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NEW JERSEY STATE DEPARTMENT OF TRANSPORTATION

*This is a draft
The Final Statement was
prepared by the U. S. Coast
Guard (1977)*

ENVIRONMENTAL ANALYSIS AND REPORT
FOR
ROUTE 18 FREEWAY EXTENSION
CITY OF NEW BRUNSWICK AND PISCATAWAY TOWNSHIP
MIDDLESEX COUNTY, NEW JERSEY

VOLUME II - APPENDIX

SECTION 1 - INTRODUCTION AND LIST OF REFERENCES

SECTION 2 - TRANSPORTATION STUDIES AND TRAFFIC FORECASTS

PREPARED FOR THE

NJDSOT

BY

KING & GAVARIS
CONSULTING ENGINEERS

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ENVIRONMENTAL ANALYSIS AND REPORT
FOR
ROUTE 18 FREEWAY EXTENSION
CITY OF NEW BRUNSWICK AND PISCATAWAY TOWNSHIP
MIDDLESEX COUNTY, NEW JERSEY

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PART FOUR
APPENDIX TO ENVIRONMENTAL IMPACT STUDY AND REPORT

Section 1. INTRODUCTION AND LIST OF REFERENCES

1.1 Introduction

The Department of Transportation of the State of New Jersey presents herewith the Environmental Impact Study and Report for the proposed Route 18 Freeway extension in the City of New Brunswick and the Township of Piscataway, both in Middlesex County, as prepared by the Department's consultant, King and Gavaris. The report consists of four parts: Part One - Detailed Analysis including Quantitative Measurements, Tests and Evaluations; Part Two - Environmental Impact Statement in Accordance with Section 102 (2) (C) of the National Environmental Policy Act of 1969 (P.L. 91-190); Part Three - Review of Highway Project Relative to Park Lands and Historical Sites in Accordance with Section 4 (f) of the U.S. Department of Transportation Act; and Part Four - Appendix to Environmental Impact Study and Report. Parts One, Two

and Three are included in Volume I.

Volume II contains Part Four only.

Volume II, Part Four - Appendix to Environmental Impact Study and Report is subdivided into eight sections, as follows:

Section 1 - Introduction and List of References, prepared by King and Gavaris, Consulting Engineers.

Section 2 - Transportation Studies and Traffic Forecasts, prepared by King and Gavaris, Consulting Engineers.

Section 3 - Final Report, Route 18 Extension, Noise Impact Study, July 1972, prepared by General Electric Co.

Section 4 - Final Report, Route 18 Extension, Air Pollution Study, July 1972, prepared by General Electric Co.

Section 5 - Report on Human Responses to Highway Noise, prepared by P. Suedfeld, Ph. D., and L.M. Ward, Ph. D.

Section 6 - Meteorological Report, prepared by Prof. A. Vaugh Havens.

Section 7 - Ecological Reports - Soils, Wildlife, Limnological, and Vegetation,

prepared by Jack McCormick & Associates,
Ecological Consultant.

Section 8 - Reports of Public Hearings,
June 19, 1964 and September 4, 1968.

Sections 3, 4, 5, 6, and 7 were prepared
under subcontracts to King and Gavaris.
The resultant findings of these reports
have been evaluated, analyzed and discussed
in the various Sections of Parts One,
Two, and Three, in Volume I.

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Section 1.2

List of References

The following reports and publications are among the references used in the preparation of this environmental analysis and report.

