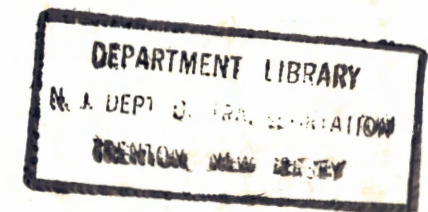


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TOPICS STUDY

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Introduction

THE STUDY AREA

The City of Camden, New Jersey lies in the heart of the Boston-Washington Megalopolis on the east bank of the Delaware River opposite Philadelphia, Pennsylvania.

If Camden were an isolated urban area, there would be little difficulty handling the traffic generated by the population of 101,000, but, in addition to being the transportation focal point of Southern New Jersey, Camden is also a major node of the Delaware Valley Region, which has a population of about 5,000,000 and is continually growing in size and travel demand. Because of these facts, investigation and evaluation of existing and future travel conditions in Camden are warranted. Demonstrating its cognizance of this need in Camden and in other urban areas with similar conditions, the Federal Government has instituted a new program of assistance called "TOPICS".

TOPICS

The TOPICS program was created by an Act of the United States Congress in 1968 to subsidize the urban areas in improving the orderly and safe flow of traffic. TOPICS, a Federal acronym standing for Traffic Operations Program to Increase Capacity and Safety, is designed to optimize the use of the existing street system by:

- a. Increasing the capacity of various segments and intersections.
- b. Improving the traffic flow and minimizing delay throughout the system.
- c. Decreasing the accident potential.

All of the above should be accomplished by the application of proven traffic engineering techniques.

To accomplish the above, the United States Department of Transportation has defined the Federal Aid Primary Type II System to allow Federal participation, for the first time, in the improvement of municipal streets.

Historically, we have solved our transportation problems by developing new transportation systems. Although these systems have solved many of our problems, they have created many new ones such as those associated with the relocation of low income families and environmental pollution. In addition, these new transportation systems have taken many years to complete with large associated capital outlay.

The TOPICS program is a logical departure from our previous thinking. Under TOPICS, although major construction is not precluded, the aim is to improve existing traffic systems with the least capital investment and community disruption, and to complete each project within a short time span.

With this objective in mind, the TOPICS Study of the City of Camden was directed primarily toward the following:

- a. Improvements and additions to the existing traffic control systems (i.e. signals, signs, etc.).

- b. Modifications of existing parking patterns especially during peak hours.
- c. Intersection widening and channelization for increased capacity and safety.
- d. Other traffic engineering type improvements that will contribute to the orderly, safe and rapid movement of vehicles through the Camden City Urban Area.

AREAWIDE TOPICS STUDY

The street system to be studied under the TOPICS Program is bounded roughly by the Delaware River on the west, U.S. 130 on the east, 36th Street on the north and Newton Creek on the south.

In order to assure development of a comprehensive study of the City of Camden street system, collector-distributor streets and arterials (high type and low type) were to be studied. In addition, the network of streets within the Camden Business District was to be examined, with the Camden Business District limits set as Elm Street on the north, Delaware Avenue on the west, Mickle Street on the south and Cooper River on the east.

REFER TO
PLATE NO. 1

Methodology

INVENTORY

The initial phase of the TOPICS study was concerned with gathering data on all items which affect roadway capacity and safety. Examples of the items inventoried were the location and type of traffic control devices, street widths, traffic volumes, accident intensities, public transportation, etc. Useful data relating to many of these items were obtained from various public agencies including the City of Camden, Transport of New Jersey, Port Authority Transit Corporation, New Jersey Department of Transportation and others. Data which was not available from these agencies was obtained through field investigations. Another key inventory item was the collection of existing plans for the area. These plans were reviewed and analyzed to determine their impact upon traffic conditions in Camden. This information was obtained primarily from the Delaware Valley Regional Planning Commission and the TOPICS study for Camden County which affected several intersections common to both studies.

Upon completion of the data collection phase, an analysis of these data leading to the identification of the problem areas which merited consideration for improvement was undertaken.

CAPACITY ANALYSIS

By using manually collected data and growth factors supplied by the New Jersey Department of Transportation, projections of traffic volumes were made for a target year of 1980. Each major intersection was then analyzed to determine if it was capable of operating at level of service C in 1980. This analysis was performed on the IBM 360-75

computer utilizing the "Capint" computer program written at the University of California. The program was derived from the "1965 Highway Capacity Manual", Special Report 87, published by the Highway Research Board. Wherever volume constraints were indicated by the capacity analysis, recommendations have been made to relieve the situation.

ACCIDENT ANALYSIS

Accident data for the study area was obtained from the City of Camden. By analyzing these statistics, which provided a breakdown of accidents by type as well as number, it was possible to determine if a correlation existed between accident type and intersection design and operation. When this case occurred, recommendations were made for alleviating the accident potential.

SPEED AND DELAY STUDIES

Speed and delay studies were conducted on the major arteries within the study areas during the peak periods. These data coupled with growth projections, assisted in identifying areas requiring route and spot improvements for the purpose of reducing travel times.

RECOMMENDATIONS

Problem areas, identified in the manner outlined heretofore have been scrutinized for possible improvements. Proposed improvements aimed at alleviating the problems at these selected locations are included in the detailed recommendations section of this report. All recommendations are based upon the use of proven traffic engineering techniques. In each case the Consultant has been cognizant of the constraint of limited construction expenditures and the realization that right-of-way acquisition must be kept minimal.

PRESENTATION OF RECOMMENDATIONS

Proposed route and intersection or spot improvements are described in the detailed recommendations section. Four basic sub-sections are illustrated on the plates and/or discussed.

- a. Route improvements which are depicted in their entirety and intersection improvements along those routes.
- b. A description of special recommendations for routes with graphic illustrations of intersection improvements along those routes.
- c. Drawings and descriptions of other intersection improvements.
- d. A description of special intersection recommendations.

REFER TO
PLATE NO. 2

PRESENTATION OF VOLUME DATA

Peak hour volumes at signalized intersections are shown on the route drawings, except at intersections which are isolated for improvements. In these cases, the volumes are shown on the intersection improvement diagrams. Volumes shown include 1971 traffic counts, as well as 1980 projected volumes.

In many cases, volumes as shown along a route improvement do not appear to "balance"; that is, the number of vehicles shown leaving an intersection may not be equal to the volume shown approaching the very next intersection. This can be explained by the fact that the peak hour conditions were usually governed by the cross streets which generally demonstrated more variable peaking conditions than through streets. For example, if the highest PM volume on a cross street was counted between 4:30 and 5:30, and at the very next street the highest hour occurred 15 minutes later, the counts taken on the through street may have varied slightly during the different intervals. However, the minor variations on the through streets were found to have less of an impact upon level of service than the larger variations on the cross streets.

Therefore, using the highest counts for studying volume and capacity conditions has resulted, in most cases, in the cross streets' volumes governing the analysis with an apparent discrepancy of through volumes resulting.

PRESENTATION OF ACCIDENT DATA

On plates depicting intersections which have been isolated for improvement, complete diagrams summarizing accidents from 1968 through 1970 are shown. Also, accident rates and intensities are shown.

Project Inventory

TRAFFIC CONDITIONS

Traffic Signals

As part of the inventory phase of the study, the locations of all traffic signals in the City of Camden were recorded. A complete listing of all signals operated by the City is contained in the technical memoranda.

The signals were considered to be the traffic control devices most adversely affecting capacity and, also indicative of heavy volumes at intersections. Therefore, primary importance was assigned to those intersections that were controlled by traffic signals.

Most of the traffic signals in the City of Camden are vertical pedestal mounted with eight inch lenses, and single dial, fixed time controllers. Most of the existing equipment, although in good operating condition, is very old.

REFER TO
PLATE NO. 3

On-Street Parking Regulations

The City of Camden has not made extensive use of parking restrictions. There are few locations where peak hour parking is prohibited. Where there is such restriction, it is not observed by motorists and, therefore, a higher level of enforcement is needed. Within the business areas of Camden, the parking is generally meter regulated.

The only other general restriction throughout the city is for part of one day per week for street cleaning.

Both sides of all study streets were examined and the least restrictive signing was used to determine the degree of restriction. For example, if one side of the street was signed for "No Parking Anytime" and the other side of the street was unsigned, then the street was considered to be unrestricted. A complete listing of parking ordinances and field signing for the study system is contained in the technical memoranda.

It should be noted that, in addition to the reduction in capacity, there exists a serious safety problem caused by on-street parking. At many locations there is virtually no sight distance due to vehicles parking extremely close to intersections.

Central Business District Off-Street Parking

The only high type parking facility in Camden is located in the Parkade Building. The Parkade parking facility is a multi-story off-street parking garage located directly west of City Hall. It has a physical capacity of 480 spaces and is privately operated as part of the Kinney System of parking garages.

In addition to the Parkade Building facility, there are several off-street at-grade lots operated by the City of Camden Parking Authority and private owners.

One-Way Street System

The City of Camden has made considerable use of the one-way street patterns for several reasons. Among these are:

- A reasonably good basic street pattern receptive to conversion to a one-way system.
- The presence of many residential streets immediately beyond the Camden Business District, with parking on both sides.
- The need to move heavy volumes of traffic through the Camden Business District on the existing city streets and low-type arterials.

Street Widths

The City of Camden has many streets that are of adequate width but are not being fully utilized due to poor pavement conditions or excessive parking. Several streets which are narrow do have sufficient right-of-way to be widened to increase capacity.

Accident Study

All intersection accident intensities for the three (3) year period from January 1, 1968 through December 31, 1970 were investigated and recorded. The further analysis of these accidents and the method of investigation is discussed in the Methodology Section of this report, beginning on page 1.

REFER TO
PLATE NO. 4

REFER TO
PLATE NO. 5

REFER TO
PLATE NO. 6

REFER TO
PLATE NO. 7

Traffic Volumes

Plate No. 8 illustrates the Average Annual Daily Traffic (AADT) on the major streets in the City of Camden. The figure was developed from information supplied by New Jersey Department of Transportation and the Delaware Valley Regional Planning Commission.

An extensive peak hour manual counting program was instituted to supplement the Average Annual Daily Traffic and to determine the levels of service of the major intersections.

Automatic recorder counts (24 hour) were made at the intersections recommended for signalization to determine whether or not traffic signal warrants were met. A list of these intersections and the results of the counts are included in the technical memoranda.

Speed and Delay Study

To supplement the traffic counts, a speed and delay study of all routes of the TOPICS Study System was made to determine which streets were operating at low speeds. Together with the capacity analysis and accident data, the speed and delay data were used to determine those locations that warrant improvement. The study was conducted during A.M. and P.M. peak hours during which the overall travel speeds were recorded.

Signing and Pavement Markings

Most areas of the City of Camden were found to be adequately signed with the exception of parking signs which frequently were in disagreement with legal ordinances. Standardization of parking ordinances mandating uniform signing which will minimize driver confusion is recommended. The recommended re-signing of streets studied is shown on the plates.

Pavement markings were found to be extremely worn on most streets. Recommendations pertaining to pavement markings are included throughout the text of the report and are illustrated on the plates.

Both signing and pavement markings have been considered as prime maintenance items and have been addressed in the section on maintenance recommendations.

Selected Traffic Operation Practices

As part of the review of the street system in the City of Camden, the Consultant conferred with the city officials responsible for traffic safety and control. Concern was expressed about the operating characteristics of the motorists at several locations during specific times of the day. These problem locations are not caused primarily by the highways but rather by the driving habits of motorists. Recommendations have been developed as a part of this report to eliminate the hazardous maneuvers which presently occur at these locations.

Trucking terminals are located primarily on Delaware Avenue which is not a heavily traveled street. As a result, the influence of these terminals on traffic was found to be minimal. The one major exception to this is at the Ferry Avenue/Second Street intersection. At this location, trucks were observed to double-park and even triple-park. Since Ferry Avenue is a major street, measures should be taken to rectify this problem.

Also involved in this phase of the study was a review of commercial deliveries and pick-ups and associated problems caused by special traffic generators such as the Campbell's Soup and R.C.A. Industrial Complex.

REFER TO
PLATE NO. 8

REFER TO
PLATE NOS.
9 AND 10

PUBLIC TRANSPORTATION

Present Bus Service

Bus service through Camden, New Jersey, is provided by five separate companies, as follows:

Approximate Percent of Total Service	Company
87.5%	TRANSPORT OF NEW JERSEY (TNJ) (operates local, medium range and long range bus service including intercity carriers)
5.6%	RED ARROW LINES, INC. (subsidiary of Southeastern Pennsylvania Transportation Authority, SEPTA) (services the Medford Lakes, Marlton and Cherry Hill areas with Camden and Philadelphia)
1.6%	PHILBORO COACH COMPANY (services Glassboro area with Camden and Philadelphia)
5.0%	CONTINENTAL TRAILWAYS (intercity service with station in Camden)
0.3%	EASTERN GREYHOUND LINES (intercity service with station in Camden)

Transport of New Jersey is the major carrier in the Camden City Area. At the present time, it operates 29 separate bus routes, 90 percent of which have end trip destinations in Philadelphia, during each weekday. These 29 bus routes generate 2,262 bus trips daily during the week and of these, 1,993 make stops in Camden's Central Business District. The express service buses that bypass the Camden Business District do so by using the Admiral Wilson Boulevard or Route 295 freeway directly to the bridges and Philadelphia. In addition to these regularly scheduled buses, specials to the racetracks and charters are also operated by Public Service.

Philboro and Red Arrow operate local bus routes serving the Glassboro and Medford areas, respectively. Both routes operate through Camden and make stops identical to Transport of New Jersey buses.

Continental Trailways and Greyhound provide intercity service to New York and Washington, D.C. using the Trailways Terminal Building on Broadway and the Parkade Terminal Building, respectively.

For this phase of the study, bus service has been segregated by distance of service as follows:

- a. Local — Less than 25 miles
- b. Medium Range — 25 to 50 miles
- c. Long Range — Greater than 50 miles

In the ensuing tables, reference is made to these classes of service. Plate 11 is a map of the City of Camden which shows the bus routings and includes the approximate locations of the eight (8) major bus stops in the Central Business District. The stops have been paired due to the fact that any one bus route will use two of the stops as per its destination. In addition, there is mixed service at some of these locations in terms of range. Table I presents a concise picture of these points.

REFER TO
PLATE NO. 11

TABLE I
BUS STOP PAIRINGS

Stopping Points		Range of Service Available
To Philadelphia	To New Jersey	
North Bound Broadway	South Bound Broadway	Local and Medium
West Bound Market	East Bound Federal	Local and Medium
West Bound Bridge Plaza	East Bound Bridge Plaza	Medium
West Bound Trailways Terminal	East Bound Trailways Terminal	Long Range
West Bound Parkade Terminal	East Bound Parkade Terminal	Long Range

The Broadway and Market-Federal stops are basically local bus traffic while the others service the ranges as indicated in Table I. The medium range bus volumes at the Broadway and Market Street-Federal Street stops are the minor movements relative to local bus traffic. Tables II and III exhibit the present and projected bus volumes by range of service.

It should be noted that the City of Camden proposes to construct a "Transportation Terminal" near the Broadway station of the P.A.T.C.O. (Port Authority Transit Corporation) High Speed Line. This terminal will service all medium and long range buses.

TABLE II
SHORT RANGE BUS SERVICE

	Northbound Broadway			Southbound Broadway			Eastbound Federal Street			Westbound Market Street		
	1971	1975	1980	1971	1975	1980	1971	1975	1980	1971	1975	1980
(1)	247	222	198	246	221	197	466	419	414	463	417	412
(2)	34	31	28	32	29	26	59	53	53	53	48	48

TABLE III
MEDIUM AND LONG-RANGE BUS SERVICE

	Medium-Range Buses			Long-Range Buses		
	1971	1975	1980	1971	1975	1980
(1)	517	465	418	350	350	350
(2)	61	55	49	30	30	30

(1) Daily Volume (Average Weekday)

(2) Peak Hour Volume

Also, a "Feeder Bus Study" by Praeger, Kavanaugh, and Waterbury made in 1968 included recommendations whose implementation would involve modifications to the bus routes shown on Plate 11. These recommendations call for the buses to bring passengers to the P.A.T.C.O. Lindenwold High Speed Rail Line Stations to continue to Philadelphia by trains. As of the writing of this report, implementation of these recommendations has not commenced.

Present Rail Transportation

P.A.T.C.O. operates the Lindenwold High Speed Rail Line with stops at Ferry Avenue, Broadway and City Hall in the City of Camden. The line operates between one car (during night service) and six cars (during peak hours) at headways varying from four minutes during the rush hours to one hour for night service. The line is grade separated and operates by third rail electrification.

PLANNED IMPROVEMENT — OTHER PROGRAMS

Special mention should be made of the planned improvements to be implemented in the City of Camden between now and 1980.

The New Jersey Department of Transportation is committed to build I-76 from the Benjamin Franklin Bridge Plaza to Morgan Boulevard. Several points of access to and egress from the interstate highway are planned and their effect upon traffic conditions in the area of their locations has been considered during this TOPICS study.

Another New Jersey Department of Transportation planned highway is the U.S. 30 (East-West) Connector to the Admiral Wilson Boulevard.

The City of Camden, through its Housing Authority and under a grant from the United States Department of Housing and Urban Development, has begun the massive reconstruction of the Camden City Centre area. Included in this redevelopment will be the rebuilding of several center city streets. Among these are Mickle Boulevard, Third Street, Fifth Street, Seventh Street, and sections of Broadway and Federal Street. Close coordination between these planned changes and TOPICS recommendations has been exercised because of the direct impact of the Urban Renewal changes upon traffic conditions on TOPICS streets.

In addition, a 2,000 car parking garage is planned between Third Street and Broadway, fronting on Mickle Boulevard. This garage should be in operation by 1975 and will greatly reduce the requirements for on-street parking spaces.

The above mentioned improvements should greatly improve the flow of traffic in the north-south direction (I-76) and also within the Camden Business District (Urban Renewal). The system-wide ramifications of each improvement have been considered in formulating traffic projections used in this study. As a result, the recommendations generated in this report reflect the impact of planned changes upon traffic conditions in Camden.

Recommendations

ROUTE IMPROVEMENT ATLANTIC AVENUE AND KAIGHNS AVENUE ONE-WAY COUPLE

Discussion

With the planned construction of the I-76 Freeway Interchange at Atlantic and Kaighns Avenues, the traffic volumes on these two streets will increase due to their function as arterial feeders to and from the interchange. Presently, both of these streets operate with one lane in each direction. Kaighns Avenue, which extends from its western terminus at Second Street to the Cooper River within the study area, is predominately 37 feet wide. Parking is permitted on both sides, except at bus stops. Atlantic Avenue proceeds from Ferry Avenue to its eastern terminus at Haddon Avenue and changes in width from 48 feet to 30 feet at Broadway. Parking is permitted only on the south side of Atlantic Avenue east of Broadway. The highest single direction peak hour volume as projected for 1980 under the existing layout is 806 vehicles/hour at Kaighns and Haddon Avenues.

The accident statistics for both of these streets indicate that they are high accident routes, especially Kaighns Avenue. The intersection of Broadway and Kaighns Avenue is one of the worst in the entire study area having an accident rate of 3.84 accidents per million vehicles entering the intersection.

Existing Plans: According to New Jersey Department of Transportation plans, a one-way square flow is planned in a one block area bordered by Seventh Street (southbound), Atlantic Avenue (eastbound), Eighth Street (northbound), and Kaighns Avenue (westbound) for the purpose of expediting flow in the area of the I-76 interchange.

Recommendations

In evaluating alternative schemes for possible improvements in the interchange area, the system-wide ramifications of each were carefully examined. The resultant recommendations optimize the use of the available street network while minimizing negative aspects of possible alternatives.

Route Wide Improvements: The institution of a one-way couple comprised of Kaighns Avenue (from Mount Ephraim Avenue westbound to Second Street) and Atlantic Avenue (eastbound from Ferry Avenue to Haddon Avenue) is the recommended improvement plan which will meet the future needs of the area to the greatest degree.

Parking: It is recommended that parking be permitted on the north side of Kaighns Avenue between Second Street and Haddon Avenue at all times (except at bus stops). Stopping or standing is to be prohibited on the southside of the street at all times between Mount Ephraim Avenue and Haddon Avenue. Parking may be permitted at all times elsewhere on the south side of Kaighns between Second Street and Haddon Avenue, except between Seventh Street and Eighth Street.

On Atlantic Avenue, parking should be permitted on the south side of the street except at bus stops and between Seventh Street and Eighth Street. Prohibition of stopping or standing on the north side of the street between Broadway and Haddon Avenue is recommended at all times.

Slight variations from these recommendations are indicated at some intersection improvement areas.

Signals: Signals should be upgraded to provide multi-dial controllers as well as mastarm displayed signals. These signals should be interconnected and synchronized to provide progression for both one-way streets.

Pavement Marking: Stop and lane lines, parking space outlines and cross walks are recommended to provide greater driver and pedestrian control.

Bus Stops: It is recommended that all bus stops be relocated to the far sides of intersections on Kaighns Avenue and far side stops be added to Atlantic Avenue. The current stops on Kaighns Avenue should be converted to parking spaces where space allows. No bus stops should be located between Seventh and Eighth Streets on either artery. The eastbound bus on Atlantic Avenue should use Mount Ephraim Avenue, rather than Haddon Avenue to gain access to eastbound Kaighns Avenue. This bus should stop once between Mount Ephraim Avenue and Haddon Avenue, at Bannard Street which should be closed to traffic at Kaighns Avenue.

Terminal Points: The projected volumes for the terminal points of this one-way couple indicate that no capacity problem exists at the western terminus, Ferry Avenue/Second Street since the primary function of the couple will be to service traffic from the eastern suburbs to and from I-76 and downtown Camden. This pattern is exemplified by the projected volumes and indicates that heavy traffic will exist at the eastern terminus of the couple. In the interest of these volumes, it is recommended that Atlantic Avenue remain one-way to Haddon Avenue. However, Kaighns Avenue should be one-way only from Mount Ephraim Avenue westbound. This arrangement is required due to a heavy volume of left turns which is projected to occur from Atlantic Avenue and a heavy right turn onto eastbound Kaighns Avenue. These movements are divided between Mount Ephraim Avenue and Haddon Avenue by the recommended layout. Kaighns Avenue should be widened slightly between Mount Ephraim Avenue and Haddon Avenue and stopping or standing must be prohibited on the south side of Kaighns Avenue in this area to provide the required capacity.

The impact of these changes upon Kaighns Avenue is felt as far east as Park Boulevard. The route is displayed to this point.

Impact of Improvements Upon I-76 Interchange: The recommended improvements will greatly expedite traffic flow in the I-76 interchange area by reducing the number of conflict points. The alterations will necessitate slight rerouting of some movements over somewhat greater distances and require the prohibition of westbound maneuvers to Atlantic Avenue from the off-ramps of I-76. However, it is anticipated that a reduction in congestion due to this rerouting will more than negate the increase in travel time required to traverse the increased distance and result in a net benefit to the overall system.

Accident Reduction: In addition to increasing capacity, reducing delay, and minimizing conflict points, the incorporation of this scheme makes a profound impact upon accident reduction. Left turns from either Atlantic Avenue or Kaighns Avenue, which are significant in number, can be negotiated without encountering opposing traffic. This fact will decrease the probability of accidents occurring during this maneuver. Also, at all intersections a minimum of one pedestrian walkway will be protected from turning movements. At the intersection of either artery and a one-way street, two crosswalks will be protected.

REFER TO
PLATE NOS.
12 TO 18

Summary: By expanding the planned function of the two streets as a one-way couple in the area of the I-76 interchange to a route-wide scheme, capacity and safety will be increased throughout the system. This increase in capacity is required to provide a higher level of service for the added volume which is anticipated due to the operation of the streets as feeder routes to and from I-76.

The total cost for implementation of all improvements on Kaighns and Atlantic Avenues, including intersections which follow, is estimated to \$344,800.*

**Intersection Improvement
Atlantic Avenue and Haddon Avenue**

This skewed "T" intersection attains increased significance due to the Kaighns Avenue/Atlantic Avenue one-way couple. It is the eastern terminus of Atlantic Avenue and will have much higher volumes than under its existing operation. Therefore, a two phase, multi-dial controlled signal interconnected with the signals on Haddon Avenue is recommended for the intersection. The Atlantic Avenue approach should have one right turn lane and one left turn lane. Because of the heavy left turn from Atlantic Avenue, which encompasses an acute angle, the turning radius should be increased by using a small section of existing right-of-way on the northwest corner. This necessitates the purchase of a small piece of right-of-way to be used for sidewalk. Parking on the south side of Atlantic Avenue may be permitted west of Norris Street. However, east of this street stopping or standing must be prohibited to expedite the turning movements. South of the intersection, parking should be permitted at all times on the east side of the street. On the east side of Haddon Avenue, north of the intersection, stopping or standing is to be prohibited during both peak periods.

**Intersection Improvement
Kaighns Avenue and Mount Ephraim Avenue**

At this intersection, Kaighns Avenue is to become one-way westbound with provision for two lanes of traffic and parking on both sides. Transition from the one-way arrangement to a two-way scheme is to be accomplished as shown on the plate. The southern approach of Mount Ephraim Avenue is to be provided with an exclusive left turn lane. Two lanes of traffic in each direction on Mount Ephraim Avenue will be used during both peak periods.

Provision is made for a westbound far side Kaighns Avenue bus stop. All other recommendations shown in the route improvement sections of Kaighns Avenue and Mount Ephraim Avenue are applicable at this location. Special attention should be given to the parking regulation revisions as stated under the Mount Ephraim Avenue recommendations beginning on page 13.

**Intersection Improvement
Kaighns Avenue and Haddon Avenue**

This location warrants improvement because of its accident history. However, due to the recommended one-way scheme, the intersection attains even higher priority.

*All estimates of cost quoted in this report are preliminary in nature and are expressed in 1972 dollars. These figures represent the cost of construction including right-of-way acquisition where required and engineering fees.

In order to provide an adequate level of service at this intersection, which is heavily impacted by the Kaighns Avenue/Atlantic Avenue one-way couple, it is recommended that several improvements be made. Among them is the widening of Kaighns Avenue in the vicinity of the intersection. This is required in order to allow three lanes of traffic and one parking lane to operate on Kaighns Avenue west of the intersection and three lanes of traffic and two parking lanes east of the intersection. Stopping or standing must be prohibited at all times on the southern side of the western approach of Kaighns Avenue. Left turns from this approach are to be prohibited. It is recommended that peak hour stopping or standing be made illegal on both sides of Kaighns Avenue between Princess Street and Kenwood Avenue. East of Kenwood Avenue a return to the existing traffic lanes and two perennial parking lanes is recommended.

On Haddon Avenue, stopping or standing should be prohibited at all times on the west side of the street between Wildwood Street and Liberty Street. On the east side of the street, prohibition of stopping or standing should be implemented during both peak periods south of Kaighns Avenue. The intersection's southern approach should have a left turn lane, one through lane, and a right turn lane. The turning radius for this right turn should be increased via a small right-of-way purchase on this corner. The southern approach should be the only one receiving an advanced green indication. The northern approach should incorporate a left turn lane and one combination through and right turn lane.

It is further recommended that signing and lane lining be refurbished throughout the area.

**Intersection Improvement
Kaighns Avenue and Park Boulevard**

This intersection is the eastern terminus of the Kaighns Avenue route improvement study. It was selected for examination because of its extremely poor alignment and other inherent deficiencies. The curb to curb distance on Park Boulevard in this area is approximately seventy feet; twenty-five feet of which is an earthen median. A special problem exists at this intersection. A driveway to Farnham Park located at the northeast corner of the intersection generates dangerous movements. Vehicles were observed to use the exit to gain access to Park Boulevard southbound and Kaighns Avenue westbound. Entrance movements originating on the western approach of Kaighns Avenue are also potential accident hazards.

Recommended improvements in the area include the use of the park road solely as an exit. It should provide access only to Park Boulevard northbound. It is believed that this measure will eliminate the problems generated by this driveway. Also recommended is the redesign of both approaches of Park Boulevard to provide better horizontal alignment. Required in this redesign is the acquisition of two small sections (700 square feet and 500 square feet) of right-of-way on the east side of Park Boulevard. The inclusion of left turn lanes from each approach is recommended to expedite flow in the area. These may be accommodated without widening Kaighns Avenue.

Repainting of pavement markings, prohibition of stopping and standing on the four approaches and modernization of signal equipment are also key recommendations in increasing the capacity and safety of this intersection.

**REFER TO
PLATE NO. 21**

**REFER TO
PLATE NO. 22**

**ROUTE IMPROVEMENT
BROADWAY**

Discussion

Broadway is a north-south arterial which extends from the Benjamin Franklin Bridge Plaza to Newton Creek within the study area. The single direction peak hour volumes on Broadway as projected for 1980 vary from 300 to 1200 vehicles per hour. The investigation of Broadway and its cross streets revealed an abundance of traffic signals, many of which were not required to regulate current volumes nor the volumes that are projected for 1980. Speed and delay runs demonstrated this overabundance of signals since a large percentage of travel time on Broadway was devoted to stoppages due to red signals. Broadway's width is 40 feet and parking is permitted on both sides from Mickle Street to Ferry Avenue (except at bus stops and loading zones) and is prohibited at all times on one side north of Federal Street and on the west side of the street between Chelton Street and Morgan Boulevard.

A lack of visibility of existing pedestal type signals is a major problem and leading contributor to accidents.

Broadway's surface is in adequate condition except for the section between Whitman Avenue and the Bulson Street overpass immediately south of Chelton Avenue. In this area, the surface is rough cobblestone and asphalt and results in losses in speed.

Recommendations

The elimination of thirteen traffic signals between Mickle Street and Morgan Boulevard is recommended. Also a modernized, interconnected system is recommended for all remaining signals. Through this measure, delay will be reduced throughout the entire system. The prohibition of left turning movements at many intersections will expedite the flow of traffic and consolidate left turn lanes at a few intersections. By prohibiting stopping or standing in the vicinity of these selected intersections, these extra lanes can be provided without relinquishing sidewalk areas. This restriction should be implemented between Chestnut Street and Lansdowne Avenue at all times to permit use of a painted island and left turn lanes onto Kaighns Avenue and Atlantic Avenue.

Widening of Broadway by three feet on each side between Chelton Street and Fairview Street to provide a 46 foot wide roadway is recommended. This widening necessitates extensive relocation of utilities but is deemed a necessary means toward improving conditions. Also, existing parking regulations in this area should be modified to prohibit stopping or standing at all times on the west side of the street and during the morning peak period on the east. Prohibition of stopping or standing at all times on the east side between Morgan Boulevard and Fairview Street and between Woodland Avenue and Chelton Street is also recommended.

Updated pavement markings and signing are vital recommendations which will contribute greatly to the success of the proposed plan for Broadway. In addition, the reconstruction of Broadway between Whitman Avenue and the Bulson Street overpass to improve driving conditions is recommended.

**REFER TO
PLATE NOS.
23 TO 28**

The signals on Broadway recommended for removal are at the following intersections:

Broadway and Stevens Street
Broadway and Berkley Street
Broadway and Clinton Street
Broadway and Line Street
Broadway and Spruce Street
Broadway and Newton Avenue
Broadway and Mount Vernon Street
Broadway and Liberty Street
Broadway and Mechanic Street
Broadway and Lansdowne Avenue
Broadway and Van Hook Street
Broadway and Viola Street
Broadway and Fairview Street

The total cost for all improvements on Broadway, including intersections which follow, is \$785,500.

**Intersection Improvement
Broadway, Walnut Street, Newton
Avenue and Mount Vernon Street**

This area is plagued with several dangerous movements caused by skewed intersection geometry as well as an overabundance of traffic signals. Signals currently exist at the intersections of all three streets crossing Broadway. All three are within 250 feet.

In order to reduce driver confusion and minimize conflicts, it is recommended that the signals at the intersections of Broadway with Newton Avenue and with Mount Vernon Street be removed and all of the Broadway approaches of Mount Vernon Street and Newton Avenue be made one-way. Also, the eastern approach of Mount Vernon Avenue should be regulated by a stop sign. Only right turns should be permitted from the approach. Channelization on the western side of the street will aid in prohibiting the through movement.

Via Fifth Street, Chestnut Street and Walnut Street, circulation throughout the area is retained and all movements which were previously negotiable remain so. Meanwhile, the delays for through Broadway traffic will be reduced in number and severity. Safety is enhanced through the reduction of conflict points.

Stopping or standing should be prohibited at all times on both sides from Chestnut Street to Walnut Street to expedite the flow of traffic and to provide area for bus stops.

Other recommendations (concerning signals, etc.) cited in the Broadway Route Improvement section for route-wide implementation are applicable at this and all other intersections involving Broadway unless otherwise stated.

**REFER TO
PLATE NO. 29**

Intersection Improvement Broadway and Ferry Avenue

This intersection has been selected for redesign because of its accident frequency record. A major cause of these accidents is the poor horizontal alignment existant at the Ferry Avenue crossing of Broadway. A heavy volume of right turns from the western approach of Ferry Avenue onto Broadway occurs during the P.M. peak hour. The reciprocal movement occurs in the morning peak hour.

To improve safety, it is recommended that both approaches of Ferry Avenue be realigned. This necessitates the removal of two vacant buildings on the north side of the Ferry Avenue approaches to provide the required right-of-way.

Prohibition of stopping or standing on Ferry Avenue is recommended within 300 feet of the intersection on the eastern approach and similar restrictions are recommended to Fillmore Avenue on the western approach.

Provision for an exclusive right turn lane on the western approach of Ferry Avenue as well as left turn lanes on both approaches of Broadway is recommended to increase capacity and better channelize traffic.

The eastward extension of the corner formed by the intersection of Ferry Avenue and Jasper Street is recommended to further improve alignment and to afford additional pedestrian protection.

Intersection Improvement Broadway and Morgan Boulevard

This "T" intersection joins Broadway and Morgan Boulevard, which is a main connecting link with the Fairview section of Camden and I-76. These functions generate large turning movements onto Broadway northbound in the A.M. peak and the reciprocal movement in the P.M. peak. The analysis for this intersection revealed a deficiency in capacity for 1980 projected volumes.

An accident potential also exists at the intersection. This problem is caused by the large number of turning movements and the difficulty involved in negotiating these turns due to narrow, poorly marked lanes and inadequate turning radii.

In order to increase capacity and safety it is recommended that all three approaches to the intersection be widened. Right-of-Way purchase is required on the east side of Broadway both north (18 feet of width for 375 feet) and south (19 feet of width for 125 feet) of the intersection. This widening will permit the usage of two left turn lanes from the northern approach of Broadway and two right turn lanes and one left turn lane from the Morgan Boulevard approach. All lanes should be of the width indicated to ensure easily negotiable turning movements. A 14 foot median provides directional separation and proper alignment on the southern approach.

Also, it is recommended that current parking restrictions which prohibit parking on both sides of Broadway in the area of the intersection be altered to prohibit stopping or standing.

REFER TO
PLATE NO. 30

REFER TO
PLATE NO. 31

ROUTE IMPROVEMENT COOPER STREET

Discussion

Cooper Street is operated as a two-way street in the northern section of Center City Camden from its western terminus, Delaware Avenue, to Federal Street, its eastern boundary. For the purpose of this examination, Seventh Street was used as the eastern border of Cooper Street in concert with New Jersey Department of Transportation plans for the East-West Connector which calls for one-way operation of Cooper Street east of Seventh.

Cooper Street is 64 feet wide (curb to curb) within the study area except for the section which is west of Second Street where it varies between 40 feet and 52 feet. The single direction peak hour volume as projected for 1980 ranges as high as 1100 vehicles per hour on Cooper Street. Turning movements from the street are high in volume, especially left turns by westbound traffic during the morning peak period. The only special provision presently made for turns is at Broadway where painted left turning lanes are employed. Parking is permitted on both sides of the street, except at bus stops, between Second Street and Sixth Street.

Recommendations

Recommendations for Cooper Street include the use of a concrete median east of Second Street. This median, varying in width from two feet to twelve feet will provide for left turning lanes where needed to prevent blockage of through traffic. It is recommended that stopping or standing be prohibited at all times on the south side of the street. This measure ensured two through lanes wherever warranted. Revised lane lining coupled with the median will provide continuity of alignment throughout Cooper Street except between Front Street and Second Street where it is recommended that small sections of curbing be removed to aid in the transition of roadway widths. It is also recommended that the median be continuous from Fifth Street to Broadway and the signal at Sixth Street be removed. Through volumes on Sixth Street are light and the left turn volume from Cooper Street onto Broadway requires storage beyond the intersection of Sixth Street. Similar treatment is recommended at existing Seventh Street after the relocation of this cross street is completed. Until then, it is recommended that through movements and signalization be retained.

Pedestrian crosswalks, stop lines, and parking space boundaries should be repainted.

Existing single dial pedestal mounted signals are recommended for replacement by a modernized interconnected system having mast arm supported signals. These measures are required to aid in enhancing the level of safety of motor vehicle operation on Cooper Street.

The total cost of all Cooper Street improvements is estimated at \$156,220.

REFER TO
PLATE NOS.
32 TO 34

**ROUTE IMPROVEMENT
FEDERAL STREET**

Discussion

Federal Street is the primary connecting link between downtown Camden and East Camden. Traffic volumes on this street are very high. 1980 peak hour projections range as high as 2155 vehicles per hour on Federal Street at River Avenue. Several inter-sections which have been isolated for improvement due to capacity problems are located along this route.

Federal Street is 46 feet wide east of River Avenue but constricts to 34 feet west of River Avenue where it bridges the Cooper River. Parking is prohibited from River Avenue to Eleventh Street which is the western end of the Federal Street route study. On this section the highest volumes occur. East of River Avenue, one-side parking is permitted as far as Twenty-fifth Street during peak hours, and two-side parking (except at bus stops) is permitted east of Twenty-fifth Street at all times.

Traffic signals along the route have a pretimed single dial master controller and are capable of only one cycle and one signal split.

Recommendations

The recommendations for Federal Street consist essentially of a series of intersection improvements linked together. In most places, these spot recommendations result in three lanes of traffic and one parking lane (during both peak periods) east of Sixteenth Street with some exceptions. The key to obtaining a reasonable level of service on Federal Street is the correction of the route's major constriction, which is the section of Federal Street over Admiral Wilson Boulevard and the Cooper River. This narrow section, combined with a heavy left turn from the western approach onto River Avenue provides a very low level of service during the evening peak period. The only solution to this problem is the widening of this narrow section of highway. Provision must be made for two through lanes and one left turn lane at River Avenue for the eastbound approach and two through westbound lanes. West of River Avenue, a left turn lane for westbound traffic to gain access to Admiral Wilson Boulevard and Flanders Avenue is recommended. To construct a roadway which provides for further additional lanes would merely relocate the constriction problem unless the entire length of Federal Street were widened. This would include right-of-way acquisition and/or create pedestrian problems in most areas.

Another key recommendation for Federal Street is the prohibition of the dangerous westbound U-turn at Cooper Street. This is made possible by the inclusion of the recommended left turn for westbound traffic at Flanders Avenue. This area will be further improved with the future use of Cooper Street as a local traffic loop in conjunction with New Jersey Department of Transportation plans for I-76 and the East-West Connector. We also recommend that, in the interest of safety, Newton Street access to Federal Street be eliminated.

Improvements which are continuous throughout the length of Federal Street, unless otherwise indicated at intersection redesigns, include the modernization of the signal system as outlined in the Federal Street/Westfield Avenue/Baird Boulevard intersection improvement section; repainted pavement markings, relocation of bus stops to far-side corners, more informative signing, and the prohibition of peak hour stopping or standing on one side of the street.

The total cost for all improvements on Federal Street, including intersections which follow, is \$962,600.

**REFER TO
PLATE NOS.
35 TO 37**

**Intersection Improvement
Federal Street and Marlton
Avenue/State Street**

This location has been selected for improvement because of a capacity problem. The single direction peak hour projection for 1980 on Federal Street is 1780 vehicles per hour at this intersection. High turning volumes add further congestion to the intersection which is presently operating with two lanes in the peak direction of Federal Street and one driving lane and parking in the off-peak direction. Marlton Avenue operates with two lanes in each direction. No special provisions (stand-by lanes, advanced green indications) are used for the heavy turning movements.

In order to achieve adequate capacity on Federal Street, widening is recommended on the western approach. Widening is feasible on the southern side of the approach because of a planned change in the existing right-of-way line which also results in an increase in right-of-way on the western side of the southern approach of Marlton Avenue. It is recommended that the planned increase in the right-of-way be laterally extended to permit the construction of an exclusive, channelized right turn lane which will always receive a green indication. This is a critical measure in improving the level of service at the intersection as this right turn is very heavy.

Also recommended for Federal Street is the prohibition of left turns from both approaches and the prohibition of stopping or standing at all times in the vicinity of the intersection.

It is recommended that both approaches of Marlton Avenue be provided with left turn lanes. The southern approach has a very high left turn volume during the A.M. peak period and requires an advanced green indication. The eastern side of this approach requires minor widening to provide transition to the recommended lane arrangement. The existing channelization island at this approach should be retained but through movement (to 21st Street) should be prohibited.

Both sides of the northern approach of Marlton Avenue should be widened using existing right-of-way. Channelization is recommended to provide guidance for the right turning movements which encompasses an acute angle.

A painted island is recommended on both Marlton Avenue approaches to form left turn lanes. Stopping and standing should be prohibited 300 feet and 450 feet from the intersection on the north and south approaches respectively.

Other recommendations cited as being continuous throughout the arteries in the Federal and State Street Route Improvement sections are applicable here.

**Intersection Improvement
Federal Street, Westfield Avenue,
27th Street and Baird Boulevard**

This area of complex intersections lies in East Camden one mile east of the Cooper River on Federal Street. High volumes, peak hour congestion and a high number of accidents are characteristic of the location. Heavy turning movements and poor alignment contribute to the delay and accident problems. It was observed that several seconds are lost during each signal cycle due to clearance phases which are required because several of the stoplines are set back from the intersections. An additional significant problem exists due to the buses which turn left from 27th Street south-bound and block the intersection while using the eastbound far side stop.

**REFER TO
PLATE NO. 38**

**REFER TO
PLATE NO. 39**

Parking is permitted at all times along both sides of Federal Street in the area. On Westfield Avenue, parking is prohibited on the north side of the block between 26th Street and 27th Street during the morning peak period and on the south side during the evening peak period.

Recommendations for the area include the prohibition of several turning movements which are largely responsible for accidents and delays. For example, movements from 27th Street southbound onto Federal Street eastbound and from 27th Street northbound onto Westfield Avenue westbound should be prohibited. Prohibition of these and other movements is accomplished through the rechannelization of the intersection as shown on the plate.

In order to increase capacity on Westfield Avenue, additional lanes are required. These may be obtained by widening the street three feet on the north and south sides from 27th Street to Leonard Street. This widening enables the insertion of a sorely needed left turn lane on the eastern approach of Westfield Avenue. This movement is of sufficient volume to require an advanced green indication. To further enhance conditions at this intersection, it is recommended that the far side eastbound bus stop at 27th Street and Westfield Avenue be relocated to the vicinity of Leonard Street and Westfield Avenue and that no buses be permitted to stop at 27th Street or Westfield Avenue.

The following parking regulation changes are recommended:

- a. Prohibit stopping or standing at all times on the south side of Westfield Avenue between 26th Street and 27th Street.
- b. Prohibit stopping or standing at all times on the south side of Westfield Avenue from 27th Street east 300 feet and prohibit stopping and standing from 7:00 A.M. to 9:00 A.M. on the north side of Westfield Avenue.
- c. Prohibit stopping or standing at all times on both sides of 27th Street from Federal Street to Cramer Street.
- d. Prohibit stopping or standing at all times westbound on Federal Street from 28th Street to 27th Street.

Recommendations concerning traffic signals at this intersection impact the entire length of Federal Street and are as follows:

- a. Replace the Traflex Master Controller with a more modern type capable of several cycles and progressions. The local intersection controllers should also be modified so that, in the event of a failure of the master, the local controllers would switch to a second dial. Under the present system, if the Traflex were to fail, the individual signals would function on a 35 second cycle. As an example of this failure, 27th Street northbound, at Federal Street, would receive only six seconds of green time. With a backup dial this problem would not exist.
- b. Retain the Traflex Controller as a backup controller in the event of failure or knockdown of the new master.
- c. Relocate traffic signals at 27th Street, Federal Street and Baird Boulevard as required due to other work.

