TRAFFIC CONTROL NOTES

CALC. BY: DATE:	LAKE COUNTY LAK-20-2.70	OHIO
CHKD. BY: DATE:		FHWA REGION 5
		FEDERAL PROJECT

5
98

A. TRAFFIC RESPONSIVE WHEREBY PATTERN SELECTION IS BASED ON DYNAMIC TRAFFIC CONDITIONS AS MEASURED BY SYSTEM SENSORS LOCATED IN THE CONTROL AREA.

B. TIME OF DAY/DAY OF WEEK WHEREBY PATTERN SELECTION IS BASED ON A PRE-PROGRAMMED BASIS WITH AUTOMATIC ADJUSTMENTS FOR SEASONAL CHANGES.

C. MANUAL OVERRIDE WHEREBY PATTERN SELECTION IS BASED ON OPERATOR COMMAND AT THE CENTRAL OFFICE MONITOR OR TRAFFIC RESPONSIVE MASTER CONTROLLER SITE.

THE MASTER CONTROLLER SHALL HAVE THE FOLLOWING CAPACITIES:

1. TOTAL LOCAL INTERSECTION CONTROLLERS: 30
2. SYSTEM SENSOR DETECTOR UNITS: 48
3. THERE SHALL BE A MINIMUM OF 30 SELECTABLE PATTERNS INCLUDING AN ADDITIONAL 4 SPECIAL PATTERNS. EACH PATTERN SHALL CONSIST OF A COMBINATION OF CYCLE, OFFSET AND SPLIT NUMBERS FOR EACH INTERSECTION IN THE SYSTEM. THE MASTER SHALL BE CAPABLE OF DIRECTING THE SYSTEM INTO FREE OPERATION. PATTERNS SELECTABLE FROM THE FOLLOWING MINIMUM PARAMETER RANGES:

   A. CYCLES: SIX (6)
   B. OFFSETS: FIVE (5)
   C. SPLITS: SIXTEEN (16)

4. SYSTEM SENSORS SHALL BE DISTRIBUTED TO A MINIMUM CAPACITY OF EIGHT (8) PER INTERSECTION, BUT NOT TO EXCEED THE TOTAL SENSOR CAPACITY.

THE MASTER CONTROLLER SHALL HAVE THE FOLLOWING FUNCTIONAL REQUIREMENTS:

1. PATTERN SELECTION DURING NORMAL TRAFFIC RESPONSIVE OPERATION SHALL BE BASED ON THE FOLLOWING QUANTITATIVE TRAFFIC FLOW PARAMETERS:

   A. VOLUME LEVEL OF ARTERIAL TRAFFIC FLOW
   B. DIRECTIONALITY OF ARTERIAL TRAFFIC FLOW
   C. RATIO OF ARTERIAL TRAFFIC FLOW TO NON-ARTERIAL TRAFFIC

2. PATTERN SELECTION DURING SPECIAL TRAFFIC RESPONSIVE OPERATION SHALL BE BASED ON THE FOLLOWING PARAMETERS:

   A. NORMAL RESPONSIVE OPERATION OVERRIDE BY DETECTION OF HIGH OCCUPANCY ON SELECTED SYSTEM SENSORS.

   B. NORMAL RESPONSIVE OPERATION OVERRIDE BY DETECTION OF QUEUE LENGTH OR DURATION ON SELECTED SYSTEM SENSORS.

3. PREFERENTIAL TRANSFER OF PATTERNS SHALL BE ACCOMPLISHED BY PROGRAMMABLE THRESHOLD VALUES. PROGRAMMABLE THRESHOLD VALUES SHALL ALSO BE PROVIDED FOR SPECIAL PATTERNS.

