D.O.T.66

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

RECEIVED OCT 11 2000

INTERDEPARTMENT CORRESPONDENCE

FILE: STP-0001-00(607) Muscogee County
P.I. No.: 0001607
SR 22/US 80 @ CS 1505/Bradley Park Drive
Intersection Improvements

OFFICE: Traffic Operations
Atlanta, Georgia
DATE: October 10, 2000

FROM: Marion G. Waters, III, P.E., State Traffic Operations Engineer

TO: Glenn Durrence, District Engineer, Thomaston
Attn: David Millen

SUBJECT: APPROVED CONCEPT REPORT

Attached is a copy of the approved concept report and a copy of our files on the above listed project for your use and further handling.

This project consists of constructing dual right turn lanes on the exit ramp of SR 22/US 80 and adding a channelized right turn island and lane to the entrance ramp. A stop & go Traffic Signal and CCTV will also be installed for monitoring purposes.

By copy of this letter, this office is transmitting a copy of the approved concept report to the Office of Environmental/Location for their use in performing the appropriate environmental studies.

Should you have any questions, please contact Ken Werho of this office at 404-635-8125.

MGW:KPW

Attachments
cc: Frank Danchetz
Tom Turner, w/attach.
David Mullins, w/attach.
Wayne Hutto, w/attach.
Herman Griffin, w/attach.
Harvey Keepler, w/attach.
Keith Rohling, w/attach.
Keith Golden, w/attach.
Chuck Hasty, w/attach.
Derrick Cameron, w/attach.
Dick Graves, w/attach.
General Files

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PROJECT CONCEPT REPORT

MUSCOGEE COUNTY

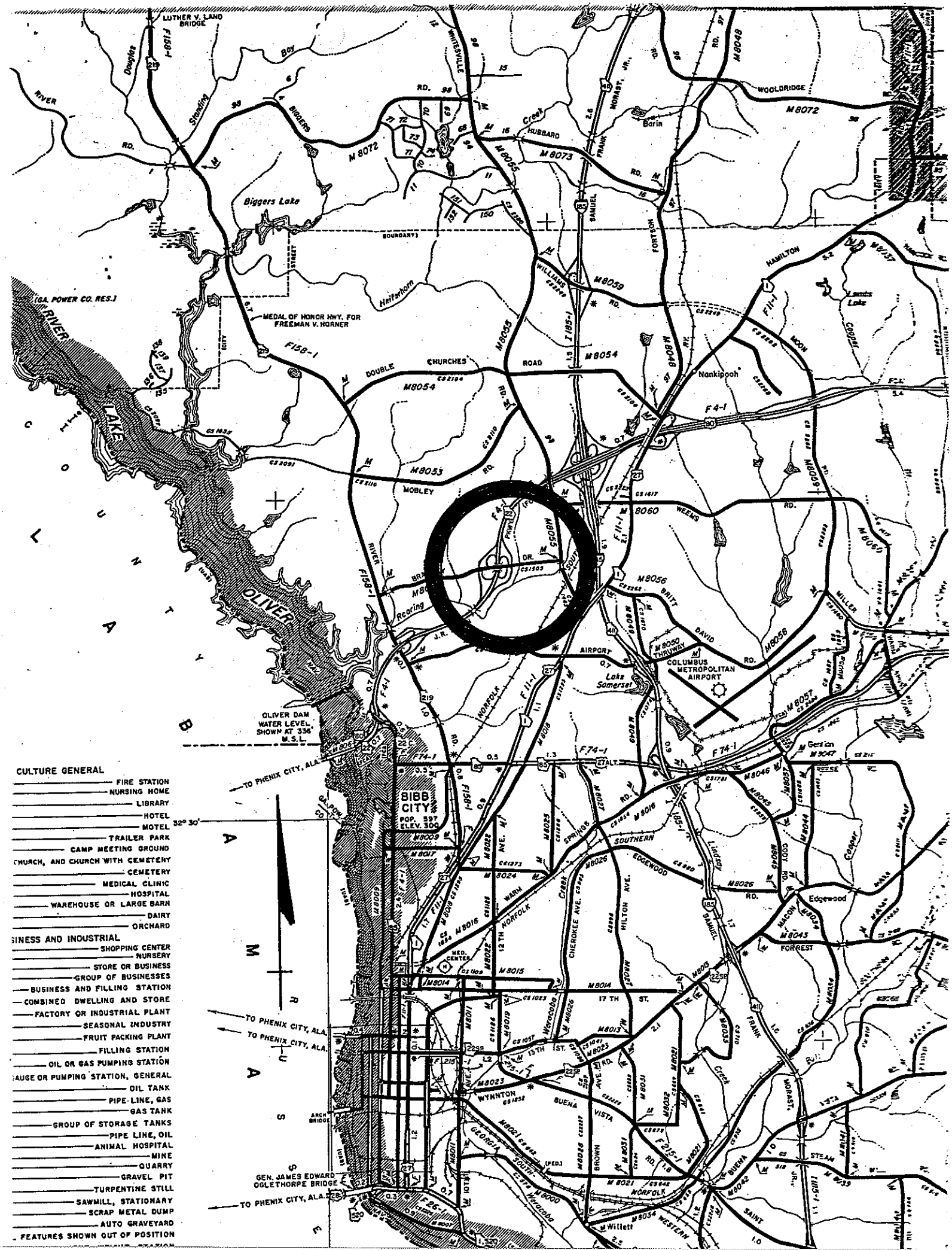
STP-0001-00(607)

FEDERAL ROUTE NO: 80
STATE ROUTE NO: 22
GADOT P.I. NO: 0001607

SEE ATTACHED
LOCATION SKETCH

Date of Report: August 23, 2000

RECOMMENDED:	8/28/2000 **DATE**	**STATE TRAFFIC OPERATIONS ENGINEER**
RECOMMENDED:	9/1/00 **DATE**	**DISTRICT ENGINEER**
RECOMMENDED:	9/8/00 **DATE**	**CHIEF ENGINEER**
APPROVED:	9/12/00 **DATE**	**COMMISSIONER**


LUTHER V. LAND BRIDGE
Biggers Lake
(GA. POWER CO. RES.)
MEDAL OF HONOR HWY. FOR FREEMAN V. HORNER
DOUBLE CHURCHES ROAD
MOBLEY
WEEMS RD.
Nankipooh
Barin
WOOLDRIDGE
HAMILTON
Lambs Lake
COLUMBUS METROPOLITAN AIRPORT
Lake Somerset
OLIVER DAM WATER LEVEL SHOWN AT 336' M.S.L.
TO PHENIX CITY, ALA.
BIBB CITY
POP. 597
ELEV. 300
32° 30'
Edgewood
FORREST
17 TH ST.
13TH ST.
WYNNTON
BUENA VISTA
GEN. JAMES EDWARD OGLETHORPE BRIDGE
Willett
CULTURE GENERAL
FIRE STATION
NURSING HOME
LIBRARY
HOTEL
MOTEL
TRAILER PARK
CAMP MEETING GROUND
CHURCH, AND CHURCH WITH CEMETERY
CEMETERY
MEDICAL CLINIC
HOSPITAL
WAREHOUSE OR LARGE BARN
DAIRY
ORCHARD
SINESS AND INDUSTRIAL
SHOPPING CENTER
NURSERY
STORE OR BUSINESS
GROUP OF BUSINESSES
BUSINESS AND FILLING STATION
COMBINED DWELLING AND STORE
FACTORY OR INDUSTRIAL PLANT
SEASONAL INDUSTRY
FRUIT PACKING PLANT
FILLING STATION
OIL OR GAS PUMPING STATION
AUGE OR PUMPING STATION, GENERAL
OIL TANK
PIPE LINE, GAS
GAS TANK
GROUP OF STORAGE TANKS
PIPE LINE, OIL
ANIMAL HOSPITAL
MINE
QUARRY
GRAVEL PIT
TURPENTINE STILL
SAWMILL, STATIONARY
SCRAP METAL DUMP
AUTO GRAVEYARD
FEATURES SHOWN OUT OF POSITION

August 23, 2000

PROJECT CONCEPT REPORT

P.I. No.: 0001607

Project No.: STP-0001-00(607) Muscogee County

Route No.: SR 22/US 80 EB
CS 1505/Bradley Park Drive EB

Location: The intersection of SR 2 @ CS 1505/Bradley Park Drive is located approximately 2.53 miles northeast of the Alabama State Line within the City Limits of Columbus in Muscogee County.