1. Location of State Route 18 Engineering Report, prepared for New Jersey State Highway Department by Parsons, Brinckerhoff, Quade & Douglas, May 1965.
2. Route 18 Extension, Final Report, submitted by the Mayor, Board of Commissioners, and the Highway Study committee, June 1964.
3. Memorandum to New Jersey State Highway Department from Township of Piscataway on the subject of Route 18, dated December 17, 1964.
4. Minutes of Middlesex County Planning Board meetings, March 6 and 18, 1964.
5. The Route 18 Extension Problems and Prospects, a report prepared by the following graduate students in the Department of Urban Planning of Rutgers University: -

Philip A. Lieberman
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Philip Andermann
Larry Bonier
Tuan Do
William Franz
Robert Meader

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Federal Highway Administration Policy
and Procedure Memorandum 90-1, dated
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and Procedure Memorandum 90-2, Interim
Noise Pollution Standards, dated July 1,
1972.
8. New Jersey State Department of Health,
Division of Clean Air and Water,
Technical Bulletin A-69-1, July 1969,
"Air Pollution Control Program - New
Jersey Air Monitoring Systems and Air
Quality Data, October 1965 through
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9. New Jersey State Implementation Plan
to meet National Air Quality Standards.
10. U. S. Environmental Protection Agency -
The Clean Air Act, December 1970.
11. Study of Noise Pollution Aspects of
Various Roadway configurations, prepared
by General Electric Company, Re-entry
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12. Report on Urban Expressway Air Pollution at Ten Sites in New York City, by L. H. Dworetzky, W. H. Giles, C. Simon and R. E. Lee.
13. Highway Research Board, National Cooperative Highway Research Program.
Report 78 - Highway Noise Measurement, Simulation and Mixed Reactions
Report 91 - Effects of De-icing Salts on Water Quality and Biota- Literature Review and Recommended Research
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14. The Sunday Home News, New Brunswick, N. J., January 23, 1972.
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16. Exploring the Little Rivers of New Jersey, by James and Margaret Cawley, published by Rutgers University Press.
17. Center for Transportation Studies, Report No. 28, "An Alternate Highway Bridge Plan for Improving Route 18", Center for Transportation Studies, Eagleton Institute of Politics, Rutgers

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Toivo Lamminen, Project Leader
Forest Markowitz
Trudy Baylock
Michael Tomaszewicz
James Mullaly
Stanford Singer
Walter Jackson
Bernard Levine

18. Middlesex County Planning Board
Comprehensive Master Plan
 - 9 - Land Use Inventory & Analysis
 - Terminal Facilities: A Locational
Analysis
 - Forecasts 1985, 2000: People, Jobs &
Land
 - 10- Highway Inventory & Analysis
 - 11- Transit Inventory & Analysis
 - 12- Open Space & Recreational Facilities
Inventory & Analysis
 - 15- Description of 1985 & 2000 Road
Network
 - An Analysis of Highway Plans
19. "Tri-State Transportation 1985 - An
Interim Plan", Tri-State Transportation
Commission, May 1966.
20. "Regional Transit Improvements", Tri-
State Transportation Commission, October
1968.

21. "Regional Transit 1990 - The Revised and Updated Regional Plan and Program", Tri-State Regional Planning Commission, April 1972.
22. "Delineation of Flood Hazard Areas - Raritan River Basin", Flood Hazard Report No. 2 - Raritan River, New Jersey State Department of Environmental Protection, Division of Water Resources, March 1972.
23. National Environmental Policy Act of 1969 - Public Law 91-190, 83 Stat. 852 (1970).
24. New Jersey State Legislature Authorizing Route 18 Freeway extension; Laws of 1962, Chapter 102.
25. New Jersey State Department of Environmental Protection, Air Pollution Control Code, Chapter 15 - Control and Prohibition of Air Pollution from Light-Duty Gasoline Fueled Motor Vehicles. Effective Date: July 5, 1972.

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PART FOUR
APPENDIX TO ENVIRONMENTAL IMPACT STUDY AND REPORT

Section 2. TRANSPORTATION STUDIES AND TRAFFIC
 FORECAST

2.1 Transportation Studies

The Department of Transportation has participated in and is aware of regional transportation studies which have been made during recent years by various governmental transportation agencies and which encompass the area of this project. The major studies affecting this project were prepared by the following agencies:

- 1) Tri-State Regional Planning Commission
- 2) New Jersey State Department of Transportation
- 3) Middlesex County Planning Board

Published results of these studies were examined and, when reviewed with respect to the proposed project, generally agree in the need, location, and type of improvement proposed by the Department of Transportation.

