

NORTH CAROLINA
DURHAM COUNTY

**MUNICIPAL OPERATIONS – COMPUTER,
COMMUNICATIONS, EQUIPMENT, AND SYSTEM
OPERATIONS FOR COMPUTERIZED TRAFFIC SIGNAL
SYSTEM AGREEMENT
SCHEDULE D**

DATE: 02/04/2014

NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION

AND

TIP #: R-4701E
WBS Element: 36247.5.1

CITY OF DURHAM

THIS AGREEMENT is made and entered into on the last date executed below, by and between the North Carolina Department of Transportation, an agency of the State of North Carolina, hereinafter referred to as the “Department” and the City of Durham hereinafter referred to as the “Municipality.”

WITNESSETH:

WHEREAS, Section 1108 of the Moving Ahead for Progress in the 21st Century (MAP-21) allows Surface Transportation Program (STP) funds to be available for certain specified transportation activities; and,

WHEREAS, the provisions of the North Carolina General Statute (NCGS) §136-18 and §136-66.1 authorize the Municipality to contract with the Department for the installation, repair, operations and maintenance of highway signs and markings, electric traffic signals, and other traffic control devices on State Highway System streets within the Municipality; and,

WHEREAS, the Department and the Municipality have a mutual interest in the efficient and effective operation of traffic signals within the Municipality; and,

WHEREAS, the Department and the Municipality recognize that each party to this Agreement has an obligation and responsibility to provide for the safe, orderly, and efficient flow of traffic on their respective street systems; and,

WHEREAS, the Municipality finds that it is in the best public interest to enter into an Agreement with the Department to operate the computerized traffic signal system; and,

WHEREAS, the Department finds it desirable and advantageous to reimburse the Municipality for costs incurred, when the Municipality operates that portion of the computerized traffic signal system that is on the State Highway System within or near the Municipality;

NOW, THEREFORE, the Department and the Municipality do hereby agree as follows:

1. GENERAL PROVISIONS

FEDERAL FUNDING ACCOUNTABILITY AND TRANSPARENCY ACT

All parties to this Agreement, including contractors, subcontractors, and subsequent workforces associated with any work under the terms of this Agreement, shall provide reports as required by the Federal Funding Accountability and Transparency Act (FFATA) for this Project.

COMPLIANCE WITH STATE/FEDERAL POLICY

The Municipality and/or its agent, including all contractors, subcontractors, or sub-recipients shall comply with all applicable Federal and State policies and procedures, stated both in this Agreement and in the Department's guidelines and procedures.

FAILURE TO COMPLY - CONSEQUENCES

Failure on the part of the Municipality to comply with any of the provisions of this Agreement will be grounds for the Department to terminate participation in the costs of the Project and, if applicable, seek repayment of any reimbursed funds.

2. SCOPE OF THE PROJECT

The Municipality shall operate the computerized traffic signal system as defined in the Appendices and as indicated hereinafter.

TIMING PLANS

- A. The Municipality shall be responsible for the evaluation and preparation of timing plans at all intersections in the traffic signal system. All traffic data needed for the evaluation and development of timing plans will be obtained by the Municipality whenever possible. The Municipality will notify the Department of any additional data that is required to evaluate and prepare the necessary timing plans. The Department shall, upon request, make available to the Municipality all current traffic count data for the existing signals.
- B. The timing plans affecting intersections on the State Highway System, utilized in system operation, will be subject to the approval of the Department and will reflect the needs of traffic on both the State Highway System and the Municipality's System. In the event the Department and the Municipality cannot agree on the selection of a given timing plan, the decision of the Department will be final.

ONGOING OPERATION OF THE SIGNAL SYSTEM

- C. The Municipality shall not install any traffic control devices, nor make any traffic signal phasing changes, on any State Highway System street without the prior approval of the Department, pursuant to NCGS §20-169.
- D. The Municipality shall operate the signal system in accordance with North Carolina General Statutes, the Department's current policies and guidelines as included in the Appendices, and all local codes and ordinances. If, in the opinion of the Department, the Municipality does not operate the signal system in accordance with the specified criteria, the Department shall have the right to enter into a separate operational agreement with a private contractor and deduct these costs from the Municipality's funds allocated under NCGS §136-41.1 and this Agreement.
- E. The Department shall review and concur with any contract entered into by the Municipality for the operation of any item(s).
- Any contract entered into with another party to perform work associated with the requirements of this Agreement shall contain appropriate provisions regarding the utilization of Disadvantaged Business Enterprises (DBEs), or as required and defined in Title 49 Part 26 of the Code of Federal Regulations and the North Carolina Administrative Code. These provisions are incorporated into this Agreement by reference <https://connect.ncdot.gov/municipalities/Pages/Bid-Proposals-for-LGA.aspx>.
 - The Municipality shall not advertise nor enter into a contract for services performed as part of this Agreement, unless the Department provides written approval of the advertisement or the contents of the contract.
 - If the Municipality fails to comply with these requirements, the Department will withhold funding until these requirements are met.
- F. The Municipality agrees to an annual audit of the performance of intersection equipment and systems. The audit is to be performed by the Department and the Municipality.

3. TIME FRAME

This agreement shall be for the current state fiscal year, beginning July 1, 2013 and ending June 30, 2014. At the end of the state fiscal year, the provision of services and quality of results may be reviewed by the Department and Municipality. The Agreement may be extended for additional fiscal years, contingent upon the availability of NCDOT maintenance funds by the General

Assembly. Extensions may be made in one (1) year increments, incorporating any mutually agreed upon adjustments, up to a total of five (5) years with the end of the final fiscal year of service being June 30, 2018. On behalf of the Municipality, extensions may be authorized and executed by the Town/City Manager and/or Mayor without further resolution of the Town/City Council. The agreement may be terminated by either party upon a thirty (30) day written notice.

- A. Upon termination of each year of service, and in connection with each extension of this Agreement, the Municipality may request an adjustment of the annual rates based on actual cost records for the prior years. This request must indicate the new rate for each Schedule D item. Each rate must be verifiable by time sheets, salary rates, materials, equipment, and other qualifying costs in conformance with the standards of allowable of costs set forth in the Office of Management and Budget (OMB) Circular A-87. This shall be actual cost incurred with the exception of equipment owned by the Municipality. Reimbursement for the rates of equipment owned by the Municipality cannot exceed the Department's rates in effect for the time period in which the work is performed.
- B. The cost records may be audited by the Department to determine any adjustments or revisions in the new rates.

4. FUNDING

The funding for this Project includes Federal and State funds. For state fiscal year July 1, 2013, the funding is 77% Federal and 23% State.

5. REIMBURSEMENT

The Department shall reimburse the Municipality quarterly, based on an annual amount, for the operation of the computerized traffic signal system as included below:

ELIGIBLE COSTS

- A. The reimbursement rates in this Agreement represent the Department's pro-rata share of the operational cost, which is based on the ratio of the number of State System intersections to the total number of intersections in the computerized traffic signal system. The Municipality shall maintain a current inventory list of all traffic signals within the system, and classify as

city- or state-owned. The current inventory list as included in the Appendices of this Agreement, will be used to determine the Department's pro-rata share.

- B. The Department shall reimburse the Municipality based on the annual operational amount of the computerized traffic signal system as included in the Appendices of this Agreement. This total amount includes the Department's pro-rata share of cost, as included in Provision 5A, for the salary, payroll additives of a Systems Operations Engineer(s) and Traffic Signals System Specialist(s), (and others as determined by system). These positions, as a minimum, shall exhibit the qualifications and perform the duties as included in the Appendices. The Systems Operations Engineer(s) and Traffic Signals System Specialist(s), (and others as determined by system) costs shall be based on the pro-rata share of time dedicated to the operation of the system.
- C. The Department shall reimburse the Municipality for operation of the Central Computer and Associated Hardware, CCTV Camera System, Communications Infrastructure, system detectors and other associated central and system field equipment. The Municipality shall be responsible for providing all needed replacement parts and equipment. Under this Agreement, the Department will reimburse the Municipality for its pro-rata share of the replacement or repair costs necessary for maintaining operability and any equipment included herein.
- D. The Municipality will not receive an annual reimbursement for fiber optic communications cable and CCTV cameras. The Department will reimburse the Municipality its pro-rata share of the actual costs for the emergency restoration of fiber optic communications and CCTV cameras. This cost shall include: fiber optic cable, interconnect centers, splice trays, fusion splicing, transceivers, Ethernet switches, labor, etc.
- E. Said reimbursement shall be limited to operational costs, which would include tasks associated with insuring the continuous, safe and efficient operation of traffic signals, traffic signal systems, and control facilities. Examples include, but are not limited to, emergency repairs to system components, periodic evaluation and adjustment to operational timing parameters, computer system and software upgrades, operational upgrades to maintain or improve safety or efficiency, etc.
- F. The Department will not reimburse operational costs for activities that do not have a direct and immediate effect on the continuous, safe and efficient operation of traffic signals, traffic signal systems, and control facilities including, but not limited to, painting of poles and signal cabinets, vegetation control adjacent to facilities, interior and exterior care of traffic control centers and parking areas, furniture for traffic control centers, etc.