Description: SR 22 EB Ramp will be reconstructed to provide dual rights to eastbound CS 1505/Bradley Park Drive. The EB Ramp from CS 1505/Bradley Park Drive to EB SR 22 will be closed to eliminate a 140' weave section between the EB entrance ramp & the WB CS 1505/Bradley Park Drive exit ramp.
CS 1505 existing 5-lane will be restriped to provide a left turn lane to eastbound SR 22.

Traffic – Current ADT: SR 22 ---------- 37,700 (1998 ADT)
CS 1505 ---------- 6,200 (1998 ADT)

Existing Typical: SR 22: 4 – 12 ft. travel lanes, two in each direction, with a 40' grassed median and 4' paved, 6' grassed inside & 10' paved, 2' grassed outside shoulders.

CS 1505: 4 – 12 ft. travel lanes, two in each direction, 1 – 14' TWLT lane with variable grassed Shoulders and curb & gutter.

Existing Right of Way: SR 22 ---------- 300' (Estimated)
CS 1505 ---------- 150' (Estimated)

Existing Traffic Control: This intersection is controlled by a stop sign.

Existing Major Structures: None.

Statement of Need & Purpose: Accident history for this location shows 98 accidents over a two year period ('98 & '99). Of the 98 accidents, 84 were rear end accidents. The safety & operational improvements with the installation of a traffic signal will greatly enhance the operational efficiency of this intersection. Also, this intersection has been chosen for the placement on an ATMS CCTV camera. This will allow for the monitoring of the ramp intersection an the next intersection 500' east of the ramps on Bradley Park Dive. The traffic signals will be interconnected with the CCTV controller. To improve the safety and orderly progression of traffic through the intersection, these improvements are recommended.

Bike & Pedestrian Considerations: None.

Length: 0.46 miles

Termini:	**- SR 22 EB Ramp -**	**- CS 1505 -**
From M.P.:	2.35	00.36
To M.P. :	2.71	00.46

PDP Class: Minor Existing

Functional Class: SR 22 ---------- Urban Freeway & Expressway
CS 1505 ---------- Urban Collector Street

Max Degree of Curve: +/- 3 Degrees **Max Grades:** +/- 2.0 %

Design Speed: SR 22 – 65mph; CS 1505 – 45mph.

Proposed Typical Section: SR 22: 2 – 12 ft. travel lanes, eastbound right turn lanes.

CS 1505: 4 – 12 ft. travel lanes, two in each direction, with a 14 ft. left turn lane.

Proposed major structures: None.

Type Access: By Permit.

Traffic Control During Construction: Existing operation shall be maintained during construction.

Right-of-Way Requirement: Department of Transportation shall be responsible for the acquisition of all Required Right-of-Way for this project. None anticipated.

Utilities: Department of Transportation shall be responsible for all Utility adjustments.

Estimated Cost:

Item	**Total Amount**
R/W ----------	$ 0 (GDOT)
Utilities ----------	$ 0 (GDOT)
Estimated LGPA Total --------	$ 0
Construction ----------	$ 246,161
Traffic Signal ----------	$ 50,000
ATMS Equipment ----------	$ 75,000
E & C 10% ----------	$ 37,116
Total Construction ----------	$ 408,277

Permits Required: None.

Level of Environmental Analysis: Categorical Exclusion.

Level of Public Involvement: None.

Time Saving Procedures Appropriate: Yes (X) No ( )

Design Variances Required: None.

Alternatives Considered: None.

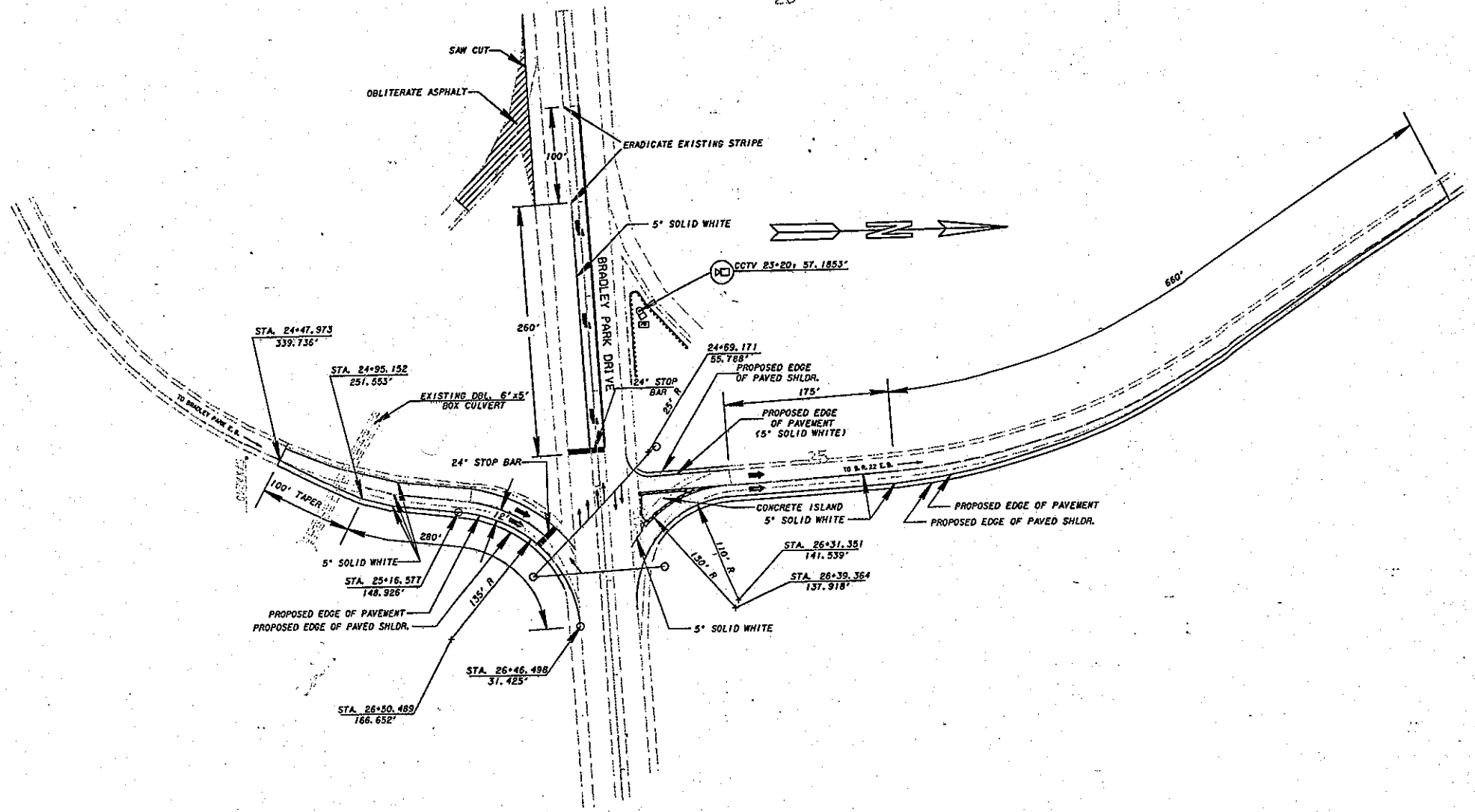
Comments:

Prepared By:

Ken Werho

STATE	PROJECT NUMBER	SHEET NO.
GA.		