Intersection Improvement Federal Street and 36th Street

This intersection, located at the eastern end of the Federal Street route study, was one whose capacity analysis for the P.M. peak period indicated that its operation was below level of service C. The low level of service is due to the narrow approach width of 36th Street and the high volumes on Federal Street. The relatively high volumes on 36th Street are caused by the existence of only two highway crossings of the Pennsylvania Reading Seashore Lines tracks leading to the Pavonia Railroad yards. One of the crossings is on 27th Street and the other is on 36th Street.

The recommended solution to this capacity problem is to create a 35th Street—36th Street one-way couple between Federal Street and Rosedale Avenue. By diverting southbound traffic on 36th Street westward along Rosedale Avenue before allowing it to resume southbound on 35th Street, and using 36th Street one-way northbound, sufficient relief is provided at 36th Street to provide operation at level of service C. 35th Street is able to operate at level of service C because it is given a separate left turn lane having no opposing traffic during this movement.

It is recommended that no through movements of left turns be allowed from the southern approach of 36th Street. This is because the northern and southern approaches of 36th Street have poor horizontal alignment and any through movement or left turns (which are currently extremely light in volume) create a hazardous situation.

All turning movements from Federal Street which formerly used both 35th and 36th Streets southbound can be made at 35th Street during the normal two-phase operation of the signal at that location. Also involved in the design in the area is the prohibition of peak hour stopping and standing on both sides of the street to provide two lanes of traffic in each direction.

Consideration was given to widening Federal Street slightly to provide a left turn lane at 36th Street in addition to the four lanes called for by this design. Upon investigation of the area, however, it was necessary to dismiss this concept since removal of any sidewalk in the area would have generated an extremely dangerous pedestrian situation.

Prohibition of stopping or standing is recommended on the east side of 35th Street and 36th Street from Federal Street to Rosedale Avenue and partial prohibitions on the west side of 35th Street and 36th Street near intersections.

It is also recommended that the street lighting on Rosedale Avenue be improved between 35th Street and 36th Street and that this area be channelized to improve traffic flow between the one-way streets.

These measures are necessary to enhance capacity in the area to provide adequate service for volumes which are anticipated in 1980.

REFER TO
PLATE NOS.
40 AND 41

**ROUTE IMPROVEMENT
HADDON AVENUE**

Discussion

Haddon Avenue operates as a two-way street from Federal Street, its northern terminus in Center City Camden, to Collingswood. The study area within Camden is bordered by Mickel Street on the north and Ferry Avenue on the south. The street is 42 feet in width with a few localized exceptions. One lane in each direction is used during off-peak hours with parking on both sides of the street (except at bus stops). Peak hour parking is prohibited on one side (east side in the morning; west side in the evening) along Haddon Avenue south of Euclid Street. North of Euclid Street, commercial establishments are frequent along the street and necessitate the presence of parking. These establishments also generate considerable pedestrian activity in the area.

1980 volumes as projected remain relatively light on Haddon Avenue north of Vesper Boulevard (300 — 600 vehicles per hour in the peak direction). However, south of Vesper Boulevard, 1980 peak hour projections range as high as 1300 vehicles per hour.

Some of the traffic signals are pedestal mounted with single dial pre-timed controllers. No interconnections of signals exist. Pavement markings are worn and in many cases totally obliterated.

Accident statistics revealed several problem intersections with the primary problems occurring at Kaighns Avenue, Newton Avenue, and Mt. Ephraim Avenue.

Recommendations

The primary recommendation for Haddon Avenue is the modernization of the signal system. A type capable of several cycles and/or signal splits is required. Also, signal displays at five intersections should be modernized to provide easily visible mast arm supported signals at all intersections where pedestal mounted signals are currently in use. Five other signals have been recommended for removal.

Because of the commercial activity along Haddon Avenue, the removal of sidewalk is not suggested and the prohibition of parking has been recommended sparingly. The use of the recommended Atlantic Avenue/Kaighns Avenue one-way couple will generate added volume on Haddon Avenue in the vicinity of the couple. This added stress requires the abolition of peak hour parking on both sides of Haddon Avenue between Kaighns Avenue and Liberty Street and on one side between Liberty Street and Atlantic Avenue.

Repainted pavement markings are recommended for this street to improve vehicle positioning conditions.

The total cost for all improvements on Haddon Avenue, including intersections which follow, is \$194,600.

**Intersection Improvement
Haddon Avenue and Newton Avenue**

This intersection was selected for improvement because of its high accident history. Approximately fifty percent of all accidents were the result of drivers' ignoring red signal indications.

**REFER TO
PLATE NOS.
42 TO 45**

**REFER TO
PLATE NO. 46**

It is recommended that modernized signals, which are recommended along the entire route, be given especially high priority at this intersection. Present visibility difficulties will be alleviated by this measure and a major accident cause will be eliminated. Re-painting of all pavement markings in the area of the intersection should also receive high priority for the purpose of achieving the same end.

**Intersection Improvement
Haddon Avenue, Mount Ephraim
Avenue and Line Street**

This intersection has an extremely high accident intensity. The unusual alignment and resulting acute angle turning movements are prime contributors to this problem.

Another factor which makes this area particularly hazardous is the presence of two railroad bridge piers within the curb lines of Haddon Avenue. Two lanes which are of opposite direction pass between the pillars within the dangerous width of twenty feet.

The lane lines in the entire area are virtually non-existent, and the sight distance on Haddon Avenue is minimal. Because of these problems, the signal displays and stop lines on the northern approach of Haddon Avenue are located north of the piers.

The recommendations for the intersection rectify the visibility problem and increase safety. By relocating and modernizing the signal to Haddon Avenue between Line Street and Pine Street and bringing all Mount Ephraim northbound onto Haddon Avenue at the signal, a new intersection is created. Mount Ephraim Avenue is to be made one-way northbound from its present intersection with Haddon Avenue.

By making Line Street one-way eastbound and permitting only right turns from both of Pine Street's approaches, a very small number of vehicles are inconvenienced.

Safety conditions for the heaviest movements in the area are enhanced by this scheme. Also, the southbound movement from Haddon Avenue to Mount Ephraim Avenue is made non-stop. Parking, as shown on the plate, is well accommodated in the area and right-of-way acquisition is not required.

A longer range remedial step which should be implemented on the northern approach of Haddon Avenue is the replacement of the aforementioned railroad bridge by a two span structure with one pier positioned at the center of the right-of-way. The reduction in the probability of head-on collisions with opposing vehicles and with the piers themselves merits the large expenditure which implementation of this recommendation will involve.

**ROUTE IMPROVEMENT
MARKET STREET**

Discussion

Market Street lies in an east-west direction in the Camden Business District. It is operated as the westbound half of a one-way couple with Federal Street from which it originates on the east. Delaware Avenue is the western terminus of Market Street, which varies in width from 45 feet to 64 feet and provides two lanes of travel with parking on both sides. The A.M. peak hourly volume is projected to range as high as 1700 vehicles per hour in 1980.

**REFER TO
PLATE NO. 47**

**REFER TO
PLATE NOS.
48 TO 50**

Recommendations

In recognition of this anticipated increase in volume, it is recommended that three lanes of traffic be operated during the A.M. peak period. This may be accomplished by prohibiting stopping or standing on the south side of the street during this period. Between Fifth Street and Seventh Street, parking may be permitted on both sides of the street because of the increased width of the roadway. By adjusting lane widths, three lanes of traffic may also be obtained in this area. Updated signing is required to establish these changes in parking.

Pavement markings (lane lines, pedestrian crossings, stop lines, parking spaces) are recommended as shown on the plates. The lack of these markings is currently the major cause of sub-optimal usage of the roadway width. Also, interconnected mast arm displayed signals are recommended to replace existing pedestal mounted signals. This will provide greater visibility to the driver and increase safety.

The total cost for all improvements on Market Street is \$101,650.

**SPECIAL RECOMMENDATIONS
MOUNT EPHRAIM AVENUE**

Discussion

Mount Ephraim Avenue lies in a north-south direction in Camden from Federal Street to the Haddon Township Boundary. South of Haddon Avenue, its width varies from 46 feet to 54 feet. The 1980 projected peak hour volumes range as high as 1500 vehicles per hour. Parking is prohibited on both sides of Mount Ephraim Avenue during both peak periods. Unfortunately, motorist compliance with this ordinance is minimal.

Traffic signals on Mount Ephraim are of the multi-dial type. However, only single dial operation is currently in effect. Signal displays are of high quality and have good visibility. Pavement surface and markings, as well as signing are all in adequate condition.

Recommendations

Several of Mount Ephraim's intersections have been identified as having problems and are included for redesign throughout this report. However, the existing capacity of the street is generally sufficient to meet present volumes as well as those projected for 1980. As a result, no route-wide improvements requiring detailed drawings have been made. To provide the required capacity along Mount Ephraim Avenue, compliance with parking restrictions is required. Therefore, it is recommended that the ordinances and signs be changed to prohibit stopping or standing and that a program of stringent law enforcement be initiated.

Also recommended is the modification of existing signals to improve conditions. This involves the exploitation of their multi-dial capability to provide traffic demand responsive cycle lengths and/or signal splits.

The total cost for all improvements on Mount Ephraim Avenue, including inter-sections which follow, is \$632,100.

**Intersection Improvement
Mount Ephraim Avenue
and Ferry Avenue**

This intersection was selected for improvement because of its capacity problem as well as its designation as a high accident area. This intersection is one of the most highly utilized in South Camden and projected volumes indicate further growth. This is due primarily to the presence of the Ferry Avenue Station of the Lindenwold High Speed Line located to the east of this intersection on Ferry Avenue, less than 3/4 mile away. The station is a major traffic generator and accounts for the high volume of left turns from the east approach of Ferry Avenue during the P.M. peak period. Mount Ephraim Avenue is used to gain access to Camden's southern suburbs.

The accident problem is caused by heavy turning movements and the poor horizontal alignment of Ferry Avenue through the intersection.

The recommended redesign of this intersection requires the acquisition of right-of-way currently occupied by a gasoline station and a trailer park. This acquisition is required in order to provide proper alignment at the intersection. Proper alignment is necessary in order to reduce the accident potential and increase capacity to meet projected future demand. An alternative proposal would require right-of-way purchase from the Evergreen and New Camden Cemeteries. This was dismissed upon consideration of legal problems which would be encountered.

Also recommended is the widening of both approaches of Mount Ephraim Avenue to provide left turn lanes. This requires a right-of-way acquisition on the east side of the street for a distance of approximately three hundred and fifty feet both north and south of the intersection. Left turn lanes are also recommended for both the eastern and western approaches of Ferry Avenue. A two-phase signal with an advanced green indication for the eastern approach of Ferry Avenue is the recommended phasing for the intersection. Also, pavement markings in the area, which are virtually non-existent on Ferry Avenue, should be repainted.

**Intersection Improvement
Mount Ephraim Avenue
and Fairview Street**

This "T" intersection is located on the border of the Fairview Manor section of Camden and Woodlyne. Peak hour volumes are very high at the intersection and accidents are also a problem. In addition, the presence of a branch of People's Bank on the east side of the intersection generates turning movements in the area. Parking is prohibited during both peak periods on both sides of Mount Ephraim Avenue.

It is recommended that the southern approach of Mount Ephraim Avenue be widened in the vicinity of the intersections by seven feet by using existing right-of-way which will permit the inclusion of a left turn lane. To maintain proper alignment, a left turn lane should also be provided on the northern approach to service the bank. This measure will also serve to increase capacity and safety.

Also recommended is the widening of Mount Ephraim Avenue's northern approach to provide two through lanes and a right turn lane as well as the left turn lane into the bank. A right-of-way purchase on the western side of Mount Ephraim Avenue is required.

**REFER TO
PLATE NO. 51**

**REFER TO
PLATE NO. 52**

The construction of concrete islands for channelization to aid in transition of both Mount Ephraim Avenue approaches is recommended.

In order to increase capacity on the Fairview Street approach, prohibition of stopping or standing on both sides at all times within 400 feet of the intersection is recommended. This permits the operation of two approach lanes.

**Intersection Improvement
Mount Ephraim Avenue and
Collings Road/Collings Avenue**

This intersection was identified as a major problem during the course of the study. The accident intensity is relatively high at this intersection and difficulty is encountered in traveling through it during peak hours, despite low volumes. A large part of the problem is directly attributable to two prime factors. One of these is the offset of Collings Road and Collings Avenue westbound on opposite sides of Mount Ephraim Avenue. This offset creates confusion to drivers turning from the southern approach of Mount Ephraim Avenue, as well as to those making the through westbound movement. The second factor of concern in the area is the patronage of a newsstand located on the median which separates eastbound and westbound traffic on Collings Road. Many hazardous traffic movements were observed in gaining access to the newstand, which is recessed from the right lane of southbound traffic on Mount Ephraim Avenue. This recession (of about 20 feet) invites dangerous movements, including vehicles moving from Mount Ephraim Avenue northbound to the newsstand and then pulling out across southbound traffic to proceed in a northbound direction again.

The analysis of these problems effected a mutual solution. By making the south side of Collings Road two-way and the north side one-way westbound (accessible only via a right turn lane from Mount Ephraim southbound) and by extending the sidewalk fronting the newsstand eastward to the edge of the through southbound lane, the resulting intersection eliminates the problems which were previously discussed. The existing directionally-divided arrangement of Collings Road is reestablished by the inclusion of a connecting road through the median to return the westbound traffic to the northside where it merges with the westbound traffic which turned from southbound Mount Ephraim Avenue.

**SPECIAL RECOMMENDATIONS
RIVER AVENUE**

Discussion

River Avenue is in the northern section of East Camden lying in a northeast-southeast configuration. Its western origin is at the eastern side of the Cooper River at Federal Street. The route crosses 36th Street, its eastern border in Camden, and proceeds into Pennsauken Township.

The highest directional volume on the street as projected for 1980 is at 36th Street where 1405 vehicles per hour are anticipated during the evening peak. This intersection, as well as River Avenue and State Street, is isolated in the intersection improvement section of Federal Street.

River Avenue has three different widths: 32 feet from Federal Street to the Pennsylvania Reading Seashore Lines (P.R.S.L.) tracks; 24 feet from the P.R.S.L. tracks to State Street; and 36 feet northwest of State Street. Parking is prohibited at all times between Federal Street and 19th Street and is permitted at all times elsewhere, except at bus stops.

Recommendations

To provide a facility which will serve the area's needs by 1980, a street having four traffic lanes and two parking lanes is mandated to replace River Avenue. However, due to the narrow 50 foot right-of-way with structures extending to the property line, thought of an extensive reconstruction and widening program under TOPICS has been dismissed. Therefore, no route-wide improvements requiring detailed drawings have been made. The recognition of the need for an alternate route to relieve congestion on River Avenue is demonstrated by the City of Camden's proposal to construct the North Shore Parkway on a line approximating Harrison Avenue.

The intersection redesigns for River Avenue included in this report will serve as a stopgap measure until major construction is undertaken. Another recommendation for the street is the modernization of traffic signals. Multi-dial interconnected controllers for mast arm displayed signals are recommended. Relocation of bus stops to far side, repainted pavement markings and revised signing throughout the route are also recommended. These improvements are exemplified by the plates showing intersection redesigns. However, it must be recognized that these minor improvements are not a long range solution for congestion on River Avenue and planning for major construction should continue.

The total cost for implementation of all recommendations on River Avenue, including intersection improvements which follow, is estimated to be \$249,600.

**Intersection Improvement
River Avenue and State Street**

Volume considerations and accident history are the major contributory factors which caused this intersection to be selected for examination. Both of the streets which form the intersection have been selected for special route study.

The northern approach width of State Street is 56 feet while the southern approach is 26 feet wide. No parking is permitted on any of the four approaches of State Street. The heaviest movements on all approaches are through vehicles. Turning movements, especially lefts, are the primary generators of accidents at the intersection. A heavy right turn from the eastern approach of River Avenue during the P.M. peak period is the turning movement of primary concern.

To improve capacity and safety in the area, it is recommended that both left turns from River Avenue be prohibited. This recommendation is made as an alternative to an extensive widening scheme which is deemed unnecessary in this case. In addition to reducing the probability of rear end collisions, this left turn prohibition will enable one through lane and an exclusive right turn lane to be operated on the eastern approach. The minor widening of the western approach by five feet will provide the proper alignment throughout the east-west direction.

**REFER TO
PLATE NO. 54**

**REFER TO
PLATE NO. 53**

Alignment and capacity will be improved in the north-south direction by the operation of two lanes, the incorporation of a painted median on the south side of the intersection, and provision for four lanes on the north side.

It is also recommended that three of the intersection's four corners be cut back using existing right-of-way to increase the turning radii as shown on the plate.

Restrictions prohibiting all stopping and standing in the area of the intersection should be instituted.

Other recommendations (pavement markings, signals, etc.) listed in the River Avenue Route Improvement section as continuous improvements are applicable at this intersection.

Intersection Improvement River Avenue and 36th Street

This intersection lies in the northern part of Cramer Hill on Camden's eastern border with Pennsauken Township. The intersection is important because of the function of 36th Street as the access route to Petty's Island. This fact accounts for a high percentage of trucks using the intersection. The stress placed on 36th Street is also magnified by the fact that it is the only street in the area which crosses the P.R.S.L. railroad tracks (south of this intersection).

This intersection was selected for examination because of a capacity problem. Accidents are negligible in number. Volumes on River Avenue are high during both peak hours and the northern approach of 36th Street has a very high volume of left turns during the P.M. peak period.

Parking is presently prohibited on both sides of all approaches of the intersection at all times. Recommendations for the intersection include the widening of all four approaches to increase capacity. Also recommended are increased turning radii on all four corners to expedite truck movements. This requires acquisition of small sections of right-of-way on each corner.

Near-side stopping or standing should be prohibited on all approaches in the vicinity of the intersection at all times.

Left turns from the western approach of River Avenue should be prohibited at all times. Contrarily, left turn stand-by lanes are recommended for both 36th Street approaches. Transition to these lanes should be accomplished through the utilization of painted channelization islands.

Other recommendations (relocation of bus stops, pavement markings, etc.) cited in the River Avenue Route Improvement section as continuous improvements are applicable here.

SPECIAL RECOMMENDATIONS STATE STREET/EAST STATE STREET/MARLTON AVENUE

Discussion

This multi-faceted street originates on the west at Delaware Avenue and runs eastward in the northern section of Camden (north of the Benjamin Franklin Bridge

Approach) as State Street. The street crosses the Cooper River via a 25 foot wide bridge and, at that point, changes in width from 36 feet to 56 feet where it becomes East State Street. Continuing eastward, East State Street crosses River Avenue and becomes Marlton Avenue and again changes width to 40 feet. It maintains this name and the same width into Pennsauken Township.

Recommendations

The planned replacement of the existing State Street bridge over the Cooper River by a bridge at Harrison Avenue presents two possibilities. If the existing bridge remains, it is recommended that State Street be repaved and the signals on it be modernized. However, the likelihood of the removal of the bridge is greater than its remaining, thereby reducing the status of State Street to that of a local street. Using this assumption, no recommendations have been made and only the section of this street which lies east of the Cooper River will be considered.

The peak period traffic volumes vary greatly on the street but are generally low with the exception of its eastern section in Camden. Volumes reach a maximum on Marlton Avenue near its intersection with Baird Boulevard, the intersection having the greatest capacity problem.

Parking is currently permitted at all times on both sides of the street (except at bus stops), with the exception of the section between River Avenue and Federal Street where parking is prohibited on both sides at all times.

The recommendations for the street include intersection improvements along the route at River Avenue (included in the River Avenue section), Federal Street (included in Federal Street section) and Baird Boulevard. One other intersection with a capacity deficiency is Marlton Avenue and Benson Street. It is recommended that the signal at this intersection be removed. Since traffic on Benson Street is extremely light, this signal reduces needed capacity on Marlton Avenue. Since these intersections are the primary problem points along the route, the entire route has not been illustrated.

Intersection Improvement Marlton Avenue and Baird Boulevard

This intersection, located in East Camden about one-half mile northeast of Baird Boulevard at the Cooper River, connects two heavily travelled arteries. Peak hour volumes on each street are projected to surpass 1000 vehicles per hour in the peak direction by 1980. Both streets are presently operated as one lane in each direction with parking, with the exception of the southern approach of Baird Boulevard where parking is prohibited and two approach lanes exist. No special provisions are made for turning movements which are high in volume. A two phase pre-timed traffic signal using pedestal mounted signal heads is used. A large thirty foot earthen median separates directional flows on Baird Boulevard. The deflection of Baird Boulevard at the intersection is a contributing factor in the relatively high number of accidents which have occurred here.

An increase in capacity is the foremost requirement which must be addressed in forming recommendations for this intersection. Alleviation of the Baird Boulevard deflection is also a primary objective. By reshaping the median, purchasing two small sections of right-of-way, widening a section of Marlton Avenue using existing right-of-way, and abolishing parking on all approaches, both of these objectives will be obtained. Exclusive left turn lanes with advanced green indications are recommended for the southern and eastern approaches. Revised pavement markings and signing, as well as modernized signals, are also recommended.

**REFER TO
PLATE NO. 56**

**REFER TO
PLATE NO. 55**

Marlton Pike should be widened by seven feet on each side for a distance of 350 feet east of the intersection and 200 feet on the west side. Right-of-way purchases of 200 square feet and 150 square feet are recommended on the southwestern and northwestern corners of the intersection which are both occupied by gas stations. It is believed that neither purchase will impact the stations' activities significantly. These purchases are critical to the recommended redesign of the area.

The total cost of the improvements for this intersection is \$70,600.

OTHER INTERSECTION IMPROVEMENTS

Intersection Improvement
Park Boulevard and Baird Boulevard

This high volume, high accident intersection is located on the west side of Farnham Park, approximately one mile southwest of Baird Boulevard at the Cooper River. Its highest single direction peak hour approach volume projected for 1980 is 1162 vehicles per hour. The curb to curb width of Park Boulevard varies from 70 feet to 72 feet in the vicinity of the intersection while that of Baird Boulevard is 34 feet to 35 feet.

The majority of traffic at the intersection in the morning peak period uses Park Boulevard to gain access to Baird Boulevard northbound, while in the evening, the reciprocal case applies. As a result, several turning movements are heavy in volume during the peak periods. Due largely to these turning movements, which are presently given no special consideration, accident frequency is very high.

To increase capacity and safety, it is recommended that the earthen median be reduced in size on both Park Boulevard approaches to provide for left turn lanes. Another critical recommendation is the widening by three feet of the Baird Boulevard northern approach to allow for an exclusive left turn lane. This lane and the left turn lane on the western approach of Park Boulevard should have advanced green signal indications.

To ease negotiation of the heavy right turn from the eastern approach of Park Boulevard onto Baird, it is recommended that the turning radius at this corner be increased. The right lane of this approach should be used exclusively for right turns.

To achieve proper alignment, the southern approach of Baird Boulevard must be widened slightly on the eastern side. This corner should be cut back to improve right turning conditions.

Critical to the increased capacity of the intersection is the relocation of bus stops to far side corners as well as the prohibition of stopping or standing in the area. Another recommendation vital to increased safety is the modernization of signals and refurbishing of the intersections' pavement marking and signing.

The total cost of improvements at this intersection is \$74,000.

Intersection Improvement
Ferry Avenue and Eighth Street
Ferry Avenue and Ninth Street

These two signalized intersections in the Centerville section of Camden were selected for improvements because of accident history. Eighth Street is one-way northbound and Ninth Street is one-way southbound. The major causes of accidents are poor signal visibility at both intersections and the poor alignment on Ninth Street.

REFER TO
PLATE NO. 57

REFER TO
PLATE NOS.
58 AND 59

The recommendations for the pair include modernized signals to increase visibility, and upgraded pavement markings to improve vehicle positioning. Also, the relocation of bus stops to far side corners is recommended to enhance visibility.

The recommendation for realignment of Ninth Street by using existing right-of-way is made in the interest of further reducing existing problems at that intersection.

The total cost for improvements at these intersectinos is \$49,400.

Intersection Improvement
Westfield Avenue and 36th Street

This intersection has a high accident incidence despite relatively low volumes. 36th Street is one of only three streets in East Camden which cross the P.R.S.L. tracks at Cleveland Avenue.

The recommendations for the intersection include the installation of overhead signal displays. The improved visibility as a result of this improvement will reduce accident potential at the intersection. By prohibiting stopping and standing on Westfield Avenue in the vicinity of the intersection, and by using a painted island for channelization, left turn standby lanes can be used to reduce the probability of rear-end collisions on Westfield Avenue.

Also recommended are refurbished pavement markings and increased turning radii for both right turns from Westfield Avenue. This can be achieved by utilizing small sections of existing right-of-way at these two corners.

The implementation of the recommendations cited for this intersection will greatly improve safety conditions in the area.

The total cost for all improvements at this intersection is \$20,350.

SPECIAL RECOMMENDATIONS
INTERSECTIONS OF FERRY AVENUE WITH
WHITE HORSE PIKE AND DAVIS STREET

While no drawings of these intersections are included in this report, traffic volumes taken at these intersections revealed extreme peaking conditions. This is due to the role these intersections play in gaining access to the Ferry Avenue Station of the Lindenwold High Speed Line. Therefore, it is recommended that these intersections be considered for signalization by the proper authorities for the purpose of enhancing conditions of safety and traffic control.

Summary Of Recommendations

Throughout this TOPICS study, emphasis has been placed on the improvement of traffic flow through the application of traffic engineering principles. The chart which follows summarizes, in matrix form, the recommended improvements to the street system in the City of Camden.

The chart is included to indicate the type of improvements recommended in this report. All improvements are discussed in the detailed recommendations section of the text.

REFER TO
PLATE NO. 60

SUMMARY OF TOPICS RECOMMENDATIONS

LOCATION	R.O.W.	Widening	Signalization	Pavement Markings	Channelization	Other
Route — Atlantic Avenue and Kaighns Avenue		X	X	X	X	X
Spot — Atlantic Avenue and Haddon Avenue	X		X	X	X	X
Spot — Kaighns Avenue and Mt. Ephraim Avenue		X	X	X		X
Spot — Kaighns Avenue and Haddon Avenue	X	X	X	X		X
Spot — Kaighns Avenue and Park Boulevard	X		X	X	X	X
Route — Broadway		X	X	X	X	X
Spot — Broadway and Newton Avenue, etc.			X	X	X	X
Spot — Broadway and Ferry Avenue	X	X	X	X	X	X
Spot — Broadway and Morgan Boulevard	X	X	X	X	X	X
Route — Cooper Street			X	X	X	X
Route — Federal Street	X	X	X	X	X	X
Spot — Federal Street and Marlton Avenue	X	X	X	X	X	X
Spot — Federal Street and Westfield Avenue	X	X	X	X	X	X
Spot — Federal Street and 36th Street	X		X	X	X	X
Route — Haddon Avenue			X	X	X	
Spot — Haddon Avenue and Newton Avenue			X	X		
Spot — Haddon Avenue and Mt. Ephraim Avenue			X	X	X	X
Route — Market Street			X	X		X
Route — Mt. Ephraim Avenue			X			X
Spot — Mt. Ephraim Avenue and Ferry Avenue	X	X	X	X	X	X
Spot — Mt. Ephraim Avenue and Fairview Street	X	X			X	X
Spot — Mt. Ephraim Avenue and Collings Road				X	X	X
Route — River Avenue			X	X		X
Spot — River Avenue and State Street		X	X	X	X	X
Spot — River Avenue and 36th Street	X	X	X	X	X	X
Route — State Street/Marlton Avenue						
Spot — Marlton Avenue and Baird Boulevard	X	X	X	X	X	X
Spot — Park Boulevard and Baird Boulevard		X	X	X	X	X
Spot — Ferry Avenue and 8th Street, 9th Street	X	X	X	X	X	X
Spot — Westfield Avenue and 36th Street			X	X	X	X

Cost Estimates And Priorities

The implementation of the improvements proposed in the detailed recommendations section of this report requires significant expenditure from several levels of government. To assist with the appropriation of these funds, priorities and estimates are presented.

Separate costs are given for each route improvement and each intersection improvement. Sub-totals are shown which include the route improvement costs plus the spot improvement costs shown under that route. The consultant has assumed that groups of projects will be designed at one time. Therefore, the engineering costs have been calculated based upon the estimated cost for the recommended design groups. These groups of projects, together with their resultant costs, have been sub-totaled in the chart that begins on page19. All estimates are preliminary and have been generated using present day costs for similar projects.

Priorities have been established by attempting to maximize the benefits accrued by expenditures; that is, one intersection may have a higher priority than an intersection with a much lower improvement cost if the former has experienced a greater accident problem and/or is creating delay for a much greater volume.

All Early Implementation Projects have been assigned priority one. These projects are the only ones to be assigned this priority.

Revised Federal Aid System

After reviewing the existing Federal Aid street system in Camden, several other streets were added to make up the TOPICS street system. While the selection of these streets was based upon several factors, the primary objective was to obtain a street system capable of providing a high level of service for the major traffic movements anticipated by 1980. The revised Federal Aid street network provides a strong radial system of arterials in the north-south and east-west directions, supplemented by an interconnecting circumferential system. This recommended arterial system is also supported by the collector street system, and other streets whose primary purpose is to service abutting property. The following tabulation summarizes the mileage contained in the existing and proposed Federal Aid system:

Federal Aid Classification	Existing Mileage	Proposed Mileage
Federal Aid Primary — Type I	2.9	2.9
Federal Aid Interstate	2.1	2.1
Federal Aid Secondary	5.2	5.2
Federal Aid Urban	23.9	23.9
Federal Aid Primary — Type II	—	11.5
TOTAL	34.1	45.6

System Maintenance And Evaluation

MAINTENANCE

It is recommended that a program of regular maintenance be established for traffic signals, signs and pavement markings. The establishment and implementation of such a program is the responsibility of the State, County and City and is dependent upon the particular street and type of maintenance duty under consideration.

The City of Camden should establish a Bureau of Traffic Engineering with an administrator directly responsible for maintenance. Purchase of a paint truck should be considered early in the program for this bureau. The establishment of a branch of the Electrical Department should be trained to the point of familiarity with state-of-the-art traffic signals and controllers. A program of this nature is not to be underestimated because it is critical to ensure the continued realization of benefits from the recommendations prescribed in this report.

EVALUATION

The evaluation of recommended changes after they are instituted should be made to measure the effectiveness of improvements in eliminating problems outlined in the report. In order to evaluate the improvements, it is recommended that accident statistics, noting both number and severity, be monitored continually and speed and delay runs as well as traffic counts be taken at regular intervals to measure the impact of TOPICS improvements upon safety, congestion and capacity.

Such an evaluation may be helpful in establishing guidelines to be used in the future for rectifying analagous problems which may occur on other streets or at other intersections in the area.

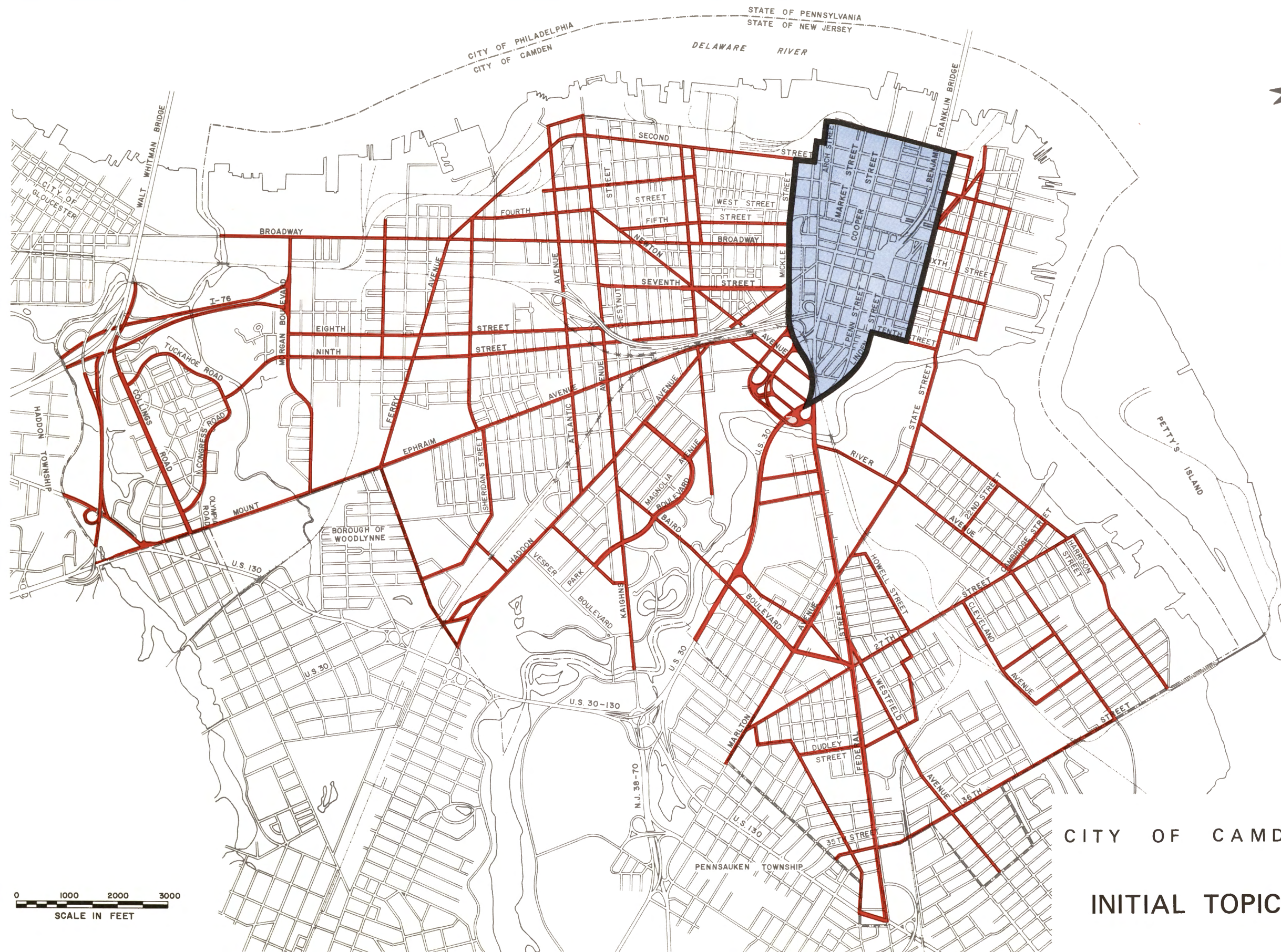
REFER TO
PLATE NO. 61

COST ESTIMATES AND PRIORITIES

Project	Construction	R.O.W.	Eng.	Total	Priority
Atlantic Ave. and Kaighns Ave. Route*	193,000				4
Atlantic Ave. and Haddon Ave.	15,000	500			4
Kaighns Ave. and Mt. Ephraim Ave.	6,000				4
Kaighns Ave. and Haddon Ave.	18,000	500			2
Kaighns Ave. and Park Blvd.	88,000	1,000			3
SUB TOTAL	\$320,000	\$ 3,000	\$21,800	\$344,800	
Broadway Route*	446,000				2
Broadway and Walnut St.	25,000				3
Broadway and Ferry Ave.	53,000	30,000			2
Broadway and Morgan Blvd.	180,000	10,000			2
SUB TOTAL	\$704,000	\$40,000	\$41,500	\$785,500	
Cooper Street Route	146,000		10,220	156,220	1
SUB TOTAL	\$146,000		\$10,220	\$156,220	
Federal Street Route*	750,000	34,000			2
Federal Street and State St.	33,000	8,000			2
Federal Street, Westfield Ave, etc.	62,000				1
Federal Street and 36th St.	25,000	1,000			2
SUB TOTAL	\$870,000	\$43,000	\$49,600	\$962,600	
Haddon Avenue Route*	120,000				3
Haddon Avenue and Newton Ave.	20,000				2
Haddon Avenue and Mt. Ephraim Ave.	41,000				2
SUB TOTAL	\$181,000		\$13,600	\$194,600	
Market St. Route	95,000		6,650	101,650	1
SUB TOTAL	\$ 95,000		\$ 6,650	\$101,650	

Project	Construction	R.O.W.	Eng.	Total	Priority
Mt. Ephraim Ave. Route*	1,000				3
Mt. Ephraim Ave. and Ferry Ave.	140,000	300,000			2
Mt. Ephraim Ave. and Fairview St.	95,000	1,000			2
Mt. Ephraim Ave. and Collings Rd.	74,000				3
SUB TOTAL	\$310,000	\$301,000	\$21,100	\$632,100	
River Ave. Route*	60,000				3
River Ave. and State St.	24,000				2
River Ave. and 36th St.	142,000	1,000			2
SUB TOTAL	\$226,000	\$ 1,000	\$22,600	\$249,600	
Marlton Ave. and Baird Blvd.	61,000	4,000	5,600	70,600	2
SUB TOTAL	\$ 61,000	\$ 4,000	\$ 5,600	\$ 70,600	
Park Blvd. and Baird Blvd.	68,000		6,000	74,000	2
SUB TOTAL	\$ 68,000		\$ 6,000	\$ 74,000	
Ferry Ave., 8th St., 9th St.	45,000		4,400	49,400	2
SUB TOTAL	\$ 45,000		\$ 4,400	\$ 49,400	
Westfield Ave. and 36th St.	18,500		1,850	20,350	3
SUB TOTAL	\$ 18,500		\$ 1,850	\$ 20,350	
GRAND TOTAL	\$3,044,500	\$392,000	\$204,920	\$3,641,420	

* Does not include costs for spot improvements.



CAMDEN CENTRAL
BUSINESS DISTRICT

0 1000 2000 3000
SCALE IN FEET

CITY OF CAMDEN TOPICS STUDY
INITIAL TOPICS STUDY SYSTEM

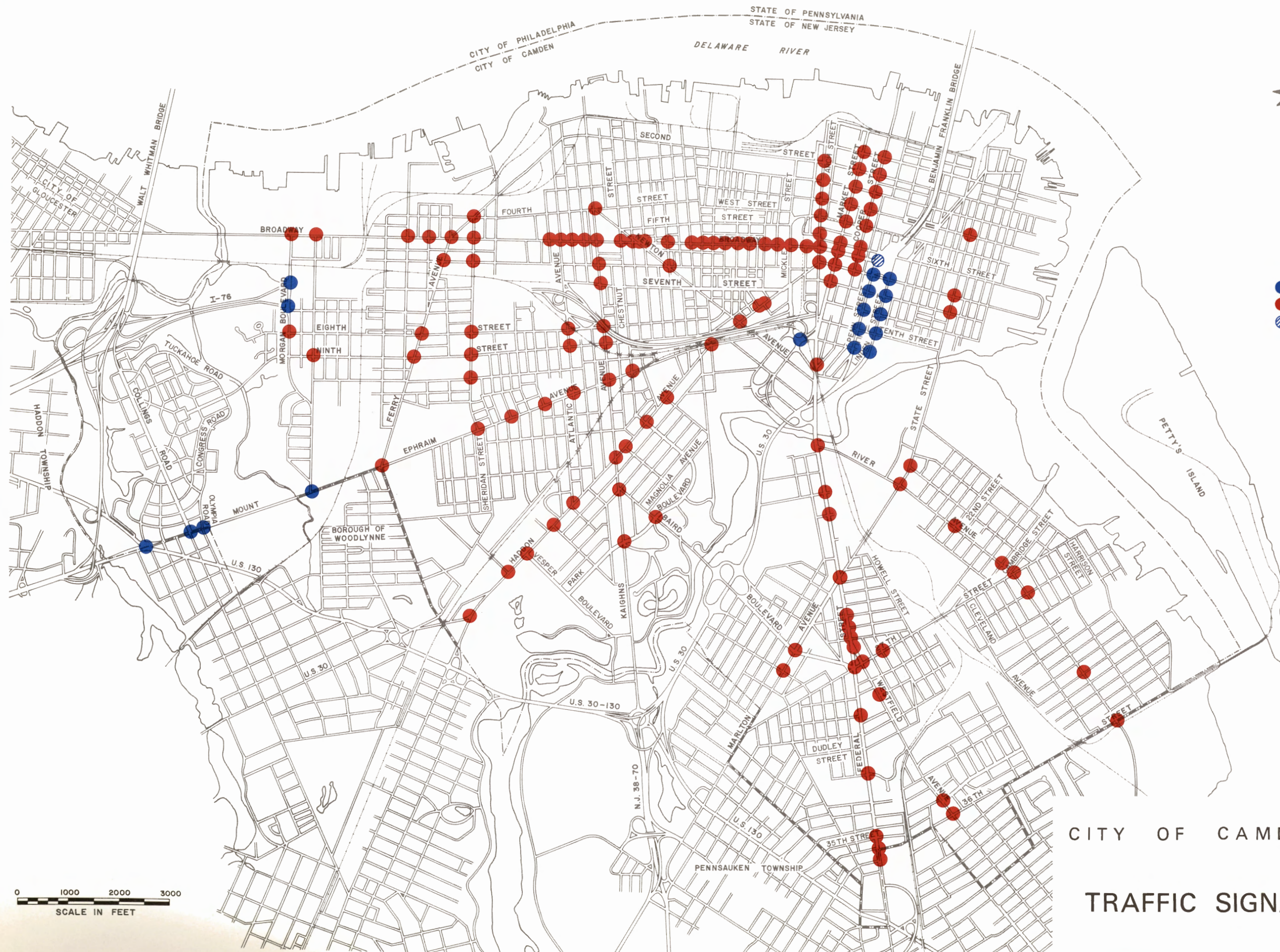


LEGEND

- SPOT IMPROVEMENT
- ROUTE IMPROVEMENT

0 1000 2000 3000
SCALE IN FEET

CITY OF CAMDEN TOPICS STUDY
RECOMMENDED TOPICS
IMPROVEMENT LOCATIONS



LEGEND

- STATE OWNED SIGNAL
- CITY OWNED SIGNAL
- PORT AUTHORITY OWNED SIGNAL

0 1000 2000 3000
SCALE IN FEET

CITY OF CAMDEN TOPICS STUDY
TRAFFIC SIGNAL INSTALLATIONS



0 1000 2000 3000
SCALE IN FEET



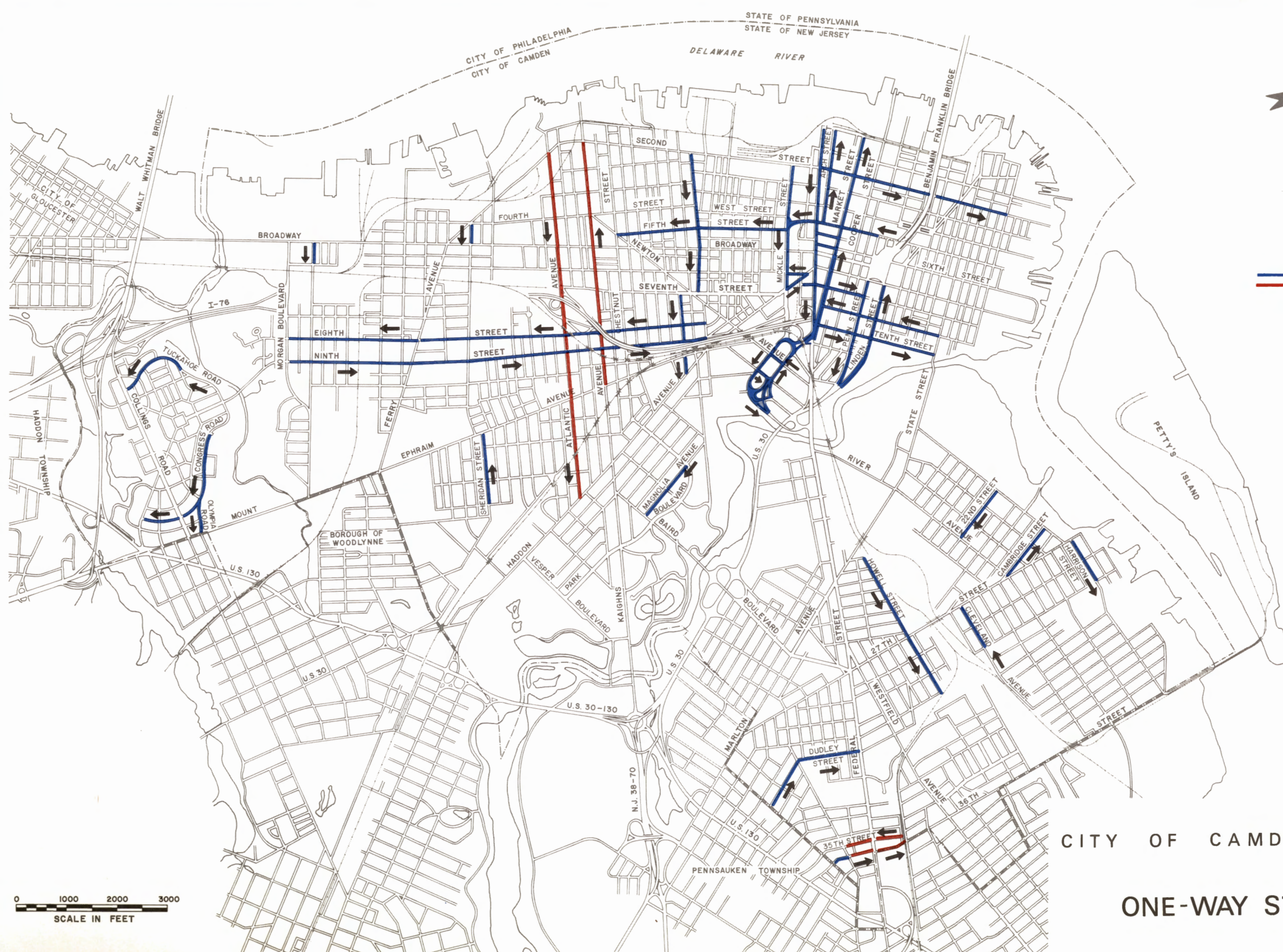
- LEGEND
- UNRESTRICTED OR PARTIALLY RESTRICTED
 - PROHIBITED
 - METERED

CITY OF CAMDEN TOPICS STUDY

PARKING REGULATIONS

URBAN ENGINEERS INC.