2.1.1 Tri-State Regional Planning Commission

In May 1966, the Commission issued a

report entitled "Tri-State Transportation 1985, An Interim Plan" which recommended rail and highway improvements for the study area to meet the future demands generated by projected growth and development of the area.

The report recommended that suburban rail improvements be concentrated on the major routes serving the bulk of the passenger travel to Manhattan and Newark.

Of particular note is the recommendation for a Regional Highway Plan with priority segments aimed for completion by 1975. The list of priority projects includes the construction of New Jersey Route 18 in Middlesex County. This project is described as an essential east-west freeway that will provide an alternate route for peak recreational traffic as well as commercial vehicles with the most urgent need being a new bridge over the Raritan River to relieve existing congestion in New Brunswick.

The interim plan was first updated in October 1968 to detail some of the

alternate elements of the original plan.

A second updating was published in April 1972 entitled "Regional Transit 1990" to integrate transit planning with land development and social objectives. The major emphasis of this report was on public transportation facilities to the densely populated business centers of Manhattan, Brooklyn and Newark.

2.1.2 New Jersey Department of Transportation

The Bureau of Highway Planning of the New Jersey State Department of Transportation has prepared a study of projected traffic movements in conjunction with this project.

A copy of this study dated June 1965 showed projected vehicular movements for the year 1985. This study was updated in April 1968 for the same projected year. In June 1972, the study was projected to the year 1995 using current traffic data. A schematic line drawing of vehicular traffic distribution is shown in Figure 2A for Route 18 Freeway from Sutphen Road to Albany Street. This figure shows projected Average Annual Daily Traffic

and Design Hourly Volumes projected to the year 1995 for through traffic as well as for adjacent local highway and street systems.

A basis for these projected movements is the analysis of traffic data collected from January 1960 to May 1972 at various locations in the vicinity of the project. This data is shown in Tables 2-1, 2-2, and 2-3 listing locations and dates when the various traffic counts were made. In addition, Figure 2B shows most of these data collection locations and their proximity to the proposed project.

2.1.3 Middlesex County Planning Board

Under a Federal grant from the Department of Housing and Urban Development, supplemented by County funds and by an appropriation of the State of New Jersey as part of the Cooperative Governmental Planning Program, the Middlesex County Planning Board embarked on the preparation of a Comprehensive Master Plan. From April 1968 to March 1970, fifteen separate reports were prepared by the Planning Board and

those relating to the proposed project were reviewed and compared with other reports and statistical data pertaining to the proposed improvement of Route 18. Report Number 10, "Highway Inventory and Analysis", dated June 1969 presents a description of the County highway network, its usage, capacity, and deficiencies, and reasons for capacity deficiencies. Subsequent studies were made to establish relationships between the social and economic characteristics of the County residents, land activity, and trip making. These relationships were used to forecast travel demands generated by concepts projected for the years 1985 and 2000. The results of these studies were presented in March 1970 in Report Number 15 entitled "Description of 1985 and 2000 Road Network and An Analysis of Highway Plans. In this report of the Master Plan, transportation systems based on long range planning concepts for highway projects under the jurisdiction of various agencies were prepared and

compared to the projected traffic demands for each of the projection years. The agencies responsible for these projects included in the transportation systems for the years 1985 and 2000 are as follows:

- New Jersey Department of Transportation
- New Jersey Highway Authority
- New Jersey Turnpike Authority
- Middlesex County
- Somerset County
- 26 Municipalities

The 1985 Road Network in the Master Plan includes a total of 88 proposed projects for the construction of new or the improvement of existing Freeways, Primary Arterials, and Secondary Arterials.

Table 2-4 shows a tabulation of these planned projects by type of project and by character of highway. It was assumed in the studies for the Master Plan that the projects for improvement of existing roads by widening or added interchanges would be completed between the years 1967 and 1985.