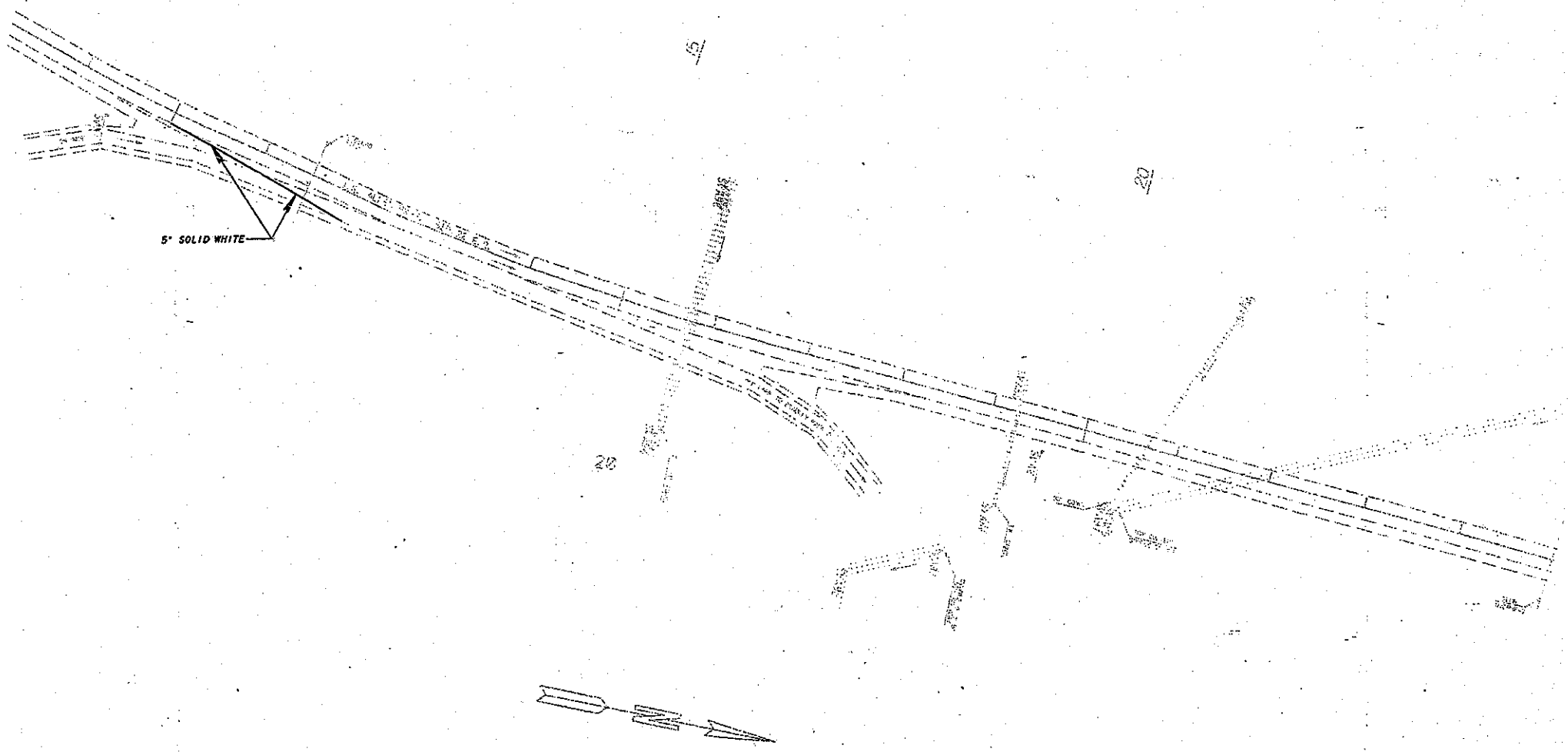
20



DATE	REVISIONS	DATE	REVISIONS

GEORGIA
DEPARTMENT OF TRANSPORTA
CONSTRUCTION PL
BRADLEY PARK DRIVE
IN COULMBUS
SHEET 1 OF 2

STATE	PROJECT NUMBER	SHEET NO.
GA.		



DATE	REVISIONS	DATE	REVISIONS

GEORGIA
DEPARTMENT OF TRANSPORTA
CONSTRUCTION PL
BRADLEY PARK DRIVE
IN COLUMBUS
SHEET 2 OF 2

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE **Muscogee County** OFFICE Thomaston

DATE June 16, 2000

FROM Glenn W. Durrence, P.E., District Engineer

TO Marion Waters, State Traffic Operations Engineer
Attention: Ken Werho, Melinda Boothe

SUBJECT **Safety Project Submittal**

Please accept the attached traffic engineering report for the State Route 22 interchange at Bradley Park Drive. The report is the result of a request by Mr. Sam Wellborn for safety improvements. The recommendation is to install a signal at the eastbound off ramp to Bradley Park Drive eastbound. The On ramp from Bradley Park Drive eastbound to State Route 22 eastbound will be closed and the signal will handle the left turn movements onto the ramp to State Route 22 eastbound from Bradley Park Drive. The construction plan attached was developed based on a field survey by district forces.

If you have any questions, please contact Keith Rohling at 706-646-6557.

KBR

Department of Transportation
State of Georgia
Thomaston District Office

Traffic Engineering Report

Thomaston District Three

June 16, 2000

LOCATION: State Route 22 at Bradley Park Drive

CITY/COUNTY: Columbus/Muscogee County

REQUESTED BY: Mr. Sam Wellborn

REASON FOR INVESTIGATION: To determine appropriate method of eliminating collisions at this interchange.

F I N D I N G S

TOPOGRAPHY: State Route 22 is a four lane divided asphalt roadway oriented north and south at this interchange with eastbound lanes actually traveling northbound. Please see concept plan attached. There is a right turn lane present for the eastbound to northbound movement and westbound to northbound movement. Bradley Park Drive is a 62' wide roadway oriented east and west. The interchange is a full cloverleaf interchange with ramps in all directions. The eastbound exit ramp and entrance ramps that make the clover leaf are close on proximity. The weave area between the two ramps is 140 feet in length.

There is a signalized commercial driveway to the east of the interchange. Both of the roadways have paved shoulders.

EXISTING TRAFFIC CONTROL: The intersection is presently controlled with a stop condition on exit ramps to Bradley Park Drive.

715 Andrews Drive, Thomaston, Ga. 30286-4524, Fax 706-646-6584

Traffic Engineering Study
State Route 22 at Bradley Park Drive
June 16, 2000

VEHICLE VOLUME: See attached counts.

VEHICULAR SPEEDS: The posted speed limit on State Route 22 is 65 MPH. The 85th percentile speed was not measured, however vehicle paces estimated the speeds about 68 MPH.

PEDESTRIAN MOVEMENTS: No pedestrians were observed.

PARKING: No vehicles were observed parking in this area and there were no signs of parking on the existing shoulders.

ACCIDENT HISTORY: The accident history provided by the City of Columbus is attached. In summary, the rear end accidents are very high with 42 of the 48 collisions in 1998 and 42 out of 50 in 1999 occurring on SR 22 exit ramp to Bradley Park Drive. See collision diagrams attached.

WARRANT ANALYSIS: See attached warrant analysis for State Route 22 Eastbound to Bradley Park Drive Eastbound. A Delay Study was not conducted however, site visit observations indicated that there is sufficient delay to meet the delay warrant.

OTHER INFORMATION

There are other signals in the area. The first signal to the east is located at the commercial development 320 feet east of the subject ramps. The original request was to review the loop ramp entrances under Bradley Park Drive. This was due to the closeness of the on-ramp and off-ramps on State Route 22 eastbound. When collision data was obtained, the problem was discovered not at the weave point of the two ramps but at the top of the ramps. The original intent of this study is to improve the safety of the interchange ramps, therefore the focus shifted.

715 Andrews Drive, Thomaston, Ga. 30286-4524, Fax 706-646-6584

Traffic Engineering Study
State Route 22 at Bradley Park Drive
June 16, 2000

CONCLUSIONS

It can be concluded from the information gathered that the interchange would benefit from stop and go signal control of the Eastbound exit and entrance ramps while closing the existing loop on-ramp eastbound. Coordination with the adjacent signal could be beneficial to the roadway system primarily for communication purposes. The 140-foot long merge area would be converted to a deceleration lane for the eastbound off ramp.