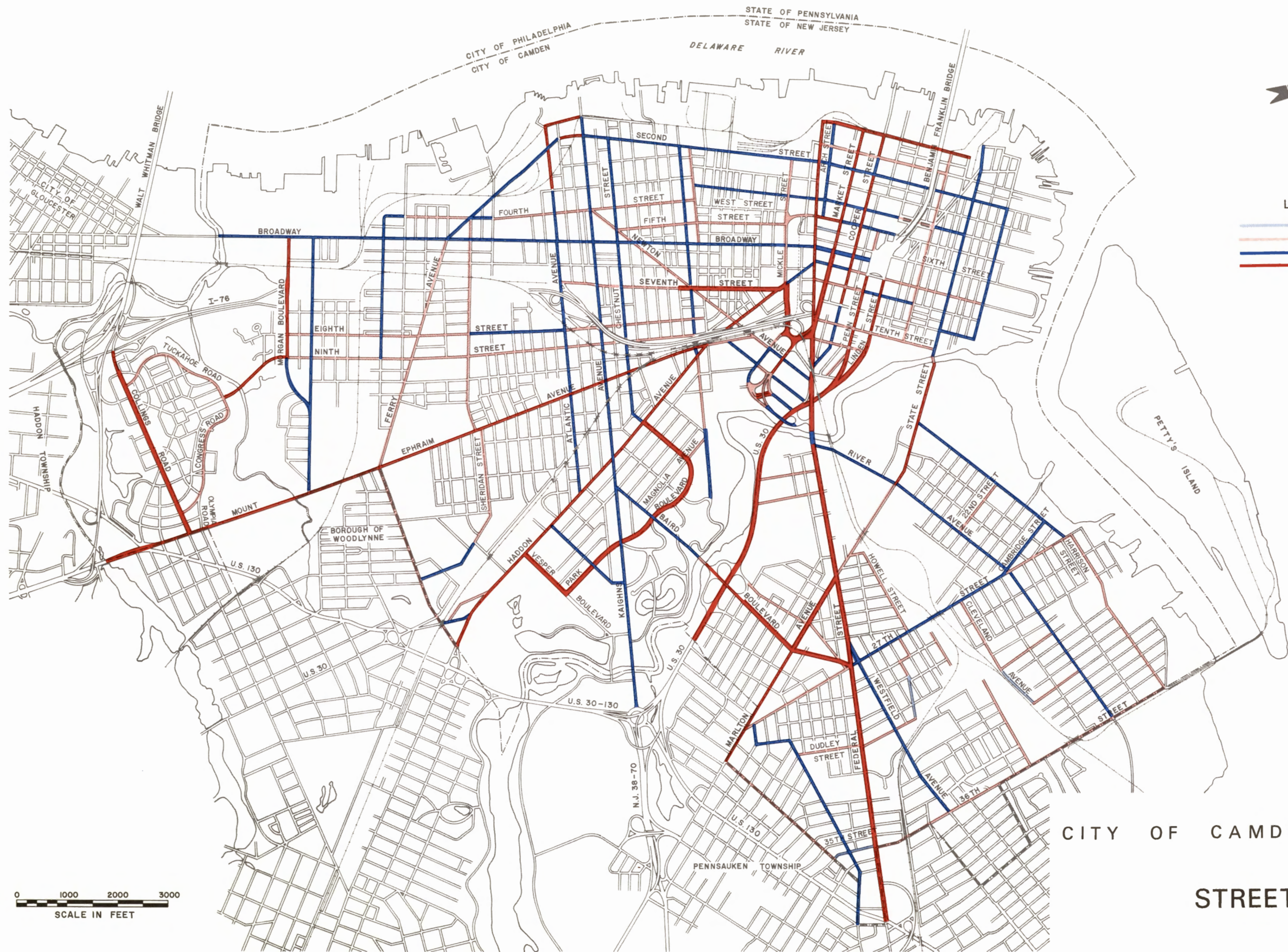
PLATE NO. 4



LEGEND
— EXISTING
— PROPOSED

0 1000 2000 3000
SCALE IN FEET

CITY OF CAMDEN TOPICS STUDY
ONE-WAY STREET SYSTEM

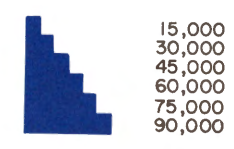


- LEGEND
- 20' OR LESS
 - 21' TO 30'
 - 31' TO 40'
 - OVER 40'

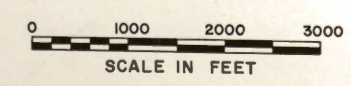


CITY OF CAMDEN TOPICS STUDY

STREET WIDTHS



SCALE



CITY OF CAMDEN TOPICS STUDY
1970 AVERAGE ANNUAL
DAILY TRAFFIC



LEGEND

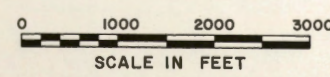
- LESS THAN 15 M.P.H.
- 15 TO 20 M.P.H.
- 20 TO 25 M.P.H.
- GREATER THAN 25 M.P.H.

CITY OF CAMDEN TOPICS STUDY
A.M. OVERALL TRAVEL SPEEDS
PEAK HOUR

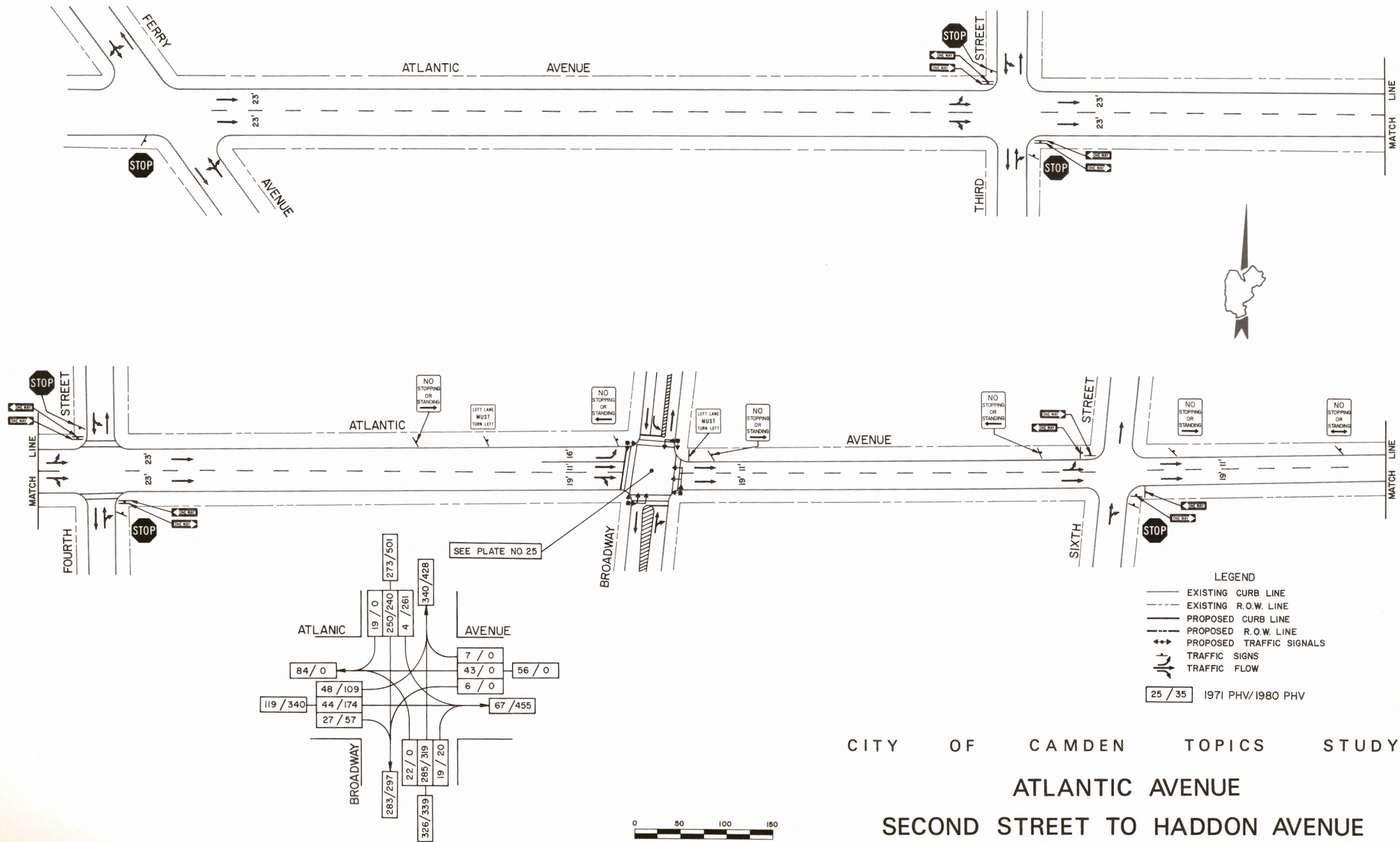


LEGEND

- ▶ LESS THAN 15 M.P.H.
- ▶ 15 TO 20 M.P.H.
- ▶ 20 TO 25 M.P.H.
- ▶ GREATER THAN 25 M.P.H.



CITY OF CAMDEN TOPICS STUDY
P.M. OVERALL TRAVEL SPEEDS
PEAK HOUR

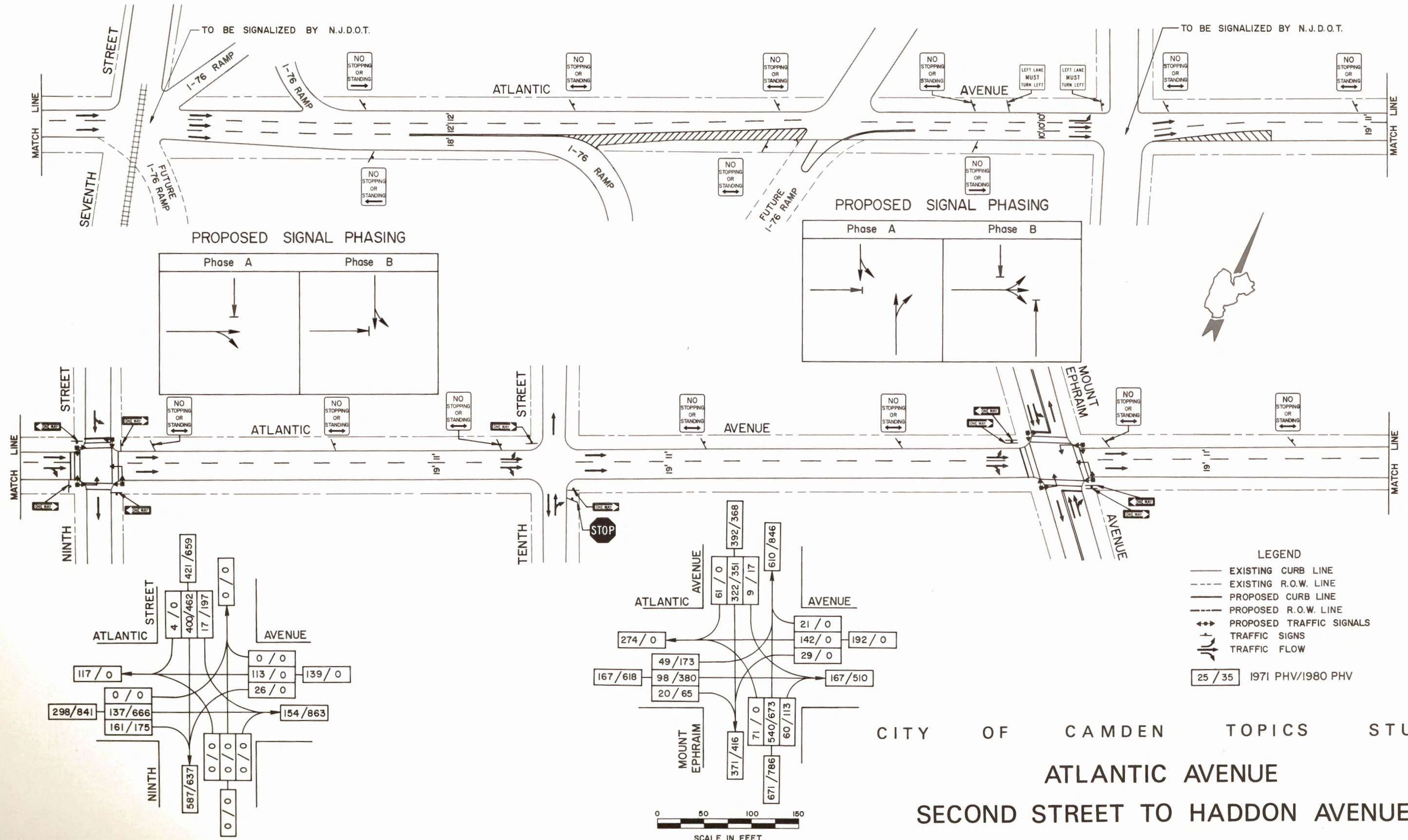


CITY OF CAMDEN TOPICS STUDY

ATLANTIC AVENUE SECOND STREET TO HADDON AVENUE

URBAN ENGINEERS INC.

PLATE NO. 12

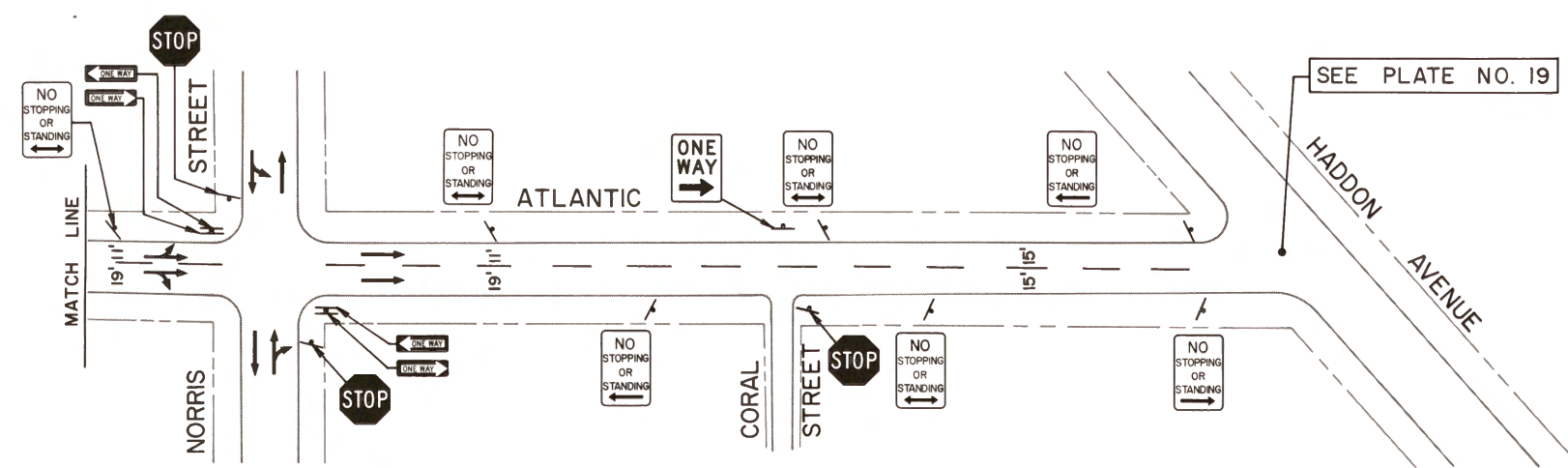
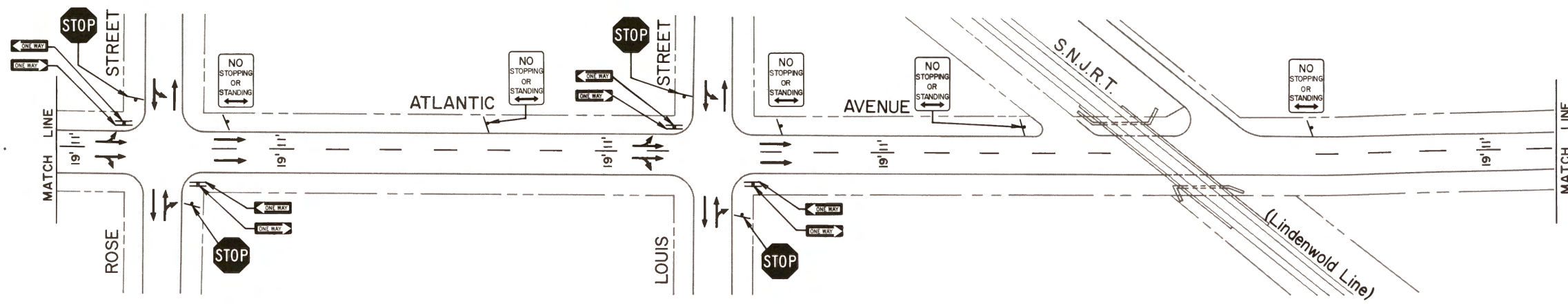


CITY OF CAMDEN TOPICS STUDY

ATLANTIC AVENUE

SECOND STREET TO HADDON AVENUE





- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ⬆⬆ PROPOSED TRAFFIC SIGNALS
 - ⬆ TRAFFIC SIGNS
 - ➡ TRAFFIC FLOW

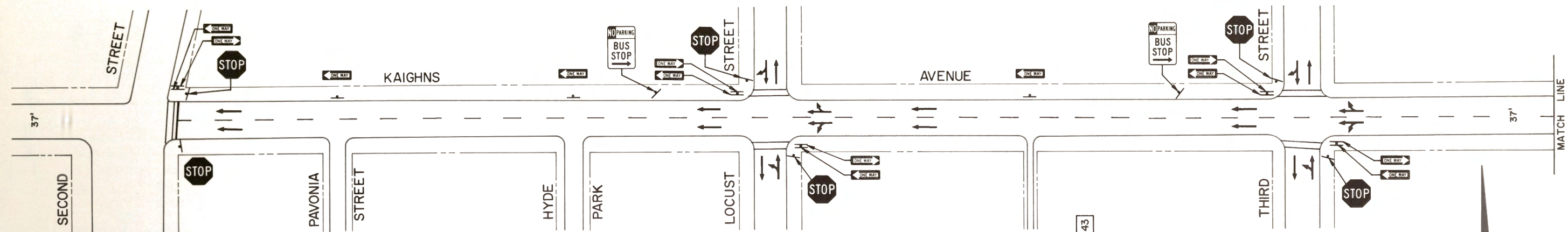
CITY OF CAMDEN TOPICS STUDY

ATLANTIC AVENUE SECOND STREET TO HADDON AVENUE

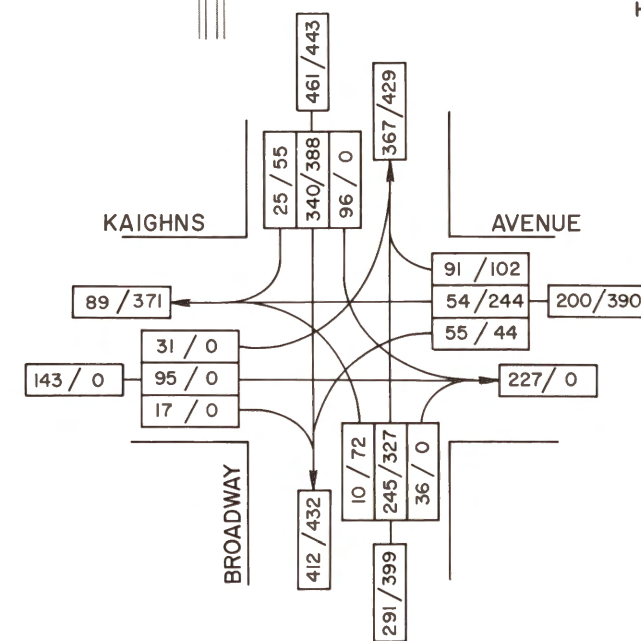
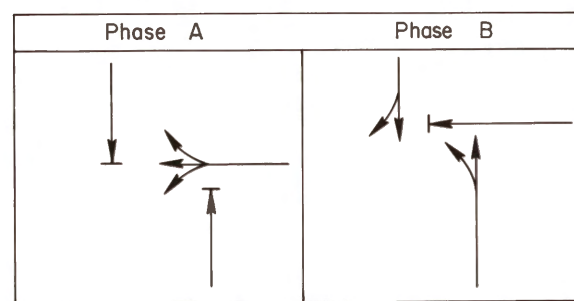


URBAN ENGINEERS INC.

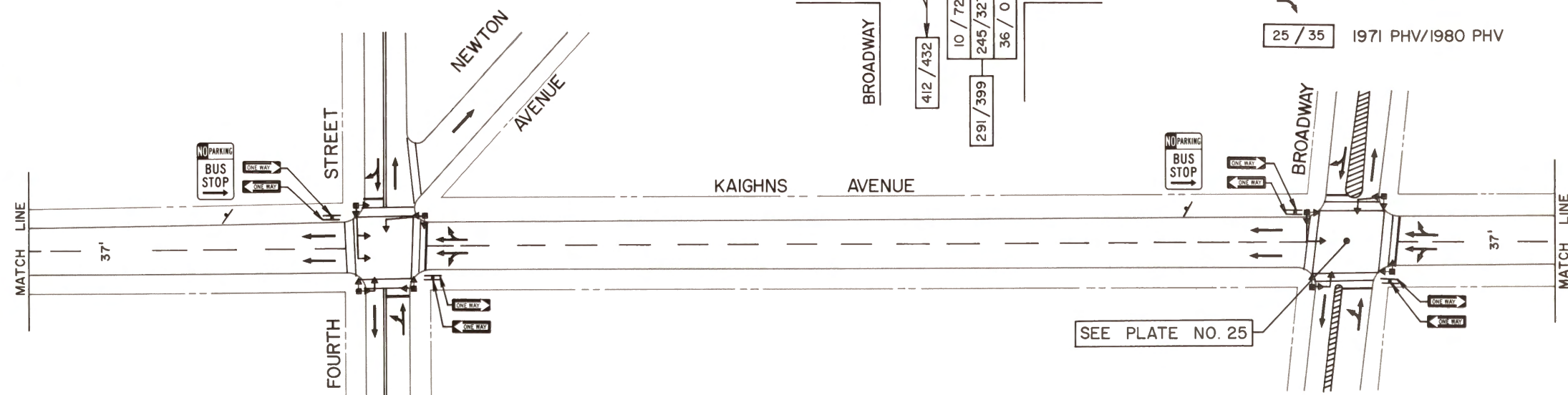
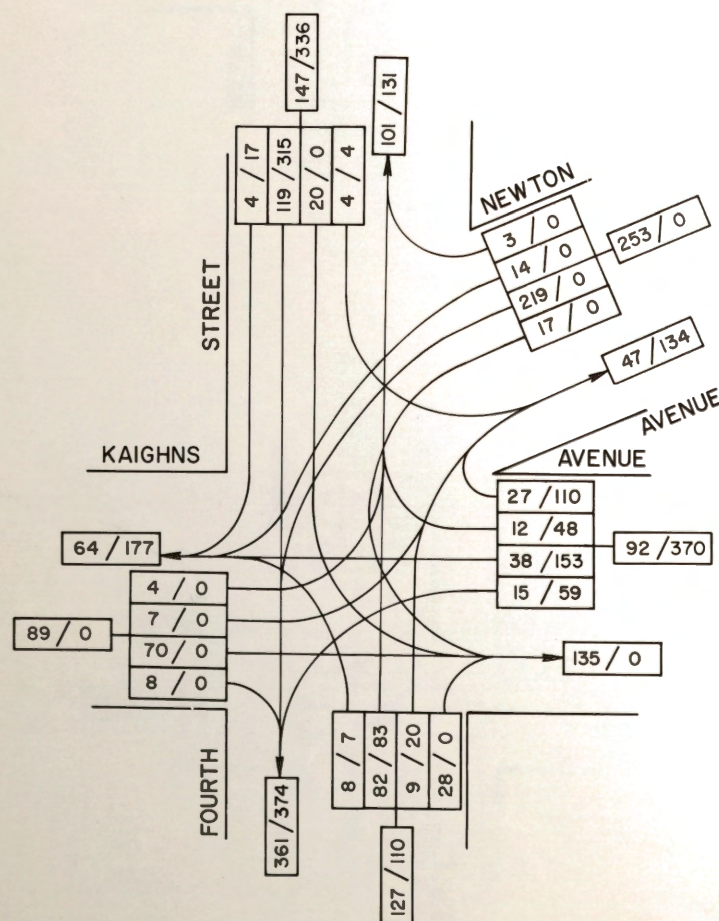
PLATE NO. 14



PROPOSED SIGNAL PHASING



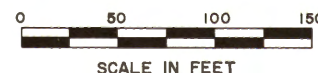
- LEGEND**
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ⬆⬆ PROPOSED TRAFFIC SIGNALS
 - ⬆⬆ TRAFFIC SIGNS
 - ➔ TRAFFIC FLOW
- 25 / 35 1971 PHV/1980 PHV



CITY OF CAMDEN TOPICS STUDY

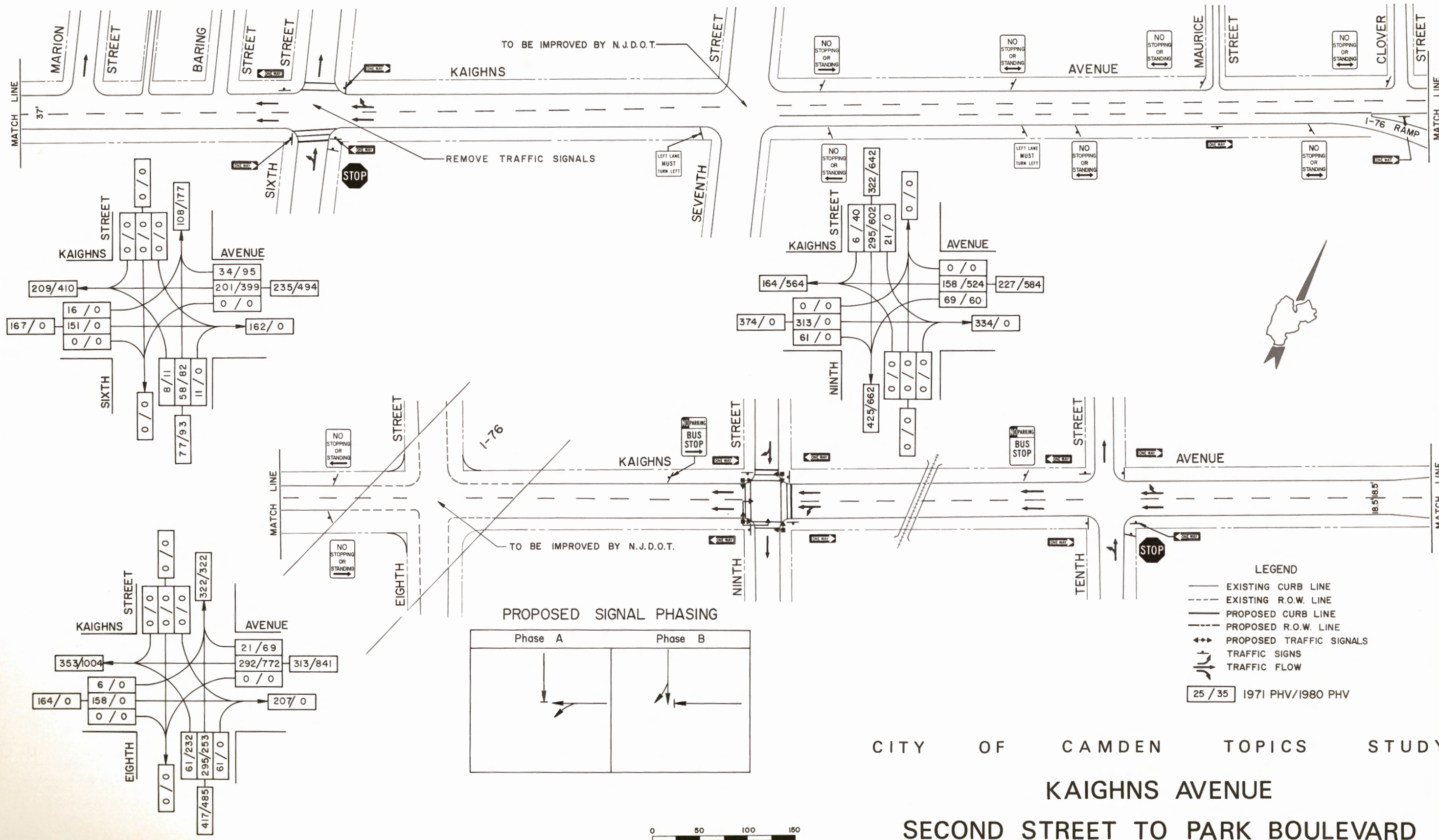
KAIGHNS AVENUE

SECOND STREET TO PARK BOULEVARD



URBAN ENGINEERS INC.

PLATE NO. 15



PROPOSED SIGNAL PHASING

Phase A	Phase B

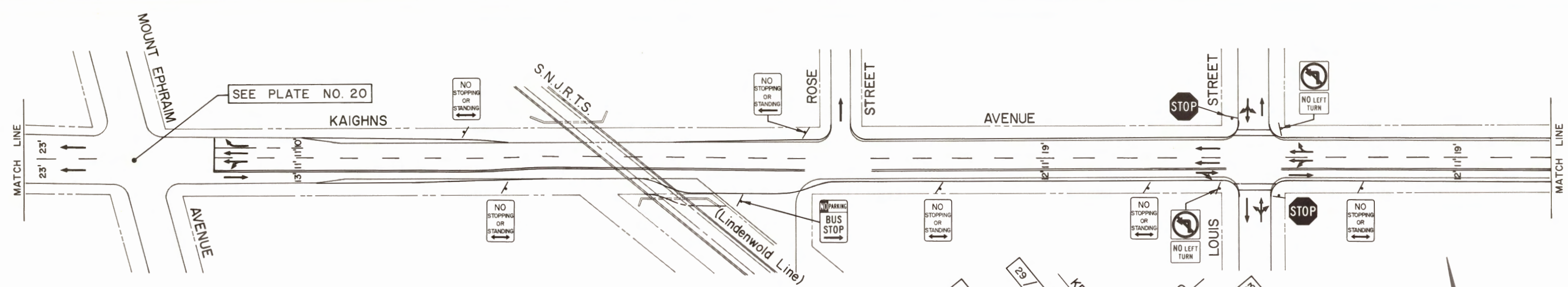
- LEGEND
- EXISTING CURB LINE
 - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - PROPOSED R.O.W. LINE
 - PROPOSED TRAFFIC SIGNALS
 - TRAFFIC SIGNS
 - TRAFFIC FLOW
- 25 / 35 1971 PHV/1980 PHV



CITY OF CAMDEN TOPICS STUDY

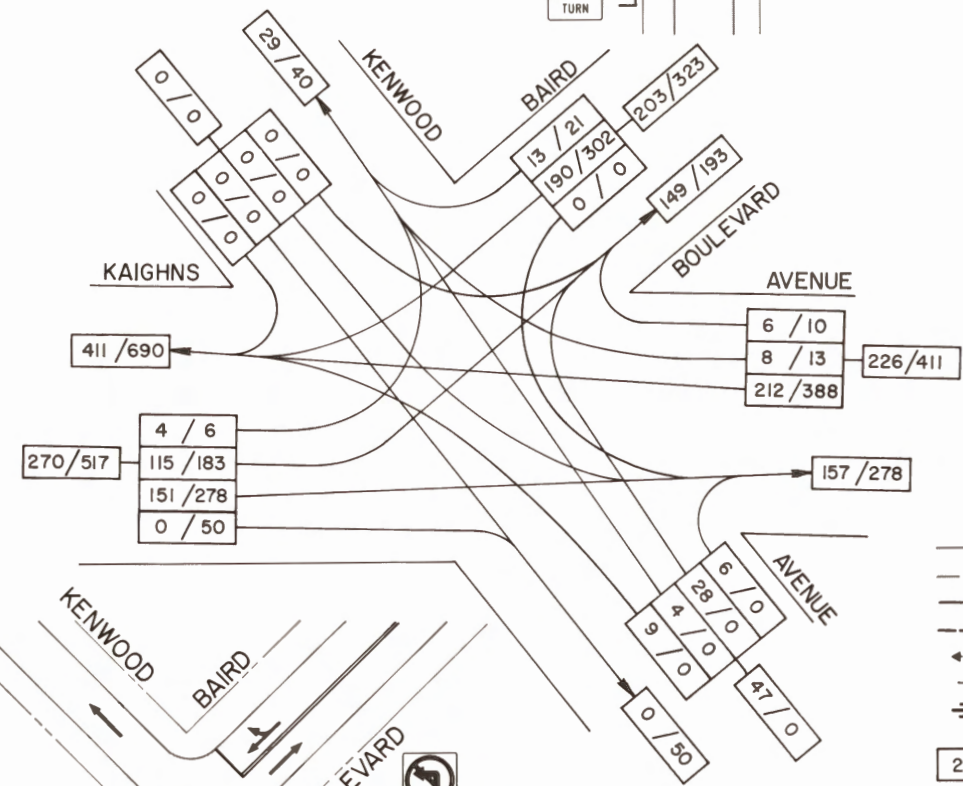
KAIGHNS AVENUE

SECOND STREET TO PARK BOULEVARD

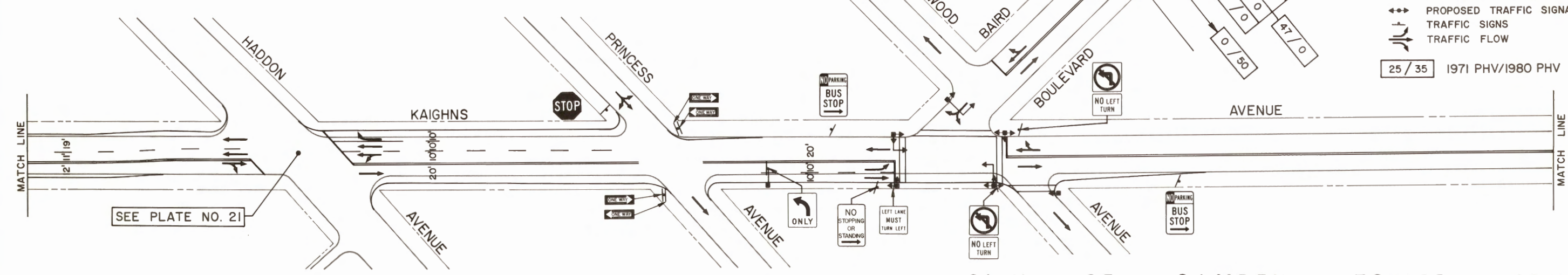


PROPOSED SIGNAL PHASING

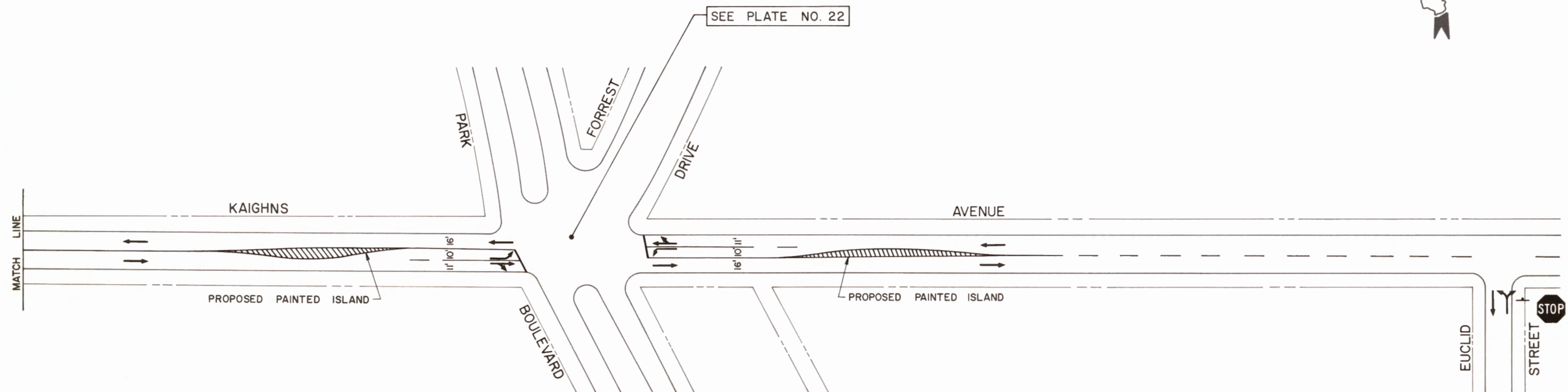
Phase A	Phase B	Phase C



- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ↔ PROPOSED TRAFFIC SIGNALS
 - ⬆ TRAFFIC SIGNS
 - TRAFFIC FLOW
- 25 / 35 1971 PHV / 1980 PHV



CITY OF CAMDEN TOPICS STUDY KAIGHNS AVENUE SECOND STREET TO PARK BOULEVARD



- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ⬆⬆⬆ PROPOSED TRAFFIC SIGNALS
 - ⬆⬆ TRAFFIC SIGNS
 - TRAFFIC FLOW

CITY OF CAMDEN TOPICS STUDY

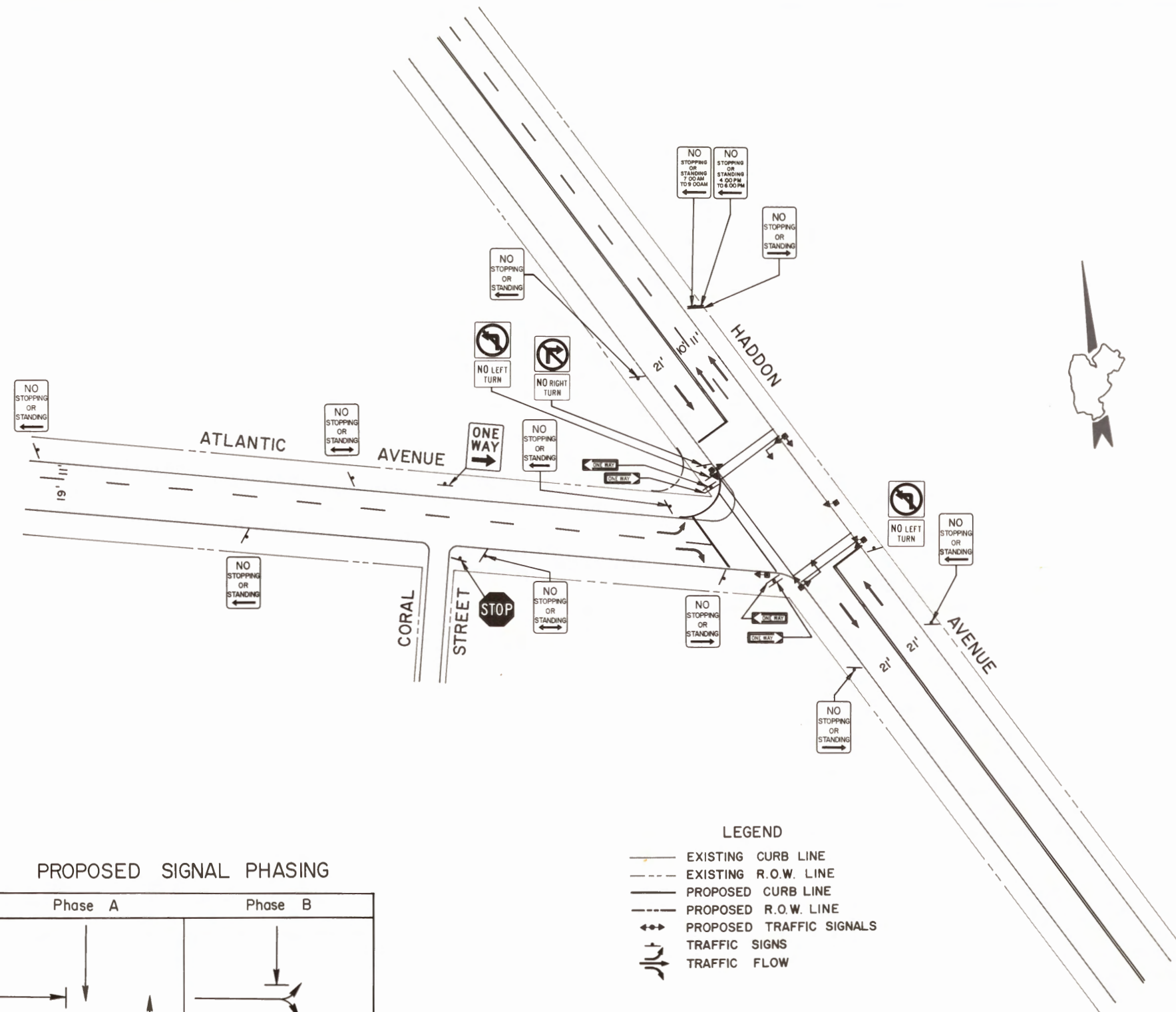
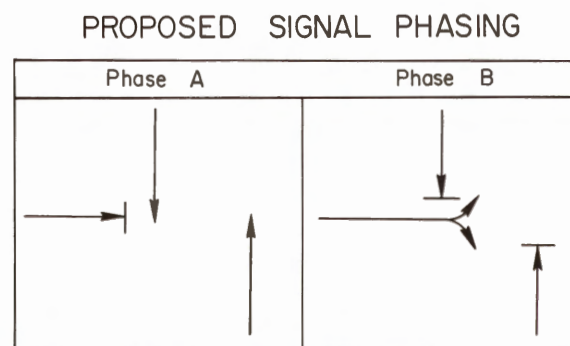
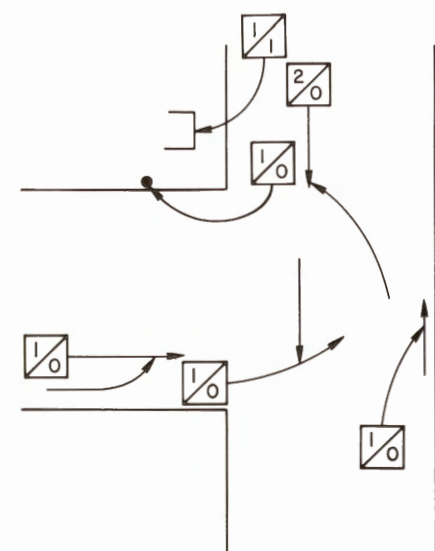
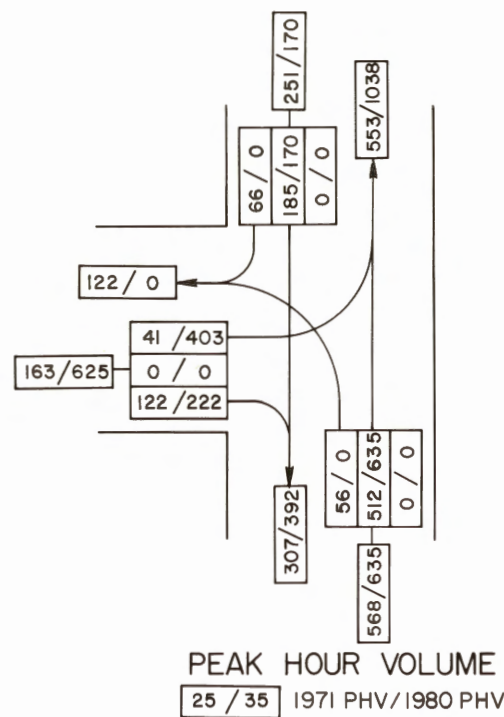
KAIGHNS AVENUE

SECOND STREET TO PARK BOULEVARD



URBAN ENGINEERS INC.