The 2000 Road Network in the Master Plan includes a total of 83 proposed projects for the construction of new or the

improvement of existing Freeways, Primary Arterials, and Secondary Arterials.

Table 2-5 shows a tabulation of these planned projects by type of project and by character of highway. It was assumed in the Master Plan studies that planned projects would be open to traffic by 1985 to complete an existing road network by that time. It was further assumed that additions would be made to the Primary and Secondary Arterial system between 1985 and 2000 and in addition, improvements such as widening or grade separated interchanges would be made to the Freeway and Arterial system during the same period.

Section 2.2 Traffic Forecast

2.2.1 General

All studies are in agreement that major increases in growth parameters will occur for the area served by the proposed project. Forecasts of increased land activity, population, employment, and auto registration all indicate that the area will change in character from

semi-urban to urban during the remainder of this century.

The interim plan of the Tri-State Regional Planning Commission for 1985 states:

"Gains will be greatest in places 20 to 60 miles out from Manhattan, where much of the presently vacant land will be developed. By 1985, on the basis of present trend, more than half of the land in the region will be fully urbanized with homes, stores, schools, offices, factories."

The Middlesex County Planning Board Report Number 15 of the Comprehensive Master Plan states:

"Translating these projections into traffic demand indicates that traffic (in Middlesex County) will more than double by 1985 and more than triple by the year 2000."

2.2.2 Traffic Projections

Traffic projections prepared by the New Jersey department of Transportation and

by the Middlesex County Planning Board with respect to this project were reviewed and found to be in general agreement.

It is obvious that the presence of many variable and indeterminate factors that influence trip distribution, traffic assignment and the relative usage or assignment of trips by transportation modes requires frequent testing of assumptions and projections. It is not unexpected that the Middlesex County Report Number 15 of the Comprehensive Master Plan, in reference to a comparison of ADT volumes for 1966, 1985, and 2000, includes the following statement:

"These volumes are indicative of the magnitude of traffic on the facilities shown and are not intended to reflect precisely the volumes assigned to each link of the detailed (1985 and 2000 road) network."

2.2.3 Planned Network Volumes

The Master Plan Report Number 15 included

four traffic assignment schemes to distribute 1985 trip projections. These assignments were to a desire line network, a net work of existing roads with no improvements from 1967, and a 1985 planned road network with improvements to which previous reference was made. The fourth assignment was the 2000 trip projections to the 2000 planned road network.

The report indicated that substantial desire volumes converge in the New Brunswick and Highland Park areas. When the 1985 trip projections were assigned to the planned 1985 road network which includes the extension of Route 18 across the Raritan River, it was estimated that a demand of 60,000 to 80,000 ADT would be produced for the east-west movement through New Brunswick. An assignment for the year 2000 indicated that the demand in the vicinity of the Raritan River crossing was estimated at 70,000 ADT.

The New Jersey Department of Transportation

assignment of 1995 trip projections to the 1995 planned road network, shown in Figure 2B, is tabulated in Table 2-6 by artery description. The table includes eastbound and westbound movements and indicates the total estimated ADT.

An analysis of these projections by travel corridor is shown in Table 2-7 which indicates that an estimated demand of 60,000 to 69,000 ADT would be produced in the east-west corridor through New Brunswick in the vicinity of the Raritan River crossing.

2.2.4 Capacity Deficiencies

Based on the assignment of the 1985 trip projections to the planned 1985 Road Network, the Master Plan Report Number 15 concluded that the proposed improvement of Route 18 Freeway west of Route 27 (Albany Street) would provide sufficient capacity to accommodate the projected traffic volume.

2.3 Summation

Various transportation studies undertaken by different public agencies, are in

general agreement on the need, location, and type of facility proposed by the New Jersey Department of Transportation for the improvement of Route 18 across the Raritan River.

The published forecasts of traffic for the years 1985, 1995, and 2000 range between 60,000 to 80,000 ADT, 60,000 to 69,000 ADT, and 70,000 ADT respectively.

The proposed improvement of Route 18 west of Albany Street crossing the Raritan River will provide sufficient capacity to accommodate the projected traffic.