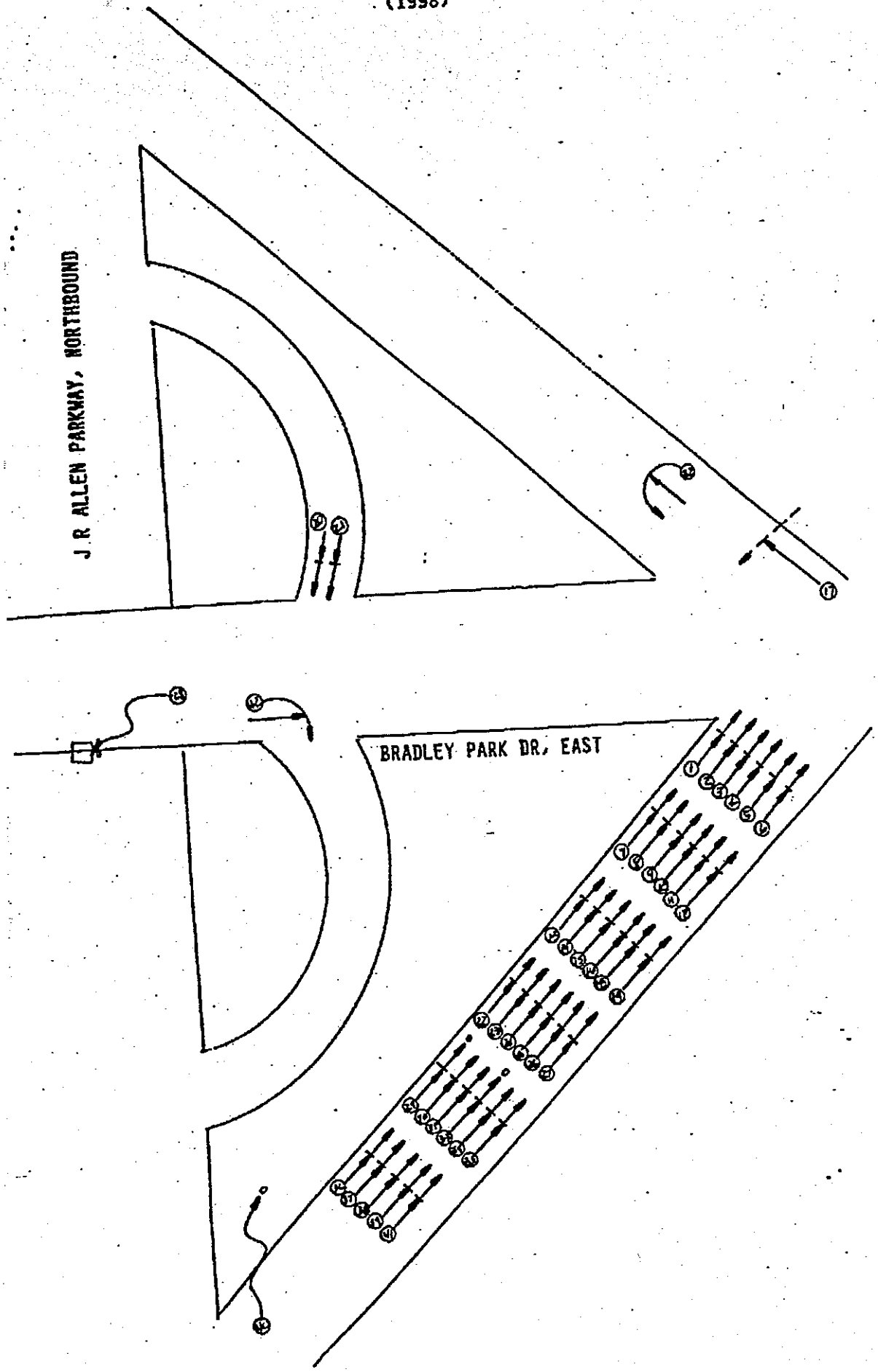
RECOMMENDATIONS

It is recommended that the City of Columbus be issued a permit for the installation and operation of a stop and go signal at the subject intersection. This installation would be accomplished along with the geometric changes as shown on the attached plan as part of a safety project.

District Traffic Operations Engineer	6-16-00 Date
District Engineer	Date
State Traffic Operations Engineer	Date
Division Director	Date

715 Andrews Drive, Thomaston, Ga. 30286-4524, Fax 706-646-6584

(1998)



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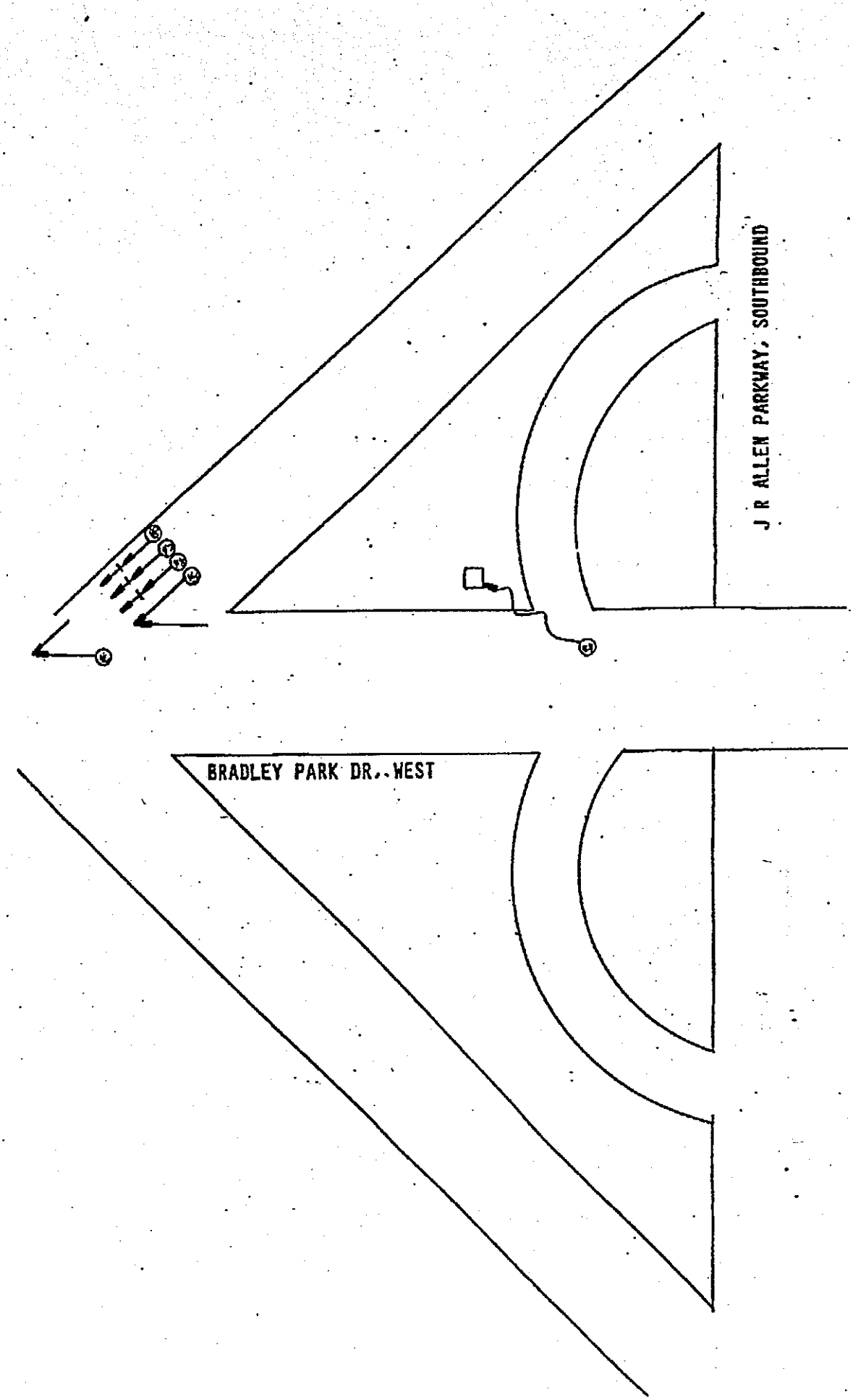


TRAFFIC ENGINEERING DIVISION
COLUMBUS CONSOLIDATED GOVERNMENT
P O BOX 1340 • COLUMBUS, GA.