PLATE NO. 18



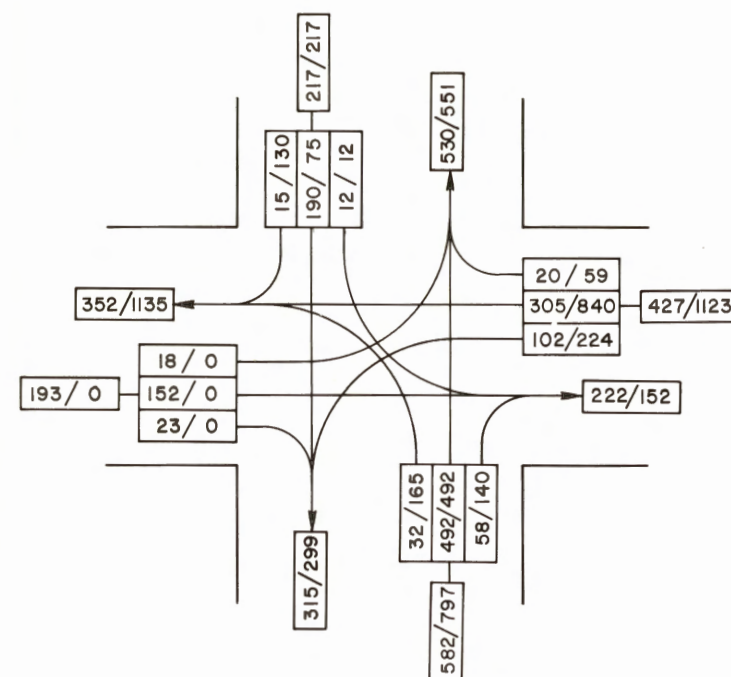
CITY OF CAMDEN TOPICS STUDY

ATLANTIC AVENUE AND HADDON AVENUE

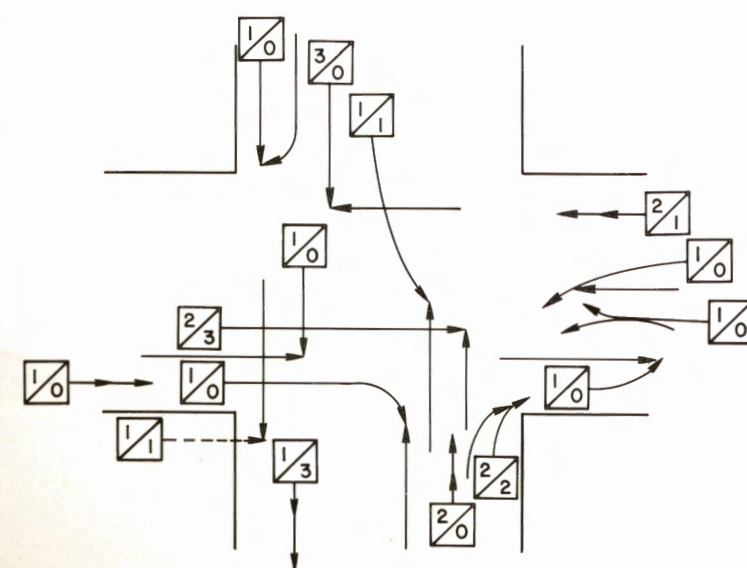


URBAN ENGINEERS INC.

PLATE NO. 19



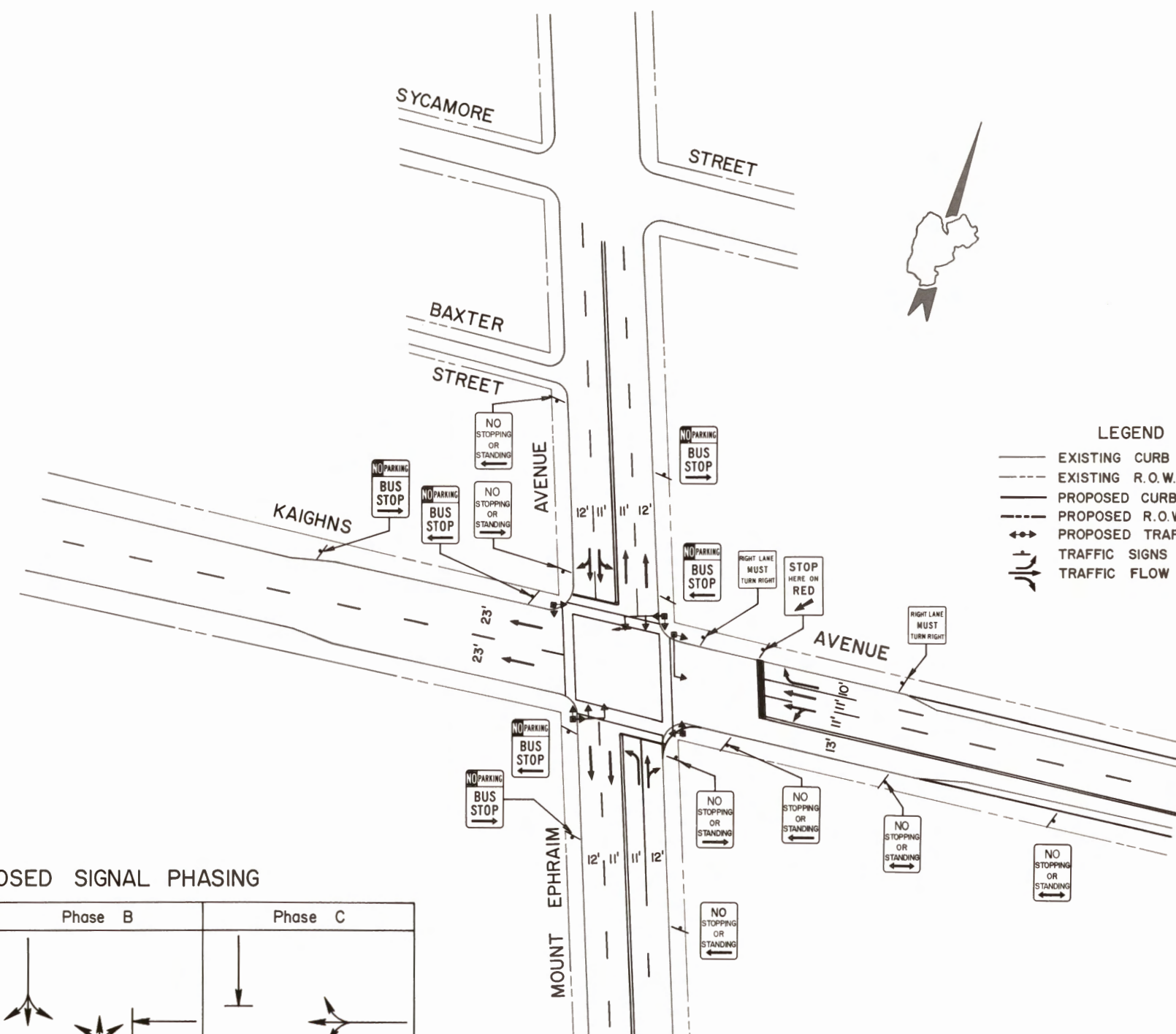
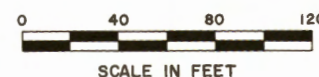
PEAK HOUR VOLUME
25 / 35 1971 PHV/1980 PHV



THREE YEAR ACCIDENT SUMMARY
1/1 NO. OF ACCIDENTS/NO. OF INJURIES
ACCIDENT RATE = 1.06 *
ACCIDENT INTENSITY = 26 (5 UNKNOWN)

* PER MILLION VEHICLES

PROPOSED SIGNAL PHASING		
Phase A	Phase B	Phase C



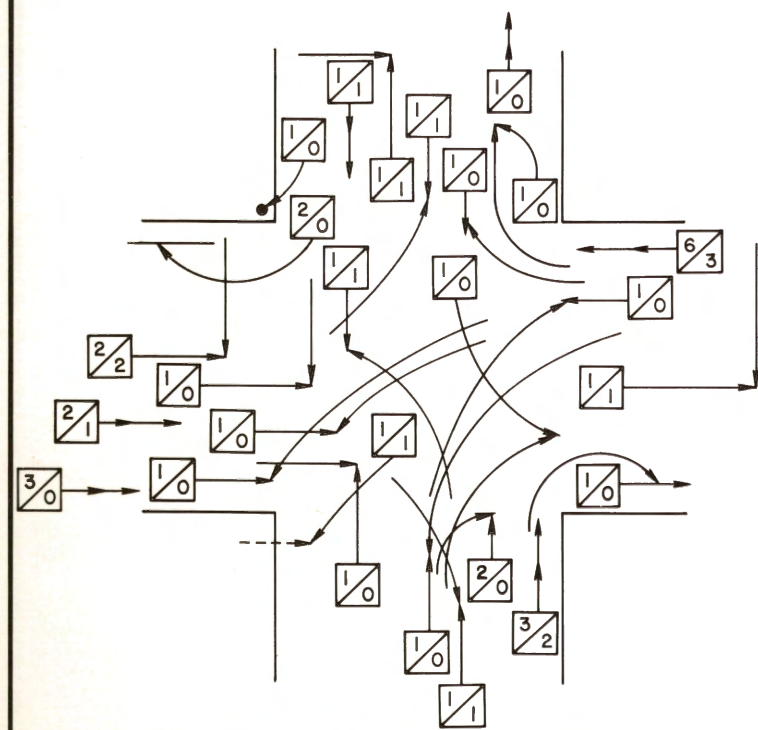
- LEGEND
- EXISTING CURB LINE
 - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - PROPOSED R.O.W. LINE
 - PROPOSED TRAFFIC SIGNALS
 - TRAFFIC SIGNS
 - TRAFFIC FLOW

CITY OF CAMDEN TOPICS STUDY

KAIGHNS AVENUE AND MOUNT EPHRAIM AVENUE

URBAN ENGINEERS INC.

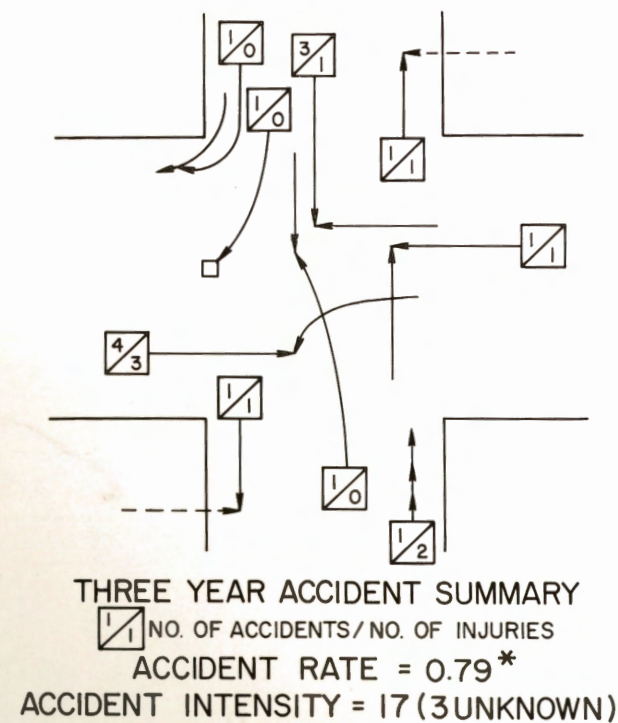
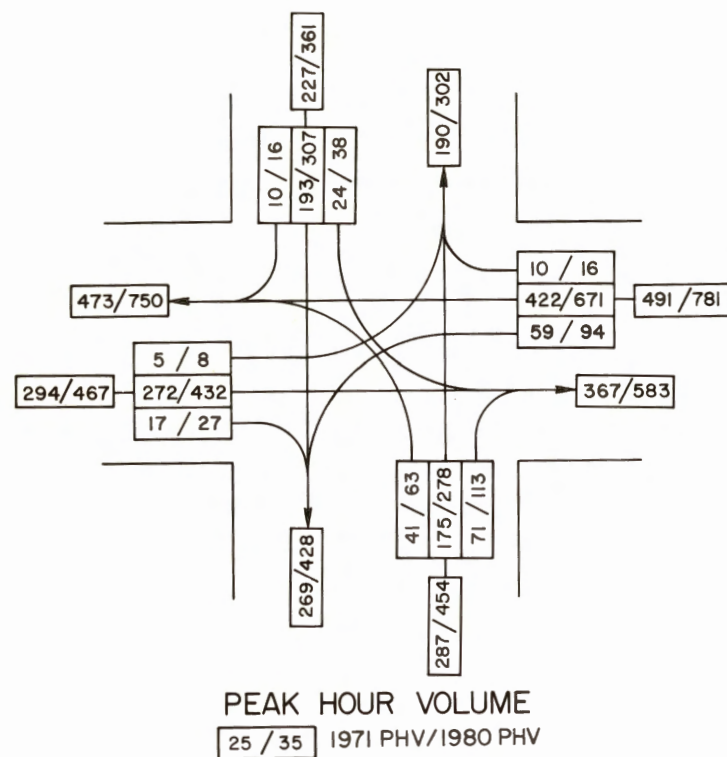
PLATE NO.20



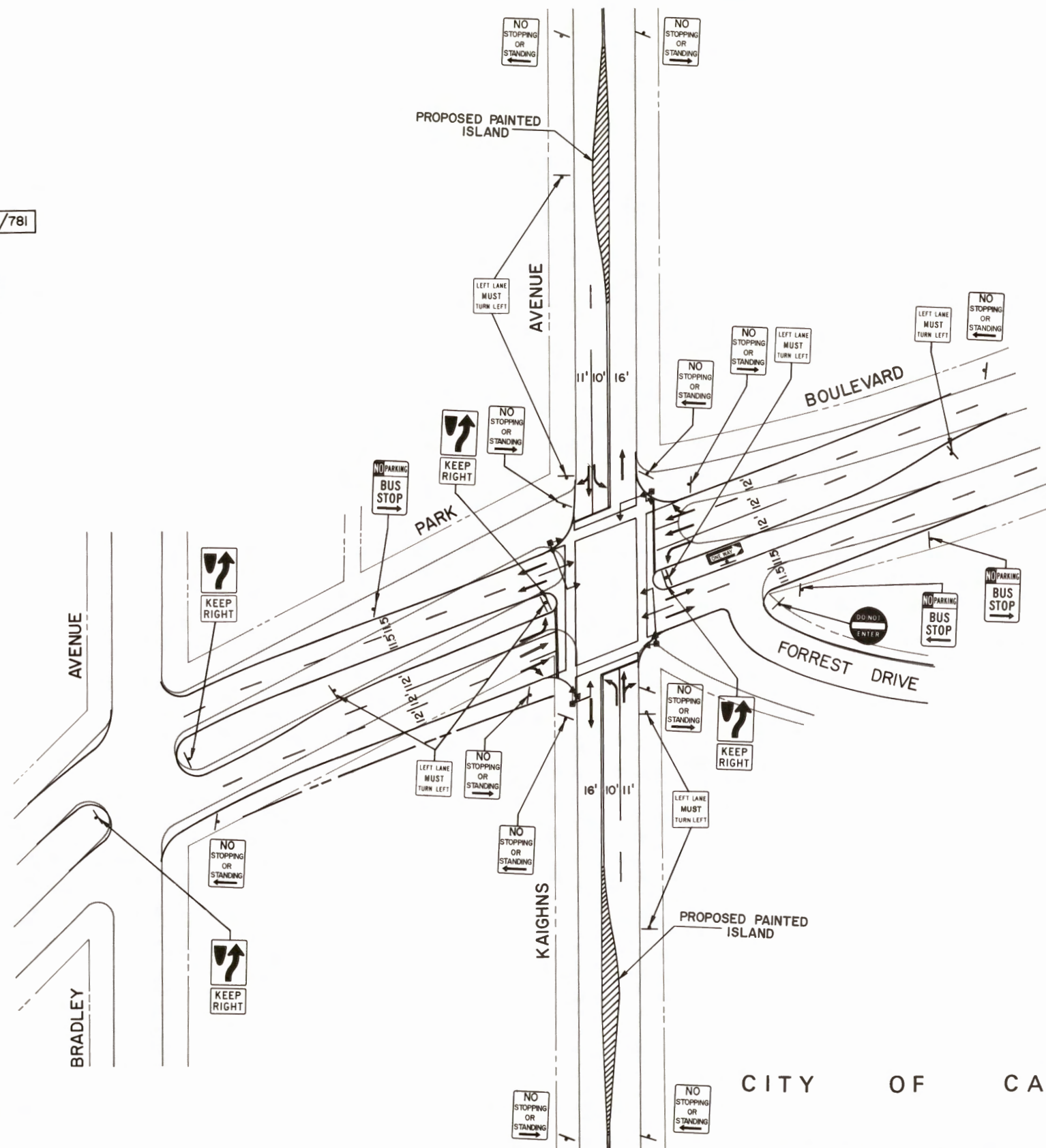
* PER MILLION VEHICLES



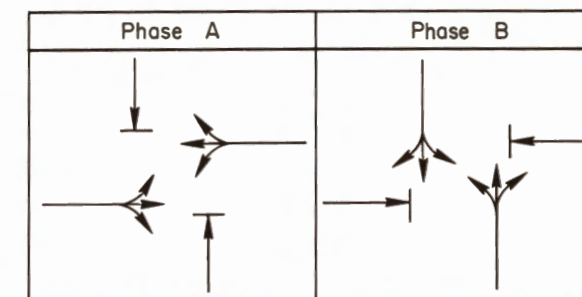
URBAN ENGINEERS INC.



* PER MILLION VEHICLES



PROPOSED SIGNAL PHASING



- LEGEND
- EXISTING CURB LINE
 - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - PROPOSED R.O.W. LINE
 - PROPOSED TRAFFIC SIGNALS
 - TRAFFIC SIGNS
 - TRAFFIC FLOW



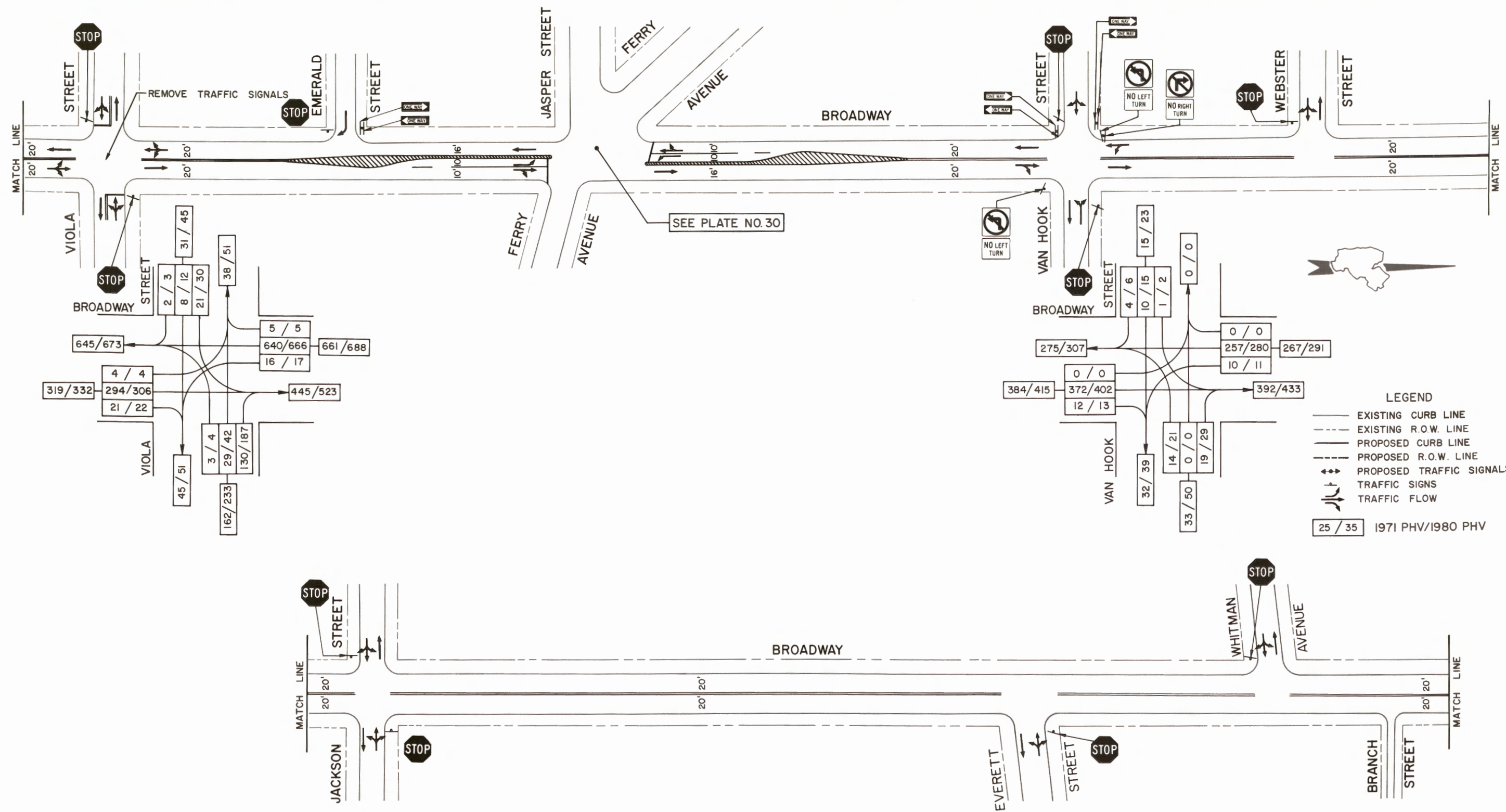
CITY OF CAMDEN TOPICS STUDY

KAIGHNS AVENUE AND PARK BOULEVARD

URBAN ENGINEERS INC.

PLATE NO.22

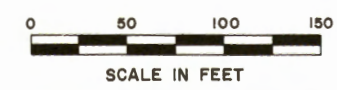




CITY OF CAMDEN TOPICS STUDY

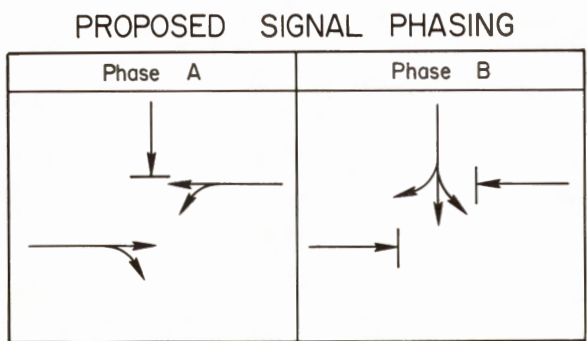
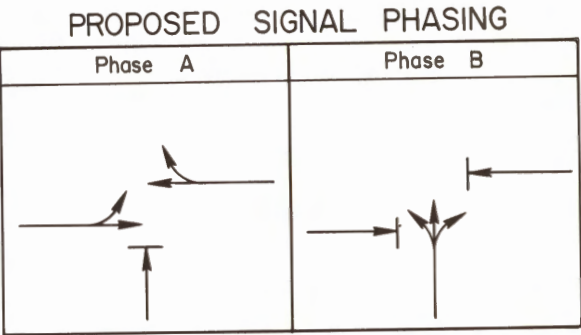
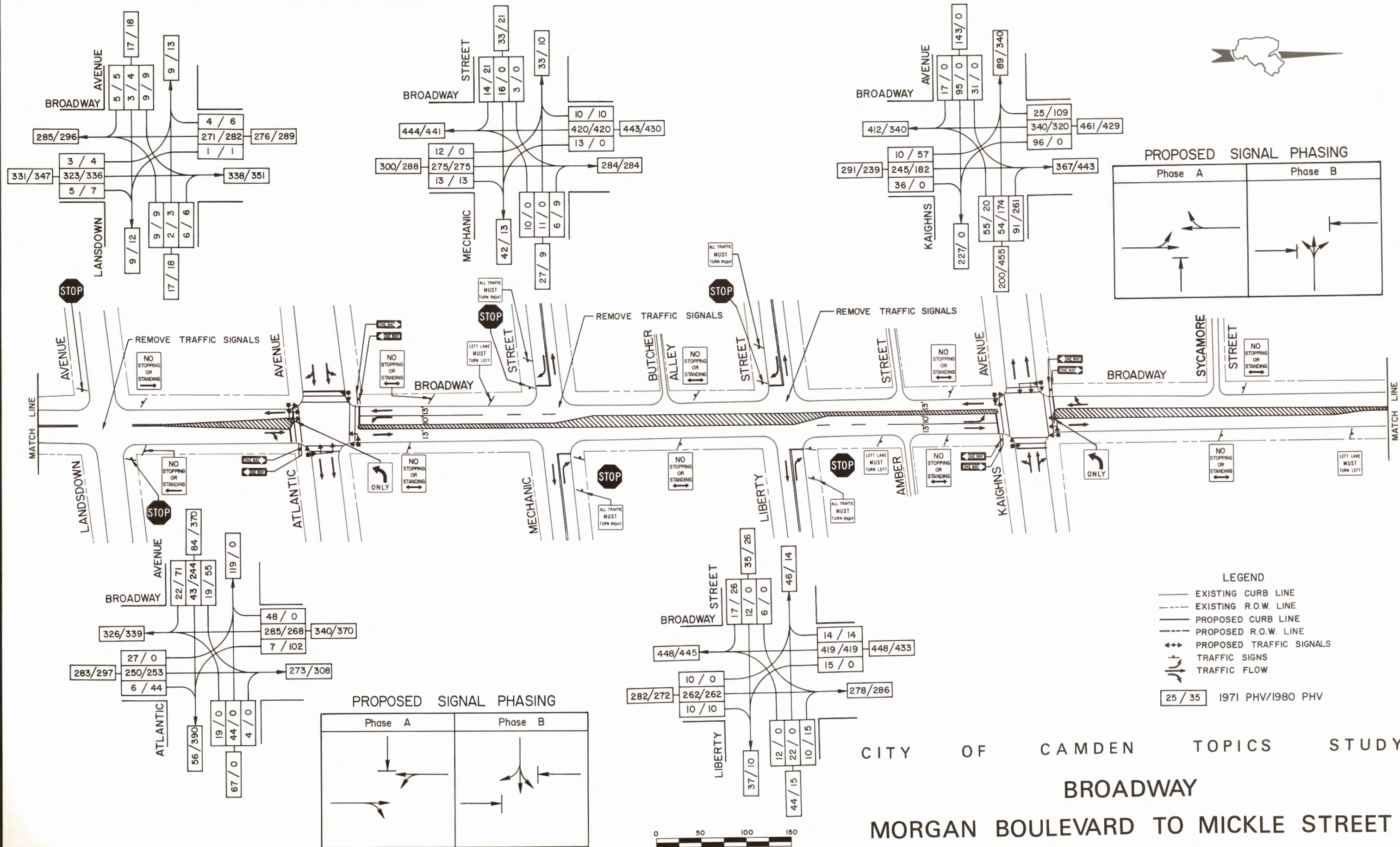
BROADWAY

MORGAN BOULEVARD TO MICKEL STREET



URBAN ENGINEERS INC.

PLATE NO. 24



- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ◄► PROPOSED TRAFFIC SIGNALS
 - ↑↓ TRAFFIC SIGNS
 - TRAFFIC FLOW
- 25 / 35 1971 PHV/1980 PHV

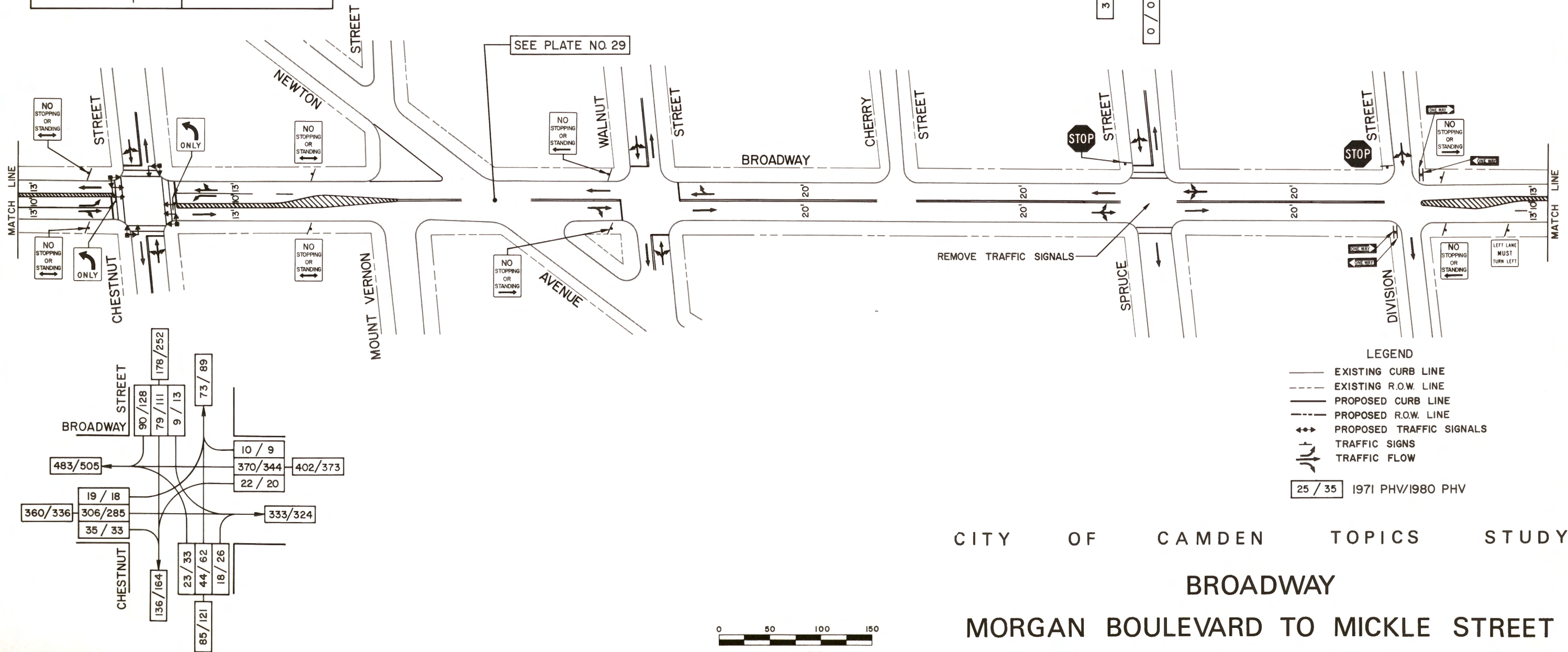
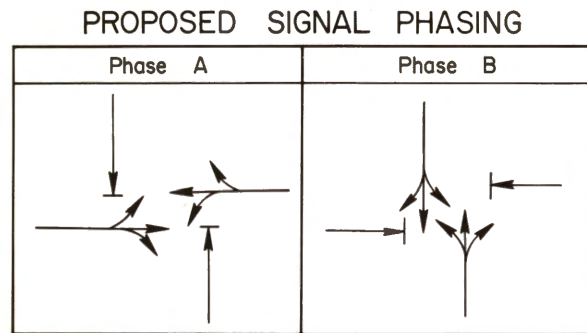


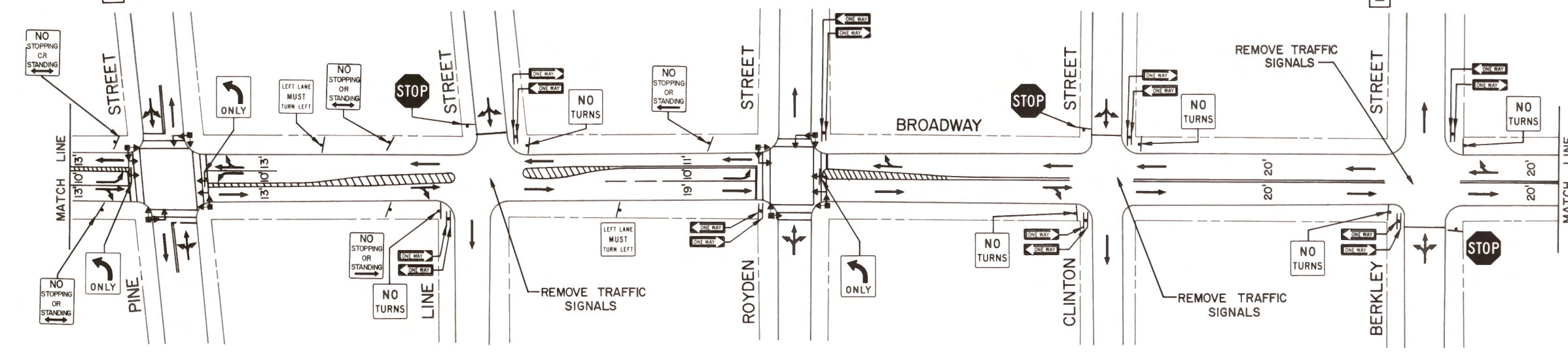
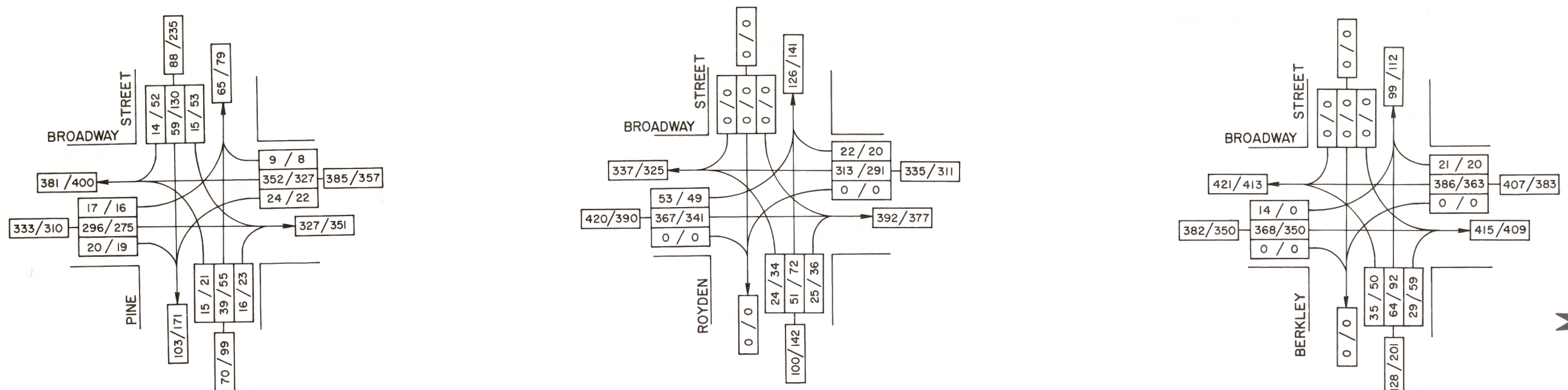
CITY OF CAMDEN TOPICS STUDY

BROADWAY

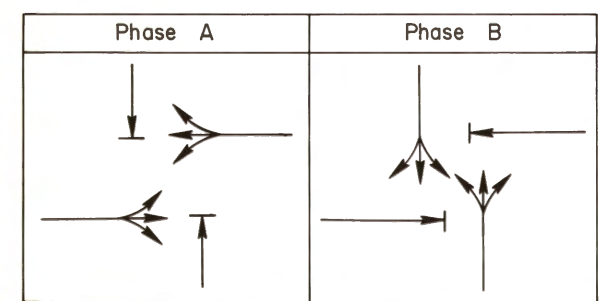
MORGAN BOULEVARD TO MICKLE STREET

URBAN ENGINEERS INC.

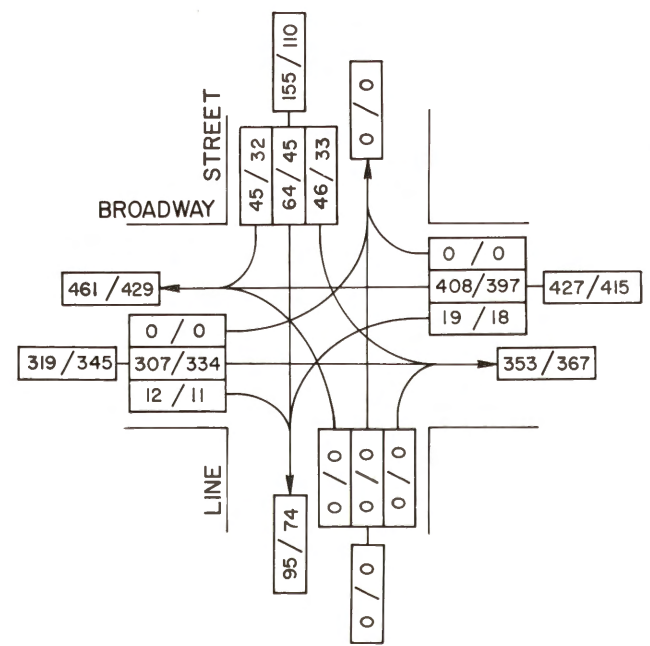
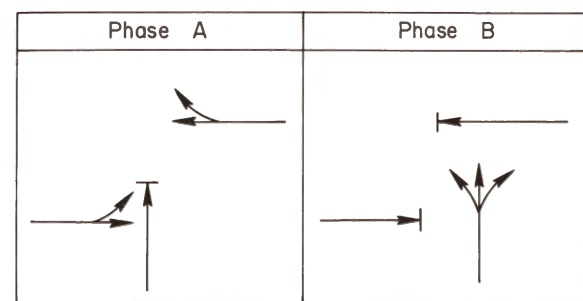




PROPOSED SIGNAL PHASING



PROPOSED SIGNAL PHASING



- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ◀▶ PROPOSED TRAFFIC SIGNALS
 - ⊕ TRAFFIC SIGNS
 - TRAFFIC FLOW
- 25 / 35 1971 PHV/1980 PHV

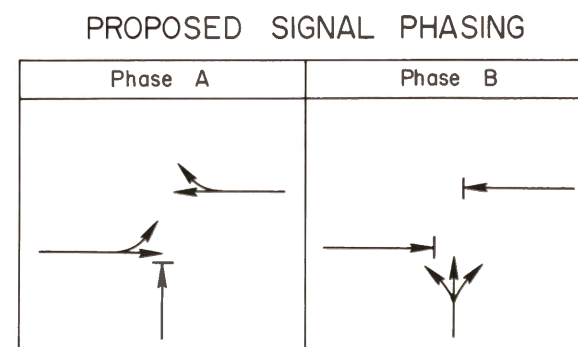
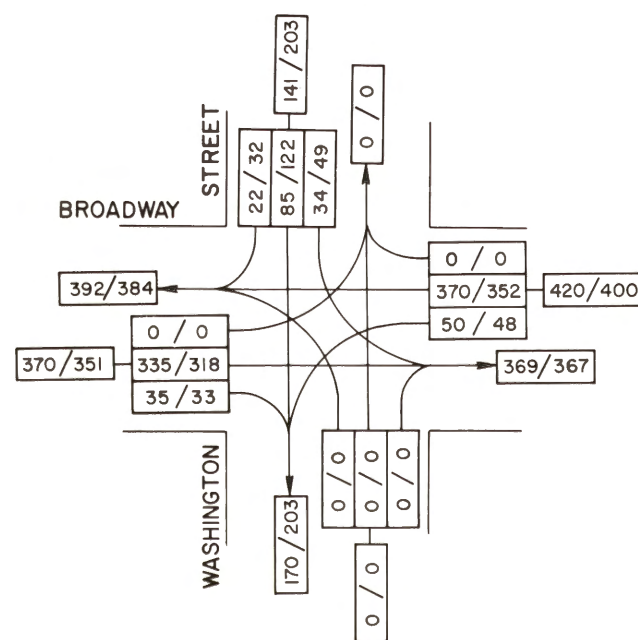
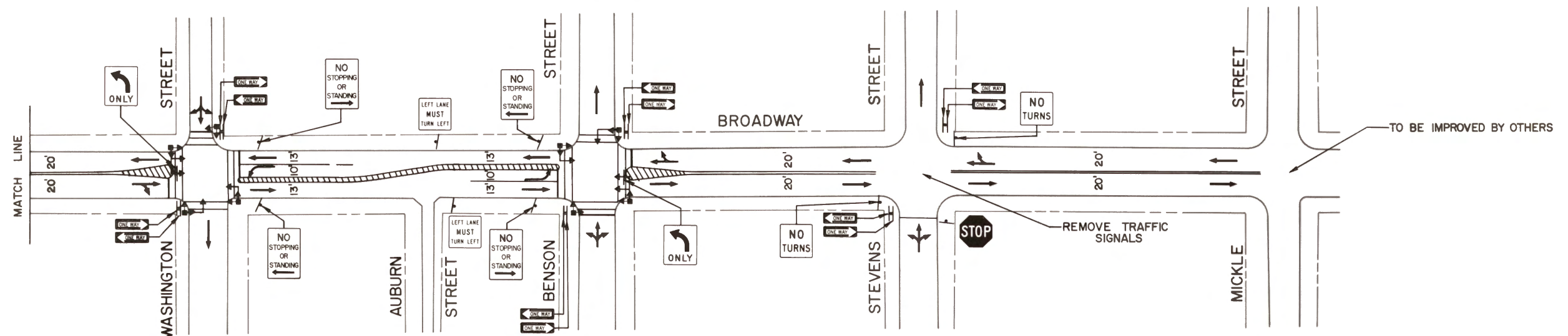
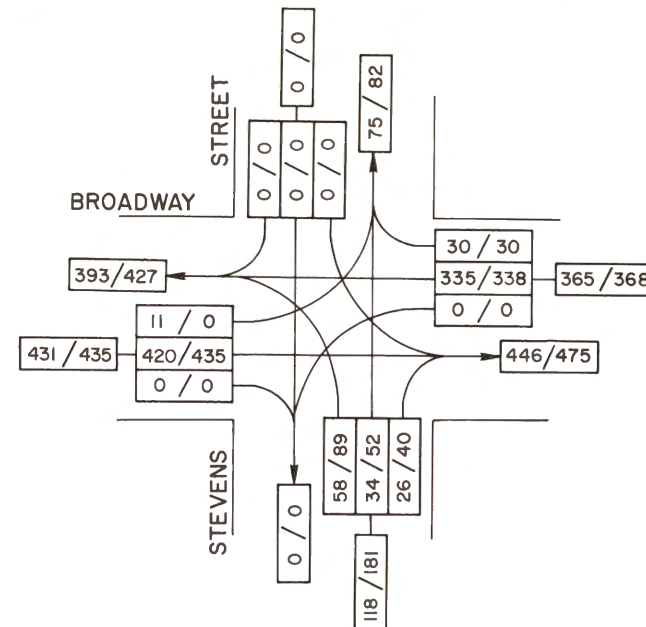
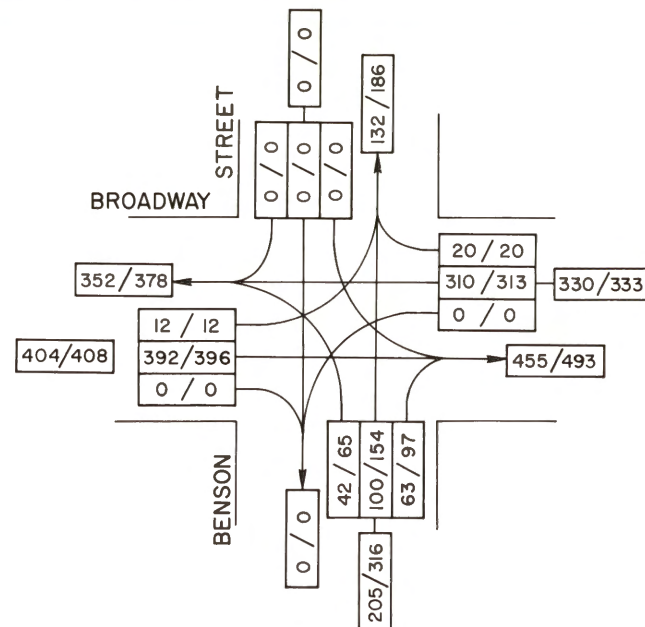
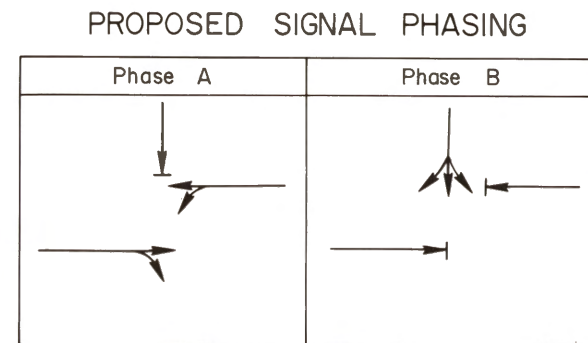


CITY OF CAMDEN TOPICS STUDY

BROADWAY MORGAN BOULEVARD TO MICKLE STREET

URBAN ENGINEERS INC.