TABLE 2-1 INTERSECTION TRAFFIC COUNTS

<u>NO.</u>	<u>DATE</u>	<u>LOCATION</u>
1	1/6/60	Route 18, Commercial Avenue
2	11/30/65	Route 18, Commercial Avenue
3	2/8/60	Route 27, River Road, Lincoln Avenue
4	10/24/63	Route 27, River Road, Lincoln Avenue
5	10/5/71	Route 27, River Road, Lincoln Avenue
6	6/6/67	Route 27, Adelaide Avenue
7	6/7/67	Route 27, South 1st Avenue
8	6/8/67	Route 27, 2nd Avenue
9	6/9/67	Route 27, 3rd Avenue
10	6/14/67	Route 27, 4th Avenue
11	6/15/67	Route 27, 5th Avenue
12	4/21/67	Route 27, 6th Avenue
13	4/25/67	Route 27, 11th Avenue
14	12/7/65	Landing Lane, George Street
15	3/26/63	Easton Avenue, Landing Road
16	9/3/68	River Road, Cedar Lane, Johnson Park Road
17	3/15/67	Traffic Circle, Route 18, Route 27
18	3/15/67	Traffic Circle, Route 18, Route 27
19	3/16/67	Traffic Circle, Route 18, Route 27
20	3/16/67	Traffic Circle, Route 18, Route 27
21	4/4/67	Traffic Circle, Route 18, Route 27
22	4/4/67	Traffic Circle, Route 18, Route 27
23	4/4/67	Traffic Circle, Route 18, Route 27
24	4/4/67	Traffic Circle, Route 18, Route 27
25	4/5/67	Traffic Circle, Route 18, Route 27
26	4/5/67	Traffic Circle, Route 18, Route 27
27	4/6/67	Traffic Circle, Route 18, Route 27
28	4/6/67	Traffic Circle, Route 18, Route 27
29	4/7/67	Traffic Circle, Route 18, Route 27
30	4/7/67	Traffic Circle, Route 18, Route 27

TABLE 2-2 CONTROL STATION TRAFFIC COUNTS
(ONE LOCATION)

<u>NO.</u>	<u>DATE</u>	<u>LOCATION</u>
31	1/12 - 1/19/66	Route 27 between Raritan River and River Road
32	3/9 - 3/19/66	
33	4/6 - 4/12/66	
34	4/13 - 4/20/66	
35	5/11 - 5/19/66	
36	6/15 - 6/22/66	
37	7/20 - 7/25/66	
38	8/17 - 8/24/66	
39	9/22 - 9/24/66	
40	9/28 - 9/30/66	
41	10/7 - 10/11/66	
42	10/20- 10/25/66	
43	10/27- 10/31/66	
44	11/22- 12/7/66	
45	1/11 - 1/18/67	
46	3/8 - 3/15/67	
47	4/12 - 4/19/67	
48	5/10 - 5/17/67	
49	6/14 - 6/21/67	
50	7/19 - 7/27/67	
51	8/16 - 8/27/67	
52	9/20 - 9/27/67	
53	10/6 - 10/9/67	
54	10/19- 10/25/67	
55	10/27- 11/1/67	
56	11/22- 11/30/67	
57	12/8 - 12/15/67	
58	2/7 - 2/14/68	
59	3/6 - 3/13/68	
60	4/3 - 4/10/68	
61	5/8 - 5/15/68	
62	6/13 - 6/21/68	
63	7/31 - 8/6/68	
64	8/14 - 8/21/68	

TABLE 2-3 CONTROL STATION TRAFFIC COUNTS
(VARIOUS LOCATIONS)