COLLISION DIAGRAM

J R ALLEN PARKWAY @ BRADLEY PARK DRIVE - 1998

#	DATE	TIME	PVT/WEATHER CONDITIONS
1.	01/07/98	04:00 PM	WR
2.	01/09/98	11:40 AM	DC
3.	01/19/98	12:30 PM	DC
4.	01/24/98	04:00 PM	DC
5.	01/30/98	09:00 AM	DC
6.	01/30/98	02:35 PM	DC
7.	02/13/98	12:33 PM	DCL
8.	02/18/98	10:00 AM	DCL
9.	03/01/98	01:00 PM	DC
10.	03/07/98	11:50 AM	WR
11.	03/20/98	05:15 PM	DCL
12.	04/02/98	05:20 PM	DCL
13.	04/03/98	12:10 PM	WCL
14.	04/11/98	01:40 PM	DC
15.	04/18/98	06:00 PM	UNK
16.	04/20/98	08:20 AM	DC
17.	04/22/98	01:00 AM	DC
18.	04/22/98	08:20 AM	DC
19.	04/23/98	07:45 AM	DC
20.	04/24/98	05:00 AM	DC
21.	04/03/98	02:10 PM	DCL
22.	04/24/98	08:40 AM	DC
23.	04/26/98	05:30 PM	DC
24.	05/08/98	04:15 PM	DC
25.	05/22/98	08:25 AM	DC
26.	05/22/98	04:45 PM	DC
27.	05/27/98	05:45 PM	DC
28.	06/01/98	04:30 PM	DC
29.	06/10/98	03:15 PM	DC
30.	07/24/98	07:00 PM	DCL
31.	08/27/98	08:00 AM	DC
32.	09/05/98	12:30 PM	DC
33.	09/09/98	02:15 PM	DC
34.	09/12/98	03:00 PM	DCL
35.	09/17/98	04:45 PM	DC
36.	10/26/98	12:10 PM	DC
37.	11/10/98	08:00 PM	WR
38.	11/11/98	04:10 PM	DC
39.	12/04/98	10:30 AM	DC
40.	12/05/98	12:15 PM	DC
41.	12/07/98	10:00 AM	DC
42.	04/11/98	06:00 AM	DC
43.	01/12/98	08:59 AM	DCL
44.	04/03/98	08:45 AM	WCL
45.	08/27/98	08:30 AM	DC
46.	10/20/98	12:15 PM	DC
47.	11/11/98	08:45 AM	WR
48.	11/19/98	08:35 AM	DCL

TYPE ACCIDENT	FATALITIES		INJURIES		PROPERTY DAMAGE		TOTALS
	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	
RIGHT ANGLE APPROACH			4				4
SAME DIRECTION			1	2	36	1	40
OPPOSITE DIRECTION							
PEDESTRIAN							
DEER							
STRUCK OBJECT			1		1		2
OTHER					1		1
TOTALS			6	2	38	2	48

LOCATION:

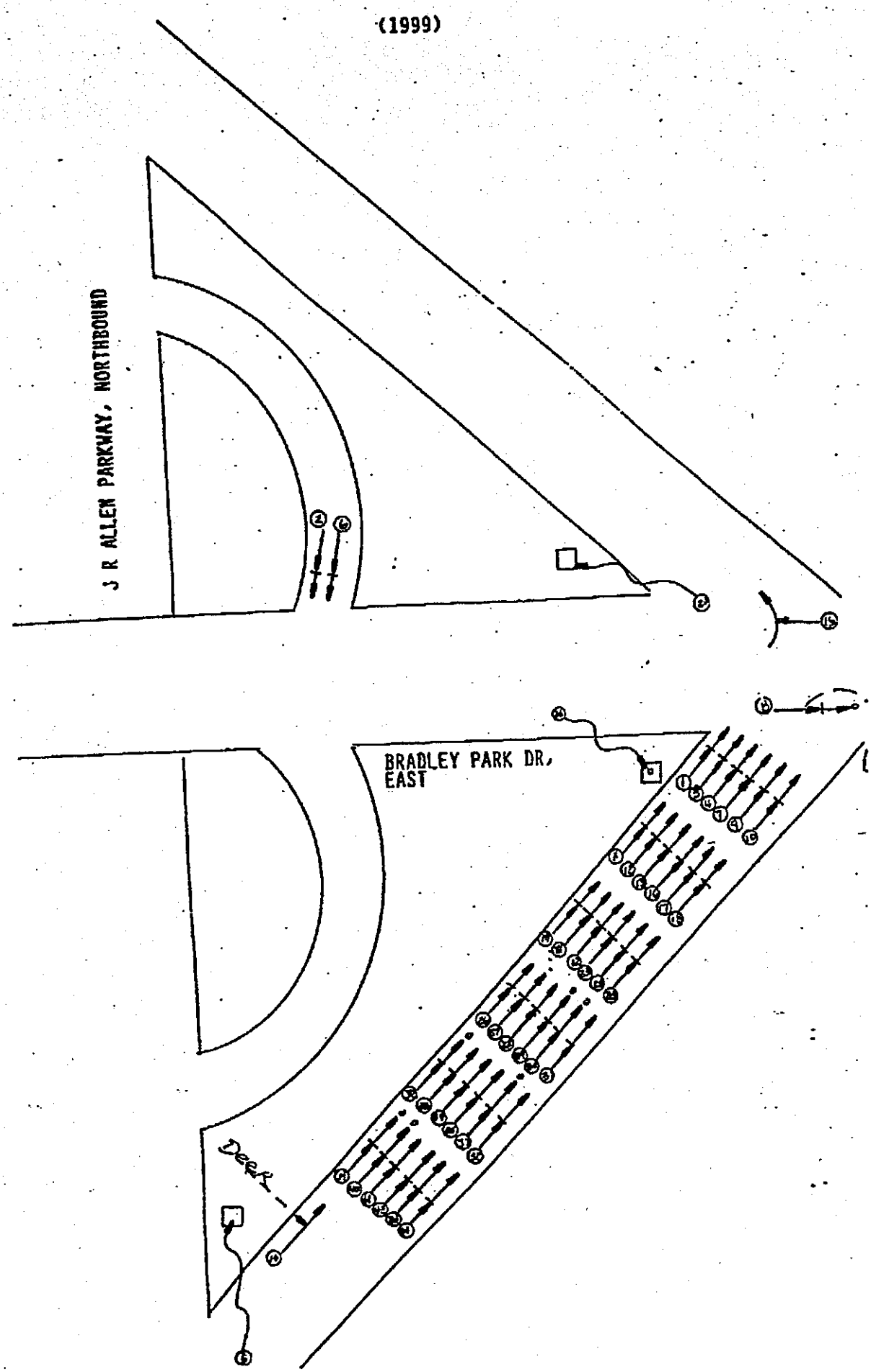
PERIOD OF: 1-1-98 TO 12-31-98

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
INJURY
REAR END COLLISION
PARKED VEHICLE
STRUCK OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE

PAVEMENT:
C=DRY I=ICY
W=WET

WEATHER:
C=CLEAR F=FOG
R=RAIN S=SNOW
SL=SLEET

(1999)