PLATE NO.27



- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - - - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ⇄ PROPOSED TRAFFIC SIGNALS
 - ↑↓ TRAFFIC SIGNS
 - TRAFFIC FLOW
- 25 / 35 1971 PHV/1980 PHV



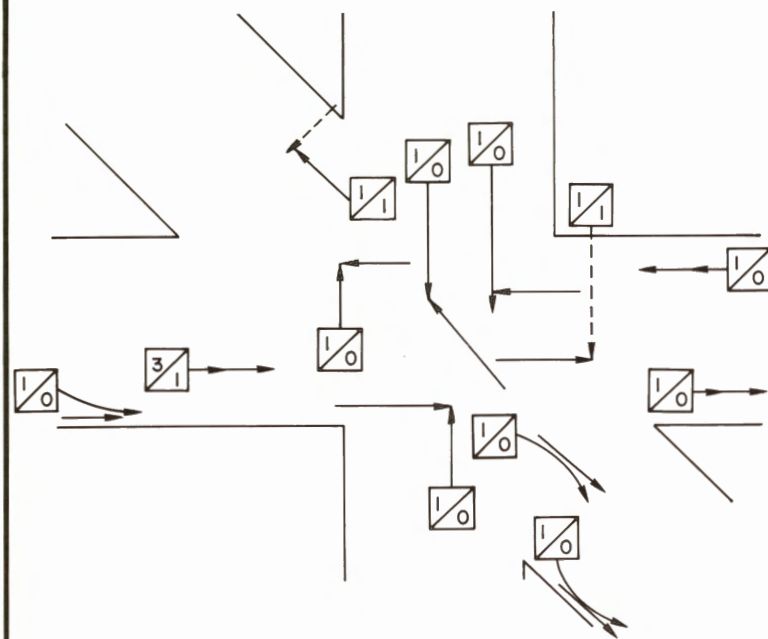
CITY OF CAMDEN TOPICS STUDY

BROADWAY

MORGAN BOULEVARD TO MICKLE STREET

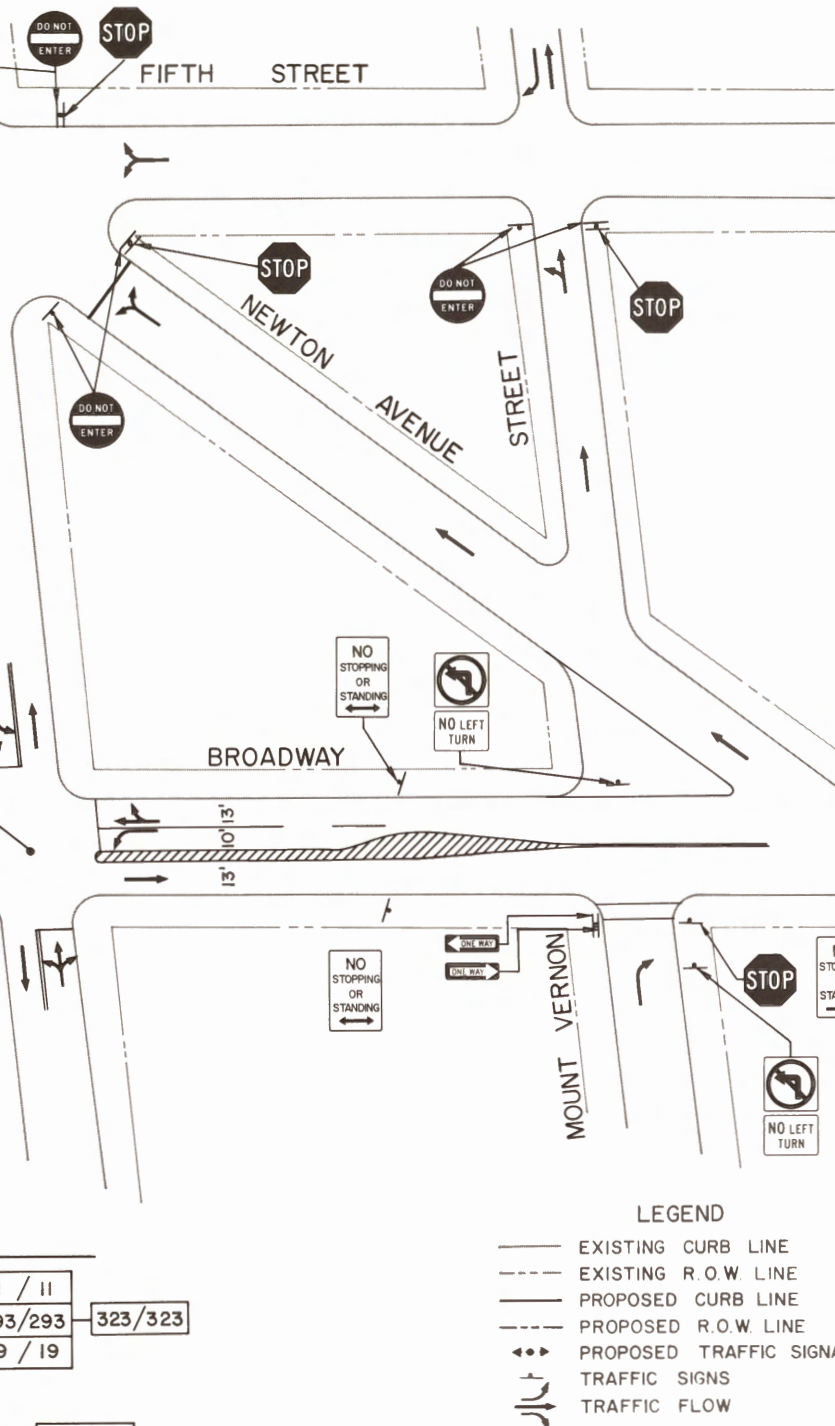
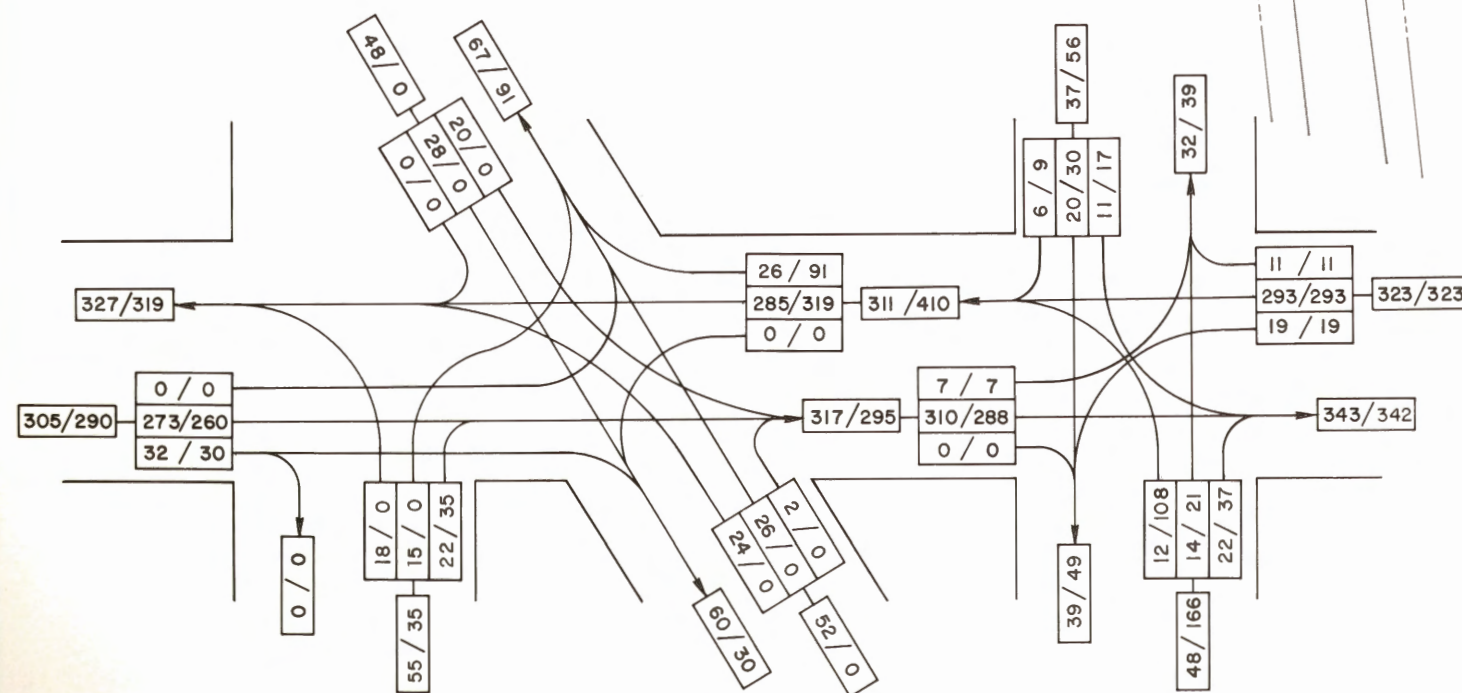
URBAN ENGINEERS INC.

PLATE NO. 28



THREE YEAR ACCIDENT SUMMARY
 NO. OF ACCIDENTS/NO. OF INJURIES
 ACCIDENT RATE = 1.10 *
 ACCIDENT INTENSITY = 16 (2 UNKNOWN)
 * PER MILLION VEHICLES

SEE PLATE NO. 26



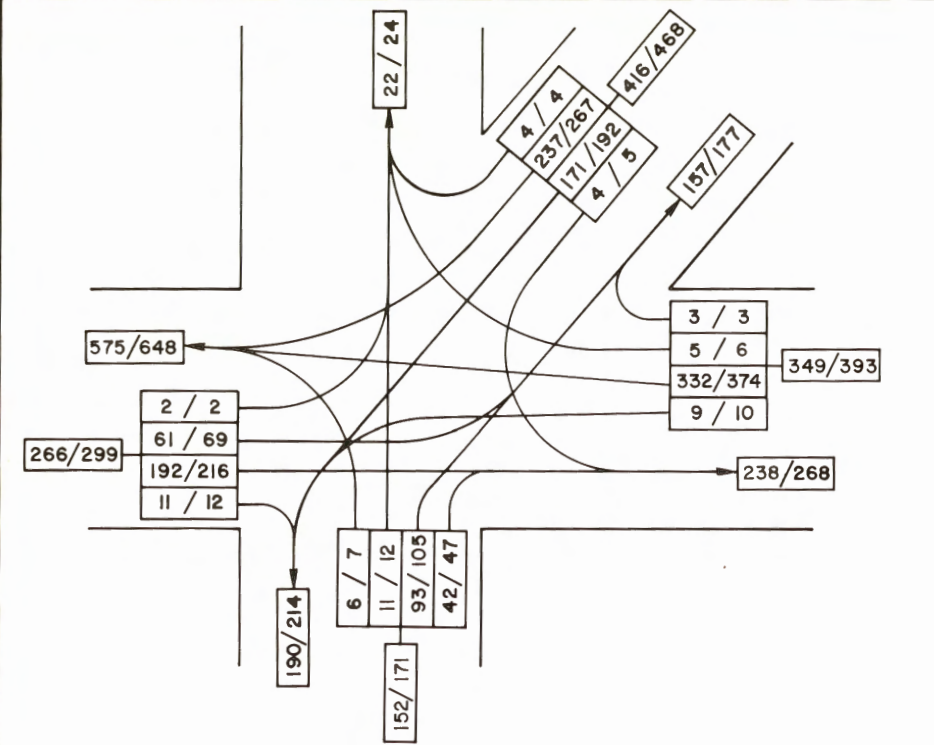
PROPOSED SIGNAL PHASING

Phase A	Phase B

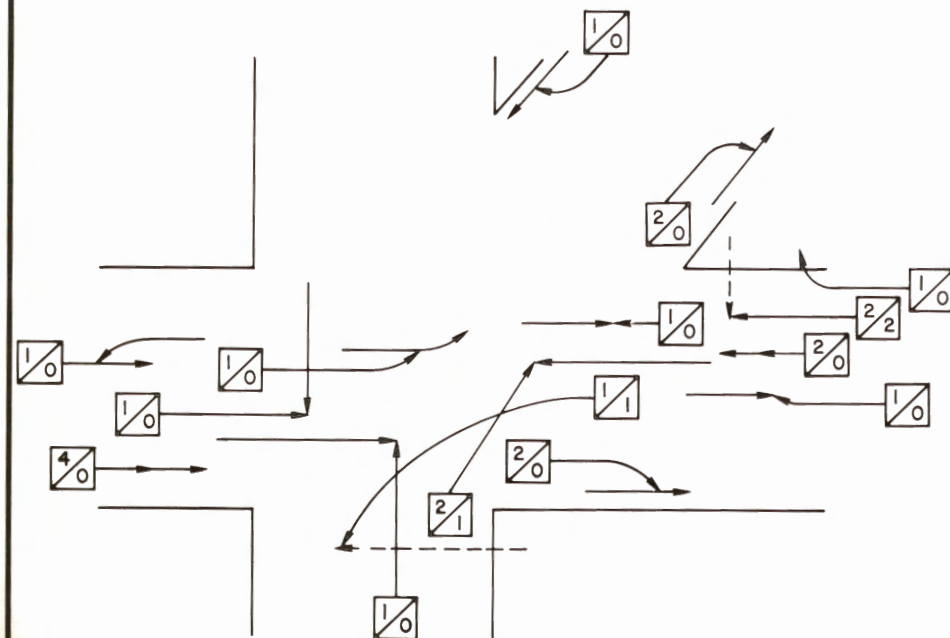
- LEGEND
- EXISTING CURB LINE
 - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - PROPOSED R.O.W. LINE
 - PROPOSED TRAFFIC SIGNALS
 - TRAFFIC SIGNS
 - TRAFFIC FLOW

CITY OF CAMDEN TOPICS STUDY

BROADWAY AND NEWTON AVENUE



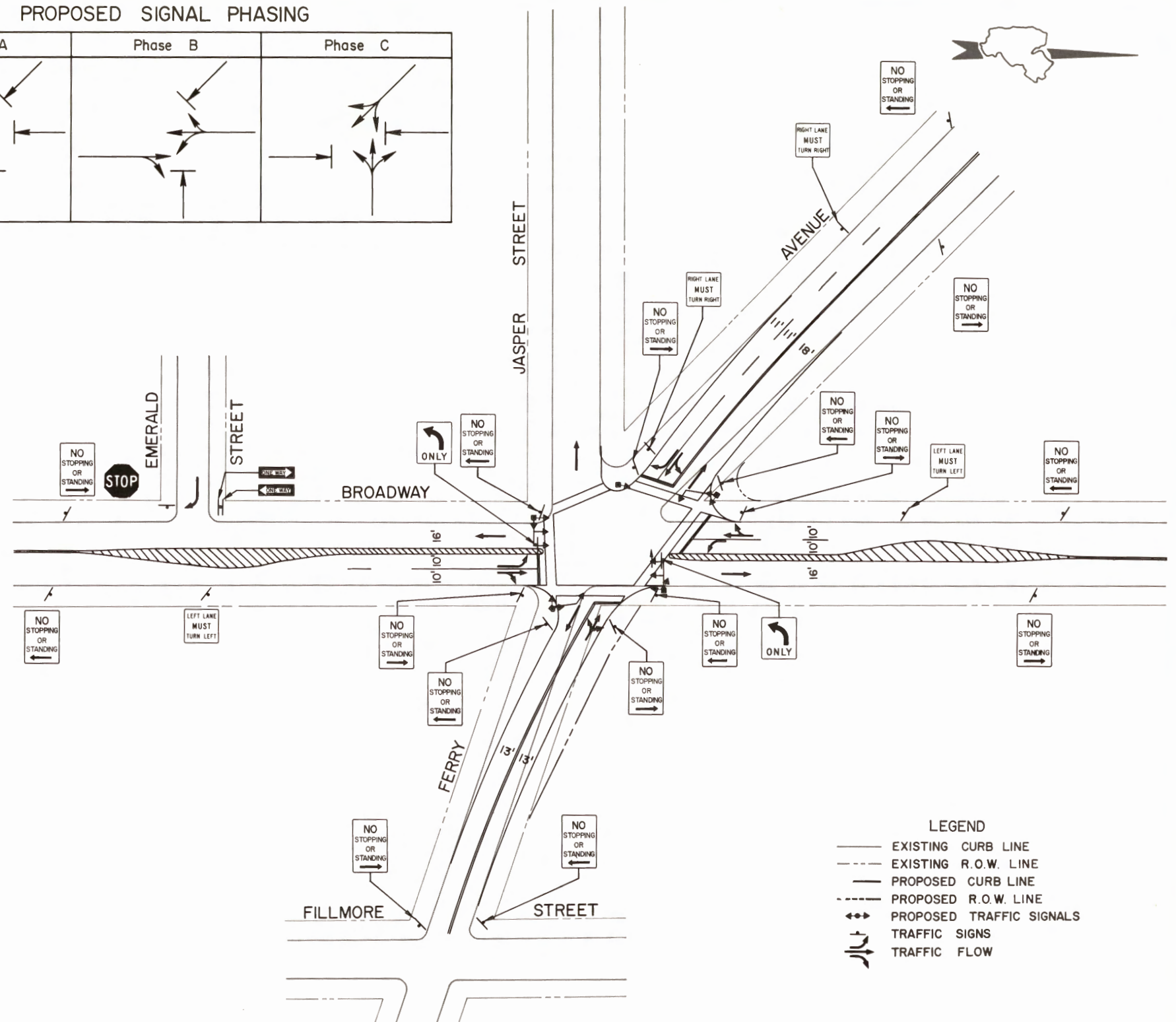
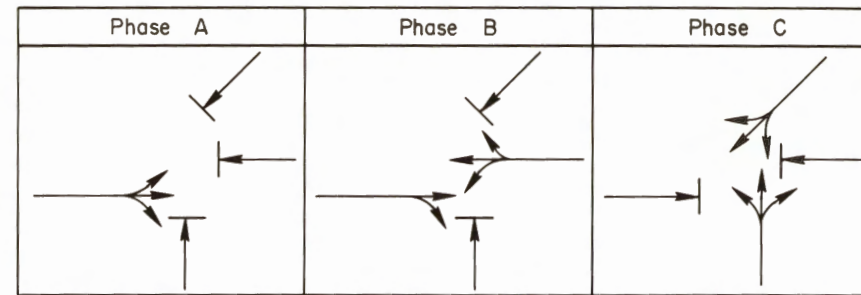
PEAK HOUR VOLUME
25 / 35 1971 PHV / 1980 PHV



THREE YEAR ACCIDENT SUMMARY
1/0 NO. OF ACCIDENTS / NO. OF INJURIES
ACCIDENT RATE = 1.25 *
ACCIDENT INTENSITY = 26 (3 UNKNOWN)

* PER MILLION VEHICLES

PROPOSED SIGNAL PHASING



- LEGEND
- EXISTING CURB LINE
 - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - PROPOSED R.O.W. LINE
 - PROPOSED TRAFFIC SIGNALS
 - TRAFFIC SIGNS
 - TRAFFIC FLOW

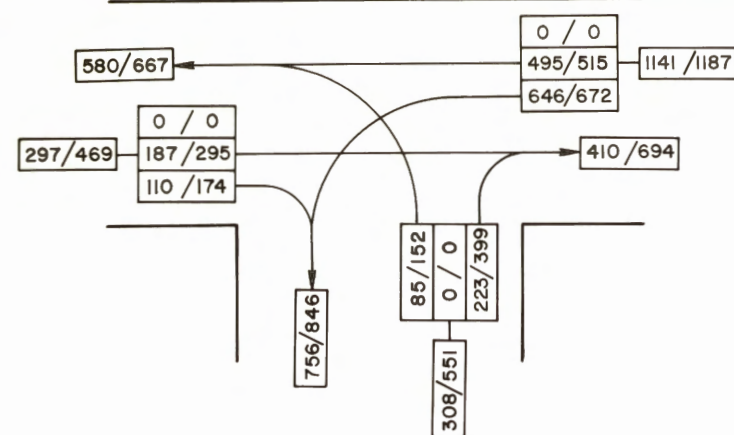


CITY OF CAMDEN TOPICS STUDY

BROADWAY AND FERRY AVENUE

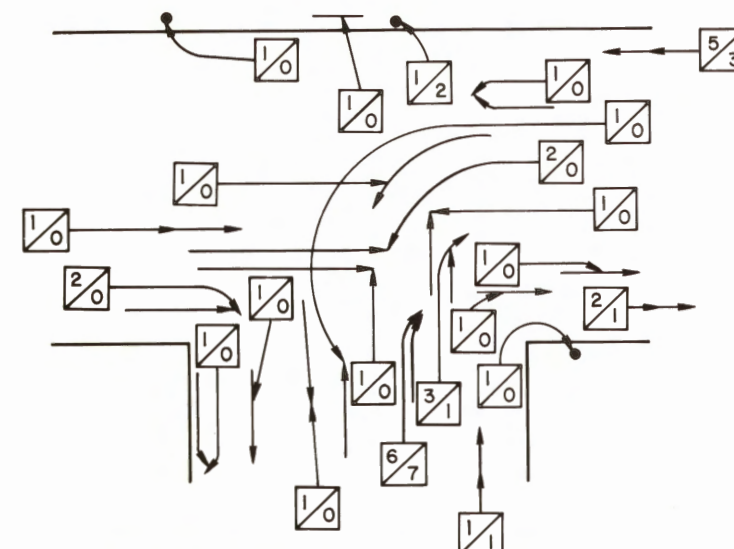
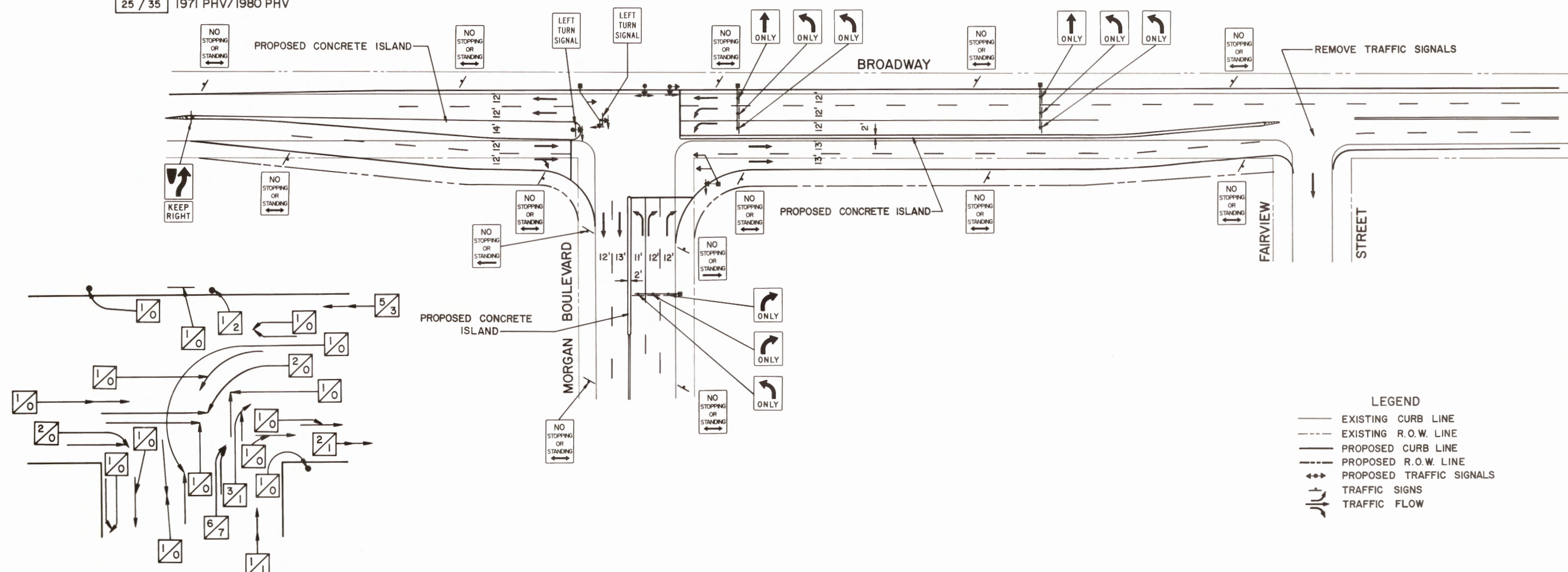
URBAN ENGINEERS INC.

PLATE NO.30



PEAK HOUR VOLUME
25 / 35 1971 PHV / 1980 PHV

PROPOSED SIGNAL PHASING		
Phase A	Phase B	Phase C



THREE YEAR ACCIDENT SUMMARY
 [Symbol] NO. OF ACCIDENTS/NO. OF INJURIES
 ACCIDENT RATE = 2.58 *
 ACCIDENT INTENSITY = 41 (5 UNKNOWN)

* PER MILLION VEHICLES



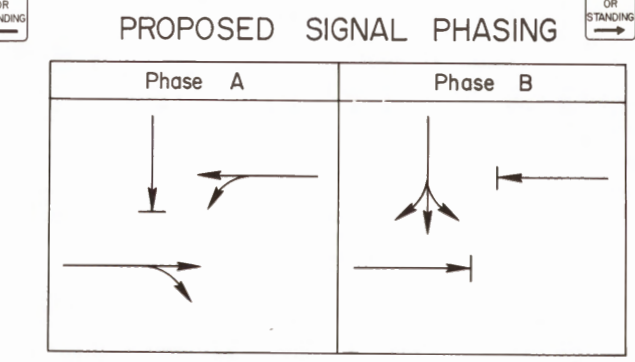
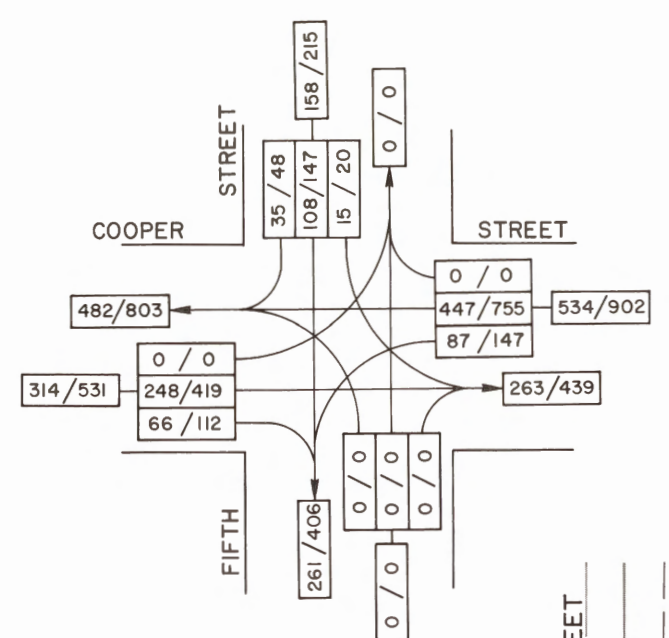
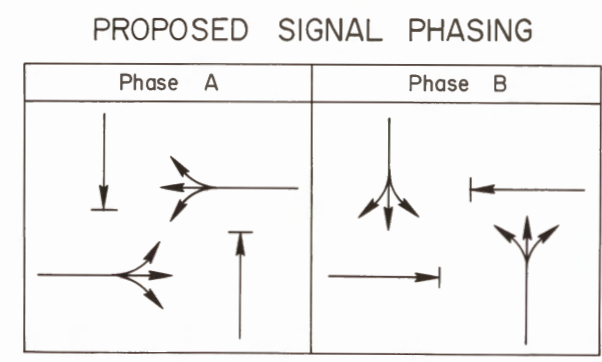
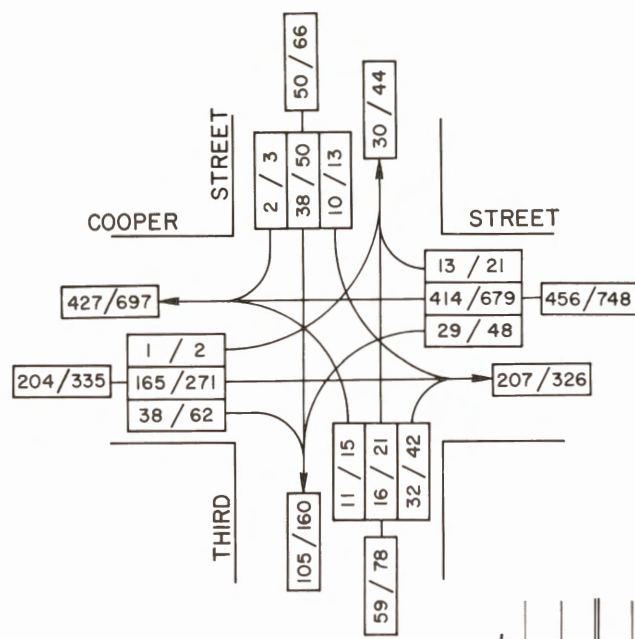
- LEGEND
- EXISTING CURB LINE
 - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - PROPOSED R.O.W. LINE
 - PROPOSED TRAFFIC SIGNALS
 - TRAFFIC SIGNS
 - TRAFFIC FLOW

CITY OF CAMDEN TOPICS STUDY

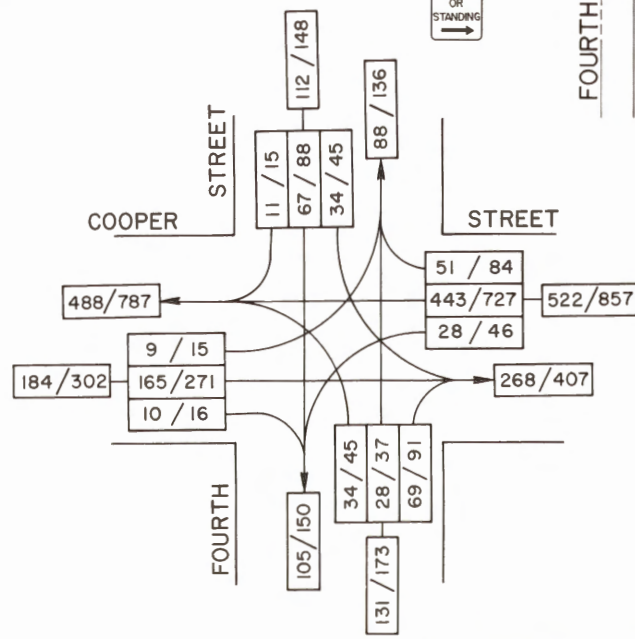
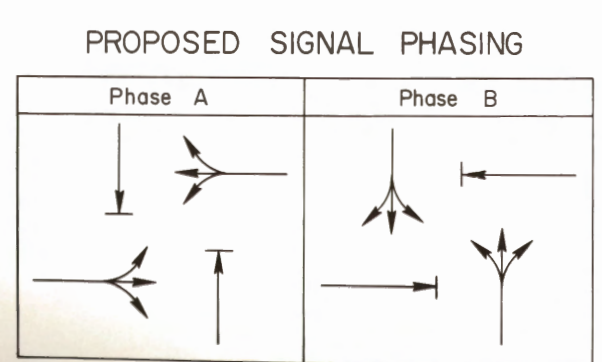
BROADWAY AND MORGAN BOULEVARD

URBAN ENGINEERS INC.

PLATE NO. 31



- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ➔➔➔ PROPOSED TRAFFIC SIGNALS
 - ➔➔➔ TRAFFIC SIGNS
 - ➔➔➔ TRAFFIC FLOW
- 25 / 35 1971 PHV/1980 PHV



CITY OF CAMDEN TOPICS STUDY

COOPER STREET

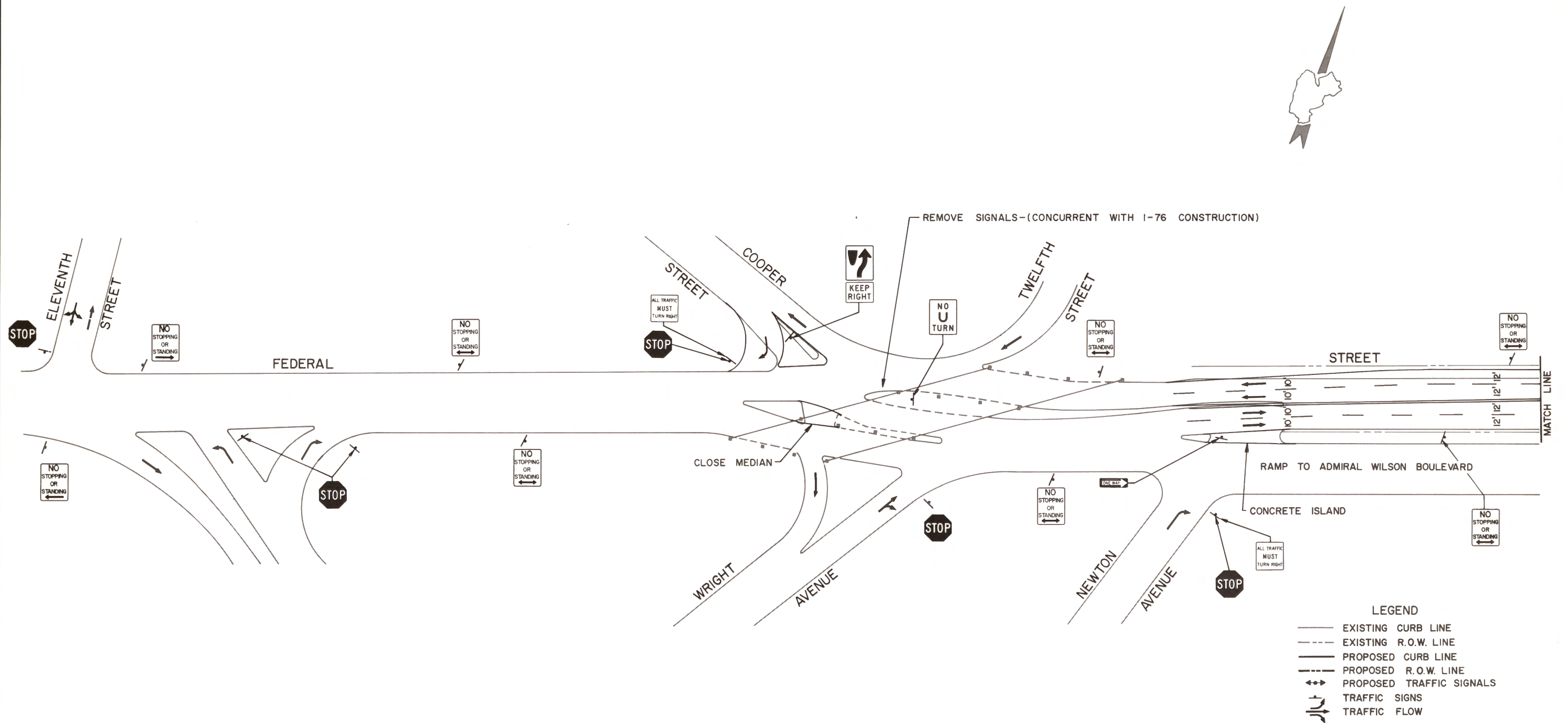
DELAWARE AVENUE TO SEVENTH STREET



Phase A	Phase B

- 25 / 35 1971 PHV/1980 PHV

PLATE NO. 34

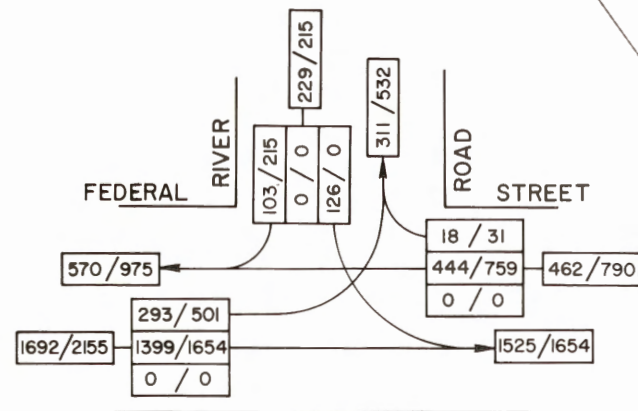
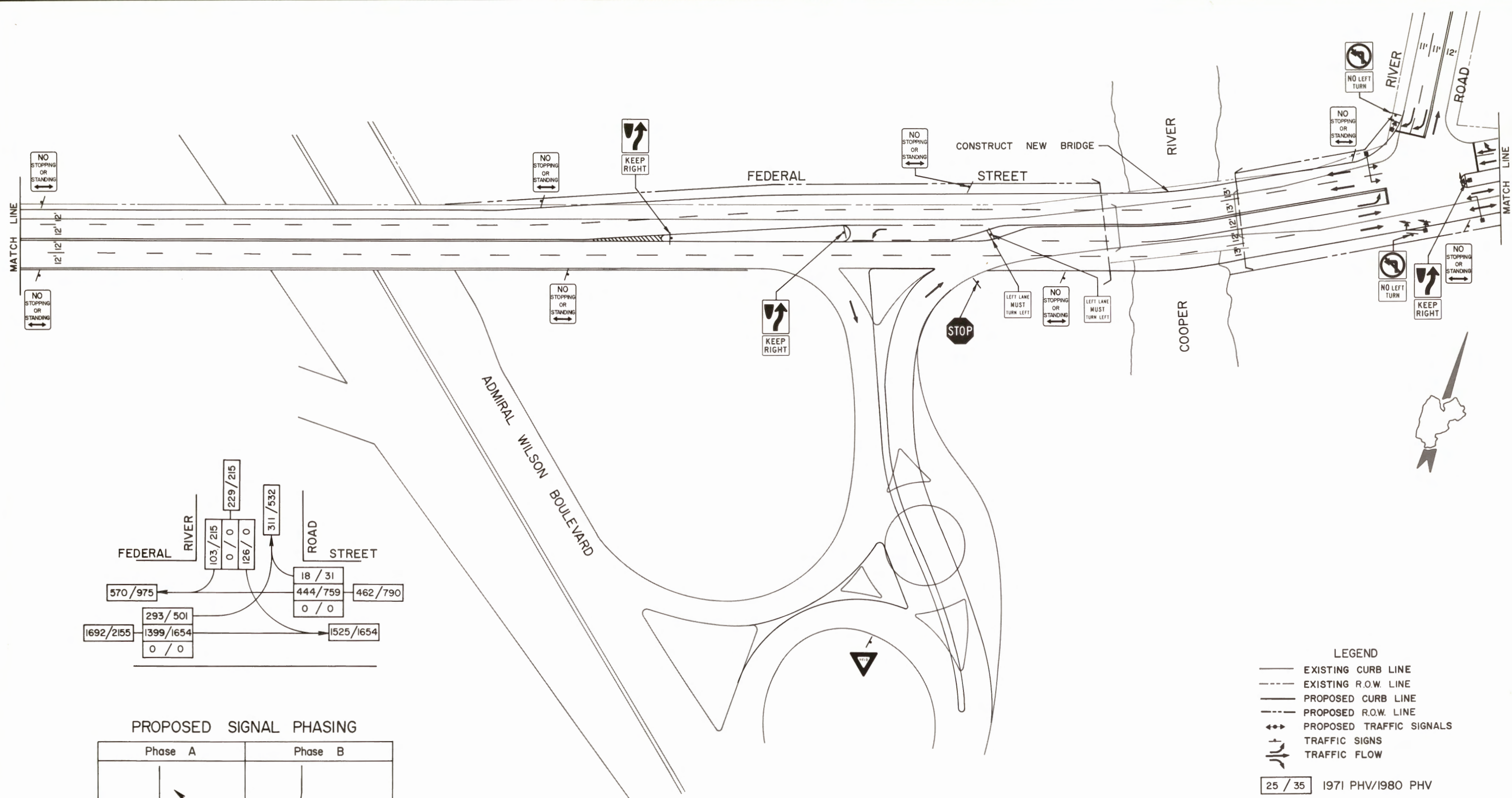


CITY OF CAMDEN TOPICS STUDY

FEDERAL STREET 11 TH STREET TO 20 TH STREET

URBAN ENGINEERS INC.

PLATE NO. 35



PROPOSED SIGNAL PHASING

Phase A	Phase B

- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ⬄ PROPOSED TRAFFIC SIGNALS
 - ⬄ TRAFFIC SIGNS
 - ⬄ TRAFFIC FLOW

25 / 35 1971 PHV/1980 PHV

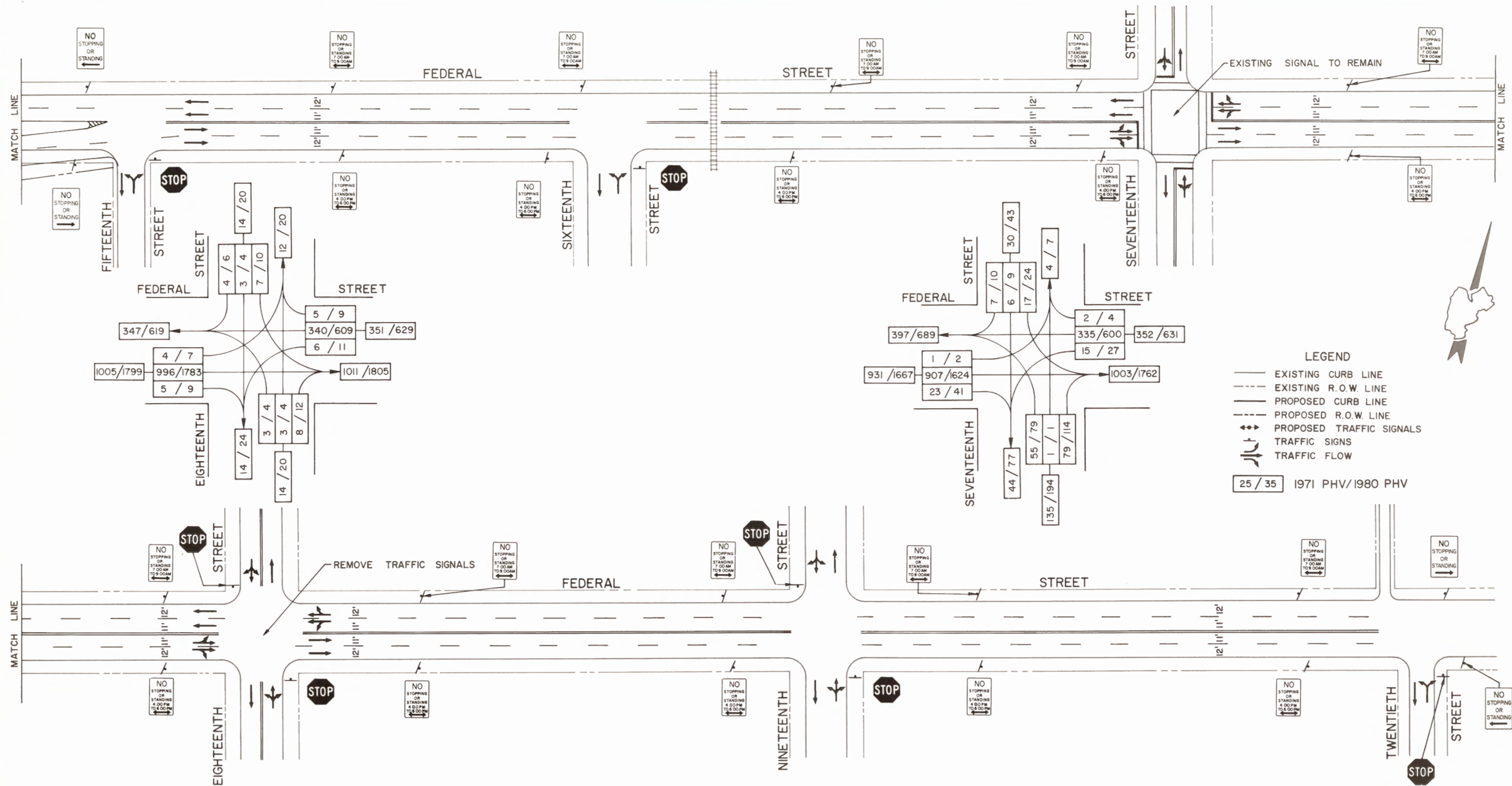
0 40 80 120
SCALE IN FEET

CITY OF CAMDEN TOPICS STUDY

FEDERAL STREET 11 TH STREET TO 20 TH STREET

URBAN ENGINEERS INC.