- G. The Municipality agrees that it shall bear all costs for which it is unable to substantiate actual costs.
- H. Any costs incurred by the Municipality prior to written notification by the Department to proceed with the work shall not be eligible for reimbursement.
- I. The Department will reimburse the Municipality for its pro-rata share, as specified in the Appendices, for any Signal Systems operational contract in which it concurs. The Department shall have access to the contractor's records and documentation for audit, which pertains to any rates billed to the Municipality for the operation of those items for a period of five (5) years from the date of the final payment made under this agreement.
- J. Equipment secured as a non-participating item by the Department (100% Municipality costs) will continue as non-participating items with respect to operations. The Division Engineer will provide the necessary documentation for non-participating items.

PROCESS

- K. The Municipality shall submit a quarterly itemized invoice including the certified status report to the Department for said costs no later than three (3) months after the scheduled quarterly invoicing date. This invoice will reflect the balance between the quarterly payments issued by the Department and the total amount not to exceed \$153,271.58, unless additional reimbursements are approved by the Department. All final invoices must be submitted within one (1) year after the work is performed or said work will be considered non-billable and will not be paid for by the Department. The Department, at its option, may elect to increase the reimbursement rates up to three percent (3%) each year in consideration of inflation rates and cost increases, subject to the availability of funds and the performance of the Municipality.
- L. The Department shall reimburse the Municipality upon approval by the Department's Division Engineer and the Fiscal Management Section.

6. FORCE ACCOUNT

Work performed by the Municipality's own forces is considered force account work. Force account work that is not a part of the operational work included under this Agreement is only allowed when there is a finding of cost effectiveness for the work to be performed by some method other than contract awarded by competitive bidding process. Written approval from the FHWA Division Administrator is required **prior to the use of force account** by the Municipality. Said invoices for force account work shall show a summary of labor, labor additives, equipment,

materials and other qualifying costs in conformance with the standards for allowable costs set forth in Office of Management and Budget (OMB) Circular A-87 (www.whitehouse.gov/omb/circulars/index.html). Reimbursement shall be based on actual cost incurred with the exception of equipment owned by the Municipality or its Project partners. Reimbursement rates for equipment owned by the Municipality or its Project partners cannot exceed the Department's rates in effect for the time period in which the work is performed, nor the maximum amount included in Appendix VI.

EMERGENCY WORK

Under current Department policy, if force account work is necessary and performed by the Municipality during emergency occurrences or occurrences that endanger public safety, additional information shall be submitted to document the emergency situation, actions taken during the occurrence and the resolution with each quarterly invoice. Approval must be obtained from the Department and the FHWA-NC Division office, before reimbursement is made.

7. RECORDS AND REPORTS

- A. The Municipality shall furnish the Department's Division Engineer a certified quarterly status report that details the operation of the signal system. The status report shall be certified in writing by the Systems Operations Engineer and shall indicate intersection failures, local and system detector failures, the percentage of time the computer system was off-line, the repairs that were made and the dates of said repairs/replacements. The quarterly report shall also identify any new/deleted intersections in the traffic signal system and all traffic signal timing optimization performed. The Division Engineer will provide detailed guidance and reporting forms for the Municipality.
- B. In accordance with OMB Circular A-133, "Audits of States, Local Governments and Non-Profit Organizations" (www.whitehouse.gov/omb/circulars/index.html), dated June 27, 2003, the Federal Single Audit Act Amendments of 1996, and NCGS §159-34, the Municipality shall arrange for an independent financial and compliance audit of its fiscal operations. The Municipality shall furnish the Department with a copy of the independent audit report within thirty (30) days of completion of the report, but not later than nine (9) months after the Municipality fiscal year ends.
- C. The Municipality shall adhere to applicable administrative requirements of Title 49 Code of Federal Regulations, Part 18 (www.fhwa.dot.gov/legsregs/directives/fapgtoc.htm) and Office of Management and Budget (OMB) Circulars A-102 (www.whitehouse.gov/omb/circulars/index.html) "Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments." Reimbursement to

the Municipality shall be subject to the policies and procedures contained in Title 23 Code of Federal Regulations, Part 140 and Part 172, which is being incorporated into this Agreement by reference at www.fhwa.dot.gov/legregs/directives/fapgtoc.htm and by Office of Management and Budget (OMB) Circular A-87 (www.whitehouse.gov/omb/circulars/index.html) "Cost Principles for State, Local, and Indian Tribal Governments." Reimbursement to the Municipality shall be subject to the guidance contained in Title 2 Code of Federal Regulations, Part 170 (<http://edocket.access.gpo.gov/2010/pdf/2010-22705.pdf>) and Office of Management and Budget (OMB) "Federal Funding Accountability and Transparency Act" (FFATA). Said reimbursement shall also be subject to the Department being reimbursed by the Federal Highway Administration and subject to compliance by the Municipality with all applicable federal policy and procedures.

- D. The Municipality shall keep and maintain all books, documents, papers, accounting records, other such cost records and supporting documentation and evidence as may be appropriate to substantiate costs incurred under this Agreement. Further, the Municipality shall make such materials available at its office at all reasonable times during the Agreement period, and for five (5) years from the date of the final payment made under this agreement, for inspection and audit by the Department's Financial Management Division and FHWA.

8. ADDITIONAL PROVISIONS

- A. This Agreement does not transfer legal control of, or responsibility, or legal liability for the State Highway System roads described herein to the Municipality, nor does it prohibit the Department from taking any action or undertaking any responsibilities with regard to such roads. This Agreement is solely for the benefit of the Municipality and the Department and not for the benefit of any other persons including, but not limited to, members of the public or users of the State Highway System roads, and no third party rights are created, or intended to be created, by this Agreement.
- B. The Municipality shall comply with Title VI of the Civil Rights Act of 1964, (Title 49 CFR, Subtitle A, Part 21). Title VI prohibits discrimination on the basis of race, color, national origin, disability, gender, and age in all programs or activities of any recipient of Federal assistance.
- C. It is the policy of the Department not to enter into any agreement with another party that has been debarred by any government agency (Federal or State). The Municipality certifies, by signature of this agreement, that neither it nor its agents or contractors are presently

- debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any Federal or State Department or Agency.
- D. Each of the parties covenants that if it enters into any subcontracts in order to perform any of its obligations under this contract, it shall require that the contractors and their subcontractors comply with the requirements of NC Gen. Stat. Article 2 of Chapter 64. In this E-Verify Compliance section, the words contractors, subcontractors, and comply shall have the meanings intended by N.C. Gen. Stat. § 160A-20.1.
 - E. The Municipality shall certify to the Department compliance with all applicable Federal and State laws and regulations and ordinances and shall indemnify the Department against any fines, assessments or other penalties resulting from noncompliance by any entity performing work under contract with the Municipality.
 - F. The Municipality is solely responsible for all agreements, contracts, and work orders entered into or issued by the Municipality for this Project. The Department shall not be held liable by the Municipality for any expenses or obligations incurred for the Project except those specifically eligible for the federal funds and obligations as approved by the Department under the terms of this Agreement. The Department shall not reimburse the Municipality any costs that exceed the total funding at any time.
 - G. The Municipality will indemnify and hold harmless the Department, FHWA, and the State of North Carolina, their respective officers, directors, principals, employees, agents, successors, and assigns from and against any and all claims for damage and/or liability in connection with the project activities performed pursuant to this Agreement including construction of the Project. The Department shall not be responsible for any damages or claims for damages, which may be initiated by third parties.
 - H. The Department must approve any assignment or transfer of the responsibilities of the Municipality set forth in this Agreement to other parties or entities.
 - I. By Executive Order 24, issued by Governor Perdue, and N.C. G.S. §133-32, it is unlawful for any vendor or contractor (i.e. architect, bidder, contractor, construction manager, design professional, engineer, landlord, offeror, seller, subcontractor, supplier, or vendor), to make gifts or to give favors to any State employee of the Governor's Cabinet Agencies (i.e., Administration, Commerce, Correction, Crime Control and Public Safety, Cultural Resources, Environment and Natural Resources, Health and Human Services, Juvenile Justice and Delinquency Prevention, Revenue, Transportation, and the Office of the Governor).