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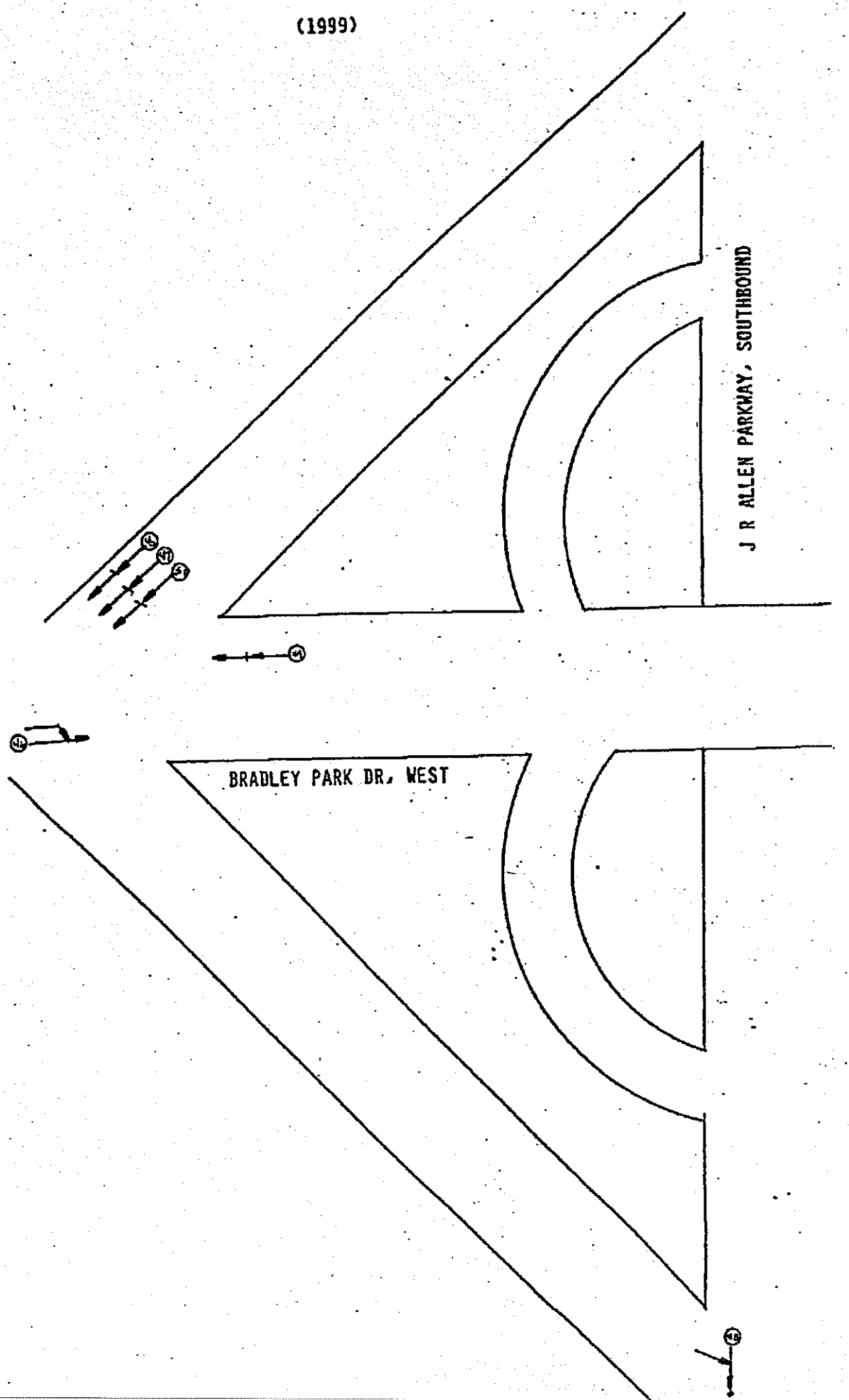

TRAFFIC ENGINEERING DIVISION
COLUMBUS CONSOLIDATED GOVERNMENT
P O BOX 1340 • COLUMBUS, GA.

COLLISION DIAGRAM

J R ALLEN PARKWAY @ BRADLEY PARK DRIVE - 1999

#	DATE	TIME	PVT/WEATHER CONDITIONS
1.	01/09/99	12:45 PM	DCL
2.	01/11/99	08:45 PM	DC
3.	01/19/99	08:05 AM	DC
4.	02/04/99	10:57 AM	DC
5.	02/12/99	01:00 PM	WR
6.	02/17/99	01:10 PM	DC
7.	02/18/99	05:30 PM	DCL
8.	02/21/99	08:30 PM	DC
9.	03/02/99	02;20 PM	DC
10.	03/14/99	03:00 PM	DCL
11.	03/29/99	12:30 PM	DCL
12.	04/07/99	05:40 PM	DC
13.	04/24/99	11:15 AM	DCL
14.	04/29/99	05:55 AM	DCL
15.	05/11/99	12:40 PM	DCL
16.	06/17/99	01:50 PM	DCL
17.	06/19/99	06:00 PM	DCL
18.	06/29/99	12:15 PM	DCL
19.	07/06/99	05:20 PM	DC
20.	07/16/99	04:11 PM	DC
21.	07/22/99	01:10 PM	UNK
22.	07/25/99	01:00 PM	DC
23.	08/14/99	10:35 AM	DC
24.	08/19/99	03:35 PM	DC
25.	08/19/99	05:20 PM	DC
26.	08/20/99	04:35 PM	WR
27.	08/25/99	08:37 AM	DC
28.	08/28/99	01:40 PM	DC
29.	08/28/99	08:50 PM	DC
30.	09/03/99	05:55 AM	DC
31.	09/07/99	08:45 PM	DCL
32.	09/17/99	07:45 PM	DC
33.	09/23/99	08:30 AM	DC
34.	09/25/99	06:00 PM	DCL
35.	10/01/99	08:00 AM	DC
36.	10/01/99	06:05 AM	DC
37.	11/08/99	05:25 PM	DC
38.	10/16/99	03:00 PM	DCL
39.	10/04/99	03:45 PM	WR
40.	12/08/99	07:30 PM	DC
41.	12/10/99	04:15 PM	DC
42.	12/18/99	08:00 PM	WR
43.	12/30/99	05:45 PM	DC
44.	12/30/99	01:20 PM	DC
45.	01/15/99	11:50 AM	DC
46.	03/17/99	09:00 AM	DC
47.	05/19/99	08:15 AM	DC
48.	08/01/99	12:00 PM	DC
49.	11/19/99	02:30 PM	DC
50.	11/22/99	06:10 PM	DC

TYPE ACCIDENT	FATALITIES		INJURIES		PROPERTY DAMAGE		TOTALS
	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	
RIGHT ANGLE APPROACH			1		1		2
SAME DIRECTION			4	3	33	4	44
OPPOSITE DIRECTION							
PEDESTRIAN							
DEER						1	1
STRUCK OBJECT					3		3
OTHER							
TOTALS			5	3	37	5	50

LOCATION:
PERIOD OF: 1-1-99 THRU 12-31-99

PATH OF MOVING VEHICLE
PEDESTRIAN PATH
FATAL
INJURY
REAR END COLLISION
PARKED VEHICLE
STRUCK OBJECT
OVERTURNED
OUT OF CONTROL
SIDESWIPE

PAVEMENT:
D=DRY I=ICY
W=WET

WEATHER:
C=CLEAR F=FOG
R=RAIN S=SNOW
SL=SLEET

Bradley Park Drive
State Route 22 EB off ramp
TRAFFIC SIGNAL WARRANT EVALUATION.

INTRODUCTION

This review is based on the methodology presented in the Manual on Uniform Traffic Control Devices (MUTCD), 1978, as amended by the Federal Highway Administration. Please refer to part 4C of that manual.

The intersection under study has the following characteristics:

The 85th percentile speed on the main street is [45] MPH.
Existing traffic control is . . . SIDE STREET STOP.
Daily traffic volume of [23,284] was counted on
THURSDAY, FEBRUARY 1, 1900.
Estimated annual traffic volume is [8,498,660] vehicles.

1. INTERSECTING TRAFFIC VOLUMES

The installation of a traffic signal may be necessary to control an intersection with large volumes of conflicting traffic. The required traffic volumes must be present for at least 8 hours of an average weekday. The minimum volumes vary according to the number of lanes on the intersecting streets, the speed of traffic on the main street, and the community size.

Number of hours required traffic present = 14
Warrant 1 is SATISFIED.

2. INTERRUPTION OF CONTINUOUS TRAFFIC

On major streets with high traffic volume, it may be necessary to use traffic signal control to provide an adequate number of gaps in traffic to allow vehicles to enter from a side street. The application of this warrant is identical to that of warrant 1, above.

Number of hours required traffic present = 13
Warrant 2 is SATISFIED.

3. CROSSING PEDESTRIAN TRAFFIC

This warrant is similar to warrant 2, but is intended to identify locations where additional gaps are needed to provide safe pedestrian crossing of a major street. A signal installed solely for pedestrians should use a fully actuated controller and, if in a signal system, be coordinated with that system. A signal installed only under this warrant shall include pedestrian signals. When installed at a midblock location, additional restrictions may apply (See section 4C-5).