PLATE NO. 36



CITY OF CAMDEN TOPICS STUDY

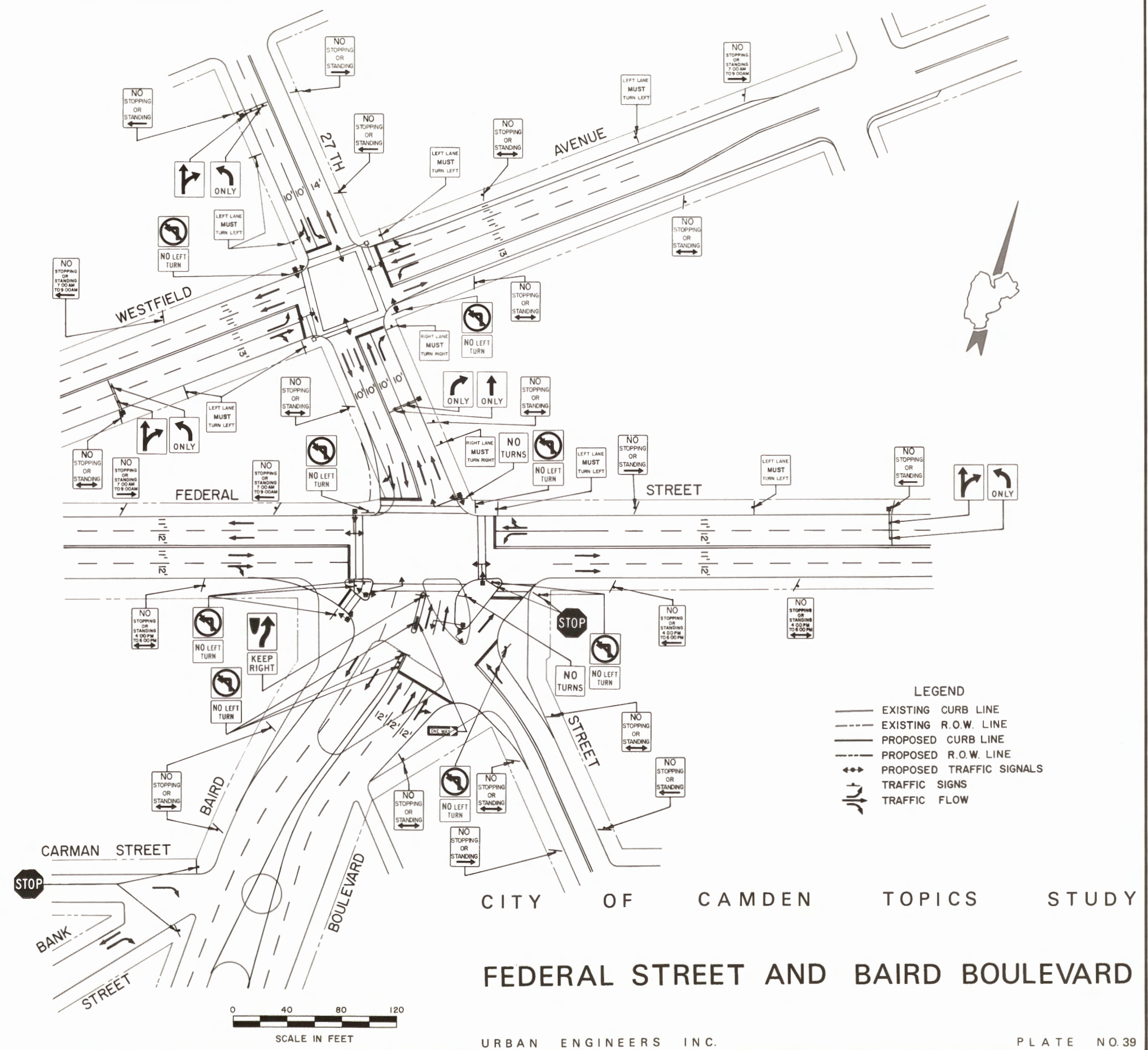
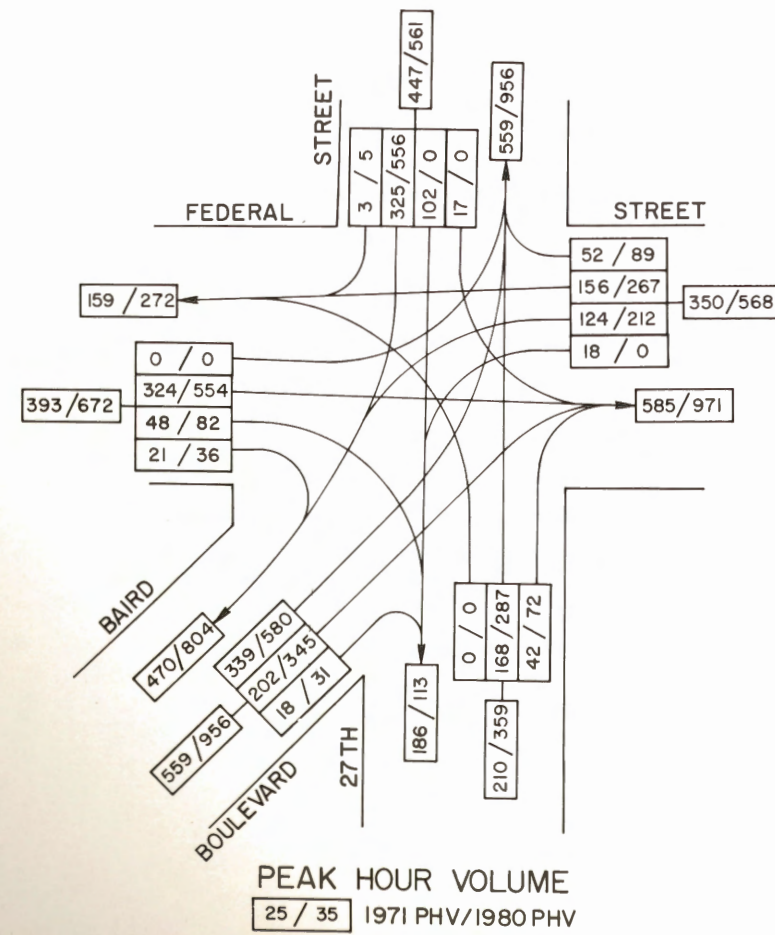
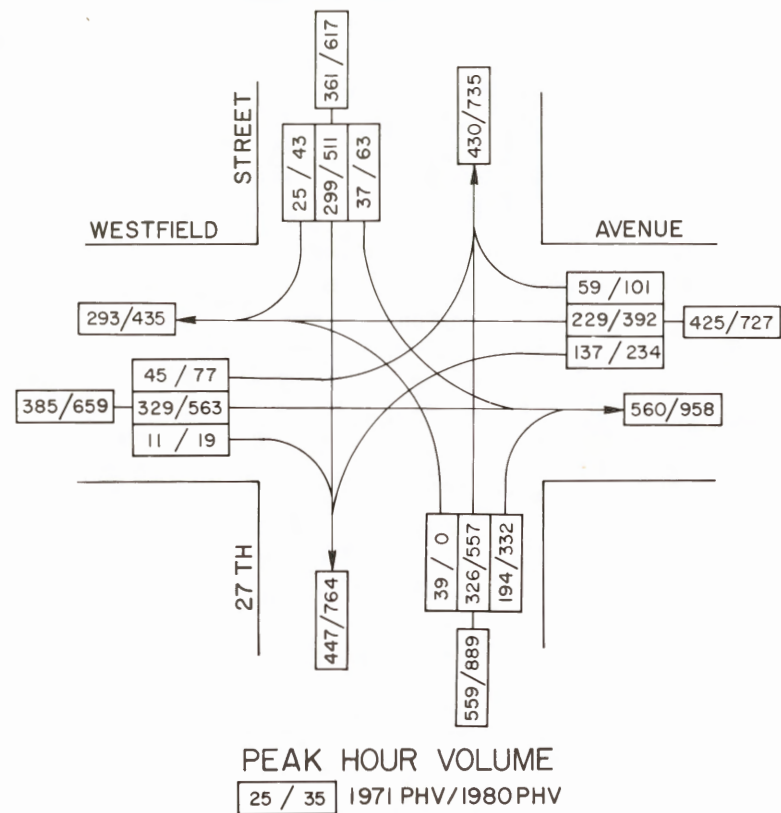
FEDERAL STREET

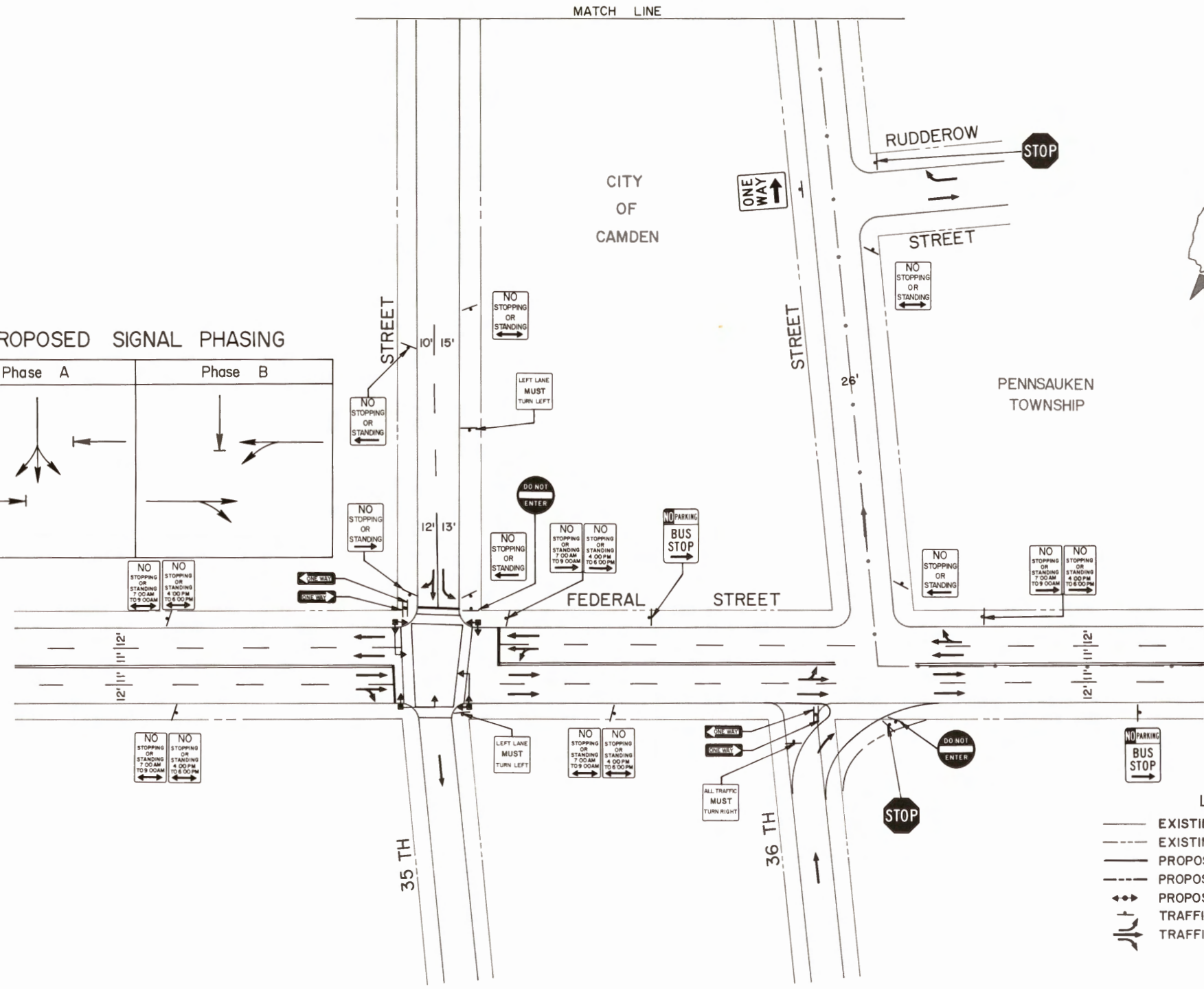
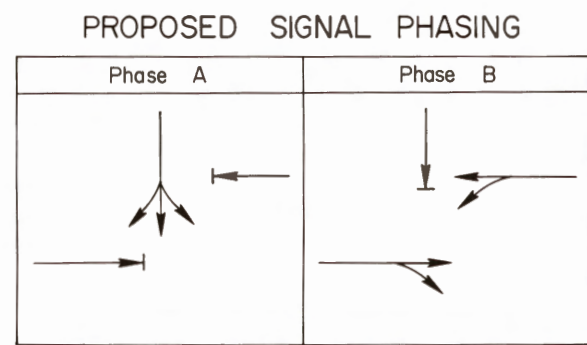
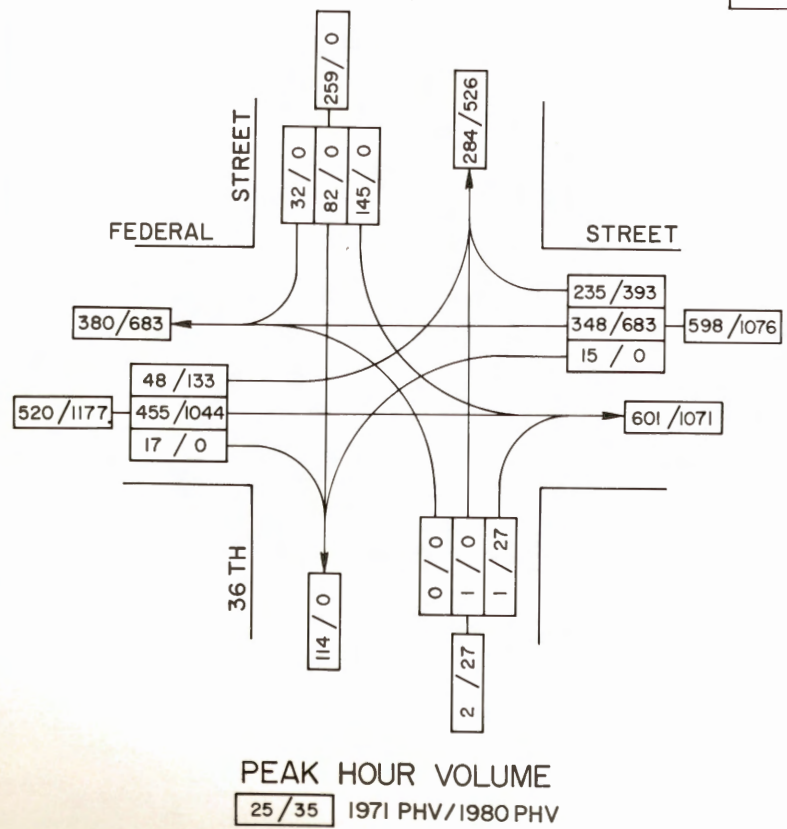
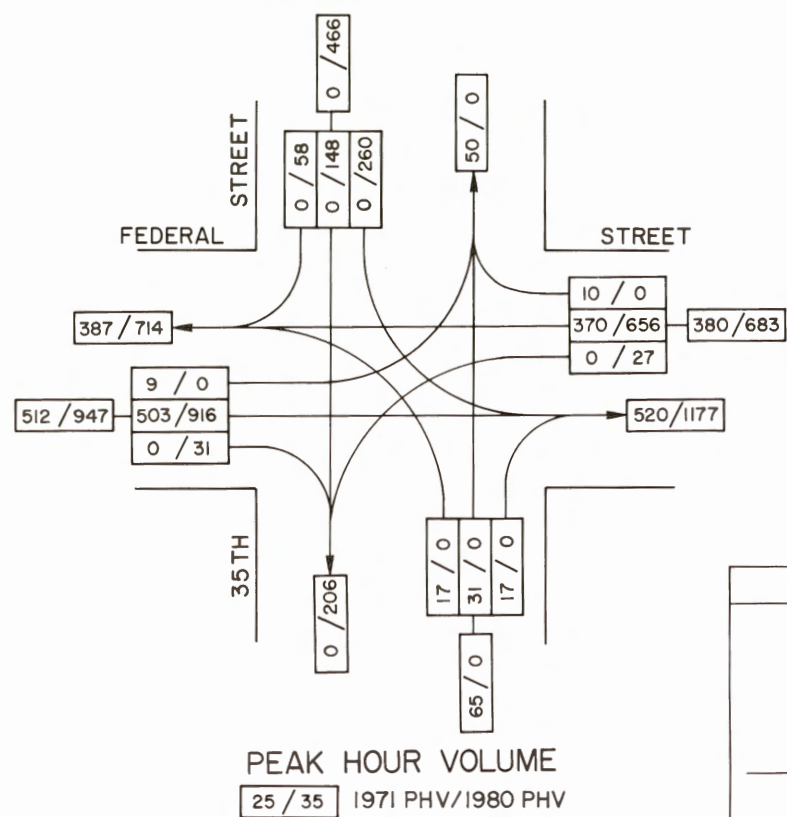
11 TH STREET TO 20 TH STREET

0 40 80 120
SCALE IN FEET

URBAN ENGINEERS INC.

PLATE NO.37



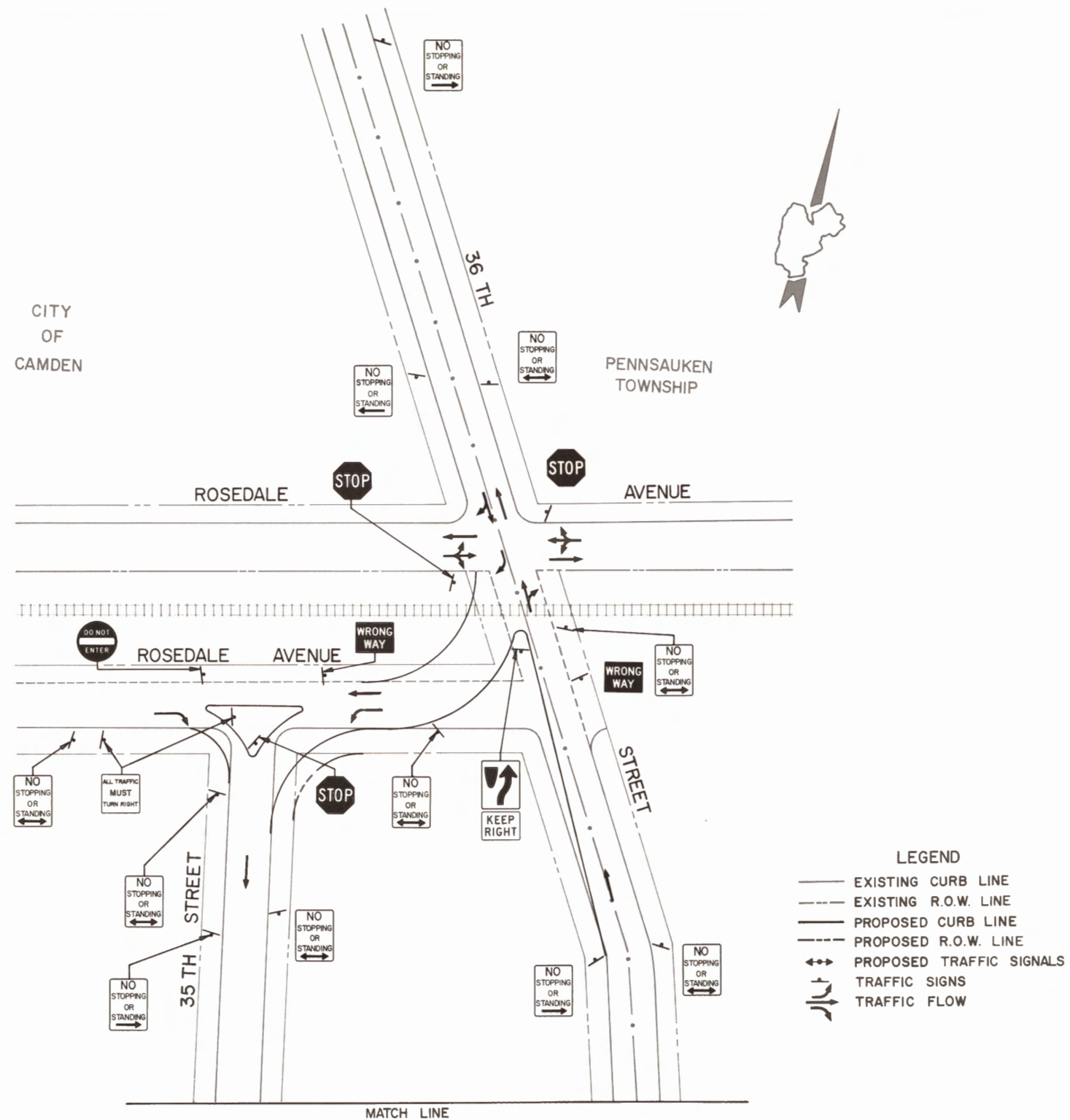
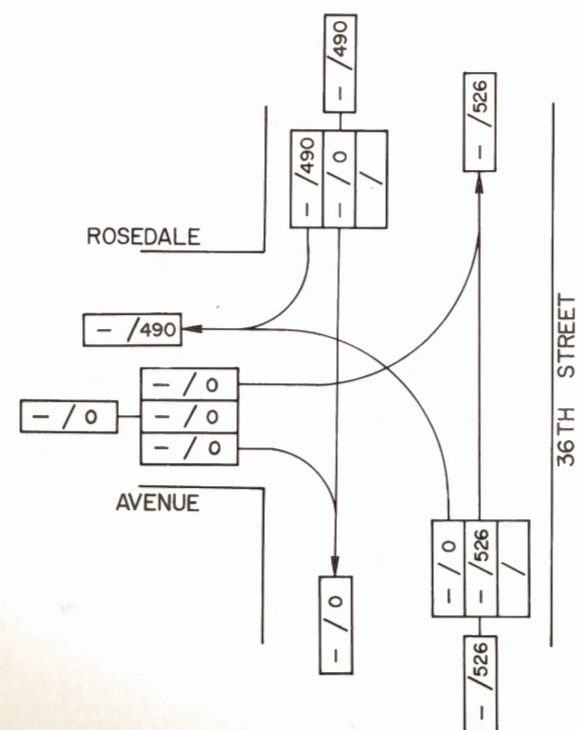
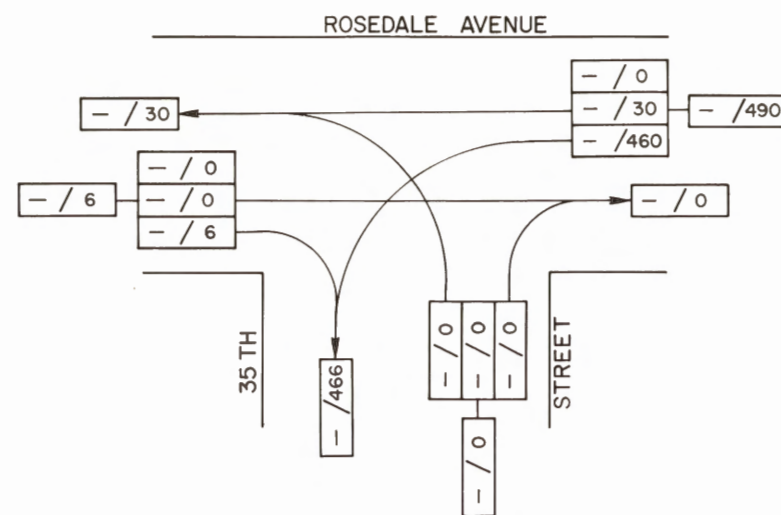


- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ⬆⬆ PROPOSED TRAFFIC SIGNALS
 - ⬆ TRAFFIC SIGNS
 - ➔ TRAFFIC FLOW

CITY OF CAMDEN TOPICS STUDY

FEDERAL STREET AND 36 TH STREET



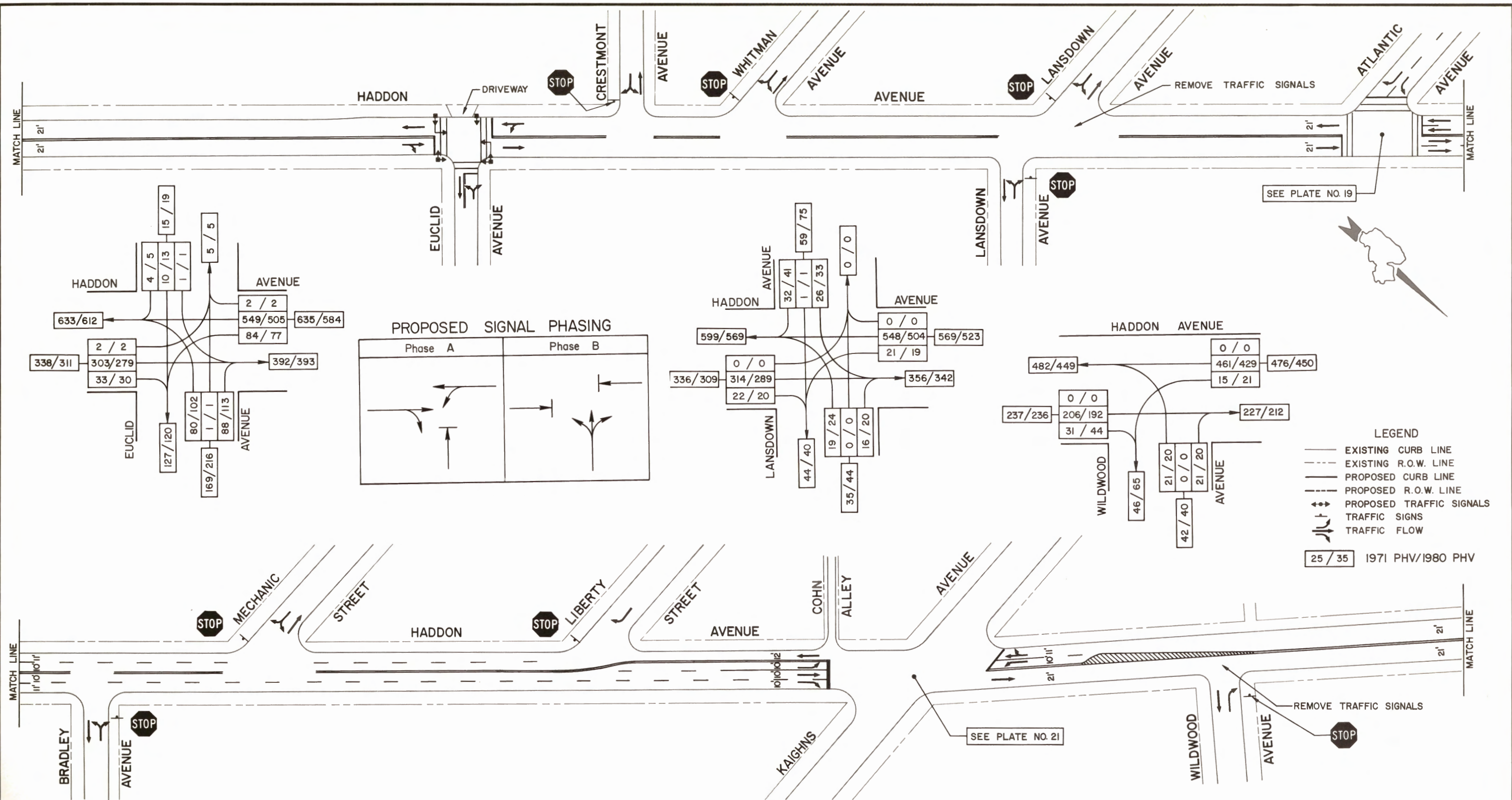


CITY OF CAMDEN TOPICS STUDY

ROSEDALE AVENUE AND 36 TH STREET

URBAN ENGINEERS INC.

PLATE NO. 41



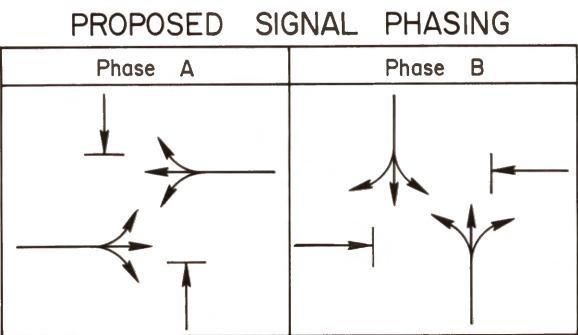
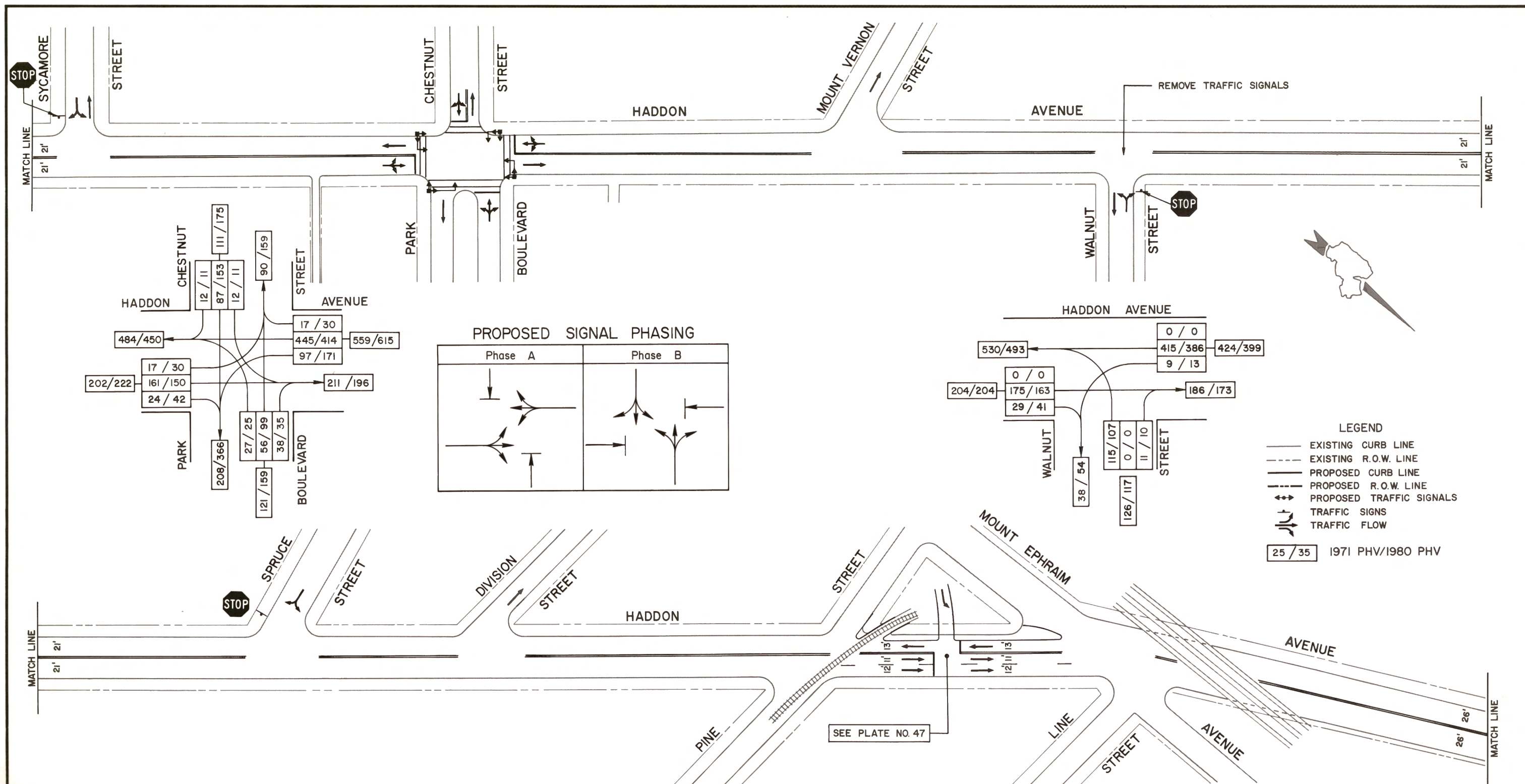
CITY OF CAMDEN TOPICS STUDY

HADDON AVENUE FERRY AVENUE TO MICKLE STREET



URBAN ENGINEERS INC.

PLATE NO.43



LEGEND

- EXISTING CURB LINE
- - - EXISTING R.O.W. LINE
- PROPOSED CURB LINE
- - - PROPOSED R.O.W. LINE
- ⬆⬆ PROPOSED TRAFFIC SIGNALS
- ⬆ TRAFFIC SIGNS
- TRAFFIC FLOW

25 / 35 1971 PHV/1980 PHV

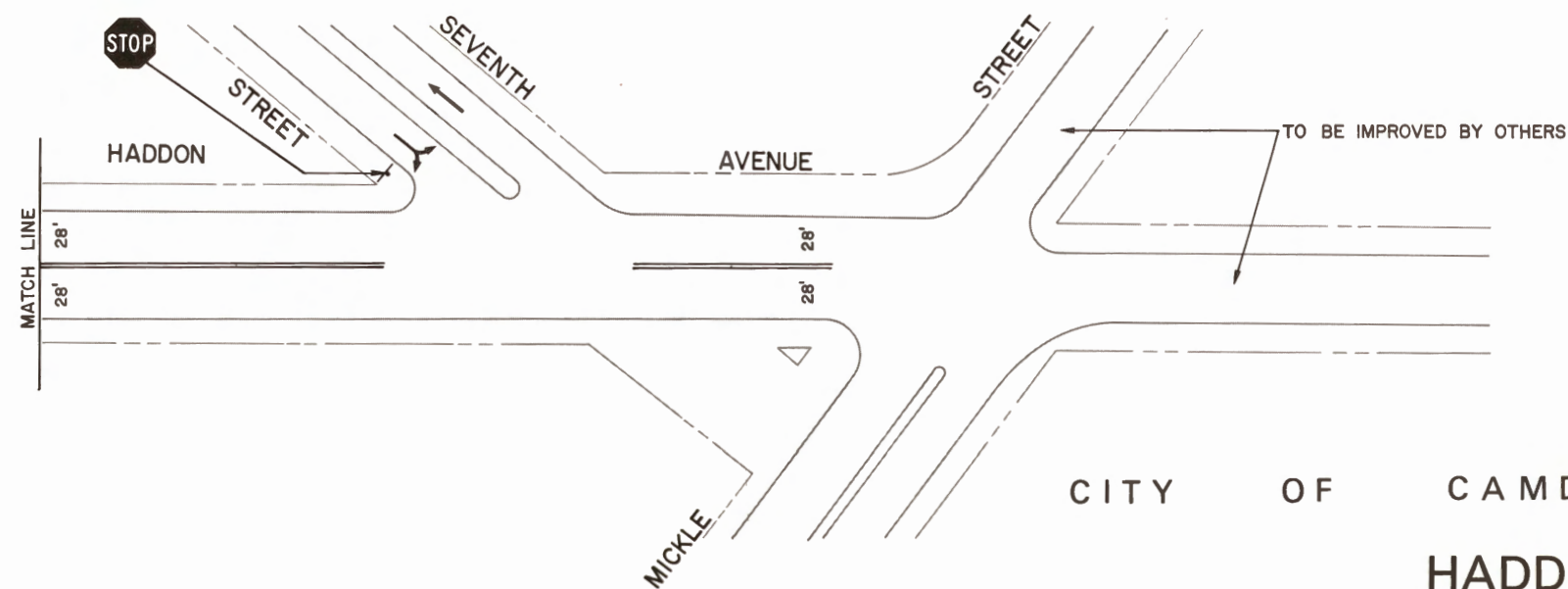
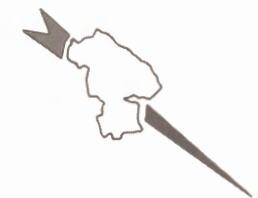
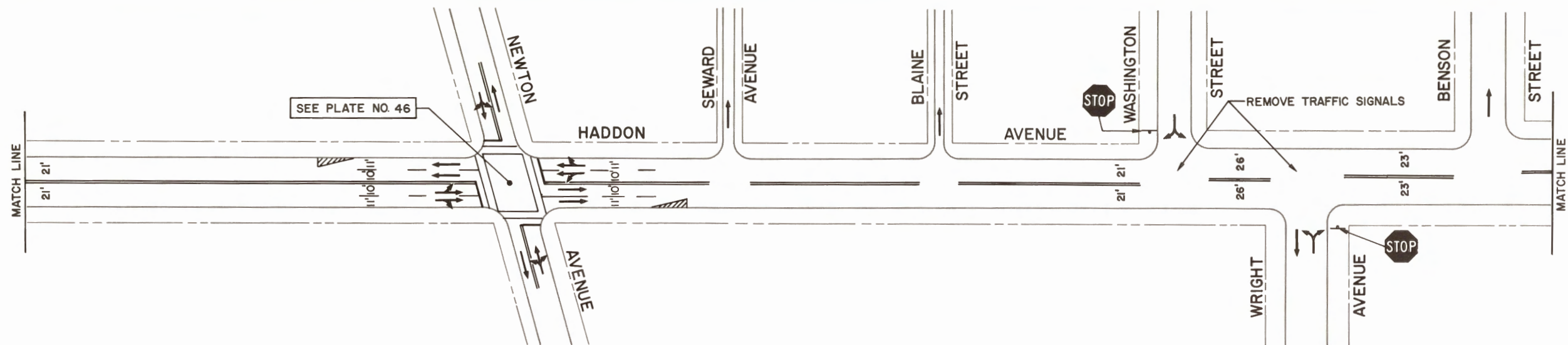
CITY OF CAMDEN TOPICS STUDY

HADDON AVENUE FERRY AVENUE TO MICKLE STREET



URBAN ENGINEERS INC.

PLATE NO.44



- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ⬆⬆ PROPOSED TRAFFIC SIGNALS
 - ⬆ TRAFFIC SIGNS
 - TRAFFIC FLOW

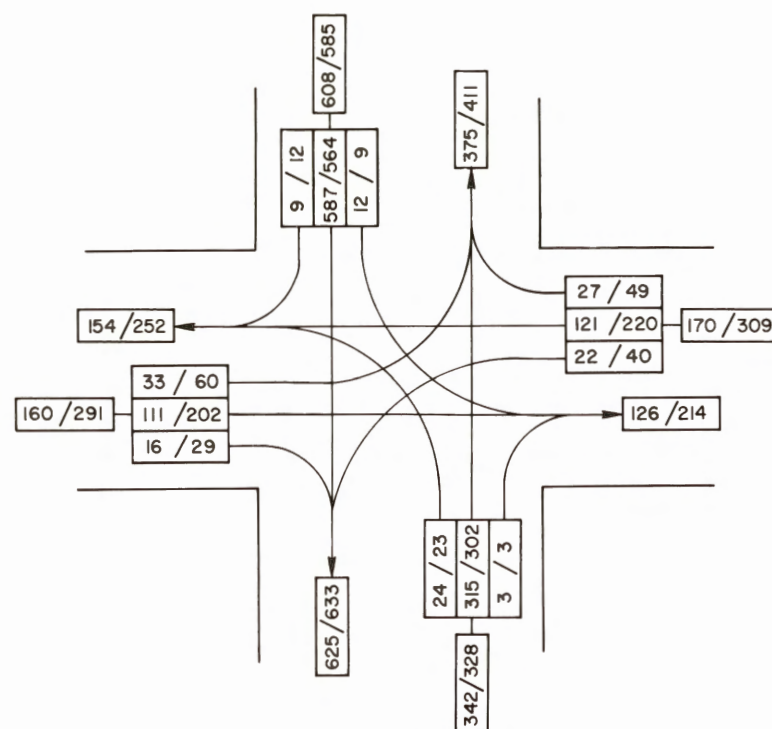


CITY OF CAMDEN TOPICS STUDY

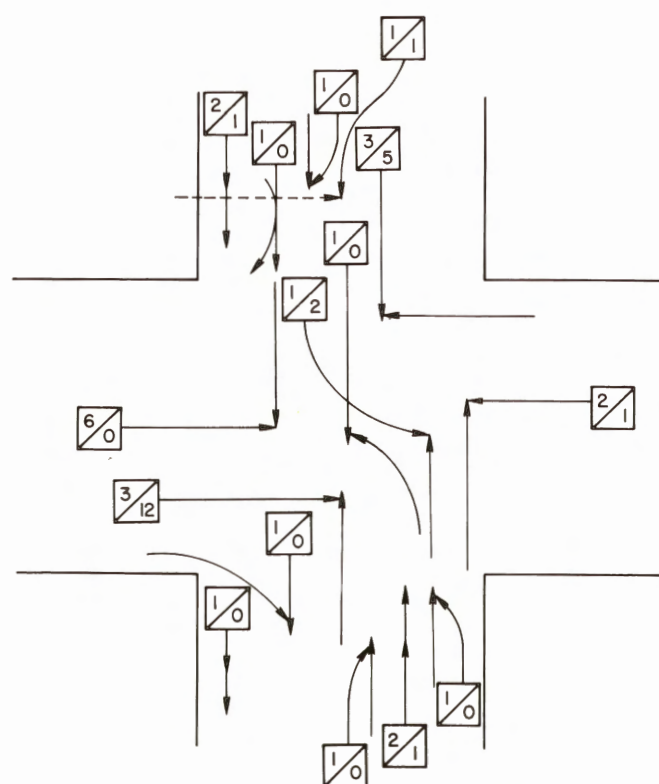
HADDON AVENUE FERRY AVENUE TO MICKLE STREET

URBAN ENGINEERS INC.