- J. This Agreement contains the entire agreement between the parties and there are no understandings or agreements, verbal or otherwise, regarding this Agreement except as expressly set forth herein.
- K. The parties hereby acknowledge that the individual executing the Agreement on their behalf is authorized to execute this Agreement on their behalf and to bind the respective entities to the terms contained herein and that he has read this Agreement, conferred with his attorney, and fully understands its contents.
- L. A copy or facsimile copy of the signature of any party shall be deemed an original with each fully executed copy of this Agreement as binding as an original, and the parties agree that this Agreement can be executed in counterparts, as duplicate originals, with facsimile signatures sufficient to evidence an agreement to be bound by the terms of the Agreement.

IN WITNESS WHEREOF, this Agreement has been executed by the Department and the Municipality by authority duly given.

ATTEST: CITY OF DURHAM

BY: _____ BY: _____

DATE: _____

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

Approved by _____ of the local governing body of the City of Durham as attested to by the signature of Clerk of said governing body on _____ (Date)

This Agreement has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

(SEAL)

BY: _____
(FINANCE OFFICER)

Remittance Address:

City of Durham

DEPARTMENT OF TRANSPORTATION

BY: _____
(CHIEF ENGINEER)

DATE: _____

PRESENTED TO BOARD OF TRANSPORTATION ITEM O: _____

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D**Traffic Signal System Operations****Levels of Service****Level-of-service “A”**

1. All of the signalized intersections in the Municipality’s jurisdiction are monitored by the system. All of the signalized intersections are actively controlled for at least some periods of the day (e.g. timing plans are developed and implemented).
2. All timing plans and day plans are evaluated on intervals of no greater than **six months**. On corridors with a significant annual growth in traffic volume (> 5.0%), new timing plans are identified **annually**. Required new plans are developed and implemented within **three months** of identification.
3. The Municipality has an active traffic data collection program that includes turning movement counts at all signalized intersections; the collection of average daily traffic counts; and performs travel-time/delay studies on all subsystems at **a minimum of every two years**. This data is used to evaluate system operations and performance.
4. Timing plans for newly installed intersections are implemented in conjunction with the installation of the traffic signal.
5. The Municipality has an active, on-going operational performance program for operation of the traffic signal system in which system communication components and central site hardware is tested and evaluated on intervals of **no less than two times per year**.
6. A minimum of 90% of all system detectors are operational at any given time. The maximum time to repair failed detection devices is **30 calendar days**.
7. The control center is staffed by qualified personnel during the AM & PM peak hours, and during other times of high traffic volumes (e.g. special events).
8. The Municipality uses traffic responsive timing plans where appropriate and continually monitors and updates the thresholds.

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D

Traffic Signal System Operations

Level-of-service “B”

1. Essentially all (+90%) of the signalized intersections in the Municipality's jurisdiction are monitored by the system. Practically all (+95%) of the monitored signalized intersections are actively controlled.
2. All timing plans and day plans are evaluated on intervals of no greater than **12 months**. On corridors with a significant annual growth in traffic volume (> 5.0%), new timing plans are identified annually. Required new plans are developed and implemented **within three months** of identification.
3. The Municipality has an active traffic data collection program that includes turning movement counts at all signalized intersections; the collection of average daily traffic counts; and performs travel-time/delay studies on all subsystems at **a minimum of every two years**. This data is used to evaluate system operations and performance.
4. Timing plans for newly installed intersections are implemented in conjunction with the installation of the traffic signal.
5. The Municipality has an active, on-going operational performance program for operation of the traffic signal system in which system communication components and central site hardware is tested and evaluated on intervals of **no less than two times per year**.
6. A minimum of 85% of all system detectors is operational at any given time. The maximum time to repair failed detection devices is **30 calendar days**.
7. The control center is staffed by qualified personnel during the AM & PM peak hours. The operations staff is on-call during other times of expected high traffic volume.
8. The Municipality uses traffic responsive timing plans where appropriate. Threshold values are evaluated **annually**.

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D

Traffic Signal System Operations

Level-of-service “C”

1. The vast majority (+80%) of the signalized intersections in the Municipality's jurisdiction are monitored by the system. The only traffic signals not monitored are those whose lack of proximity does not lend them to cost-effective communication. The vast majority (+80%) of monitored signals are actively controlled by the system.
2. All timing plans and day plans are evaluated on intervals of no greater than **18 months**. On corridors with a significant annual growth in traffic volume (> 5.0%), new timing plans are identified **annually**. On average, required new plans are developed and implemented within **six months** of identification.
3. The Municipality obtains the data that is used to evaluate system operations and performance.
4. Timing plans for newly installed intersections are implemented within **30 calendar days** of the installation of the traffic signal.
5. The Municipality has an active, on-going operational performance program for operation of the traffic signal system in which system communication components and central site hardware is tested and evaluated on intervals of **no less than two times per year**.
6. A minimum of 80% of all system detectors are operational at any given time. The maximum time to repair failed detection devices is **60 calendar days**.
7. The control center is staffed by qualified personnel during the AM & PM peak hours. The operations staff is on-call during other times of expected high traffic volume.
8. The Municipality uses traffic responsive timing plans where appropriate. Threshold values are evaluated **annually**.

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D

Traffic Signal System Operations

Level-of-service “D”

1. Most (+60%) of the signalized intersections in the Municipality’s jurisdiction are monitored by the system. Signalized intersections that are in close proximity to other signalized intersections (<0.5 mile) are in operation but are not monitored by the system. Most (+60%) of the monitored signals are actively controlled by the system.
2. All timing plans and day plans are evaluated on intervals of no greater than 24 months. On corridors with a significant annual growth in traffic volume (> 5.0%), new timing plans are identified on intervals of no greater than **two years**. New plans are developed and implemented within **12 months** of identification.
3. The Municipality obtains the data is used to evaluate system operations and performance.
4. Timing plans for newly installed intersections are implemented within **60 calendar days** of the installation of the traffic signal.
5. The Municipality has an active, on-going operational performance program for operation of the traffic signal system in which system communication components and central site hardware is tested and evaluated on intervals of **no less than one time per year**.
6. A minimum of 60% of all system detectors are operational at any given time. The maximum time to repair failed detection devices is **90 calendar days**.
7. The control center is staffed during either the AM or PM peak hour; whichever is the highest volume period.
8. The Municipality has not evaluated the use of traffic responsive timing plans.

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D

Traffic Signal System Operations

Level-of-service “F”

1. Less than half (<50%) of the signalized intersections in the Municipalities' jurisdiction are monitored by the system. Signalized intersections that are in close proximity to other signalized intersections (<0.5 mile), are in operation but are not monitored by the system. Most (+60%) of the monitored signals are actively controlled by the system.
2. All timing plans and day plans are evaluated on intervals greater than **30 months**. On corridors with a significant annual growth in traffic volume (> 5.0%), new timing plans are identified on intervals of no greater than **two years**. On average, new plans are developed and implemented on intervals **not to exceed 18 months** after identification.
3. The Municipality does not collect data to evaluate system performance and retune signals. All data used is provided by others.
4. Timing plans for newly installed intersections are implemented **greater than 90 days** of installation of the traffic signal.
5. The Municipality does not have an active, on-going operational performance program for operation of the traffic signal system in which system communication components and central site hardware is tested and evaluated. The Municipality provides emergency restoration only for system communication and hardware components.
6. A minimum of 50% of all system detectors are operational at any given time. The maximum time to repair failed detection devices is **120 calendar days**.
7. The control center is staffed during either the AM or PM peak hour; whichever is the highest volume period.
8. The Municipality has not evaluated the use of traffic responsive timing plans.

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D

SIGNALS LIST

City Inv #	NC Inv #	Location
1	2	Chapel Hill St./Foster & Chapel Hill St./Corcoran
2	6	Chapel Hill St., Morris St., & Main St.
3	9	Chapel Hill St. & Rigsbee Av.
4	10	Corcoran St. & Main St.
5	14	Dillard St. & Main St.
6	15	Dillard St. & Pettigrew St.
7	41	Anderson St., Main St. & Fifteenth
8	52	Anderson St. & Campus Dr.
9	54	Anderson St., Cranford Rd., & Morehead Av.
10	55	Anderson St. & Duke University Rd.
11	58	Arnette Av. & Morehead Av.
12	63	Bacon St. & Pettigrew St.
13	74	Buchanan Blvd. & Club Blvd.
14	75	Buchanan Blvd. & Green St.
15	77	Buchanan Blvd. & Markham Av.
16	78	Buchanan Blvd. & Trinity Av.
17	99	Club Blvd. & Washington St.
18	107	Driver St. & Main St.
19	133	Foster St. & Geer St.
20	139	Grant St., Ramseur St., & Pettigrew St.
21	140	Green St. & Ninth St.
22	148	Guthrie St. & Liberty St.
23	160	Hyde Park Av. & Liberty St.
24	165	Lawson St. & Lincoln St.
25	166	Lawson St. & Ridgeway Av.
26	170	Markham Av. & Washington St.
27	171	Miami Blvd. & Raynor St.
28	177	Roxboro St. & Enterprise St.
29	179	Trinity/Foster & Trinity/Washington
30	192	Bacon St. & Lawson St.
31	220	Corporation St. & Foster St.
32	222	Shannon Rd. & University Dr.
33	230	Guess Rd. & Northgate Mall Entrance
34	236	Liberty St. & Elizabeth St.