4. THE FOLLOWING SYSTEM SENSOR DATA SHALL FORM THE BASIS FOR ALL RESPONSIVE PATTERNS INITIATED BY THE MASTER:

   A. VOLUME, OCCUPANCY AND QUEUE DATA.

   B. EACH SYSTEM SENSOR SHALL BE CAPABLE OF SELECTIVE WEIGHTING.

   C. SYSTEM SENSOR DATA SHALL BE AVERAGED ON A MOVING BASIS, UTILIZING A USER PROGRAMMABLE TIME FACTOR.

   D. EACH SYSTEM SENSOR SHALL BE MONITORED FOR CONSTANT CALL, ABSENCE OF CALL AND ERRATIC OUTPUT. THERE SHALL BE AN OPTION TO ELIMINATE THE MONITORING OF ABSENCE OF CALLS DURING LIGHT TRAFFIC PERIODS ON A TIME OF DAY BASIS. SENSORS WHICH FAIL ANY MONITORING TEST SHALL BE AUTOMATICALLY DELETED FROM VOLUME AND OCCUPANCY CALCULATIONS. UPON RESUMPTION OF SATISFACTORY OPERATION, SENSORS SHALL AUTOMATICALLY RESUME INPUT TO VOLUME AND OCCUPANCY CALCULATIONS. A USER PRESCRIBED MINIMUM NUMBER OF DESIGNATED SENSORS SHALL BE REQUIRED TO MAINTAIN RESPONSIVE OPERATION. THE MINIMUM NUMBER OF OPERATIONAL SENSORS SHALL BE PROGRAMMABLE FOR EACH COMPUTATIONAL CHANNEL. IF FEWER THAN THE PRESCRIBED NUMBER OF SYSTEM SENSORS ARE OPERATIONAL, THEN THE MASTER SHALL REVERT TO THE TIME OF DAY, DAY OF WEEK MODE.

   E. EACH COMPUTATIONAL CHANNEL SHALL BE ASSIGNED FROM UP TO TWELVE (12) DIFFERENT SYSTEM SENSORS FROM THE TOTAL OF 48.

5. IT SHALL BE POSSIBLE TO SELECT ANY SYSTEM PATTERN FROM THE MASTER ON A PRE-PROGRAMMED TIME OF DAY, DAY OF WEEK BASIS. THERE SHALL BE TIME OF DAY OVERRIDE OF RESPONSIVE OPERATION. TIME OF DAY OPERATION SHALL UTILIZE A 99 YEAR CALENDAR-CLOCK WITH AUTOMATIC DAYLIGHT SAVINGS TIME CHANGE.

6. MEANS SHALL BE PROVIDED TO ALLOW INTER-MASTER LINKING IN ORDER TO AFFORD COORDINATION BETWEEN CONTIGUOUS SYSTEM CONTROL AREAS. THIS SHALL INCLUDE SYNCHRONIZATION OF MASTER REFERENCE CLOCKS.

7. PATTERN CHANGES FOR EACH LOCAL CONTROLLER IN THE SYSTEM SHALL BE IMPLEMENTED SMOOTHLY AND IN THE SHORTEST TIME FRAME POSSIBLE WITHOUT VIOLATING MINIMUM INTERVAL VALUES.

8. THE MASTER CONTROLLER SHALL STORE AND FORMAT MONITORED FUNCTION DATA FOR EITHER IMMEDIATE OUTPUT TO THE CENTRAL OFFICE MONITOR OR SHALL STORE DATA FOR FUTURE OUTPUT FOR A MINIMUM STORAGE PERIOD OF FORTY-EIGHT HOURS. AS A MINIMUM THE FOLLOWING REPORTS SHALL BE INCLUDED:

   A. AN ACTIVITY LOG WHICH INCLUDES TIME, INTERSECTION AND ACTIVITY TYPE OF ALL MONITORED LOCAL INTERSECTION FAILURE CONDITIONS.

   B. A SYSTEM SENSOR FAILURE LOG WHICH INCLUDES TIME, SENSOR LOCATION AND TYPE OF FAILURE.

   C. A PATTERN CHANGE LOG WHICH INCLUDES THE OPERATING PATTERN AND THE TIME OF CHANGE WHILE IN THE RESPONSIVE MODE.

   D. A SYSTEM STATUS REPORT WHICH SHOWS THE CURRENT OPERATING MODE AND PATTERN FOR ALL LOCAL INTERSECTION CONTROLLERS ON LINE.

   E. A SYSTEM SENSOR DATA REPORT WHICH INCLUDES VOLUME, OCCUPANCY AND AVERAGE SPEED FOR ALL SYSTEM SENSORS.

PAYMENT FOR 633 CONTROLLER, MASTER, SOLID STATE DIGITAL MICROPROCESSOR, TRAFFIC RESPONSIVE, AS PER PLAN WILL BE MADE AT THE CONTRACT PRICE FOR EACH CONTROLLER IN PLACE, COMPLETELY INSTALLED IN THE LOCAL CONTROLLER SHOWN IN THE PLANS, WIRED, TESTED, AND ACCEPTED.