<u>NO.</u>	<u>DATE</u>	<u>LOCATION</u>
65	5/22 - 5/28/63	Route 27 (EB) betw. 9th, 10th
66	5/23 - 5/26/67	Route 27 (EB) betw. Lincoln, Adelaide
67	5/23 - 5/25/67	Route 27 (WB) betw. Lincoln, Adelaide
68	3/29/72	Route 18 (EB) at Oliver
69	3/29/72	Route 18 (WB) at Oliver
70	3/28 - 3/30/72	Route 18 (EB) betw. Oliver, Hassart
71	3/28 - 3/30/72	Route 18 (WB) betw. Oliver, Hassart
72	4/27 - 5/12/72	Route 18 (EB) at George St. ramps
73	4/27 - 5/12/72	Route 18 (WB) at George St. ramps
74	1/13 - 1/14/72	George St. 210' n. of Bishop Pl.
75	4/7 - 4/24/72	George St. (NB) 100' n. of Bishop Pl.
76	4/7 - 4/24/72	George St. (SB) 100' n. of Bishop Pl.
77	7/26 - 7/27/71	Bishop Pl. betw. College, George
78	7/22 - 7/23/71	Huntington St. betw. College, George
79	1/5 - 1/17/65	River Road, betw. Walter, Lincoln

TABLE 2-4 PLANNED PROJECTS INCLUDED
IN MIDDLESEX COUNTY
ROAD NETWORK FOR 1985

NUMBER OF PROJECTS

<u>TYPE OF HIGHWAY</u>	<u>TYPE OF CONSTRUCTION NEW</u>	<u>CONSTRUCTION IMPROVE</u>	<u>TOTAL PROJECTS</u>
Freeway	9	7	16
Primary Arterial	17	21	38
Secondary Arterial	<u>8</u>	<u>26</u>	<u>34</u>
TOTAL	34	54	88

TABLE 2-5 PLANNED PROJECTS INCLUDED
IN MIDDLESEX COUNTY
ROAD NETWORK FOR 2000

NUMBER OF PROJECTS

<u>TYPE OF HIGHWAY</u>	<u>TYPE OF CONSTRUCTION NEW</u>	<u>CONSTRUCTION IMPROVE</u>	<u>TOTAL PROJECTS</u>
Freeway	0	3	3
Primary Arterial	8	13	21
Secondary Arterial	<u>16</u>	<u>43</u>	<u>59</u>
TOTAL	24	59	83