35	256	Westgate Dr. & University Dr.
36	920	Lawson St. Crossing & Durham Tech
37	921	Hyde Park Av. & Juniper St.
38	922	Renaissance Pkwy. & American Tobacco Trail
39	932	Murray Ave. & Museum of Life & Science
40	943	University Dr. & University Pl.
41	944	Westgate Dr. & Westgate Shopping Center
42	949	MLK Pkwy. & Shannon Rd.
43	954	Roxboro St., South St., & Masondale Ave.
44	957	University Dr. & Snowcrest Trail
45	958	Broad St., Haverford Pl., & North Pointe Dr.
46	959	Lawson St. & Merrick St.
47	960	Cecil St. & Lincoln St.
48	968	M.L.K. Parkway & South Roxboro St.
49	969	M.L.K. Parkway & Cook Rd.
50	970	M.L.K. Parkway & Yorktown
51	975	Driver St. & Pettigrew
52	978	Renaissance Parkway & Lodge Apartments
53	981	North Pointe Dr. & Home Depot
54	982	M.L.K. Parkway & Stratford Lakes
55	983	Broad St., Stadium Dr.
56	990	Duke University Rd. & Towerview Dr.
57	991	Barbee Rd. & Woodcroft Parkway
58	992	Renaissance Pkwy. & Mall Site Dr.
59	1776	Ben Franklin & William Penn

59 TOTAL CITY SIGNALS

NCDOT SIGNALS

City Inv #	NC Inv #	Signal #	Location
1	950	05-0006	Chapel Hill Blvd. (US 15-501 Bus.) & Tower Dr.
2	20	05-0009	Great Jones St., Morris St., & Morgan St.
3	145	05-0123	Guess Rd. (NC 157) & I-85 SB
4	144	05-0124	Guess Rd. (NC 157) & I-85 NB
5		05-0125	Cheek Rd. & Hardee Rd.
6	233	05-0130	Swift Av. & NC 147 NB
7	89	05-0132	Chapel Hill St. & NC 147 SB
8	216	05-0133	Cole Mill Rd. & Hillsborough Rd. (US 70 Bus)
9	59	05-0135	Avondale Dr. & Foushee St.
10	156	05-0138	Holloway St.(NC 98) & Junction Rd.
11	206	05-0143	Chapel Hill Blvd. (15-501 Bus) & Westgate Dr.
12	108	05-0145	Duke St.(US 501) & Fairfield St.
13	40	05-0146	Academy Rd. (NC 751) & University Dr.
14	43	05-0147	Alston Av. (NC 55) & Dowd St.
15	18	05-0193	Foster St. & Morgan St.
16	32	05-0206	Morgan St. & Rigsbee Av.
17		05-0227	Alexander Dr. & Cornwallis Rd.
18	972	05-0228	Alston Ave. (NC 55) & Taylor St.
19		05-0234	Cornwallis Rd. & West Institute Dr.
20	19	05-0250	Great Jones St. & Main St.
21	105	05-0251	Research Dr., Douglas St., & Erwin Rd.
22	152	05-0254	Oakland Av., Trent Dr., & Hillsborough Rd.(US 70 Bus)
23	150	05-0265	Hillsborough Rd. (US 70 Bus) & LaSalle St.
24	157	05-0271	Holloway St.(NC 98) & Raynor St.
25		05-0274	Cornwallis Rd. & 15-501 N.B.
26	50	05-0275	Alston Av. (NC 55) & Linwood St.
27	154	05-0276	Hillsborough Rd. (US 70 Bus) & US 15-501 NB
28	101	05-0277	Cornwallis Rd. & Fayetteville St. (north)
29	923	05-0278	Cameron Blvd.(NC 751) & Science Dr.
30	86	05-0279	Chapel Hill Rd. & Lakewood Av.
31	167	05-0280	Liberty St. & Miami Blvd.
32	45	05-0284	Alston Av. (NC 55), Gann St., & NC 147 NB
33	927	05-0289	Cornwallis Rd. & NC 55
34	7	05-0290	Chapel Hill St. & Mangum St. (15-501 Bus.)
35	246	05-0294	Hillandale/I-85 NB & Hillandale/I-85 SB
36	82	05-0301	Carver St. & Duke St.(US 501)
37	110	05-0302	Duke St.(US 501) & Leon St.
38	173	05-0304	Murray Av. & Roxboro St. (US 501 Bus)

39	66	05-0305	Bon Air Av. & Roxboro St. (US 501 Bus)
40	98	05-0307	Club Blvd. & Roxboro St. (US 501 Bus)
41	61	05-0308	Avondale Dr., St. Paul St., & Roxboro St.
42	46	05-0311	Alston Av. (NC 55) & Geer St.
43	48	05-0317	Alston Av. (NC 55) & Lawson St.
44	127	05-0318	Fayetteville St. & Lawson St.
45	130	05-0319	Fayetteville St. & Umstead St.
46	128	05-0321	Fayetteville/Pettigrew & Fayetteville/NC 147 NB
47	115	05-0324	Duke St. & University Dr. (15-501 Bus)
48	162	05-0325	Lakewood Av. & Roxboro/Mangum Connector
49	106	05-0330	Dowd St. & Roxboro St.
50	176	05-0332	Roxboro St. (15-501 Bus) & Trinity Av.
51	980	05-0336	Old Chapel Hill Rd, & University Dr. (s)
52	3	05-0341	Chapel Hill St. & Duke St.
53	5	05-0342	Chapel Hill St. & Gregson St.
54	73	05-0344	Buchanan Blvd. & Chapel Hill St.
55	88	05-0345	Chapel Hill St., Kent St., & Duke University Rd.
56	161	05-0346	Kent St., & Morehead Av.
57	93	05-0347	Club Blvd. & Duke St.
58	111	05-0348	Duke St. & Markham Av.
59	114	05-0349	Duke St. & Trinity Av.
60	71	05-0356	Broad St., Swift Av., & Main St.(US 70 Bus)
61	124	05-0357	Erwin Rd., Main St.(US 70 Bus), & Ninth St.
62	56	05-0359	Anderson St. & Erwin Rd.
63	126	05-0360	Erwin Rd. & Trent Dr.
64	151	05-0362	Hillsborough Rd., Markham Av. & Ninth St.
65	70	05-0363	Broad St., Sunset Av., & Guess Rd.
66	68	05-0364	Broad St. & Club Blvd.
67	72	05-0365	Broad St. & Markham Av.
68	135	05-0376	Miami Blvd., Gary St., & Holloway St.(NC 98)
69	57	05-0377	Angier Av. & Driver St.
70		05-0381	Blackwell St., Corcoran St., & Pettigrew St.
71	8	05-0382	Chapel Hill St. & Pettigrew St.
72	901	05-0383	Infinity Rd., Latta Rd. & Roxboro St.(US 501)
73	925	05-0384	Chapel Hill Blvd. (US 15-501) & Garrett Rd.
74	109	05-0385	Duke St.(US 501) & Horton Rd.
75	84	05-0386	Chapel Hill Blvd. (15-501 Bus) & University Dr.
76	122	05-0388	Erwin Rd. & Fulton St.
77		05-0389	Mineral Springs Rd. & NC 98
78	918	05-0390	NC 54 & NC 55
79	159	05-0391	Hope Valley Rd.(NC 751) & University Dr.