633 CONTROLLER, ACTUATED, BY PHASE, SOLID STATE DIGITAL MICROPROCESSOR, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING ACTUATED, SOLID STATE DIGITAL MICROPROCESSOR TYPE CONTROLLERS WITH SECONDARY COORDINATOR, MENU DRIVEN PROMPTS, INTERNAL TBC, TELEMETRY UNIT, AND ALL OTHER ACCESSORIES THAT ARE NECESSARY TO MAKE THE CONTROLLER COMPLETELY FUNCTIONAL AND OPERATIONAL AS SHOWN IN THE PLANS.

THE CONTROLLER AND CABINET SHALL CONFORM TO O.D.O.T. SPECIFICATION 633 AND SHALL HAVE THE FOLLOWING FEATURES:

1. THE LOAD SWITCHES SHALL PROVIDE INPUT AND OUTPUT INDICATIONS.
2. THE CONFLICT MONITOR CAPABLE OF 6 OR 12 CHANNEL OPERATION, EXTENDED MONITORING, LCD DISPLAY, RS-232 PORT AND FAULT/EVENT STORAGE AND REPORTING.
3. THE FOLLOWING SWITCHES SHALL BE ACCESSIBLE VIA THE POLICE PANEL DOOR:

   A. SIGNAL SHUTDOWN
   B. FLASH CONTROL

4. THE FOLLOWING SWITCHES SHALL BE MOUNTED ON THE SWITCH PANEL IN THE CABINET:

   A. RUN/STOP TIMING
   B. CONTROLLER TIMER POWER
   C. DETECTOR TEST

5. A SERVICE LAMP WITH DOOR ACTIVATED ON/OFF SWITCH.
6. A TELEPHONE MODEM COMPLETELY WIRED TO REPORT CABINET FAILURES, DETECTOR FAILURES AND TRAFFIC COUNTS AT THOSE LOCATIONS SHOWN IN THE PLANS.
7. THE CABINET EXTERIOR SHALL BE ALUMINUM COLORED AND INTERIOR SHALL BE WHITE.
8. THE CONTRACTOR SHALL FURNISH FOR APPROVAL A CABINET PLAN SHOWING COMPONENT PLACEMENT.

PAYMENT FOR 633 CONTROLLER, ACTUATED, BY PHASE, SOLID STATE DIGITAL MICROPROCESSOR, WITH TELEPHONE MODEM, AS PER PLAN WILL BE MADE AT THE CONTRACT PRICE FOR EACH CONTROLLER IN PLACE, INCLUDING PRE-WIRED CABINET COMPLETELY INSTALLED, WIRED, TESTED, AND ACCEPTED.

632 PHONE DROP

THIS ITEM OF WORK SHALL CONSIST OF SUPPLYING A PHONE DROP TO THE CONTROLLER AT THE INTERSECTIONS AS SHOWN IN THE PLANS. IT SHALL INCLUDE CONDUIT RISER, TRENCH, CONDUIT, SHIELDED 2/C CABLE, LIGHTNING ARRESTOR AND CABINET TERMINALS TO COMPLETELY WIRE TO THE TELEPHONE MODEM SPECIFIED IN THE PLANS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ARRANGEMENTS WITH THE LOCAL TELEPHONE COMPANY TO HAVE TELEPHONE SERVICE DROP INSTALLED AT THE LOCATION SHOWN IN THE PLANS.

PAYMENT FOR 632 PHONE DROP WILL BE AT THE CONTRACT UNIT PRICE FOR EACH PHONE DROP IN PLACE, COMPLETELY INSTALLED IN THE LOCAL CONTROLLER SHOWN IN THE PLANS, WIRED, TESTED AND ACCEPTED.

633 CENTRAL OFFICE MONITOR

THIS ITEM OF WORK SHALL CONSIST OF INSTALLING A CENTRAL OFFICE MONITOR TO BE LOCATED AT THE CITY OF WILLOUGHBY TRAFFIC SIGNAL DEPARTMENT. THE BASIC CENTRAL EQUIPMENT COMPLEMENT SHALL BE SUPPLIED AND SHALL CONSIST OF THE FOLLOWING:

1. AN IBM OR IBM COMPATIBLE PERSONAL COMPUTER, 486/33MHZ PROCESSOR WITH 4 MB USER MEMORY, 1.44 MB INTERNAL 3.5 INCH FLOPPY DISKETTE DRIVE, 70 MB HARD DISK DRIVE, BUILT-IN SVGA, THREE EXPANSION SLOTS, MATH CO-PROCESSOR, ONE SERIAL PORT, ONE PARALLEL PORT AND DOS VERSION 5.0 OR LATER.