PLATE NO. 45



PEAK HOUR VOLUME
25/35 1971 PHV/1980 PHV



THREE YEAR ACCIDENT SUMMARY

1/1 NO. OF ACCIDENTS/NO. OF INJURIES

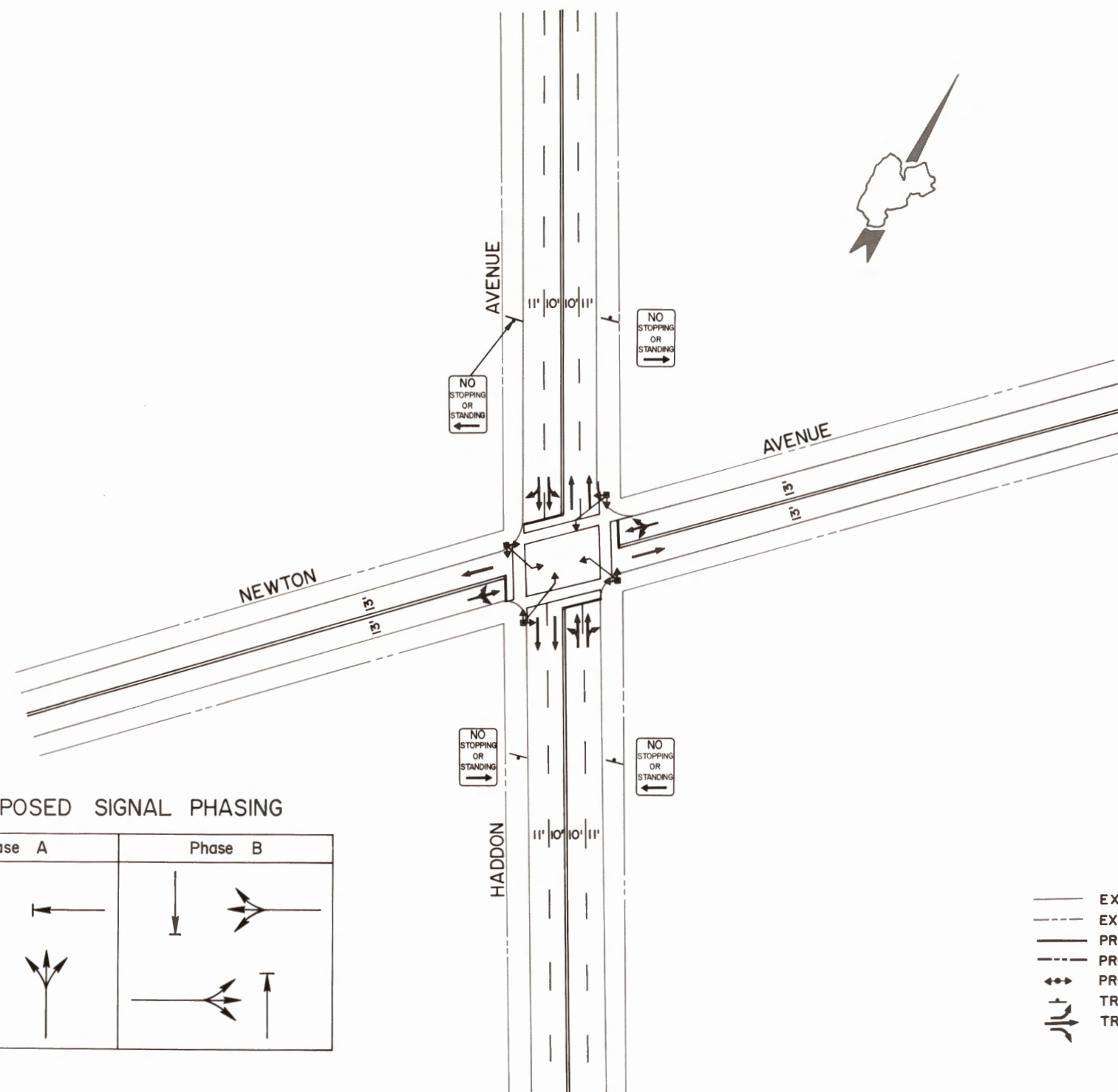
ACCIDENT RATE = 1.79 *

ACCIDENT INTENSITY = 29 (2 UNKNOWN)

* PER MILLION VEHICLES

PROPOSED SIGNAL PHASING

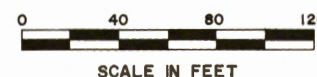
Phase A	Phase B



- LEGEND
- EXISTING CURB LINE
 - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - PROPOSED R.O.W. LINE
 - PROPOSED TRAFFIC SIGNALS
 - TRAFFIC SIGNS
 - TRAFFIC FLOW

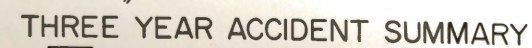
CITY OF CAMDEN TOPICS STUDY

HADDON AVENUE AND NEWTON AVENUE



URBAN ENGINEERS INC.

PLATE NO. 46

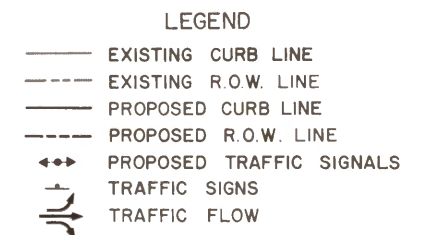
[illegible]

ACCIDENT RATE = 2.21 *

ACCIDENT INTENSITY = 37 (11 UNKNOWN)

* PER MILLION VEHICLES

Phase A	Phase B



CITY OF CAMDEN TOPICS STUDY

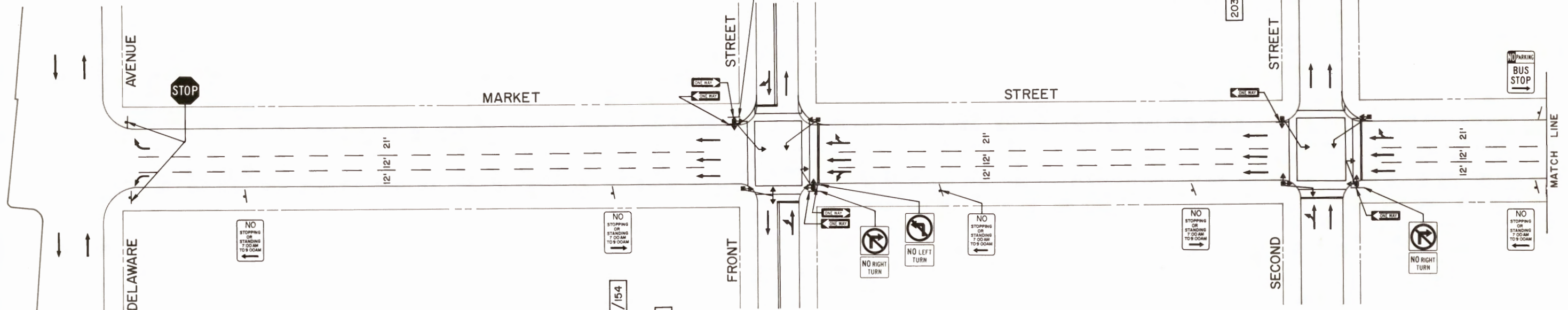
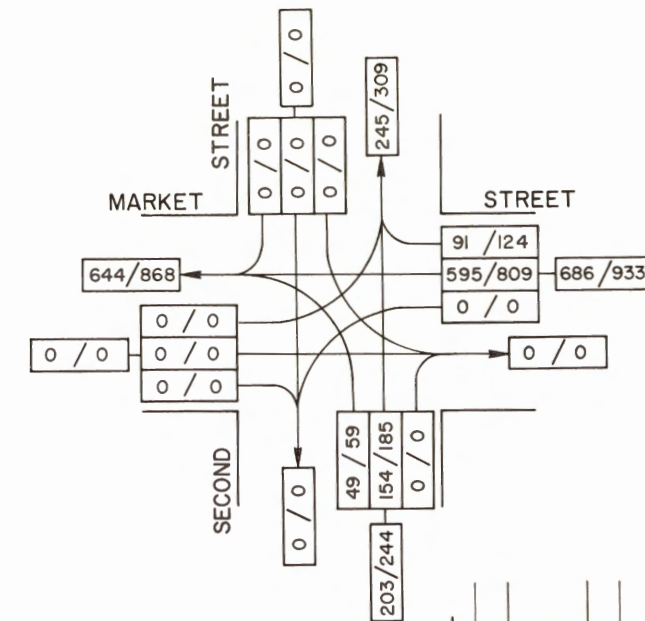
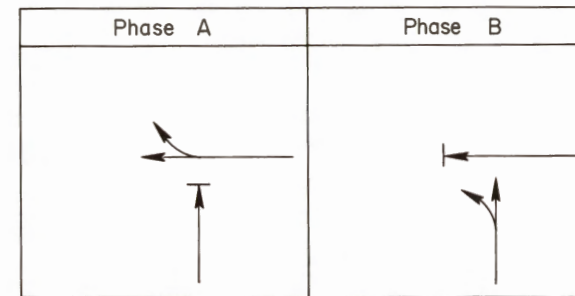
HADDON AVENUE
AND MOUNT EPHRAIM AVENUE

URBAN ENGINEERS INC.

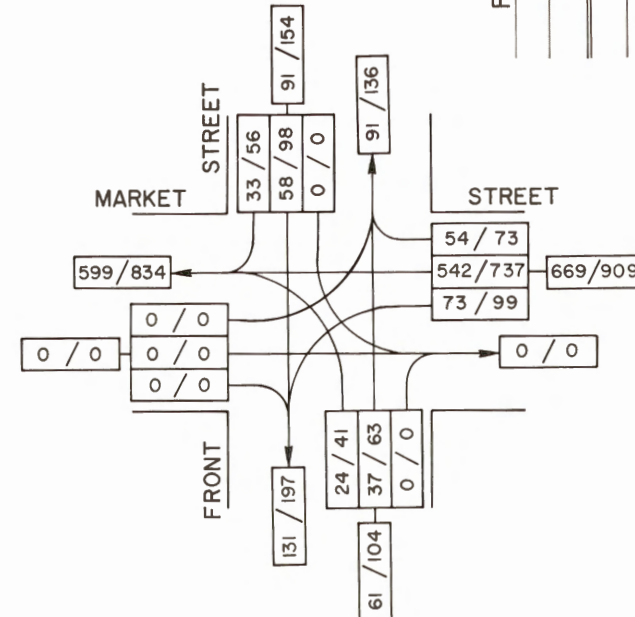
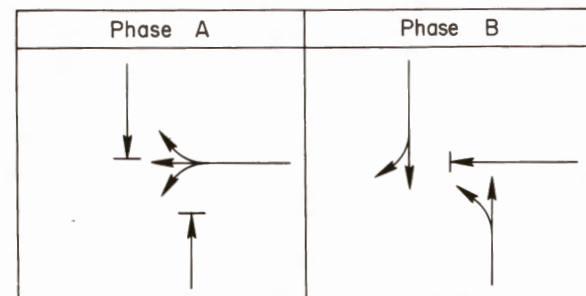
PLATE NO. 47



PROPOSED SIGNAL PHASING



PROPOSED SIGNAL PHASING



- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ◀▶ PROPOSED TRAFFIC SIGNALS
 - ↑↓ TRAFFIC SIGNS
 - TRAFFIC FLOW
- 25 / 35 1971 PHV/1980 PHV



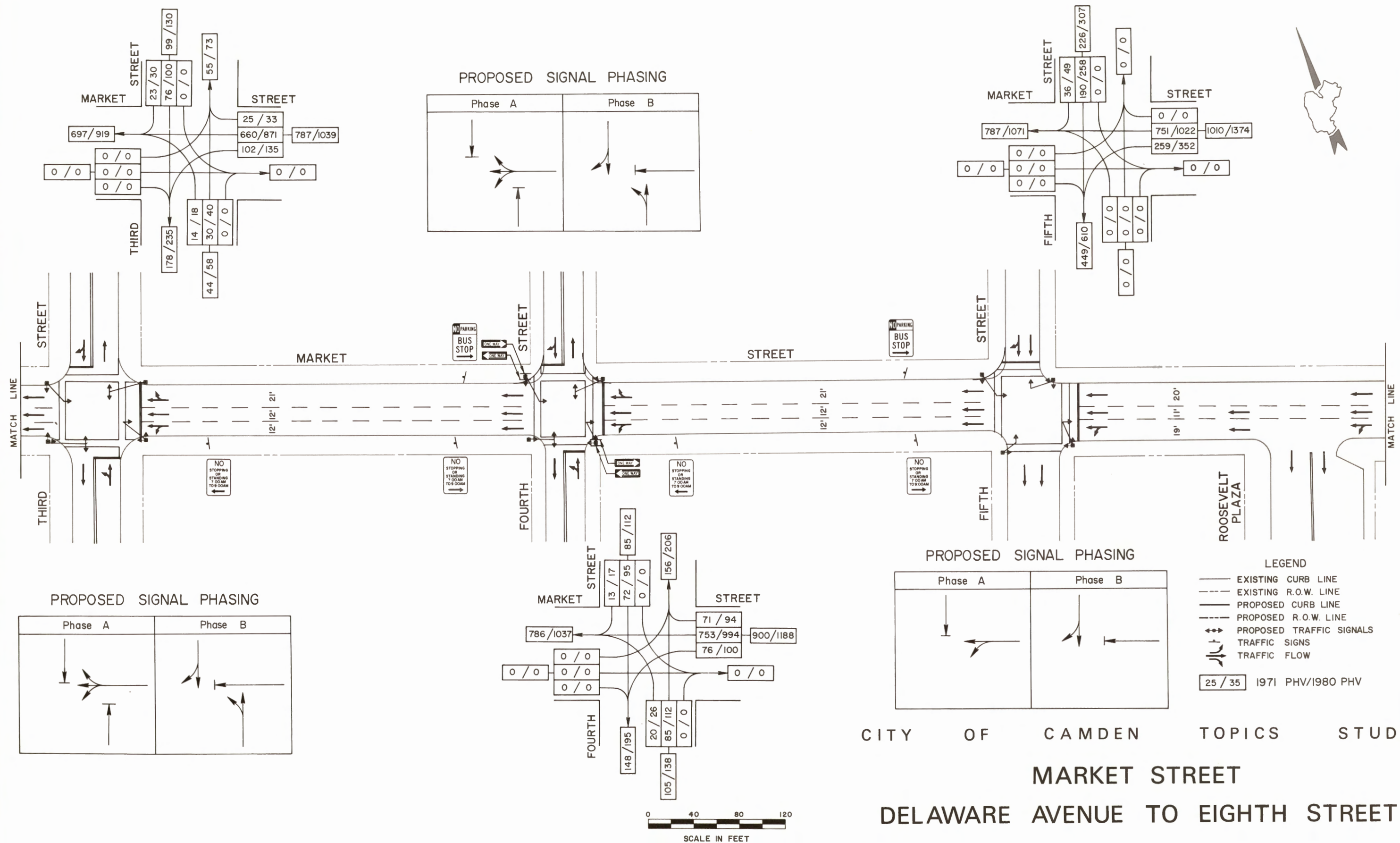
CITY OF CAMDEN TOPICS STUDY

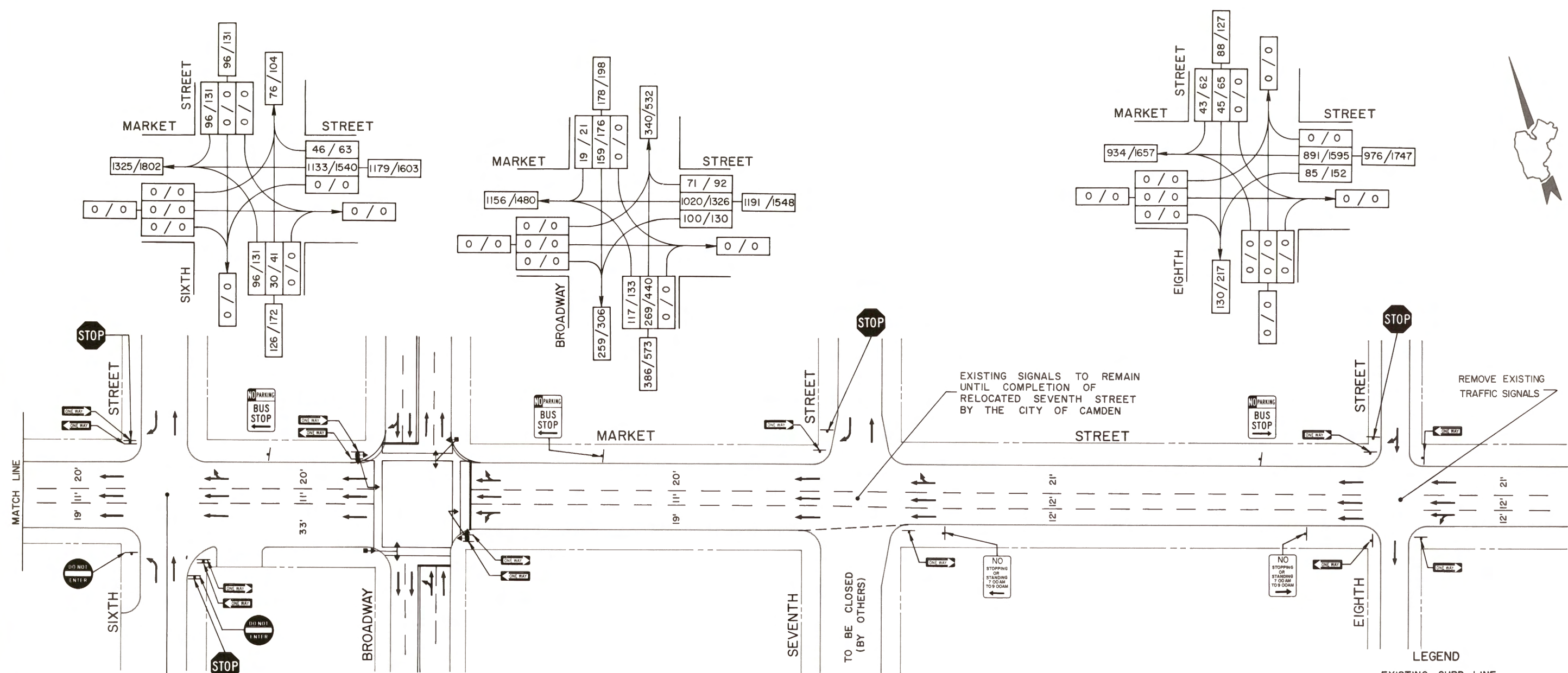
MARKET STREET

DELAWARE AVENUE TO EIGHTH STREET

URBAN ENGINEERS INC.

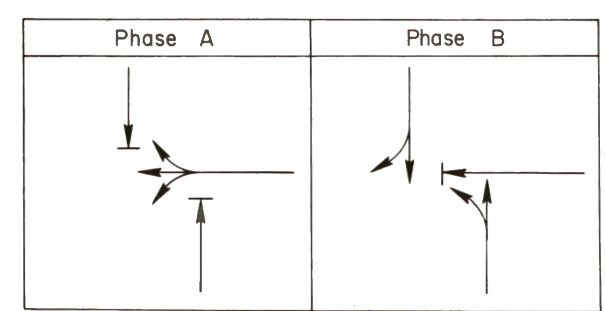
PLATE NO. 48



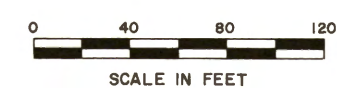


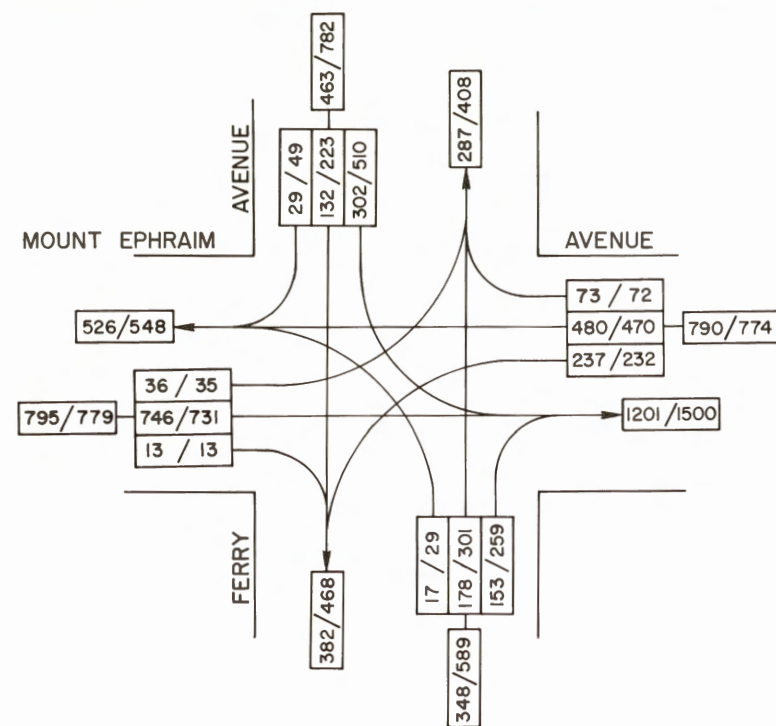
REMOVE EXISTING TRAFFIC SIGNALS

PROPOSED SIGNAL PHASING

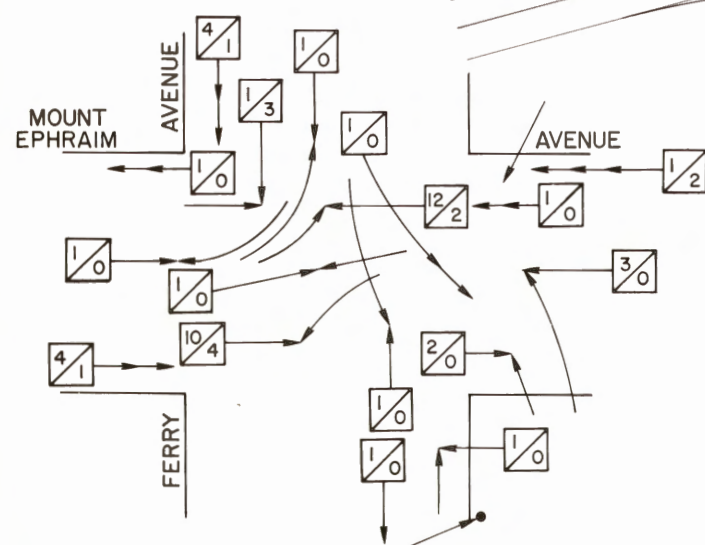


- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ↔ PROPOSED TRAFFIC SIGNALS
 - ⬆ TRAFFIC SIGNS
 - ➔ TRAFFIC FLOW
- 25 / 35 1971 PHV/1980 PHV





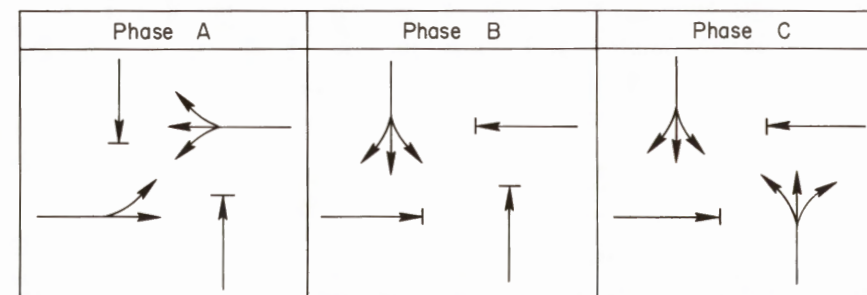
PEAK HOUR VOLUME
25 / 35 1971 PHV / 1980 PHV



THREE YEAR ACCIDENT SUMMARY
1/1 NO. OF ACCIDENTS / NO. OF INJURIES
ACCIDENT RATE = 2.02 *
ACCIDENT INTENSITY = 51 (5 UNKNOWN)

* PER MILLION VEHICLES

PROPOSED SIGNAL PHASING



0 40 80 120
SCALE IN FEET

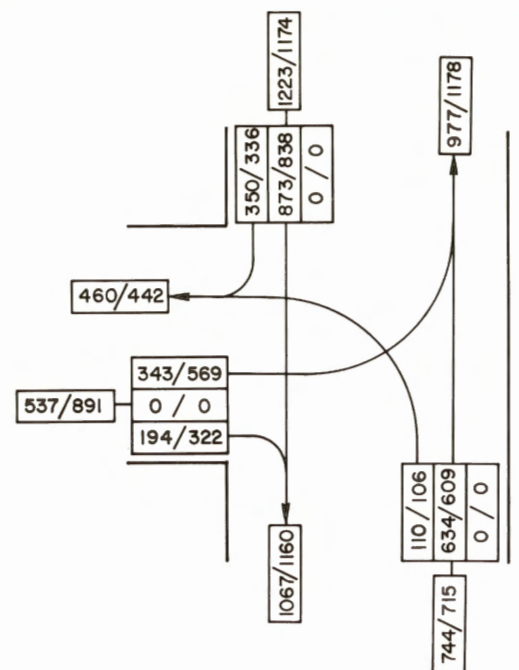
- LEGEND
- EXISTING CURB LINE
 - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - PROPOSED R.O.W. LINE
 - PROPOSED TRAFFIC SIGNALS
 - TRAFFIC SIGNS
 - TRAFFIC FLOW

CITY OF CAMDEN TOPICS STUDY

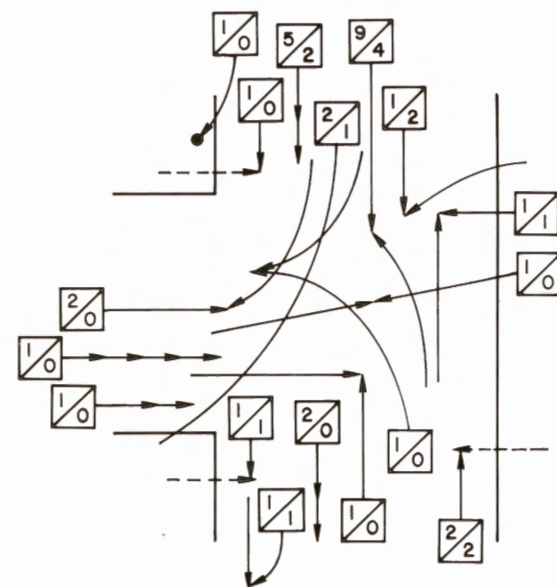
MOUNT EPHRAIM AVENUE AND FERRY AVENUE

URBAN ENGINEERS INC.

PLATE NO. 51

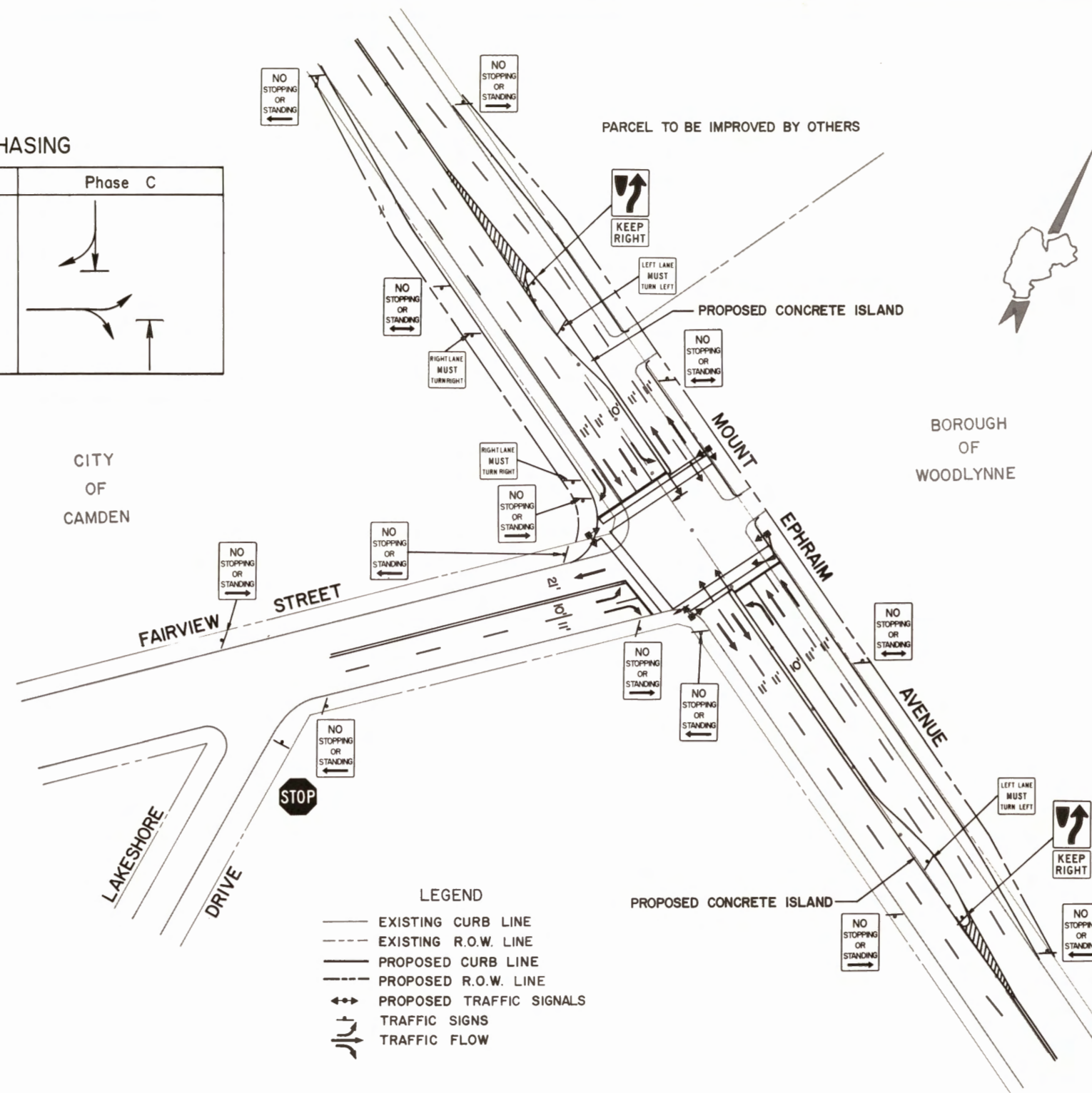
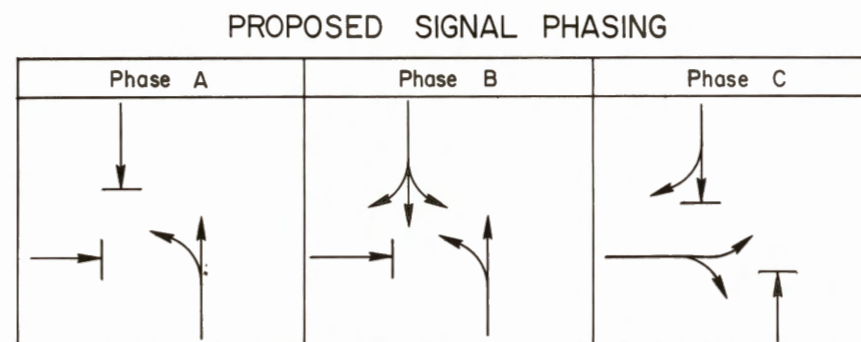


PEAK HOUR VOLUME
25 / 35 1971 PHV/1980 PHV



THREE YEAR ACCIDENT SUMMARY
 [Symbol] NO. OF ACCIDENTS/NO. OF INJURIES
 ACCIDENT RATE = 1.52*
 ACCIDENT INTENSITY = 40 (7 UNKNOWN)

*PER MILLION VEHICLES

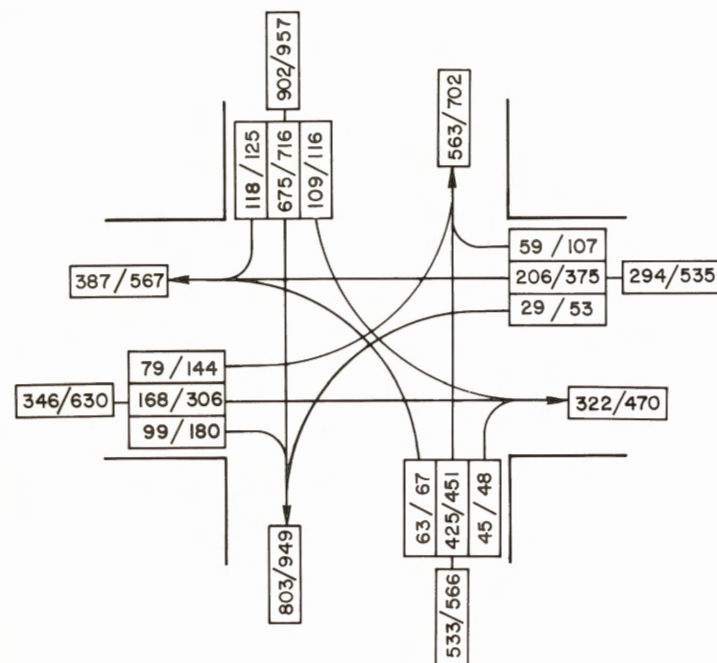


CITY OF CAMDEN TOPICS STUDY
 MOUNT EPHRAIM AVENUE AND
 FAIRVIEW STREET

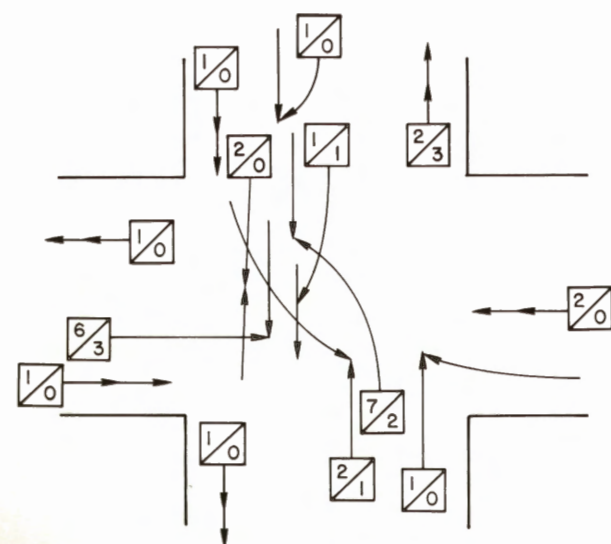


URBAN ENGINEERS INC.

PLATE NO. 52



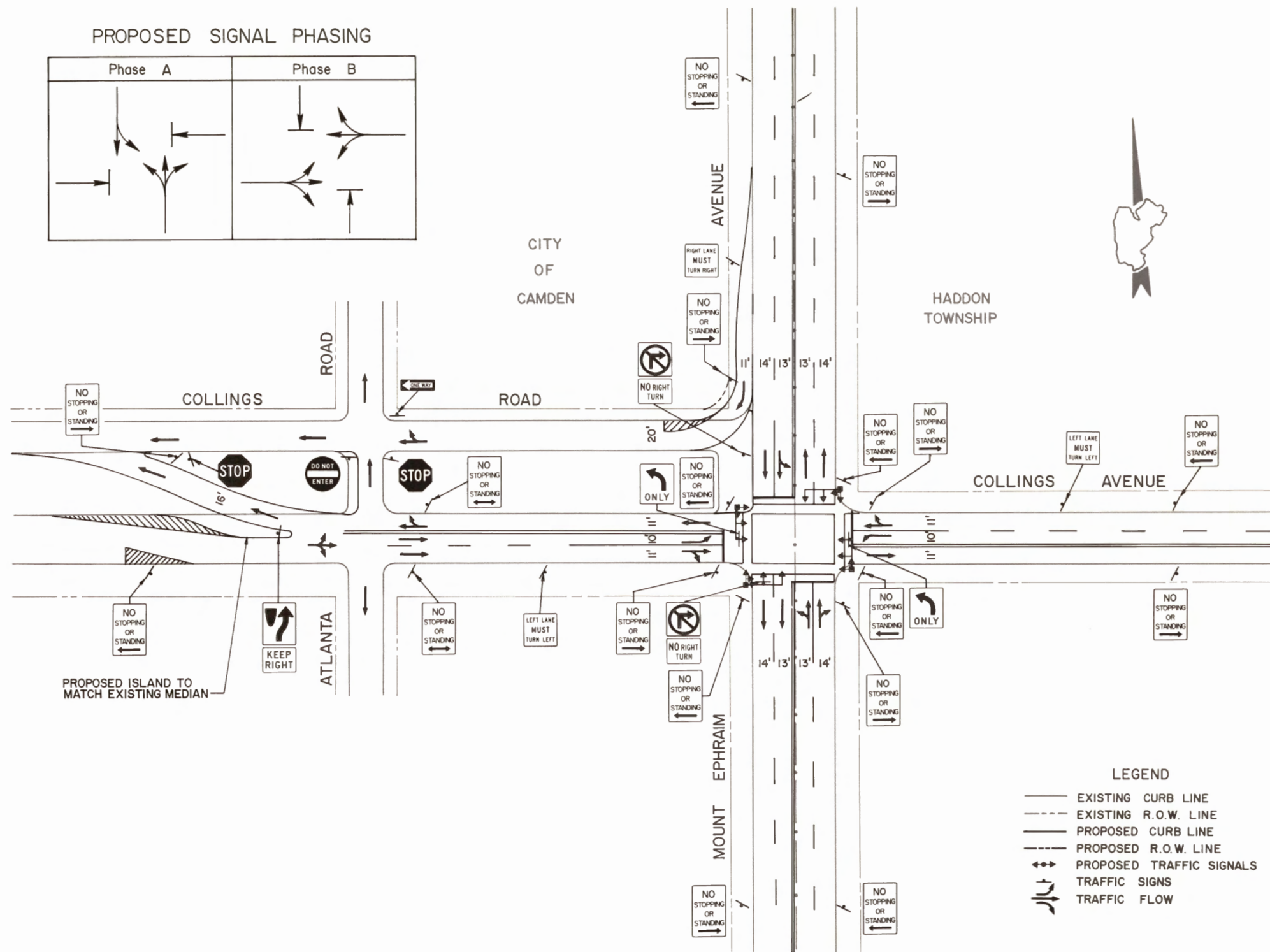
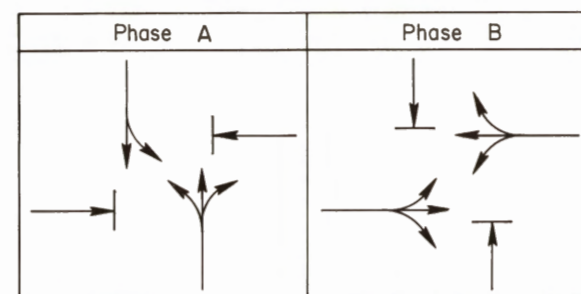
PEAK HOUR VOLUME
25 / 35 1971 PHV/1980 PHV



THREE YEAR ACCIDENT SUMMARY
 [Symbol] NO. OF ACCIDENTS/NO. OF INJURIES
 ACCIDENT RATE = 1.22 *
 ACCIDENT INTENSITY = 38 (10 UNKNOWN)

* PER MILLION VEHICLES

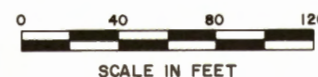
PROPOSED SIGNAL PHASING



- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ⬆⬆⬆ PROPOSED TRAFFIC SIGNALS
 - ⬆ TRAFFIC SIGNS
 - ➡ TRAFFIC FLOW

CITY OF CAMDEN TOPICS STUDY

MOUNT EPHRAIM AVENUE AND COLLINGS ROAD/COLLINGS AVENUE



URBAN ENGINEERS INC.

PLATE NO. 53



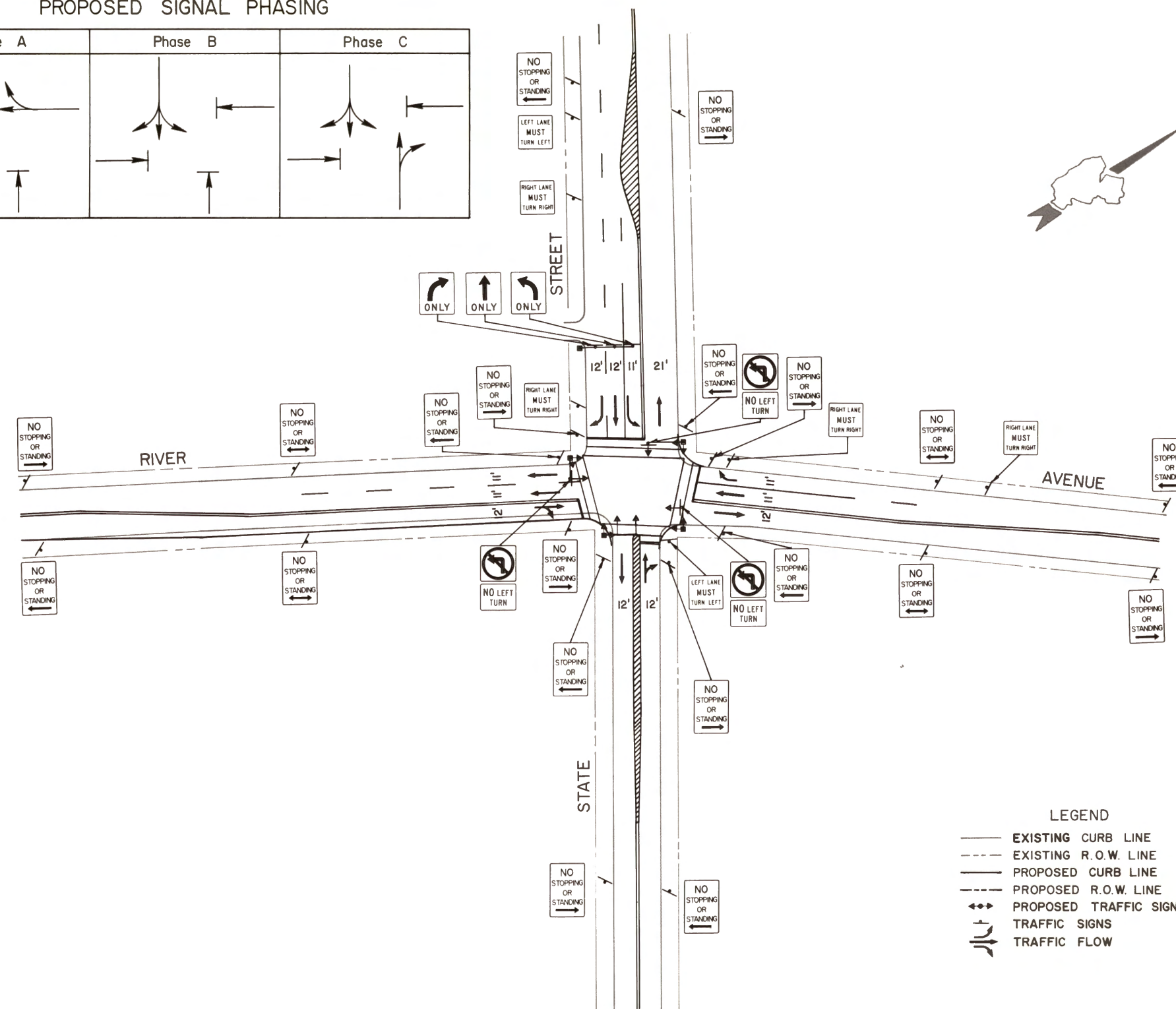
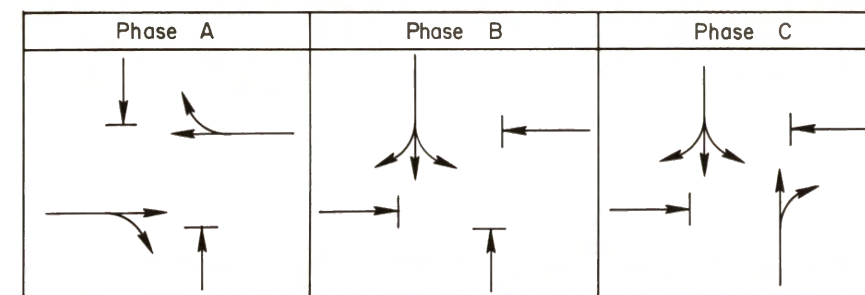
	NO. OF ACCIDENTS/NO. OF INJURIES
1.	
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100.	