80		05-0392	Lynn Rd. & US 70
81		05-0393	Pleasant Dr. & US 70
82	804	05-0394	Angier Ave. & Miami Blvd
83	83	05-0396	Carver St. & Guess Rd.(NC 157)
84	137	05-0397	Miami Blvd. & Geer St.
85	175	05-0398	Olympic Av. & Roxboro St. (US 501 Bus)
86	102	05-0401	Cornwallis Rd. & Roxboro St.
87	129	05-0402	Fayetteville St. & Pilot St.
88	67	05-0404	Brant St. & Fayetteville St.
89	39	05-0405	Academy Rd. (NC 751) & Woodburn Rd.
90	79	05-0406	Burlington Av. & Fayetteville St.
91	38	05-0407	Academy Rd. (NC 751) & Cornwallis Rd.
92	85	05-0408	Chapel Hill Rd. & Cornwallis Rd.
93	53	05-0409	Anderson St. & Chapel Hill Rd.
94	113	05-0410	Duke St.(US 501) & Murray Av.
95	142	05-0411	Gregson St. & Northgate Mall
96	172	05-0412	Morehead Av. & Vickers St.
97		05-0413	East End Av. & US 70
98		05-0414	Miami Blvd., Sherron Rd., & US 70
99	123	05-0426	Erwin Rd. & LaSalle St.
100	207	05-0427	Chapel Hill Rd., Dixon Rd., & University Dr.
101	903	05-0428	Roxboro St. (US 501) & Seven Oaks Rd.
102	902	05-0429	NC 55 & Riddle Rd.
103	104	05-0430	Denfield St., Horton Rd., & Roxboro St.(US 501 Bus)
104	105	05-0432	S. Miami Blvd., NC 54, & Page Rd.
105	96	05-0433	Club Blvd. & Hillandale Rd.
106	807	05-0434	Ellis Rd. & Miami Blvd.
107	916	05-0435	Hope Valley Rd.(NC 751) & NC 54
108	917	05-0456	Barbee Rd. & NC 54
109	181	05-0461	Academy Rd., 15-501 Serv. Rd., & Chapel Hill Blvd.
110	231	05-0462	Duke St.(US 501) & Stadium Dr.
111	149	05-0463	Hardee St. & Holloway St.(NC 98)
112		05-0472	Alexander Dr. & N.C. 54
113	929	05-0474	Pickett Rd. & Ridge Rd.
114	158	05-0486	Holloway St.(NC 98) & US 70 EB
115		05-0534	Angier Ave. & Ellis Rd./Pettigrew
116	930	05-0607	Alston Av. & NC 54
117	203	05-0661	Cecil St., Alston Av. & NC 55
118	809	05-0664	Roxboro Rd. (US 501) & Milton Rd.
119	197	05-0668	Cameron Blvd.(NC 751) & Erwin Rd.
120	910	05-0671	Farrington Rd. & NC 54

121		05-0681	Guess Rd. & Umstead Rd.
122	934	05-0704	S. Miami Blvd. & Cornwallis Rd.
123		05-0754	US 70 & Leesville Rd.
124	112	05-0757	Duke St. & Morehead Av.
125	905	05-0761	Fayetteville St. & Cornwallis Rd. (south)
126	153	05-0776	Hillsborough Rd. (US 70 Bus) & US 15-501 SB
127	909	05-0790	Fayetteville Rd. & NC 54
128	103	05-0807	Cornwallis Rd. & University Dr.
129	911	05-0812	Revere Rd. & NC 54
130	229	05-0834	Duke St.(US 501) & Roxboro St.(US 501 Bus)
131	205	05-0845	Chapel Hill Blvd. (15-501 Bus) & James St.
132	946	05-0853	Chapel Hill Rd. & Garrett Rd.
133		05-0861	Cornwallis Rd. & Davis Dr.
134	812	05-0862	Guess Rd. (NC 157) & Latta Rd.
135	813	05-0863	Alexander Dr., Southern Pkwy., & Miami Blvd.
136	228	05-0866	Duke St.(US 501) & Holt School Rd.
137	36	05-0889	Pacific Av. & Roxboro St.(US 501 Bus)
138	194	05-0896	Blackwell St., South St., & Lakewood Av.
139	125	05-0917	Erwin Rd. & Morreene Rd.
140	814	05-0918	Revere Rd. & Clermont Dr.
141		05-0927	Davis Dr. & N.C. 54
142	914	05-0939	NC 54 & I-40 EB
143	912	05-0940	NC 54 & I-40 WB
144		05-0948	Davis Dr. & I-40 WB
145	904	05-0956	Guess Rd. (NC 157) & Horton Rd.
146		05--0957	Alexander Dr. & IBM Entrance
147	941	05-0961	Page Rd. & I-40 WB
148	146	05-0965	Fifteenth St. & Hillsborough Rd.
149	933	05-0979	S. Miami Blvd. & IBM Entrance
150	23	05-0984	Holloway St. & Roxboro St.
151	174	05-0985	Old Oxford Hwy. & Roxboro St. (US 501 Bus)
152	118	05-0986	Morehead Av. & Roxboro St.(15-501 Bus)
153	178	05-0987	Roxboro St. (15-501 Bus) & Jackie Robinson
154	169	05-0988	Mangum St. & Jackie Robinson Dr.
155	168	05-0989	Mangum St. (US 15-501 Bus) & Trinity Av.
156	31	05-0990	Mangum St., Ramseur & Pettigrew St.
157	117	05-0991	Mangum St.(15-501 Bus) & Morehead Av.
158	27	05-0992	Main St., Peabody St., & Roxboro St.(Bus 15-501)
159	29	05-0993	Mangum St.(15-501 Bus) & Parrish St.
160	28	05-0994	Mangum St.(15-501 Bus) & Morgan St.
161	26	05-0995	Main St.(US 70 Bus), Morgan St. & Watts St.,

162	25	05-0996	Main St. & Mangum St.(15-501 Bus)
163	24	05-0997	Liberty St. & Roxboro St.(15-501 Bus)
164	33	05-0998	Pettigrew St. & Roxboro St.(15-501 Bus)
165	164	05-1000	Lavender Av. & Roxboro St.(US 501 Bus.)
166	163	05-1001	Lakewood Av. & Vickers St.
167	155	05-1002	Holloway St.(NC 98) & Hyde Park Av.
168	147	05-1003	Guthrie St. & Holloway St.(NC 98)
169	143	05-1004	Gregson St. & Trinity Av.
170	22	05-1005	Gregson St. & Morgan St.
171	141	05-1006	Gregson St. & Markham Av.
172	21	05-1007	Gregson St. & Main St.
173	138	05-1008	Roxboro St.(15-501 Bus) & Geer St.
174	136	05-1009	Mangum St.(15-501 Bus) & Geer St.
175	131	05-1010	Vickers St., Forest Hills Blvd. E., & University Dr.
176	132	05-1011	Forest Hills Blvd. W. & University Dr.
177	17	05-1012	Duke St. & Morgan St.
178	16	05-1013	Duke St. & Main St.
179	13	05-1015	Dillard St. & Liberty St.
180	12	05-1016	Dillard St., Oakwood Av. & Holloway St. (NC 98)
181	95	05-1017	Club Blvd. & Gregson St.
182	91	05-1018	Cleveland St., Corporation St., & Mangum St.
183	200	05-1020	Carver St. & Hillandale Rd.
184	81	05-1021	Campus Dr. & Main St.(US 70 Bus)
185	76	05-1022	Buchanan Blvd. & Main St.(US 70 Bus)
186	69	05-1023	Broad St. & Green St.
187	65	05-1024	Blackwell St. & Jackie Robinson Dr.
188	42	05-1026	Alston Av. (NC 55) & Angier Av.
189	47	05-1027	Alston Av. (NC 55) & Holloway St. (NC 98)
190	44	05-1028	Alston Av. (NC 55) & NC 147 SB
191	49	05-1029	Alston Av. (NC 55) & Liberty St.
192	51	05-1030	Alston Av. (NC 55) & Main St.
193	60	05-1031	Avondale Dr. & Markham Av.
194	62	05-1032	Avondale Dr. & Trinity Av.
195	119	05-1034	Elizabeth St. & Geer St.
196	116	05-1035	Fayetteville St., Morehead Av. & NC 147 SB
197	913	05-1069	NC 55 & I-40 WB
198	915	05-1070	NC 55 & I-40 EB
199	928	05-1071	Alston Av. & Cornwallis Rd.
200		05-1073	Cornwallis Rd. & Burroughs Welcome
201	4	05-1075	Chapel Hill St., Ramseur St., & Great Jones St.
202		05-1080	Office Park Dr. & N.C. 54
203		05-1081	Nortel Dr. Entrance & N.C. 54