TABLE 2-6

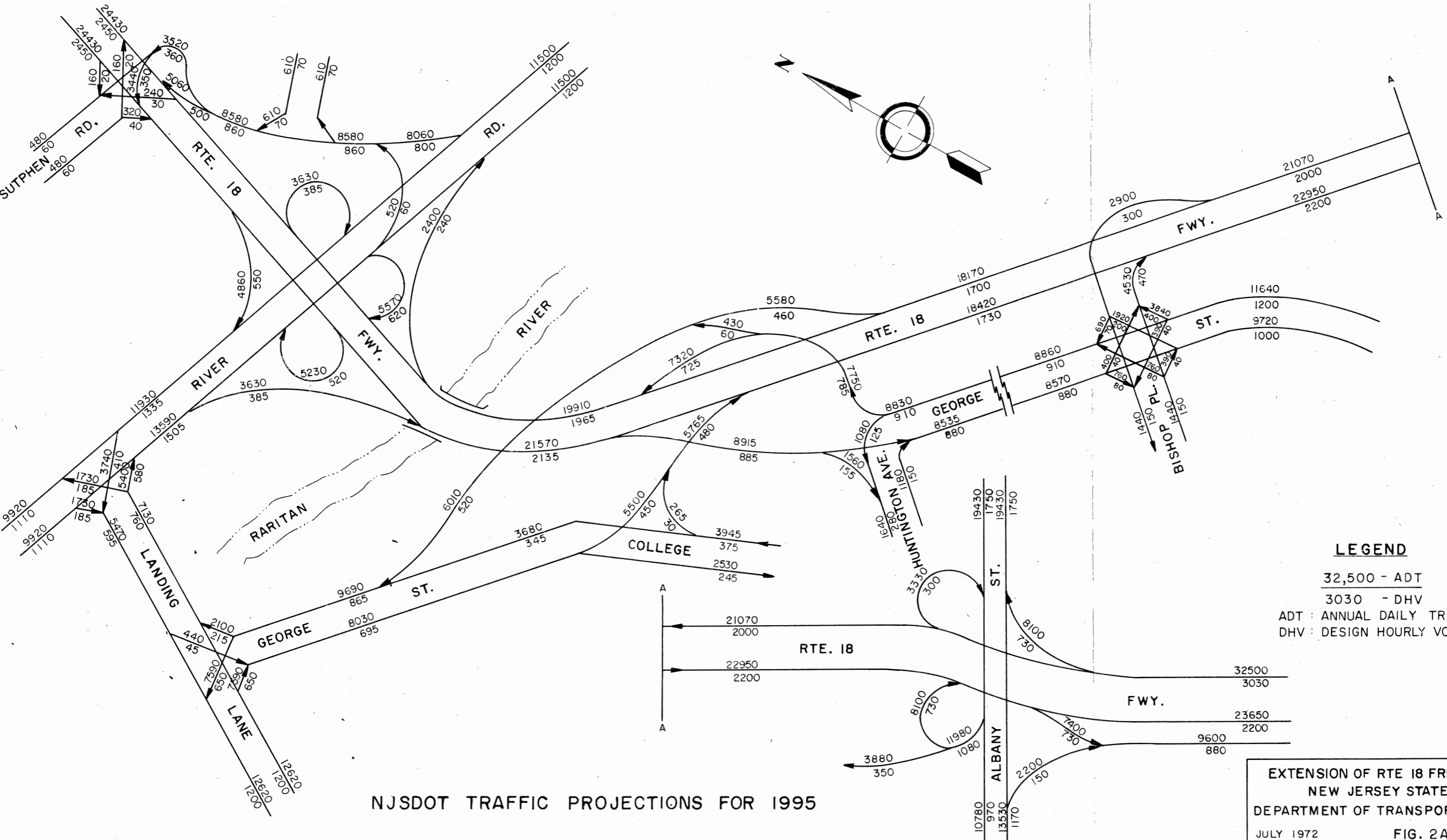
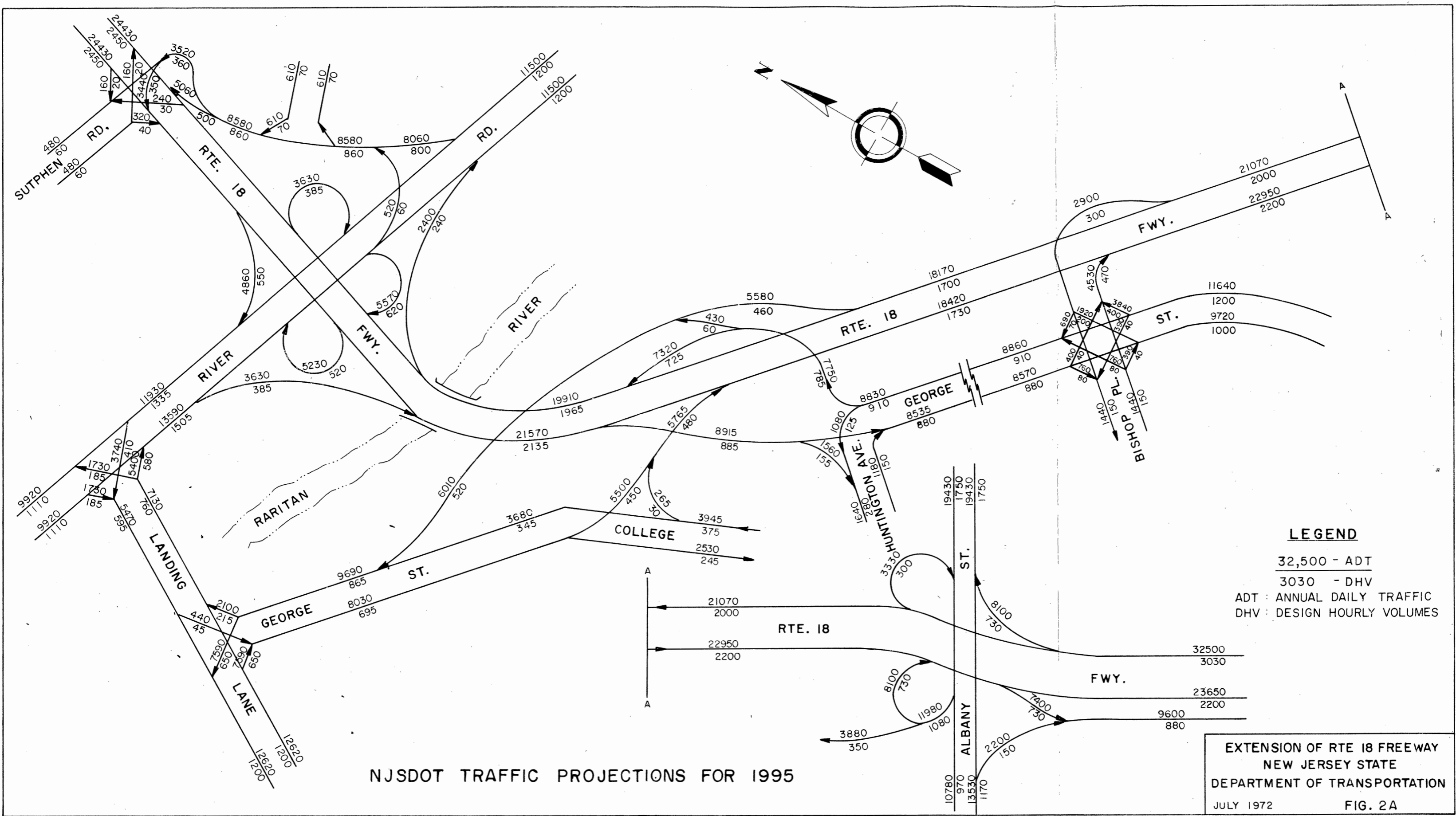
NJSDOT TRAFFIC ASSIGNMENT OF
AVERAGE DAILY TRAFFIC
FOR 1995