ACCIDENT RATE = 1.49 *

ACCIDENT INTENSITY = 26 (4 UNKNOWN)

* PER MILLION VEHICLES

PROPOSED SIGNAL PHASING



LEGEND

	EXISTING CURB LINE
	EXISTING R.O.W. LINE
	PROPOSED CURB LINE
	PROPOSED R.O.W. LINE
	PROPOSED TRAFFIC SIGNALS
	TRAFFIC SIGNS
	TRAFFIC FLOW

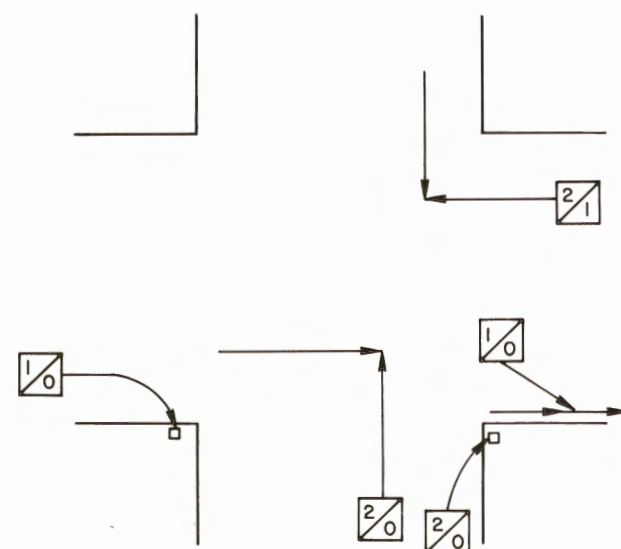
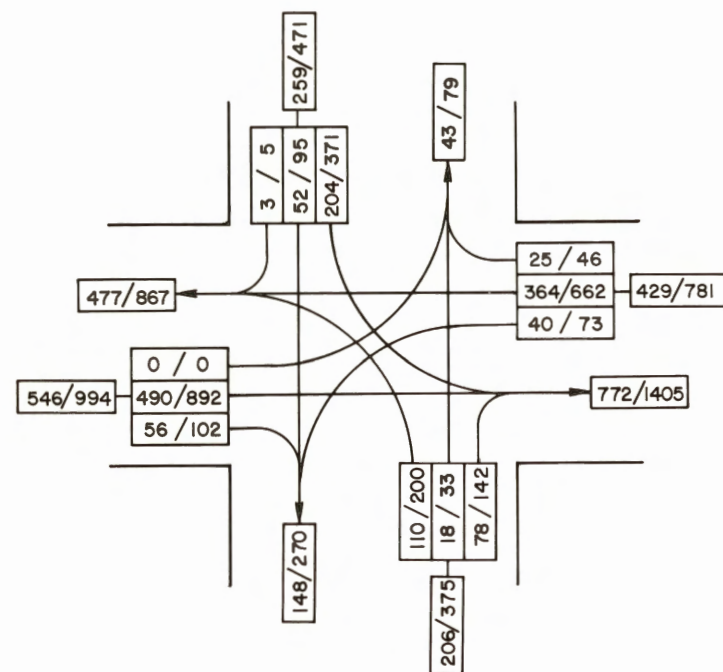
CITY OF CAMDEN TOPICS STUDY

RIVER AVENUE AND STATE STREET

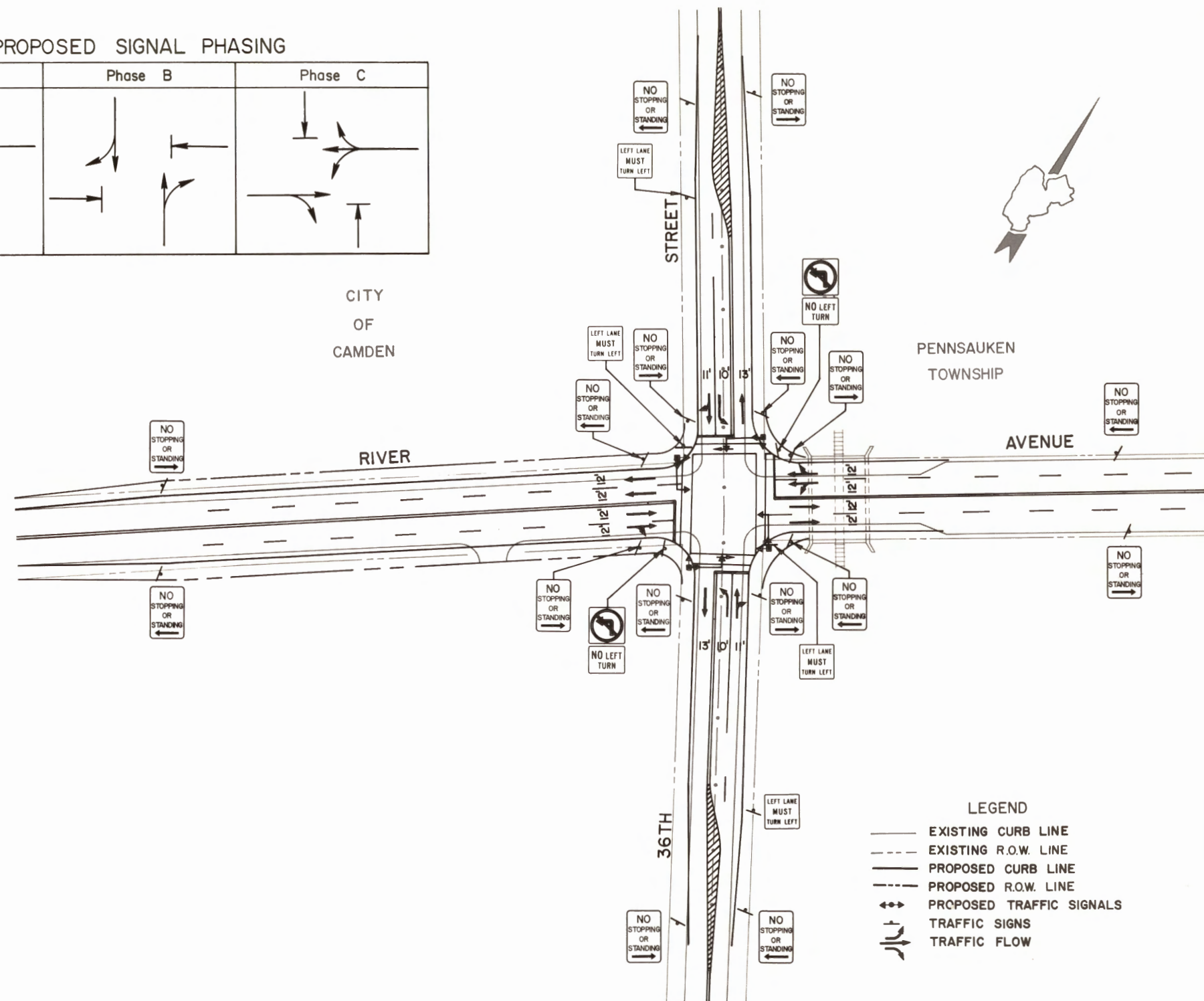
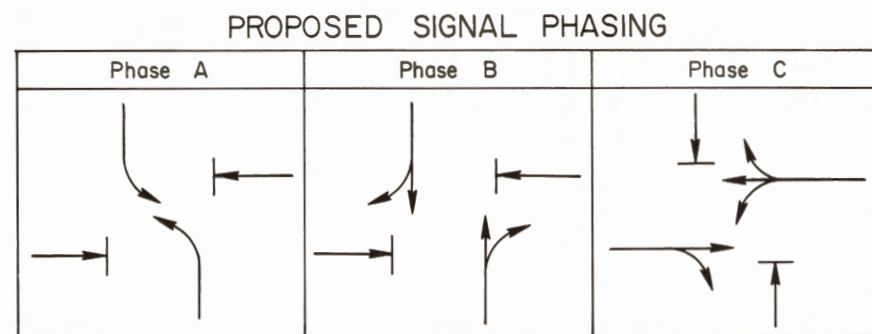


URBAN ENGINEERS INC.

PLATE NO. 54



* PER MILLION VEHICLES



- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ⬆⬆ PROPOSED TRAFFIC SIGNALS
 - ⬆ TRAFFIC SIGNS
 - ➔ TRAFFIC FLOW

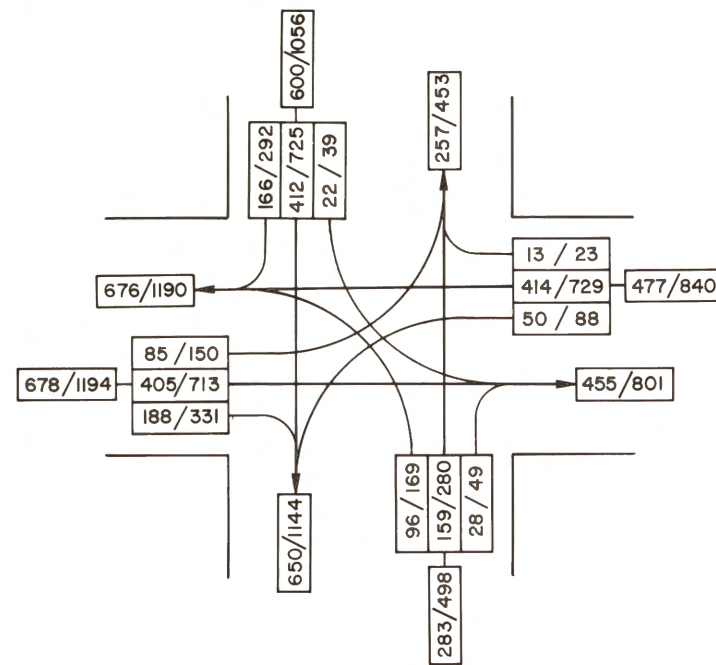
CITY OF CAMDEN TOPICS STUDY

RIVER AVENUE AND 36 TH STREET

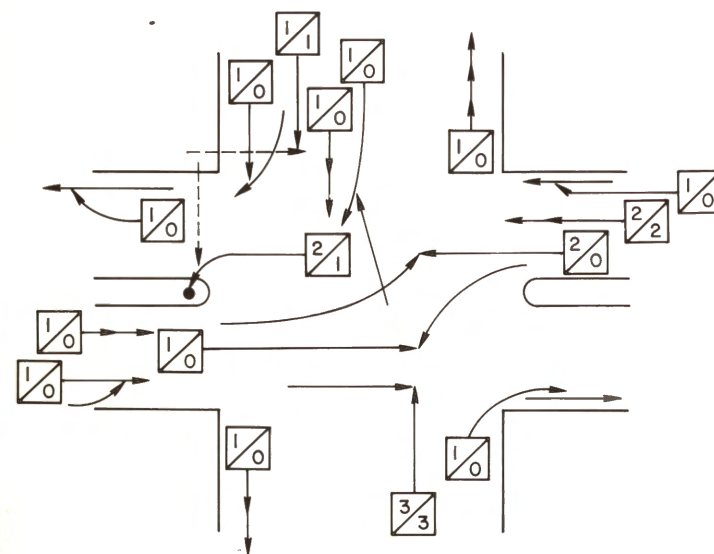
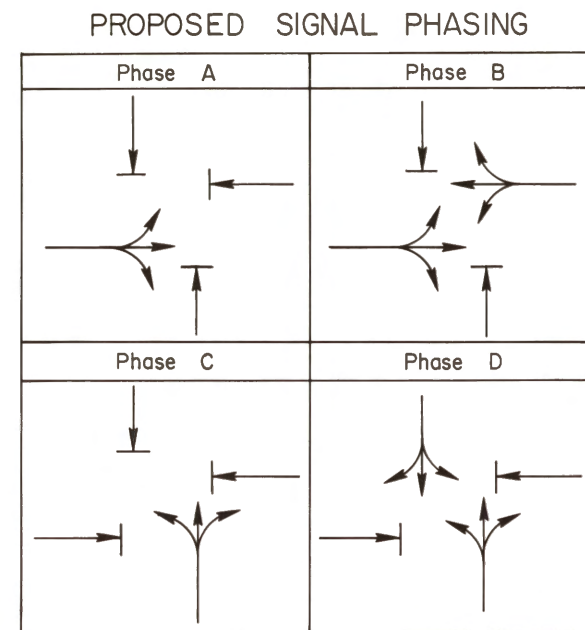


URBAN ENGINEERS INC.

PLATE NO. 55

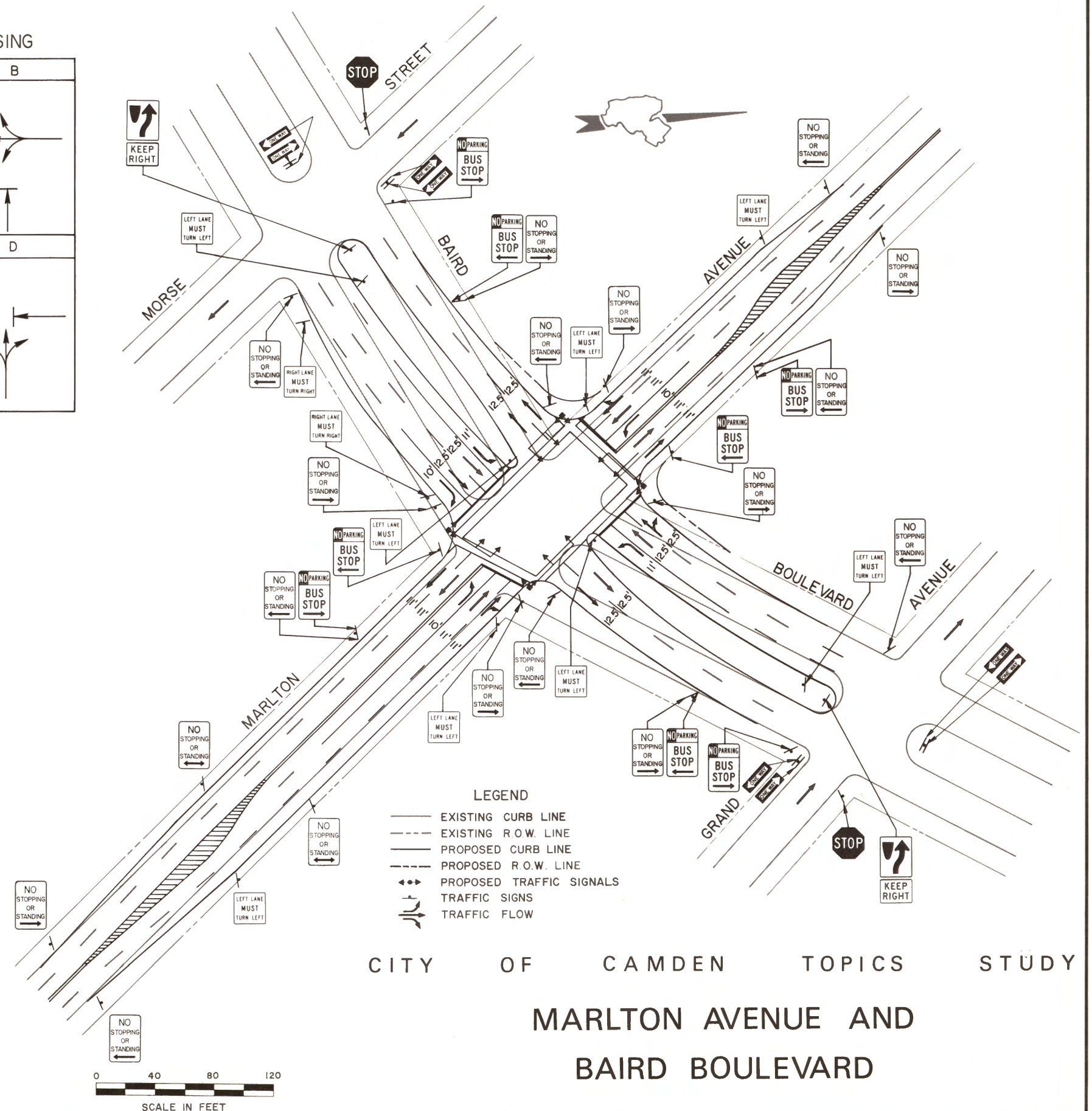


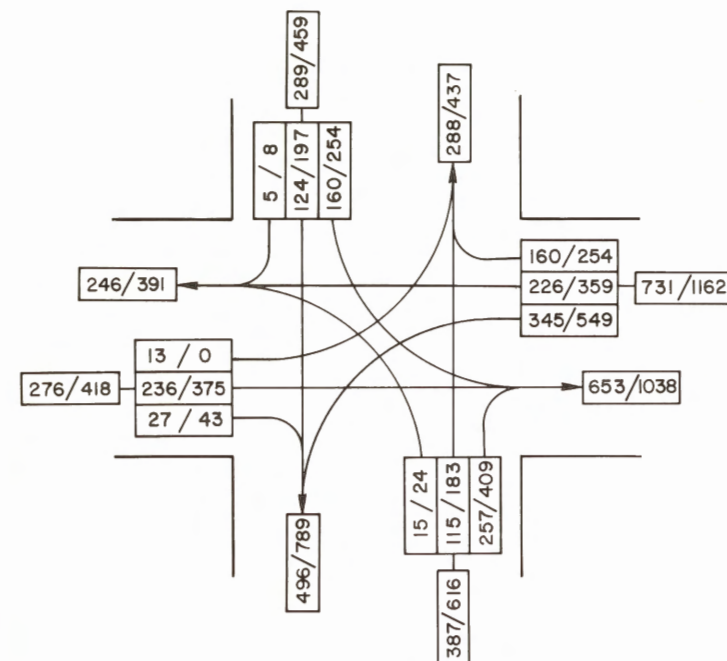
PEAK HOUR VOLUME
25 / 35 1971 PHV/1980 PHV



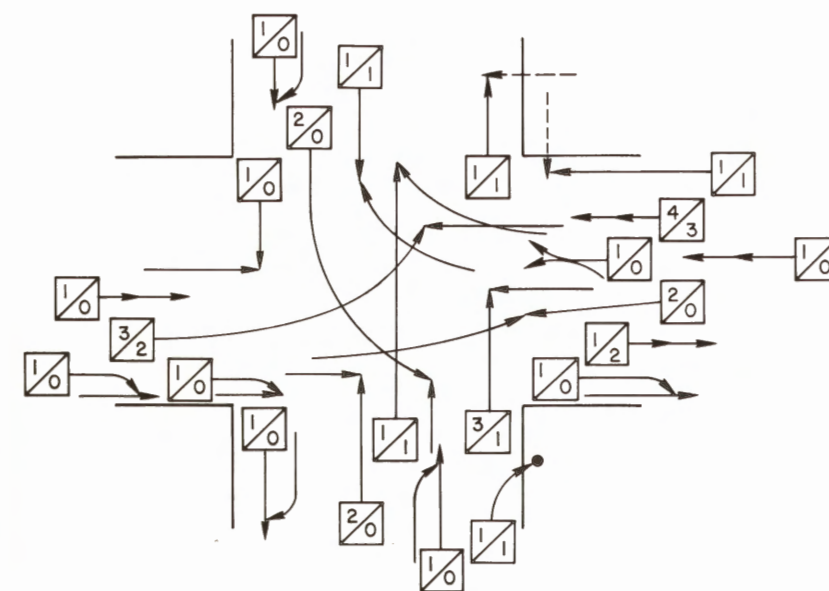
THREE YEAR ACCIDENT SUMMARY
 NO. OF ACCIDENTS/NO. OF INJURIES
 ACCIDENT RATE = 1.42 *
 ACCIDENT INTENSITY = 31 (10 UNKNOWN)

* PER MILLION VEHICLES





PEAK HOUR VOLUME
25 / 35 1971 PHV / 1980 PHV



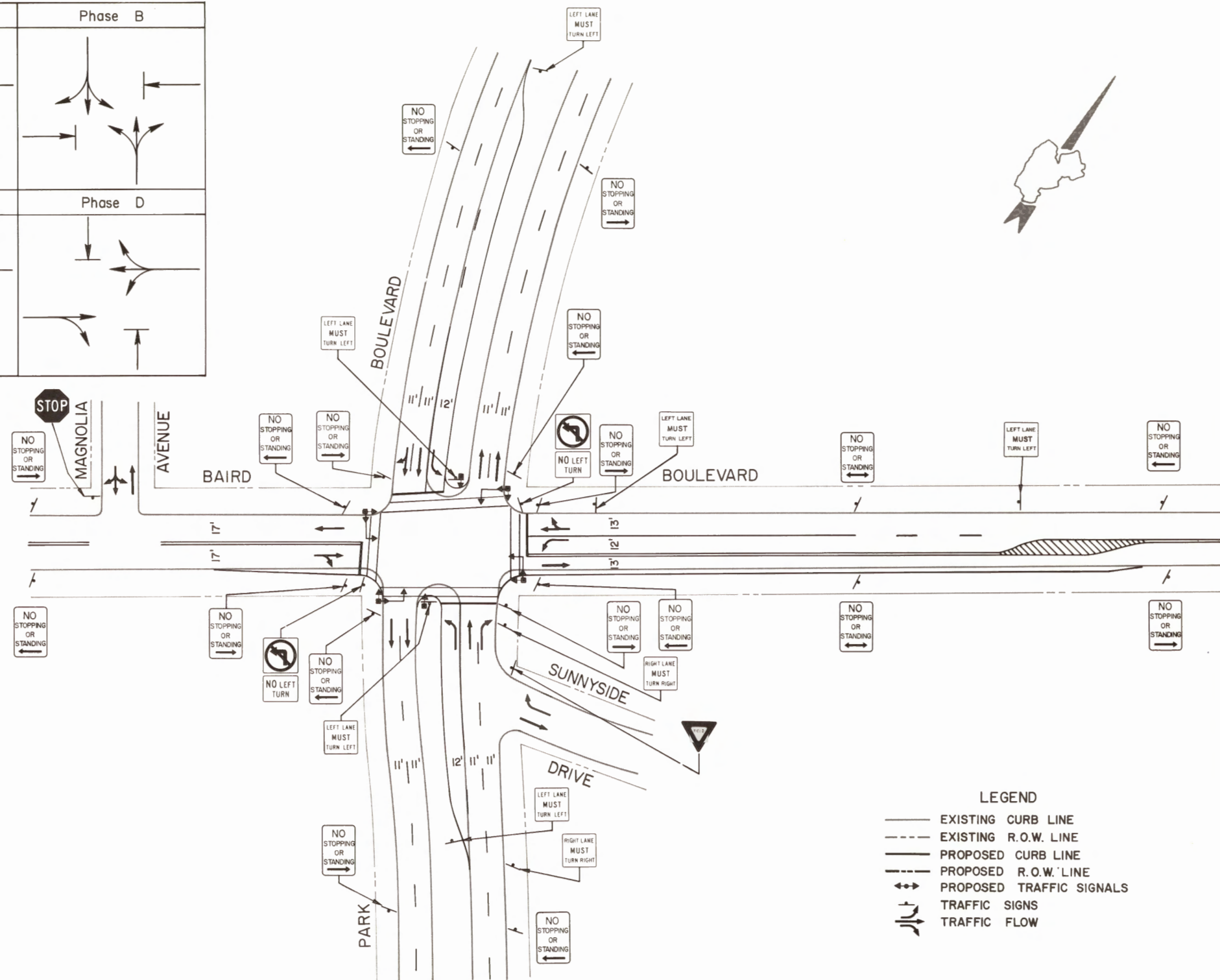
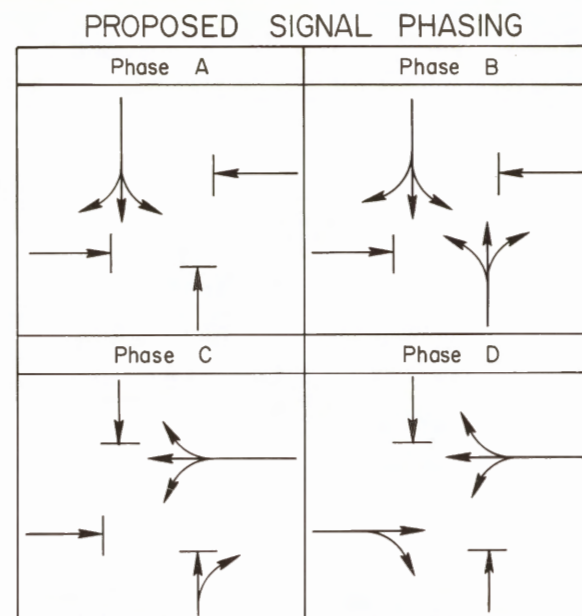
THREE YEAR ACCIDENT SUMMARY

1/1 NO. OF ACCIDENTS / NO. OF INJURIES

ACCIDENT RATE = 2.48 *

ACCIDENT INTENSITY = 37 (5 UNKNOWN)

* PER MILLION VEHICLES



- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - - - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ⬆⬆⬆ PROPOSED TRAFFIC SIGNALS
 - ⬆ TRAFFIC SIGNS
 - ➔ TRAFFIC FLOW

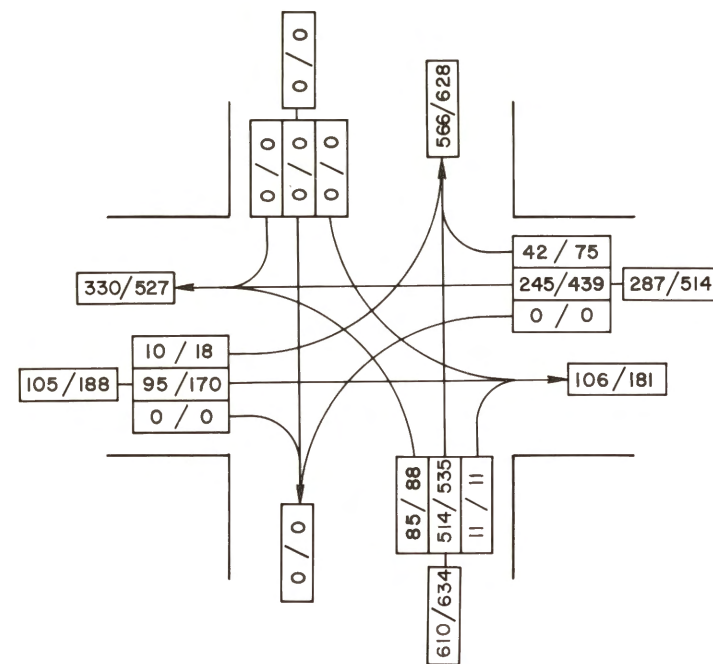
CITY OF CAMDEN TOPICS STUDY

PARK BOULEVARD AND BAIRD BOULEVARD

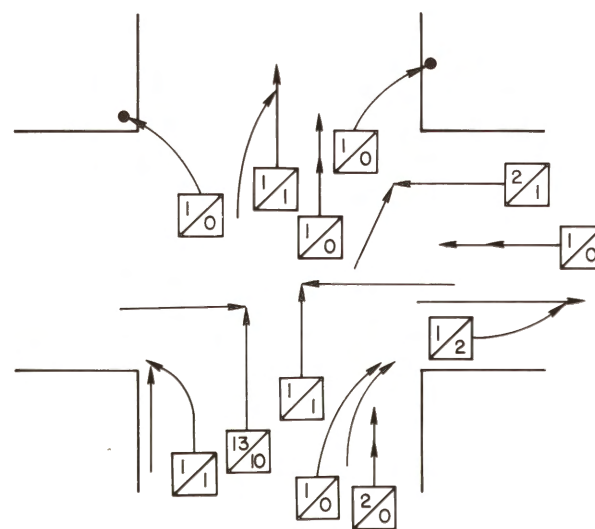


URBAN ENGINEERS INC.

PLATE NO. 57



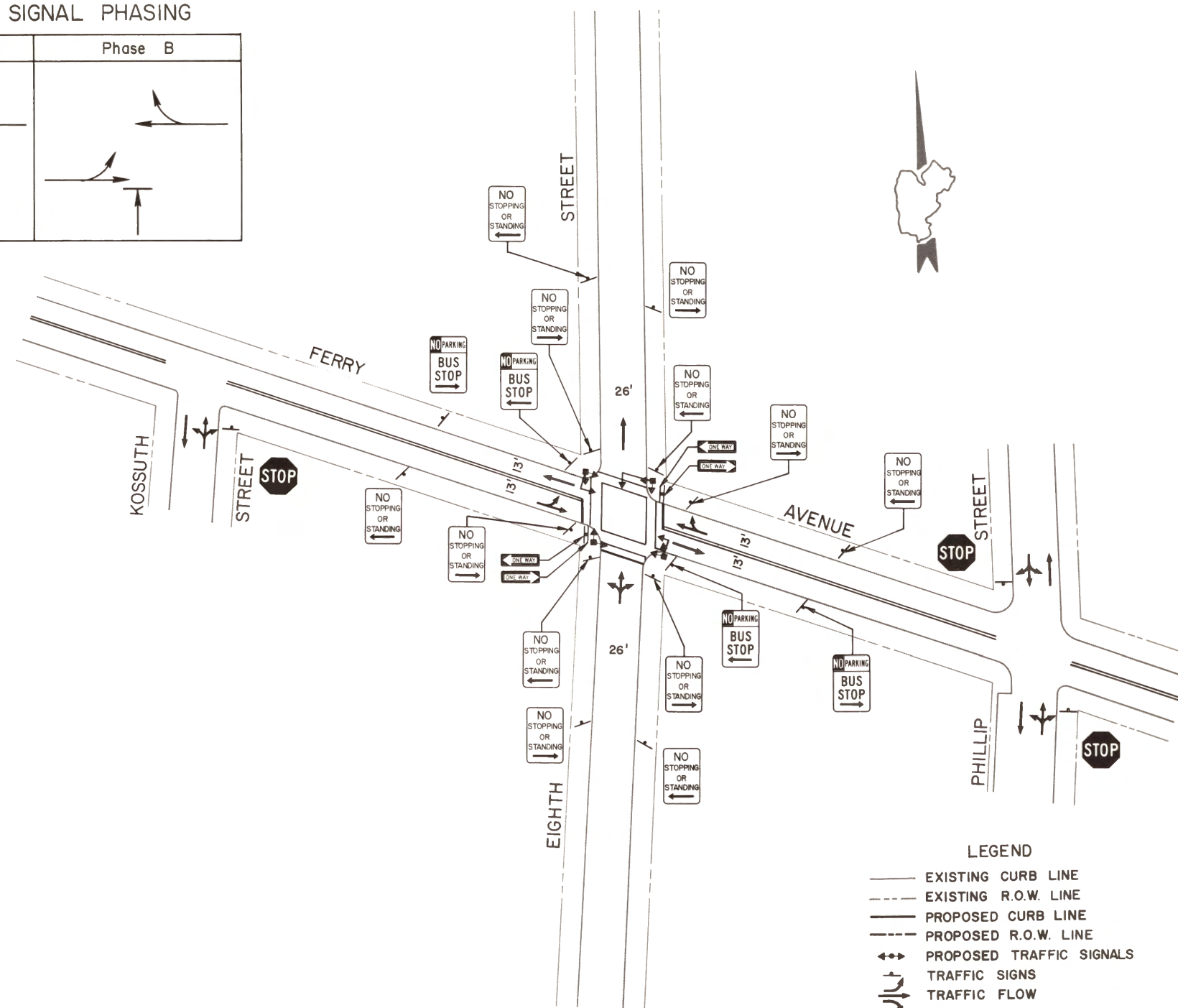
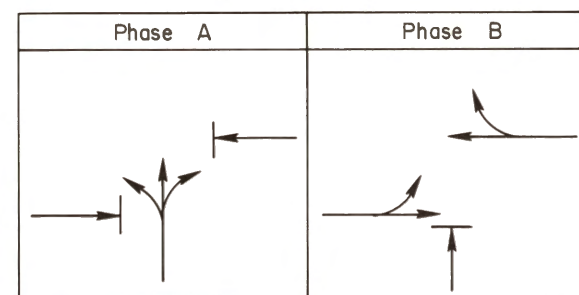
PEAK HOUR VOLUME
25 / 35 1971 PHV / 1980 PHV



THREE YEAR ACCIDENT SUMMARY
NO. OF ACCIDENTS / NO. OF INJURIES
ACCIDENT RATE = 2.38 *
ACCIDENT INTENSITY = 28 (2 UNKNOWN)

* PER MILLION VEHICLES

PROPOSED SIGNAL PHASING



- LEGEND
- EXISTING CURB LINE
 - - - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - - - PROPOSED R.O.W. LINE
 - ⬆⬆ PROPOSED TRAFFIC SIGNALS
 - ⬆ TRAFFIC SIGNS
 - ⬆ TRAFFIC FLOW

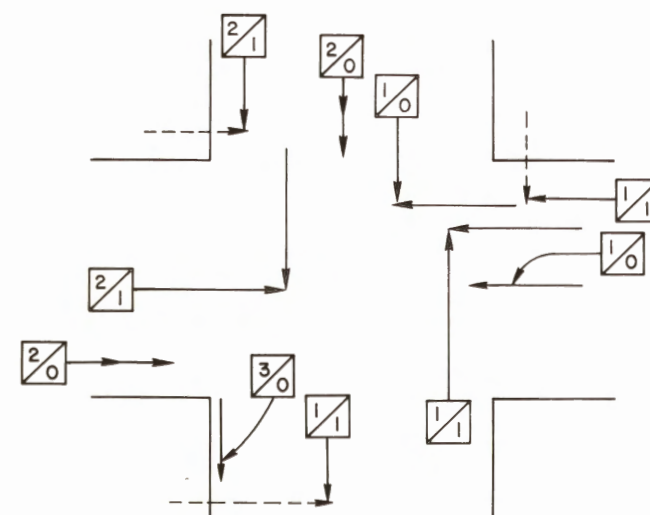
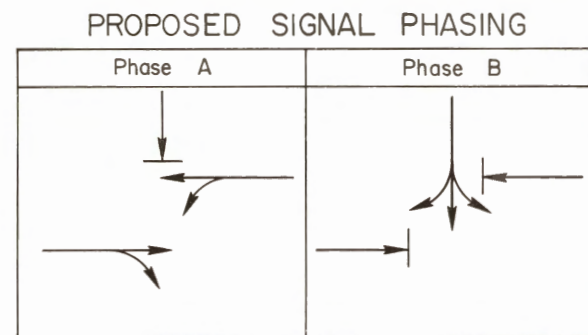
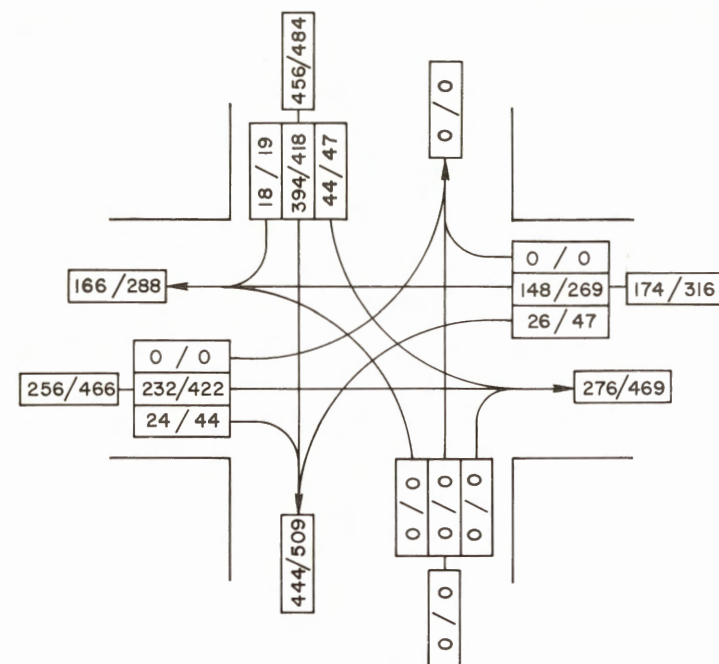
CITY OF CAMDEN TOPICS STUDY

FERRY AVENUE AND EIGHTH STREET



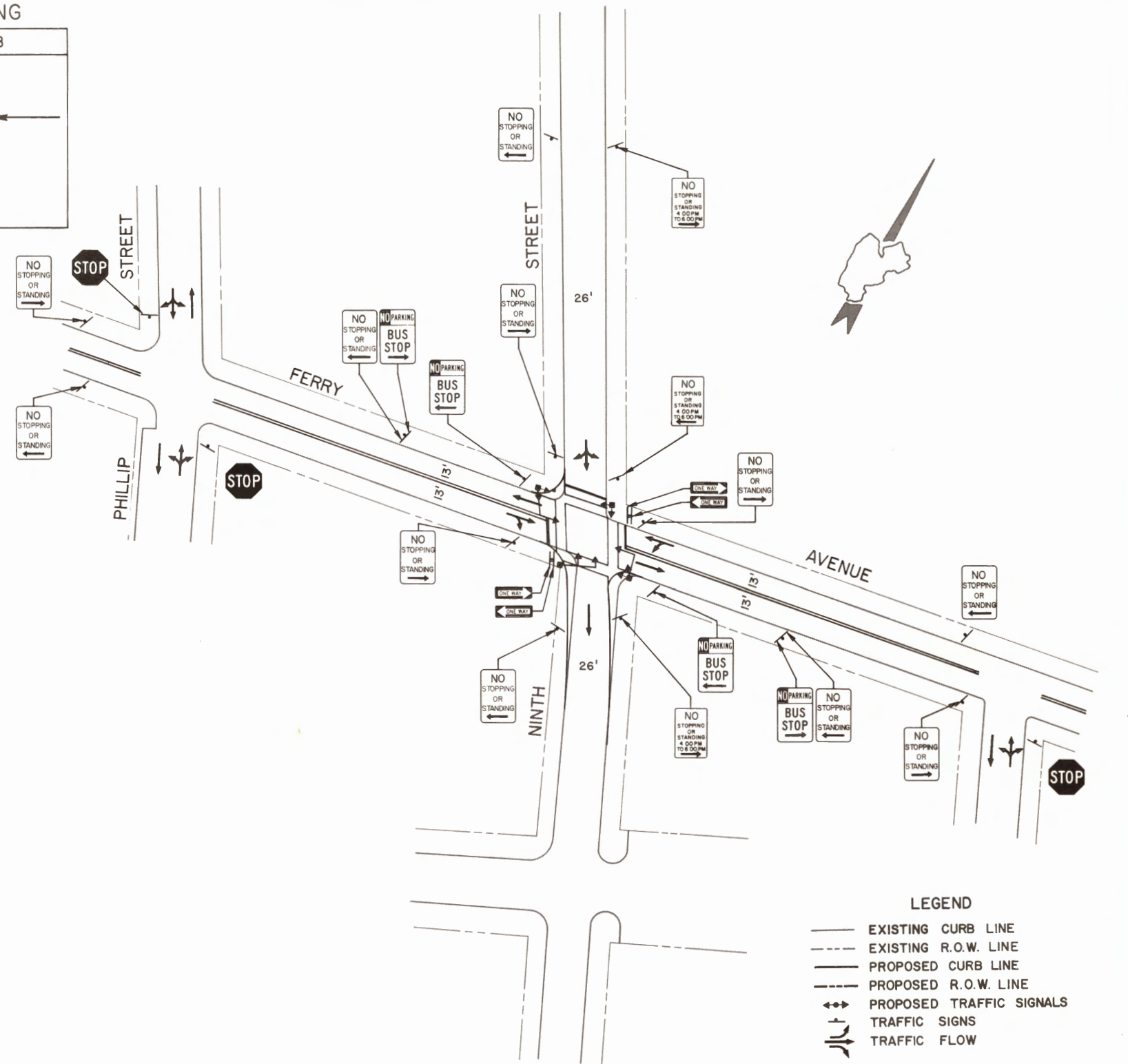
URBAN ENGINEERS INC.

PLATE NO. 58



THREE YEAR ACCIDENT SUMMARY
 [Box with 1/1] NO. OF ACCIDENTS/NO. OF INJURIES
 ACCIDENT RATE = 1.72 *
 ACCIDENT INTENSITY = 17 (1 UNKNOWN)

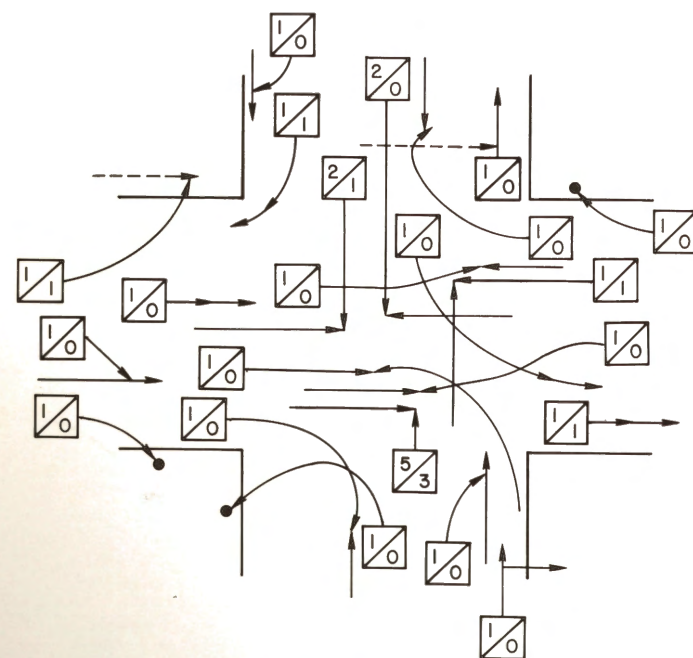
* PER MILLION VEHICLES



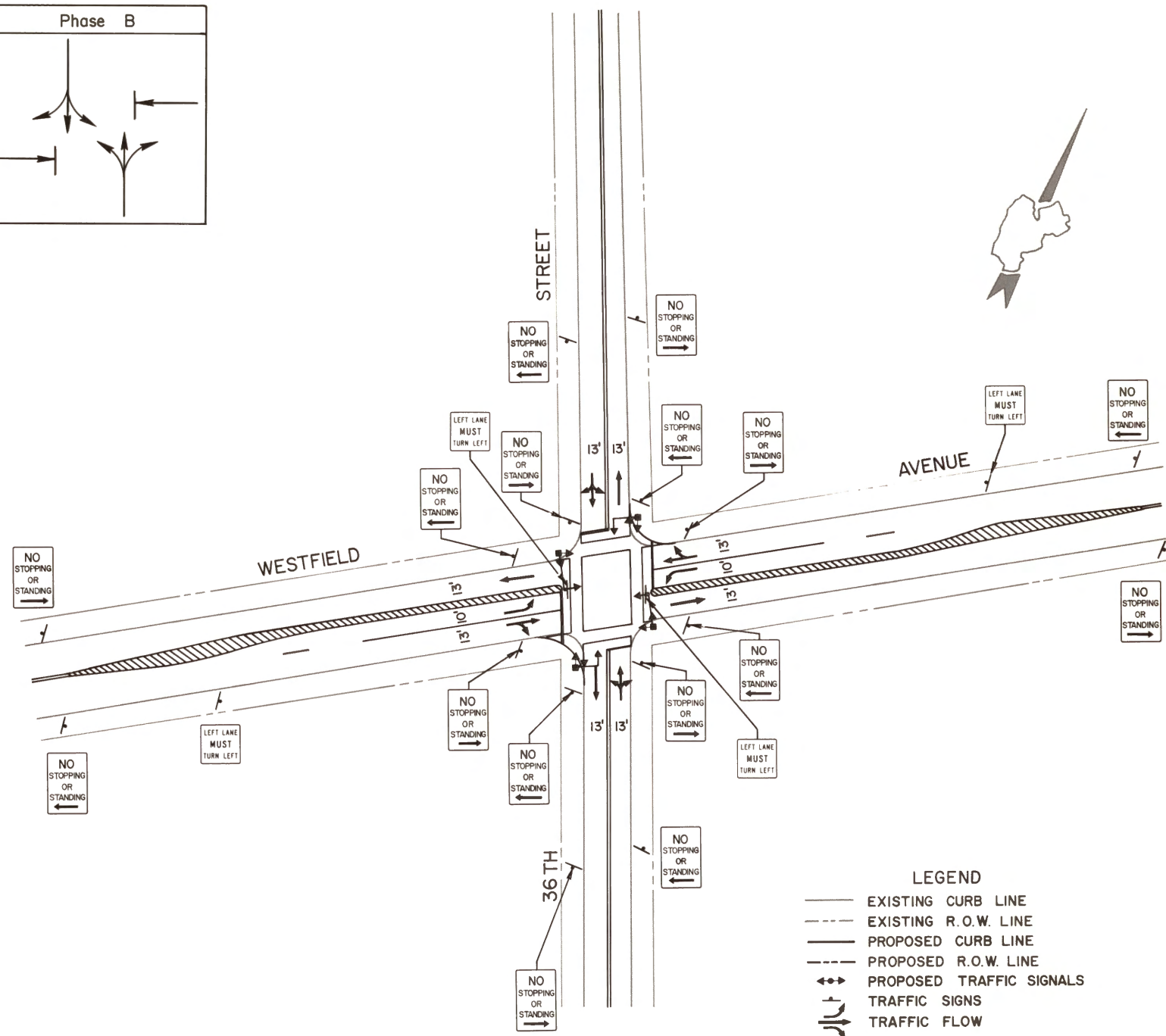
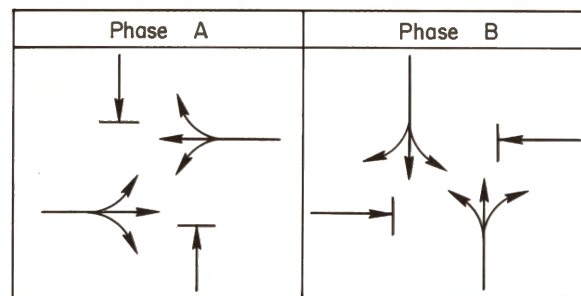
- LEGEND
- EXISTING CURB LINE
 - EXISTING R.O.W. LINE
 - PROPOSED CURB LINE
 - PROPOSED R.O.W. LINE
 - PROPOSED TRAFFIC SIGNALS
 - TRAFFIC SIGNALS
 - TRAFFIC FLOW

CITY OF CAMDEN TOPICS STUDY

FERRY AVENUE AND NINTH STREET



PROPOSED SIGNAL PHASING



WESTFIELD AVENUE AND 36 TH STREET



PLATE NO. 60



0 1000 2000 3000
SCALE IN FEET

LEGEND

CLASSIFICATION	MILEAGE
FEDERAL AID INTERSTATE	2.1
FEDERAL AID PRIMARY TYPE I	2.9
FEDERAL AID SECONDARY	5.2
FEDERAL AID URBAN	23.9
RECOMMENDED FEDERAL AID PRIMARY TYPE II	11.5
TOTAL	45.6

CITY OF CAMDEN TOPICS STUDY RECOMMENDED FEDERAL AID SYSTEM

URBAN ENGINEERS INC.

PLATE NO. 61



URBAN ENGINEERS, INC.
CONSULTANTS