204	939	05-1082	Emperor Blvd., Page Rd., & I-40 EB
205	920	05-1083	Carpenter Fletcher Rd. & NC 55
206	198	05-1093	Cameron Blvd. (N.C. 751) & 15-501 S.B.
207	100	05-1108	Main St., Elizabeth St., & Fayetteville St.
208	906	05-1113	Cook Rd., Hillside High, & Fayetteville St.
209	822	05-1115	Lumley Rd. & Miami Blvd.
210	823	05-1117	Stirrup Creek Dr., IBM Entrance, & Miami Blvd.
211		05-1121	US 70 & Page Rd. Extension
212	936	05-1123	S. Miami Blvd. & I-40 EB
213	935	05-1124	S. Miami Blvd. & I-40 WB
214	80	05-1132	Elba St. & Fulton St.
215	945	05-1137	Sedwick Rd. & NC 55
216	908	05-1160	Holloway St.(NC 98) & Lynn Rd.
217	907	05-1161	Auto Dr. & Shannon Rd.
218	238	05-1162	Fayetteville St. & Lakewood Av.
219	210	05-1163	Chapel Hill Rd. & University Dr.
220	931	05-1194	Cole Mill Rd. & Rose of Sharon Rd.
221		05-1205	Cheek Rd. & U.S. 70 WB
222		05-1206	Cheek Rd. & Hwy. 70 E.B.
223		05-1208	Roxboro Rd. & I-85 N.B. Connector
224		05-1209	Avondale & I-85 N.B. Connector
225		05-1210	Avondale & I-85 S.B. Connector
226	120	05-1211	Hillsborough Rd.(US 70 Bus) & Main St.
227	87	05-1212	Hillsborough Rd. & Hillandale-Hillsborough Conn.
228	215	05-1213	Hillandale Rd. & Hillandale-Hillsborough Conn.
229	825	05-1220	Guess Rd. (NC 157) & Rose of Sharon Rd.
230		05-1224	Fayetteville Rd. & I-40 Ramps
231		05-1225	Fayetteville Rd. & Southpoint Mall
232	183	05-1226	Pickett Rd. & Academy Rd. (NC 751)
233		05-1228	N.C. 98/Patterson/Sherron
234		05-1231	N.C. 751 & I-40 EB Ramp
235		05-1232	N.C. 751 & I-40 WB Ramp
236		05-1233	Duke St. & I-85 SB Ramp
237	218	05-1234	Cole Mill Rd. & I-85 SB
238	217	05-1235	Cole Mill Rd. & I-85 NB
239	826	05-1239	Roxboro Rd. (US 501) & Goodwin Rd.
240	180	05-1342	Academy Rd., Duke U. Rd., & Cameron Blvd.
241	926	05-1374	NC 54 & Rollingwood Dr.
242		05-1375	Guess Rd. & Lebanon Circle
243		05-1394	Emperor Blvd. & NC 54
244	919	05-1395	Hillsborough Rd. (US 70) & Sparger Rd.

245		05-1396	Alexander Dr. & Moore Dr.
246	11	05-1424	Corcoran St. & Ramseur St.
247	253	05-1428	Campus Walk Ave. & Morreene Rd.
248	64	05-1432	Blackwell St. & Morehead Av.
249	201	05-1433	Carver St. & Roxboro St.(US 501 Bus.)
250	922	05-1434	Hope Valley Rd.(NC 751) & Garrett Rd.
251		05-1438	Erwin Rd. & Cornwallis Rd.
252	251	05-1462	Hillandale Rd., Fulton St., & NC 147
253	121	05-1463	Swift Av. & NC 147 SB
254		05-1477	Davis Dr. & I-40 EB
255	224	05-1509	Oxford Commons S.C. & Roxboro St.(US 501 Bus)
256	254	05-1511	Morreene Rd. & US 15-501 SB
257	942	05-1528	Meridian Pkwy. & NC 55
258		05-1531	Ellis Rd./NC 147 SB
259		05-1532	Ellis Rd. & Glaxo Entrance
260		05-1539	Alexander Dr. & N.C. 147 NB Ramp
261		05-1540	Alexander Dr. & N.C. 147 SB Ramp
262	952	05-1563	Hillandale Rd. & Sprunt Ave.
263		05-1583	Alexander Dr. & N.C. 55
264	947	05-1600	Woodcroft Pkwy & Fayetteville St.
265	227	05-1634	Duke St., Gregson St., & I-85 SB
266	953	05-1635	University Dr. & MLK Pkwy.
267	248	05-1655	Holloway St.(NC 98) & Hoover Rd.
268	204	05-1659	Chapel Hill Blvd. (15-501 Bus) & Shannon Rd.
269	966	05-1673	Chapel Hill Rd, Farrington Rd., & Watkins Rd.
270		05-1701	Holloway St. (NC 98) & Clayton Rd.
271	249	05-1717	Holloway St.(NC 98) & US 70 WB
272		05-1718	Erwin Rd., Mt. Sinai Rd., & Lochнора Pkwy.
273	948	05-1727	Woodcroft Pkwy & Hope Valley Rd. (NC 751)
274		05-1744	N.C. 54 & Huntingridge Rd.
275	951	05-1799	Dearborn Dr. & Old Oxford Hwy.
276	235	05-1854	Elizabeth St. & Holloway St. (NC 98)
277		05-1858	Davis Dr. & Hopson Rd.
278		05-1862	Cole Mill Rd. & Umstead Rd.
279	226	05-1867	Albany St., Woodmont Dr., & Guess Rd.
280		05-1889	Fayetteville St. & Timothy Ave.
281		05-1912	Cornwallis Rd. & 15-501 S.B.
282	956	05-1913	Fayetteville St., Riddle Rd. & Buxton St.
283	961	05-1967	Cecil St. & Fayetteville St.
284	969	05-1976	Fayetteville St. & Barbee Rd.
285	962	05-1977	M.L.K. Parkway & N.C. 55

286	964	05-1978	Hope Valley Rd. & M.L.K. Parkway
287	963	05-1979	Fayetteville Rd. & M.L.K. Parkway
288	965	05-1980	Old Chapel Hill Rd. & M.L.K. Parkway
289		05-2000	Page Rd. & Slater Rd.
290	967	05-2006	Frasier St., William Penn Plaza & Roxboro St.
291	974	05-2008	Hopson Rd. & NC 54
292		05-2010	Cheek Rd. & Midland Terrace
293		05-2012	Geer St. & Midland Terrace
294		05-2013	Geer St. & Hardee Rd.
295	970	05-2015	Duke St. & Jackson St.
296	982	05-2026	Hope Valley Rd. (NC 751) & S. Roxboro St.
297	971	05-2027	Fayetteville St. & Elmira Ave.
298	985	05-2048	Chin Page Rd. & S. Miami Blvd
299		05-2066	Fayetteville St. & Massey Ave.
300		05-2087	Alexander Dr. & UNC TV/National Driving
301		05-2093	Roxboro Rd. & I-85 S.B Connector
302		05-2094	Mineral Springs Rd. & Sharron Rd.
303		05-2095	N.C. 55 & Kit Creek
304		05-2096	Old Oxford Hwy., Meriweather Dr. & Belvin Ave.
305		05-2097	N.C. 751 & Renaissance Parkway
306		05-2102	Fayetteville St. & Renaissance Parkway
307		05-2104	Garrett Rd. & Trotter Ridge
308		05-2109	Club Blvd. & Washington St.
309		05-2111	N.C. 54 & Quadrangle
310		05-2115	Cornwallis Rd. & Northeast Creek Pkwy.
311		05-2116	Ellis Rd. & Northeast Creek/So Hi Dr.
312		05-2121	Club & Dearborn, & Midland Terrace
313		05-2137	Emperor Blvd. & Slater Rd.
314		05-2154	Cole Mill Rd. & Sparger Rd.
315		05-2156	N.C. 55, Allendown & Park West
316		05-2165	Dixon Rd. & M.L.K. Parkway
317		05-2169	I-85 SB Ramp & Hillandale Rd.
318		05-2170	Carver St. & Rose of Sharon Rd.
319		05-2188	Fayetteville Rd. & Herndon Rd.
320		05-2202	N.C. 751 & Audubon Lake Dr.
321		05-2223	Fayetteville Rd. & Crooked Creek/Southpoint Crossing
322		05-2328	Pickett Rd. & Western Blvd.
323		05-2238	Fayetteville Rd., Geneva Dr. & Sutton Place
324		05-2243	Duke St. & Fraasier St.
325		05-2251	Cameron Blvd. (N.C. 751) & 15-501 N.B.
326		05-2282	N.C. 54, Garrett Rd., & Hope Valley

327	05-2285	Broad St. & Perry St.
328	05-2291	Carver St. & Stadium Dr.
329	05-2294	Briggs Avenue and Lawson Street
330	05-2321	Hopson Rd. & Triangle Parkway S.B.
331	05-2322	Hopson Rd. & Triangle Parkway N.B.
332	05-2323	Davis Dr. & Triangle Parkway S.B.
333	05-2324	Davis Dr. & Triangle Parkway N.B.
334	05-2371	Fayetteville Road & Stratford Lakes
335	05-2379	Hillandale Rd. & Bertland Ave.
336	05-2396	Fayetteville Road & Juliette Dr.
337	05-2403	Roxboro Rd. & Dillard St.
338	05-2414	Alston Ave. & Avondale Dr.
339	05-2423	Erwin Rd. & Eye Care Dr.
340	05-2424	Davis Dr. & Park Knoll Dr.
341	05-2459	Cornwallis Rd. & Hope Valley Dr.
342	07-0886	NC 751 & Hillsborough Rd. (US 70)