Number of hours required traffic present = 0
Warrant 3 is NOT APPLICABLE.

4. SCHOOL CROSSING

An established school crossing may require signal protection if an engineering study reveals that there is less than one gap per minute during the period of crossing usage. The restrictions on signals installed under this warrant are similar to those of warrant 3.

WARRANT 4 IS NOT APPLICABLE.

5. SIGNAL PROGRESSION

A traffic signal may occasionally be used to maintain vehicle grouping in a coordinated system. Such a signal should not be within 1,000 FT of adjacent signalized intersections in the system.

Warrant 5 is NOT APPLICABLE.

6. ACCIDENT PREVENTION

Many traffic signals are installed on the premise of reducing accidents; however, it must be recognized that signals may actually increase some types of accidents. The result is often contrary to the intended goal. Four conditions must be met before a signal is installed solely to reduce accidents:

(1) There has been five or more accidents of types preventable by traffic signals in the last 12 months;

(2) at least one volume requirement of warrant 8 must be satisfied;

(3) traffic progression would not be seriously disrupted, and

(4) less restrictive solutions have been tried and enforced with unsatisfactory results.

A signal installed solely under this warrant should be traffic actuated.

Total number of accidents = 17
Number of preventable accidents = 2
Accident rate is 2 per million vehicles
Number of warrant 8 volume requirements met = 2
Parts 1 and 2 are NOT SATISFIED.

7. TRAFFIC SYSTEM OPERATION

Traffic signal control may be used to encourage concentration and organization of vehicles on the major street network. Such a signal may be installed at the intersection of two major routes as defined by section 4C-9 of the MUTCD, with a total volume of 800 vehicles during the typical peak weekday hour, or for five (5) weekend hours.

Warrant 7 is NOT APPLICABLE.

8. COMBINATION OF WARRANTS

In exceptional cases, signal control may be justified where no single warrant is satisfied, but where at least two of warrants 1, 2, or 3 are met when the required volumes are reduced to 80% of normal. Adequate trial of other measures which cause less delay and inconvenience must be tried and enforced first.

Number of warrants satisfied at the 80% level = 2
Volume requirements for warrant 8 are SATISFIED.

9. FOUR HOUR VOLUME WARRANT

This warrant was approved as an amendment to the MUTCD on December 31, 1984. This warrant is similar to warrant 1, except that the required traffic volumes must be present for at least four hours of an average weekday. The traffic volumes required are based on curves (Figures 4-3 & 4-4) shown in the MUTCD.

Warrant 9 is SATISFIED.

10. PEAK HOUR DELAY

This warrant was approved as an amendment to the MUTCD on December 31, 1984. This warrant is intended for application where traffic conditions will cause undue delay to traffic entering or crossing the main street. The peak hour delay warrant is satisfied when the following conditions exist for one hour (any four consecutive 15-minute periods) of an average day:

(1) The total delay by the traffic on a side street controlled by a stop sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach;

(2) the volume on the side street equals or exceeds 100 VPH for one moving lane of traffic and 150 VPH for two moving lanes;

(3) the total traffic volume serviced during 1 hour equals or exceeds 800 VPH for an intersection with four (or more) approaches or 650 VPH for three approaches.

Warrant - 10
Part 1 - Delay to be determined by traffic engineer.

Part 2 - SATISFIED
Part 3 - SATISFIED

11. PEAK HOUR VOLUME

This warrant was approved as an amendment to the MUTCD on December 31, 1984. This warrant applies to traffic entering from the minor street which encounters undue delay crossing the main street. This warrant is satisfied when the main street and side street traffic volumes satisfy the curves (Figures 4-5 and 4-6) shown in the MUTCD.

Warrant 11 IS SATISFIED.

TABLE 1
TWENTY-FOUR HOUR VEHICULAR TRAFFIC EVALUATION
WARRANTS 1,2 AND 8

HOUR OF DAY	MAIN ST. VOLUME	SIDE ST. VOLUME	WARRANT 1	WARRANT 2	WARRANT 8 PART 1	WARRANT 8 PART 2
12 AM	50	15				
1 AM	26	7				
2 AM	20	7				
3 AM	28	16				
4 AM	53	68		SIDE		SIDE
5 AM	137	184	SIDE	SIDE	SIDE	SIDE
6 AM	261	171	SIDE	SIDE	SIDE	SIDE
7 AM	823	466	BOTH	BOTH	BOTH	BOTH
8 AM	1096	492	BOTH	BOTH	BOTH	BOTH
9 AM	730	323	BOTH	BOTH	BOTH	BOTH
10 AM	853	249	BOTH	BOTH	BOTH	BOTH
11 AM	1072	464	BOTH	BOTH	BOTH	BOTH
12 PM	1542	470	BOTH	BOTH	BOTH	BOTH
1 PM	1468	446	BOTH	BOTH	BOTH	BOTH
2 PM	1255	330	BOTH	BOTH	BOTH	BOTH
3 PM	1329	393	BOTH	BOTH	BOTH	BOTH
4 PM	1316	367	BOTH	BOTH	BOTH	BOTH
5 PM	1674	522	BOTH	BOTH	BOTH	BOTH
6 PM	1281	399	BOTH	BOTH	BOTH	BOTH
7 PM	840	277	BOTH	BOTH	BOTH	BOTH
8 PM	582	168	BOTH	SIDE	BOTH	BOTH
9 PM	392	149	SIDE	SIDE	BOTH	SIDE
10 PM	247	75		SIDE		SIDE
11 PM	117	34				
REQUIRED VOLUMES:	MAIN STREET		420	630	336	504
	SIDE STREET		105	53	84	42

NOTE: SIDE STREET VOLUMES SHOWN ARE FOR EACH HOUR'S PEAK APPROACH.

NU-METRICS HI-STAR FRAME STUDY -- HDM Version 5.1 02/04/00

[Report #1 DATE/TIME/VOLUME/AVG SPEED/TEMP]

Hi-Star ID: 9135 Begin: 01/11/00 12:00 End: 01/12/00 11:00
Route: SR 22 EB to SB Bradl Lane: Hours : 24 hrs
Loc/Sta SR 22 EB to SB Bradl Oper: SKP Period: 60 min
City: Columbus, GA Posted: 45 mph Raw Count:6092
County: Muscogee AADT Factor: 1.00 AADT Count: 6092

Day	Date	Time	Count	Avg Sp(mph)	Temp (F)	Wx
Thu	01/11/00	12:00	470	NA	NA	
	01/11/00	13:00	446	NA	NA	
	01/11/00	14:00	330	NA	NA	
	01/11/00	15:00	393	NA	NA	
	01/11/00	16:00	367	NA	NA	
	01/11/00	17:00	522	NA	NA	
	01/11/00	18:00	399	NA	NA	
	01/11/00	19:00	277	NA	NA	
	01/11/00	20:00	168	NA	NA	
	01/11/00	21:00	149	NA	NA	
	01/11/00	22:00	75	NA	NA	
	01/11/00	23:00	34	NA	NA	
Fri	01/12/00	00:00	15	NA	NA	
	01/12/00	01:00	7	NA	NA	
	01/12/00	02:00	7	NA	NA	
	01/12/00	03:00	16	NA	NA	
	01/12/00	04:00	68	NA	NA	
	01/12/00	05:00	184	NA	NA	
	01/12/00	06:00	171	NA	NA	
	01/12/00	07:00	466	NA	NA	
	01/12/00	08:00	492	NA	NA	
	01/12/00	09:00	323	NA	NA	
	01/12/00	10:00	249	NA	NA	
	01/12/00	11:00	464	NA	NA	

6pdrsb

BRADLEY PARK DRIVE

	OUTSIDE S(E)	INSIDE S(E)		OUTSIDE N(W)	INSIDE N(W)	
11:00	225	287	575	299	198	497
12:00	293	363	792	425	325	750
13	258	302	664	466	338	804
14	207	270	547	469	239	708
15	203	291	636	417	276	693
16	219	311	628	414	274	688
17	257	380	869	551	254	805
18	198	264	566	469	246	715
19	164	159	376	323	141	464
20	91	89	208	260	114	374
21	63	53	145	178	69	247
22	27	16	56	161	30	191
23	17	8	37	65	15	80
00	10	6	17	26	7	33
1	3	3	8	15	3	18
2	4	3	8	8	4	12
3	11	11	22	3	3	6
4	25	7	33	18	2	20
5	58	19	83	47	7	54
6	71	37	137	98	26	124
7	229	145	482	195	146	341
8	251	257	627	284	185	469
9	153	172	394	222	114	330
10	163	220	442	269	142	41
				5687	2158	

