	3	\$5.18	\$15.53	Along skip line only
- White Edge Line	LF	400	\$1.09	\$437.00	200' transitions, 100' narrowed lane, 50 MPH
- Yellow Edge Line	LF	600	\$1.09	\$655.50	200' transitions, 100' narrowed lane, 50 MPH
- White Skip Line	LF	200	\$0.28	\$55.20	
- 24" Stop Bar	LF	32	\$8.05	\$257.60	
SU	\$1,420.83				
Signing					
- W3-7, Ramp Meter Ahead	EA	2	\$747.50	\$1,495.00	Sign and post only
- W3-8, Ramp Metered When Flashing	EA	2	\$747.50	\$1,495.00	Sign and post only
- R10-6R and R10-6L, Stop Here on Red	EA	2	\$201.25	\$402.50	Pedestal mounted
- R10-28, One Vehicle Per Green	EA	2	\$201.25	\$402.50	Pedestal mounted
- W4-1L, Merge Left	EA	2	\$747.50	\$1,495.00	
- Sign Structure (Cantilever)	EA	2	\$57,500.00	\$115,000.00	

Typical Design and Construction Costs Two Lane Freeway to Freeway Ramp Meter

Log No.: 129 Ramp: I-85 Southbound

Categories Descriptions	Unit	Quantity	Unit Cost	Total Cost	Assumptions
- Ramp Meter On Sign	EA	1	\$5,750.00	\$5,750.00	
(Message A)					
- Ramp Meter On Sign	EA	1	\$5,750.00	\$5,750.00	
(Message B)					
SUI	\$131,790.00				
SUBTOTAL CONSTRUCTION	\$260,919.37				
Traffic Control	15%			\$39,137.91	
Contingencies	10%			\$26,091.94	
TOTAL CONSTRUCTION	\$326,149.21				
Design	8%			\$26,091.94	
Construction Administration	10%			\$32,614.92	
TOTAL DESIGN AND CON	\$384,856.07				