342 TOTAL STATE SIGNALS

401

TOTAL

85 % NCDOT PRO-RATA SHARE

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D

CCTV CAMERA LIST

Current Operating Cameras

April 25, 2011

	County	Cam #	Location	Primary Ctrl
1	Durham	2001	NC 54 & Miami Blvd/Slater Rd	Durham City
2	Durham	2002	NC 54 & Emperor Dr.	Durham City
3	Durham	2004	Fayetteville St. & MLK Blvd.	Durham City
4	Durham	2007	US 70 Bypass & NC 98	Durham City
5	Durham	2008	NC 54 & NC 751/Garrett Rd	Durham City
6	Durham	2009	US 70 & Miami Blvd/Mineral Springs Rd	Durham City
7	Durham	2010	I-85 & Roxboro St	Durham City
8	Durham	2013	I-85 & Guess Rd	Durham City
9	Durham	2014	I-85 & Hillandale Rd	Durham City
10	Durham	2015	Roxboro Rd (US 501) & Latta/Infinity Rd	Durham City
11	Durham	2016	US 15-501 & Hillsborough Rd	Durham City
12	Durham	2017	Erwin Rd & Fulton St	Durham City
13	Durham	2018	Downtown Durham	Durham City
14	Durham	2019	US 15-501 & MLK Pkwy	Durham City
			City Controlled	14
			State Controlled	0
			Total	14

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D

DETECTOR LIST

<u>DETECTOR LOCATION</u>	<u>DET. ID #</u>	<u>OWNERSHIP</u>	<u>CONTROL</u>
05-0006 - Chapel Hill (15-501) & Tower (3)	SL 125 - 127	State	City
05-0124 - Guess & I-85 (4)	SL 219 - 221	State	City
05-0133 - Cole Mill & Hillsborough (8)	SL 198 - 201	State	City
05-0143 - Westgate & US 15-501 (3)	SL 122 - 124	State	City
05-0145 - Fairfield & Duke (4)	SL 84 - 87	State	City
05-0146 - University & Academy (5)	SL 146 - 150	State	City
05-0227 - Cornwallis & Alexander (3)	SL 250 - 251	State	City
05-0265 - Hillsborough & LaSalle (2)	SL 202 - 203	State	City
05-0276 - Hillsborough & 15-501 NB (2)	SL 196 - 197	State	City
05-0280 - Miami & Liberty (2)	SL 54 - 55	State	City
05-0294 - Hillandale & I-85 (2)	SL 212 - 213	State	City
05-0311 - Alston & Geer (4)	SL 70 - 73	State	City
05-0317 - Lawson & Alston (2)	SL 39 - 40	State	City
05-0318 - Lawson & Fayetteville (2)	SL 116 - 117	State	City
05-0344 - Chapel Hill & Buchanan (1)	SL 192	State	City
05-0345 - Kent-Chapel Hill- Gattis (1)	SL 193	State	City
05-0346 - Kent & Morehead (2)	SL 155 - 156	State	City
05-0349 - Duke & Trinity (2)	SL 228 - 229	State	City
05-0357 - Main, Erwin & 9th (2)	SL 177 - 178	State	City
05-0360 - Erwin & Trent (4)	SL 173 - 176	State	City
05-0364 - Club & Broad (2)	SL 222 - 223	State	City
05-0376 - Holloway & Miami & Gary (2)	SL 50 - 51	State	City
05-0383 - Roxboro & Latta/Infinity (8)	SL 102 - 107	State	City
05-0384 - Garrett & US 15-501 (6)	SL 257- 263	State	City
05-0385 - Duke & Horton (3)	SL 88, SL 90/91	State	City
05-0388 - Erwin & Fulton (4)	SL 165 - 168	State	City
05-0393 - 70 & Pleasant (6)	SL 27 - 32	State	City
05-0398 - Roxboro & Olympic (4)	SL 80 - 83	State	City
05-0401 - Roxboro & Cornwallis (2)	SL 151 -152	State	City
05-0402 - Fayetteville & Pilot (3)	SL 41 - 43	State	City
05-0411 - Northgate & Gregson (2)	SL 224 - 225	State	City
05-0433 - Club & Hillandale (2)	SL 206 - 207	State	City
05-0456 - 54 & Barbee (2)	SL 8 - 9	State	City
05-0462 - Duke & Stadium (4)	SL 112 - 115	State	City
05-0463 - Holloway & Hardee (2)	SL 52 - 53	State	City
05-0661 - Cecil & NC55 (4)	SL 35 - 38	State	City
05-0664 - Roxboro & Milton (4)	SL 108 - 111	State	City
05-0668 - Cameron (751) & Erwin (4)	SL 161 - 164	State	City

05-0704 - Cornwallis & Miami (6)	SL 10 - 15	State	City
05-0754 - 70 & Leesville (4)	SL 265 - 268	State	City
05-0776 - Hillsborough & 15-501 SB (2)	SL 194 - 195	State	City
05-0834 - Duke & Roxboro (4)	SL 96 - 99	State	City
05-0863 - Miami & Alexander (6)	SL 20 - 24	State	City
05-0866 - Duke & Holt School Rd (4)	SL 92 - 95	State	City
05-0939 - NC54 & I-40 EB (2)	SL 2 - 3	State	City
05-0940 - NC54 & I-40 WB (1)	SL 1	State	City
05-0956-Guess & Horton (2)	SL 236 - 237	State	City
05-0985 - Old Oxford & Roxboro (2)	SL 78 - 79	State	City
05-0995 - Main & Morgan (2)	SL 190 - 191	State	City
05-1000 - Roxboro & Lavender (4)	SL 74 - 77	State	City
05-1004 - Gregson & Trinity (2)	SL 226 - 227	State	City
05-1008 - Geer & Roxboro (2)	SL 66 - 67	State	City
05-1009 - Mangum & Geer (2)	SL 64 - 65	State	City
05-1011 - University & Forest Hills (2)	SL 120 - 121	State	City
05-1021 - Main & Campus (4)	SL 183 - 186	State	City
05-1022 - Main & Buchanan (2)	SL 187 - 188	State	City
05-1026 - Alston & Angier (2)	SL 48 - 49	State	City
05-1032 - Trinity & Avondale (2)	SL 68 - 69	State	City
05-1113 - Cook & Fayetteville (2)	SL 44 - 45	State	City
05-1117 - Miami & Sturrip Creek (4)	SL 16 - 19	State	City
05-1132 - Elba & Fulton (4)	SL 169 - 172	State	City
05-1161 - Auto & Shannon (4)	SL 138 - 141	State	City
05-1211 - Hillsborough & Main (2)	SL 208 - 209	State	City
05-1213 - Hillandale & Hillsbor. Conn (2)	SL 204 - 205	State	City
05-1342 - Cameron & Duke, Acadamy (4)	SL 157 - 160	State	City
05-1434 - Garrett & Hope Valley (751) (6)	SL 4 - 7 SL 275 - 276	State	City
05-1463 - 147 NB & Swift (4)	SL 179 - 182	State	City
05-1531 - Ellis & NC147(2)	SL 242 - 243	State	City
05-1563 - Hillandale & Sprunt (2)	SL 210 - 211	State	City
05-1635 - MLK Pkwy & University (2)	SL 142 - 143	State	City
05-1655 - Holloway & Hoover (2)	SL 58 - 59	State	City
05-1701 - Holloway (98) & Clayton (4)	SL 60 - 63	State	City
05-1717 - Holloway & US70 WB (2)	SL 56 - 57	State	City
05-1718 - Erwin & Lochnora (2)	SL 230 - 231	State	City
05-1867 - Woodmont & Guess (4)	SL 214 - 217	State	City
05-1913 - Fayetteville & Riddle/Buxton (2)	SL 269 - 270	State	City
05-1913 - Fayetteville & Riddle/Buxton (2)	SL 46 - 47	State	City
07-0886 - Hillsborough & 751 (2)	SL 238 - 239	State	City
C-0078 - Buchanan & Trinity (1)	SL 189	City	City
C-0139 - Pettigrew & Ramseur (2)	SL 33 - 34	City	City
C-0256 - Westgate & University (8)	SL 128 - 135	City	City
C-0949 - MLK Pkwy & Shannon (4)	SL 118 - 119 SL 144 - 145	City	City

TOTAL NUMBER OF CITY CONTROLLED DETECTORS:	246
TOTAL NUMBER OF STATE CONTROLLED DETECTORS:	0
TOTAL NUMBER OF ALL DETECTORS:	246

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D

POSITION QUALIFICATIONS

TRAFFIC SIGNAL SYSTEMS OPERATIONS MANAGER

EDUCATION AND EXPERIENCE

- Graduation from a four-year college or university with a major in Civil Engineering or equivalent or a minimum of 6 years of progressive transportation engineering experience; or an equivalent combination of training and directly related experience in traffic signal operations.
- Operations experience and knowledge of ITS concepts, data communications, and computerized traffic signal systems equipment.
- Excellent planning and organizational skills. Excellent oral and written communications skills including the ability to make public presentations.
- Working knowledge of the principles and practices of traffic signal timing and microcomputer applications of traffic signal optimization software (e.g. Synchro 3.2, PASSER-II, PASSER IV, TRANSYT 7F, NETSIM).
- Working knowledge of AUTOCAD or MICROSTATION and PC-BASED programs including: MS Office (Word, Excel, Access, PowerPoint), GIS, and various software programs for traffic optimization and traffic analysis.
- Regular NC driver's license required.