NU-METRICS HI-STAR FRAME STUDY -- HDM Version 5.1 02/02/00

[Report #1 DATE/TIME/VOLUME/AVG SPEED/TEMP]

Hi-Star ID: 9441 Begin: 02/01/00 12:00 End: 02/02/00 01:00
Route: Bradley Park Dr. @ S Lane: Rt. turn EB Hours : 24 hrs
Loc/Sta Bradley Park Dr. @ S Oper: SKP Period: 60 min
City: Columbus, Ga Posted: 45 mph Raw Count:1474
County: Muscogee AADT Factor: 1.00 AADT Count: 1474

Day	Date	Time	Count	Avg Sp(mph)	Temp (F)	Wx
Thu	02/01/00	12:00	136	NA	NA	
	02/01/00	13:00	104	NA	NA	
	02/01/00	14:00	70	NA	NA	
	02/01/00	15:00	142	NA	NA	
	02/01/00	16:00	98	NA	NA	
	02/01/00	17:00	232	NA	NA	
	02/01/00	18:00	104	NA	NA	
	02/01/00	19:00	53	NA	NA	
	02/01/00	20:00	28	NA	NA	
	02/01/00	21:00	29	NA	NA	
	02/01/00	22:00	13	NA	NA	
	02/01/00	23:00	7	NA	NA	
Fri	02/02/00	00:00	1	NA	NA	
	02/02/00	01:00	2	NA	NA	
	02/02/00	02:00	1	NA	NA	
	02/02/00	03:00	0	NA	NA	
	02/02/00	04:00	1	NA	NA	
	02/02/00	05:00	6	NA	NA	
	02/02/00	06:00	29	NA	NA	
	02/02/00	07:00	108	NA	NA	
	02/02/00	08:00	119	NA	NA	
	02/02/00	09:00	69	NA	NA	
	02/02/00	10:00	59	NA	NA	
	02/02/00	11:00	63	NA	NA	

NU-METRICS HI-STAR FRAME STUDY -- HDM Version 5.1 01/12/00

[Report #1 DATE/TIME/VOLUME/AVG SPEED/TEMP]

Hi-Star ID: 9440
Route: SR 22 WB to SB Bradl
Loc/Sta SR 22 WB to SB Bradl
City: Columbus, GA
County: Muscogee

Begin: 01/11/00 11:00
Lane:
Oper: SKP
Posted: 45 mph
AADT Factor: 1.00

End: 01/12/00 12:00
Hours : 24 hrs
Period: 60 min
Raw Count: 2652
AADT Count: 2652

Day	Date	Time	Count	Avg Sp(mph)	Temp (F)	Wx
Thu	01/11/00	11:00	217	NA	NA	
	01/11/00	12:00	199	NA	NA	
	01/11/00	13:00	172	NA	NA	
	01/11/00	14:00	169	NA	NA	
	01/11/00	15:00	196	NA	NA	
	01/11/00	16:00	231	NA	NA	
	01/11/00	17:00	188	NA	NA	
	01/11/00	18:00	121	NA	NA	
	01/11/00	19:00	96	NA	NA	
	01/11/00	20:00	58	NA	NA	
	01/11/00	21:00	17	NA	NA	
	01/11/00	22:00	15	NA	NA	
	01/11/00	23:00	5	NA	NA	
Fri	01/12/00	00:00	6	NA	NA	
	01/12/00	01:00	6	NA	NA	
	01/12/00	02:00	6	NA	NA	
	01/12/00	03:00	17	NA	NA	
	01/12/00	04:00	51	NA	NA	
	01/12/00	05:00	67	NA	NA	
	01/12/00	06:00	203	NA	NA	
	01/12/00	07:00	240	NA	NA	
	01/12/00	08:00	113	NA	NA	
	01/12/00	09:00	98	NA	NA	
	01/12/00	10:00	161	NA	NA	

Loop

NU-METRICS HI-STAR FRAME STUDY -- HDM Version 5.1 01/12/00

[Report #1 DATE/TIME/VOLUME/AVG SPEED/TEMP]

Hi-Star ID: 9441 Begin: 01/11/00 12:00 End: 01/12/00 11:00
Route: SR 22 EB to NB Bradl Lane: Hours : 24 hrs
Loc/Sta SR 22 EB to NB Bradl Oper: SKP Period: 60 min
City: Columbus, GA Posted: 45 mph Raw Count:333
County: Muscogee AADT Factor: 1.00 AADT Count: 333

Day	Date	Time	Count	Avg Sp(mph)	Temp (F)	Wx
Thu	01/11/00	12:00	21	NA	NA	
	01/11/00	13:00	31	NA	NA	
	01/11/00	14:00	22	NA	NA	
	01/11/00	15:00	17	NA	NA	
	01/11/00	16:00	25	NA	NA	
	01/11/00	17:00	21	NA	NA	
	01/11/00	18:00	7	NA	NA	
	01/11/00	19:00	8	NA	NA	
	01/11/00	20:00	1	NA	NA	
	01/11/00	21:00	3	NA	NA	
	01/11/00	22:00	1	NA	NA	
	01/11/00	23:00	0	NA	NA	
Fri	01/12/00	00:00	2	NA	NA	
	01/12/00	01:00	0	NA	NA	
	01/12/00	02:00	0	NA	NA	
	01/12/00	03:00	0	NA	NA	
	01/12/00	04:00	0	NA	NA	
	01/12/00	05:00	0	NA	NA	
	01/12/00	06:00	0	NA	NA	
	01/12/00	07:00	64	NA	NA	
	01/12/00	08:00	50	NA	NA	
	01/12/00	09:00	23	NA	NA	
	01/12/00	10:00	19	NA	NA	
	01/12/00	11:00	18	NA	NA	

Loop

NU-METRICS HI-STAR FRAME STUDY -- HDM Version 5.1 01/12/00

[Report #1 DATE/TIME/VOLUME/AVG SPEED/TEMP]

Hi-Star ID: 9135
Route: SR 22 EB to SB Bradl
Loc/Sta SR 22 EB to SB Bradl
City: Columbus, GA
County: Muscogee

Begin: 01/11/00 12:00
Lane:
Oper: SKP
Posted: 45 mph
AADT Factor: 1.00

End: 01/12/00 11:00
Hours : 24 hrs
Period: 60 min
Raw Count: 6092
AADT Count: 6092

Day	Date	Time	Count	Avg Sp(mph)	Temp (F)	Wx
~~Thu~~	01/11/00	12:00	470	NA	NA	
TUE	01/11/00	13:00	446	NA	NA	
	01/11/00	14:00	330	NA	NA	
	01/11/00	15:00	393	NA	NA	
	01/11/00	16:00	367	NA	NA	
	01/11/00	17:00	522	NA	NA	
	01/11/00	18:00	399	NA	NA	
	01/11/00	19:00	277	NA	NA	
	01/11/00	20:00	168	NA	NA	
	01/11/00	21:00	149	NA	NA	
	01/11/00	22:00	75	NA	NA	
	01/11/00	23:00	34	NA	NA	
WED	01/12/00	00:00	15	NA	NA	
~~Fri~~	01/12/00	01:00	7	NA	NA	
	01/12/00	02:00	7	NA	NA	
	01/12/00	03:00	16	NA	NA	
	01/12/00	04:00	68	NA	NA	
	01/12/00	05:00	184	NA	NA	
	01/12/00	06:00	171	NA	NA	
	01/12/00	07:00	466	NA	NA	
	01/12/00	08:00	492	NA	NA	
	01/12/00	09:00	323	NA	NA	
	01/12/00	10:00	249	NA	NA	
	01/12/00	11:00	464	NA	NA	

Diamond