	<u>EASTBOUND</u>	<u>WESTBOUND</u>	<u>TOTAL</u> <u>ADT</u>
Route 18			
South of Albany St.	23,650	32,500	56,150
North of Albany St.	22,950	21,070	44,020
South of Raritan River	18,420	18,170	36,590
Raritan River Bridge	21,570	19,910	41,480
North of River Road	24,430	24,430	48,860
Burnet Street (South of Albany St.)	9,600	-	9,600
George Street (North of Albany St.)	9,720	11,640	21,360
George Street (South of Raritan River)	8,570	8,860	17,430
College Avenue	2,530	3,945	6,475
River Road	9,920	9,920	19,840

TABLE 2-7

NJSDOT 1995 ADT PROJECTIONS
FOR PLANNED NETWORK

<u>EAST-WEST CORRIDOR</u>		<u>TOTAL ADT</u> <u>IN CORRIDOR</u>
South of Albany Street		
Route 18	56,150	
Burnet Street	<u>9,600</u>	65,750
North of Albany Street		
Route 18	44,020	
George Street	<u>21,360</u>	65,380
South of Raritan River		
Route 18	36,590	
George Street	17,430	
College Avenue	<u>6,475</u>	60,495
North of Raritan River		
Route 18	48,860	
River Road	<u>19,840</u>	68,700



NJSDOT TRAFFIC PROJECTIONS FOR 1995

LEGEND
 32,500 - ADT
 3030 - DHV
 ADT : ANNUAL DAILY TRAFFIC
 DHV : DESIGN HOURLY VOLUMES

**EXTENSION OF RTE 18 FREEWAY
 NEW JERSEY STATE
 DEPARTMENT OF TRANSPORTATION
 JULY 1972
 FIG. 2A**

KING & GAVARIS - CONSULTING ENGINEERS