ESSENTIAL DUTIES

- Oversees the activities of the computerized traffic signal system operation to ensure that all required functions, activities and tasks are performed in an effective, efficient and timely manner.
- Directly manages employees in a Transportation Management Center. Is responsible for the overall direction, coordination, and evaluation of the unit.

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D

POSITION QUALIFICATIONS

TRAFFIC SIGNAL SYSTEMS OPERATIONS MANAGER

ESSENTIAL DUTIES (CONT'D)

- Supervises staff in accordance with the organization's policies and applicable laws. Responsibilities include interviewing, hiring, and training employees; planning, assigning, and directing work; appraising performance; rewarding and disciplining employees; addressing complaints and resolving problems.
- Works with supervisor to manage staffing and work assignments. Supervises traffic signal staff by assigning tasks and reviewing work on a routine basis and provides ongoing guidance and feedback.
- Provides oversight for field investigations, collection and analysis of traffic data and Measures of Effectiveness (MOEs), computes traffic parameters to refine signal timing programs for optimum systems timing efficiency and develops time-space diagrams. Ensures new signal timing plans created by changes in traffic flow patterns, land-use and population are implemented.
- Responds to the complaints and concerns of the community regarding traffic signal design and intersection safety and efficiency.
- Reviews traffic signal designs for impact on general traffic flow and provides recommendations.

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D

POSITION QUALIFICATIONS

TRAFFIC SIGNAL SYSTEMS OPERATIONS ENGINEER

EDUCATION AND EXPERIENCE

- Graduation from a four-year college or university with a major in Civil Engineering and a minimum of 3 years of progressive transportation engineering experience; or an equivalent combination of training and directly related experience in traffic signal operations.
- Operations experience and knowledge of ITS concepts, data communications, and computerized traffic signal systems equipment.
- Outstanding planning and organizational skills. Excellent oral and written communications skills including the ability to make public presentations.
- Working knowledge of the principles and practices of traffic signal timing and microcomputer applications of traffic signal optimization software (e.g. Synchro 3.2, PASSER-II, PASSER IV, TRANSYT 7F, NETSIM).
- Working knowledge of AUTOCAD or MICROSTATION and PC-BASED programs including: MS Office (Word, Excel, Access, PowerPoint), GIS, and various software programs for traffic optimization and traffic analysis.
- Regular NC driver's license and Professional Engineer License required.

ESSENTIAL DUTIES

- Plans, organizes, and directs the activities of the computerized traffic signal system operation to ensure that all required functions, activities and tasks are performed in an effective, efficient and timely manner.
- Performs field investigations, collects and analyzes traffic data and Measures of Effectiveness (MOEs), computes traffic parameters to refine signal timing programs for optimum systems timing efficiency and develops time-space diagrams. Develops and implements new signal timing plans created by changes in traffic flow patterns, land-use and population.

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D

POSITION QUALIFICATIONS

TRAFFIC SIGNAL SYSTEMS OPERATIONS ENGINEER

ESSENTIAL DUTIES (CONT'D)

- Prepares and installs timing plans (traffic responsive and time-of-day/day-of-week) for all corridors; prepares and implements special event timing plans; and prepares temporary timing plans for failed detector locations.
- Maintains system databases and modifies as necessary to allow for expansion; reviews and evaluates all signalized intersections for phasing optimization; provides system data for and assists with various traffic studies and analysis projects regarding the computerized traffic signal system.
- Provides assistance to the transportation operations staff in diagnostic and operational activities.
- Interacts with and uses the features of the signal system control software to develop and modify timing plans using PC-based timing plan software.
- Manages the traffic signal system operational functions including: operation of the graphics monitoring databases; performing periodic schedule data backup; assures the periodic image and graphic backups are accomplished and safely stored.
- Coordinates with the Department on roadway construction projects, which affect the traffic operations in the computerized traffic signal system. Develops and implements temporary timing plan strategies for construction work zones, alternate routes, and incident diversion routes.
- Maintains daily control logs, event logs, timing plan ledgers and daily summary reports.

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D

POSITION QUALIFICATIONS

TRAFFIC SIGNAL SYSTEMS SPECIALIST

EDUCATION AND EXPERIENCE:

- Graduation from a two-year college or university and a minimum of 1 year of experience in traffic signal operations; or an equivalent combination of education and experience directly related to traffic signal operations.
- Knowledge of traffic signal system operations, Intelligent Transportation Systems (ITS) devices, data communications and computerized traffic signal systems equipment.
- Working knowledge of the principles and practices of traffic signal timing and microcomputer applications of traffic signal optimization software (e.g. MIST software system).
- Thorough knowledge of; ability to pay attention to detail and respond to changes in conditions; ability to coordinate work with others.
- Excellent planning and organizational skills. Excellent oral and written communications skills. Ability to maintain records.
- Working knowledge of AUTOCAD or MICROSTATION and PC-BASED programs including MS Office (Word, Excel, Access, Powerpoint); GIS and various software programs for traffic optimization and traffic analysis.
- Regular NC driver's license required.

ESSENTIAL DUTIES:

- Monitors the operations of the computerized traffic signal system operation on a daily basis to ensure that all required functions are performed in an effective, efficient and timely manner.

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D

POSITION QUALIFICATIONS

TRAFFIC SIGNAL SYSTEMS SPECIALIST

ESSENTIAL DUTIES (CONT'D)

- Installs new or revised timing plans (traffic responsive and time-of-day/day-of-week) for corridors; implements special event timing plans and prepares temporary timing plans for failed detector locations through the use of Traffic System software.
- Monitors real time traffic operations through video sources to report incidents and special event information to the appropriate agencies (NCDOT, NC State Highway Patrol, Emergency Management, etc.) and the local Police and Fire departments.
- Performs traffic signal system operational functions including: maintaining the graphics monitoring databases; performing periodic schedule data backup; assures the periodic image and graphic backups are accomplished and safely stored. Coordinates signal repair work with operations staff.
- Coordinates with local TV stations and webmasters assuring periodic image and graphic are displayed and provided.
- Maintains daily control logs, event logs, timing plan ledgers and daily summary reports.

MUNICIPAL OPERATIONS AGREEMENT – SCHEDULE D

COMPENSATION

ITEM	UNIT	ANNUAL RATE	PERCENT UTILIZATION	QUANTITY	PRO-RATA PERCENT	COST
FIXED ANNUAL COSTS						
SYSTEM OPERATIONS ENGINEER (Salary + Additives)	LS	\$91,972.00	100%	1	85.0%	\$78,176.20
SIGNAL SYSTEMS SPECIALIST (Salary + Additives)	LS	\$88,347.50	100%	1	85.0%	\$75,095.38
PER INCIDENT REIMBURSEMENT SCHEDULE						
Per Incident Reimbursements shall consist of all costs associated with repairs and/or replacement of any equipment, software and supplies used to maintain operation of Durham's Computerized Traffic Signal System at a pro rata share of 85.0%. This includes equipment or software such as, but not limited to: Central computer hardware and software (KVM switch, servers, workstations, laptops, printers, UPSs, software), Maintenance equipment (test equipment, display boards and monitors, laptops), Communications cable and equipment (core switch, routing switches, media converters, GPS Clock Sync equipment, fiber modems, phone lines, dialup modems, serial multiport equipment, fiber interconnect centers, fiber patch panels, hub cabinets, ethernet cables, fiber materials and equipment, network management software), CCTV equipment (camera assemblies and cabinets, encoders, decoders, Master Distribution Amplifier, Matrix Bays, multiplexor, CCTV Intelligent Keyboards, DVR, switches, monitors) Office supplies (fax machine, printer repair and supplies, paper, pens, pencils and miscellaneous supplies).						
TOTAL ANNUAL COSTS:						\$153,271.58

Note: Items included on this Schedule may be added or deleted to those above by written request signed by a Municipal Representative. The letter should be sent in quadruplicate to the Division Engineer accompanied by four copies of the revised Schedule. If the Division Engineer approves the new schedule, he will sign all copies as APPROVED; then forwards one copy of the letter and Schedule to the DOT Controller, the State Traffic Engineer, the Municipality, and retains one for Division file. The new Schedule will then become effective at the beginning of the next half for reimbursement. The Board of Transportation reserves the right of verification that all listed operations functions are being properly performed. If it is determined that any authorized operations function is not being performed, the reimbursement will be reduced accordingly.

L.S.
ATTEST

CITY OF DURHAM, NC

CLERK

MUNICIPAL REPRESENTATIVE

DEPARTMENT OF TRANSPORTATION
DIVISION ENGINEER