

TO MY FRIEND
AND COLLEAGUE

ALEX TAFI

MAY YOU CONTINUE TO RIDE BY ALTERNATIVE MEANS

Bill

December 1996

URBAN ROUTE BICYCLE SYSTEM
MASTER PLAN

CITY OF NEWARK, DELAWARE
SEPTEMBER 1973

THE PREPARATION OF THIS DOCUMENT WAS FINANCED IN PART THROUGH A COMPREHENSIVE PLANNING GRANT FROM THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, UNDER THE PROVISIONS OF SECTION 701 OF THE HOUSING ACT OF 1954, AS AMENDED.

TABLE OF CONTENTS

	PAGE
Forward	i
The Need For A Protected Bicycle System	1
Travel Desire Patterns	3
Bike User Classifications	4
"Utilitarian" or Activity-Centered Bicycling	4
"Recreational" and "Physical Fitness" Bicycling	5
Urban Route Bicycle System	7
Background	7
System Criteria	7
Terminology	8
Master Plan Stages	9
Stage One Description	11
Construction Elements	18
Bicycle Signs	18
Bicycle Paths	19
Corrective Measures	20
Public Awareness Program	21
System Implementation	23
Appendix: Bicycle Rules and Regulations	24

LIST OF FIGURES

	PAGE
1. Master Plan Urban Route Bicycle System	13
2. Stage One	14
3. Stage Two	15
4. Stage Three	16
5. Stage Four	17

FORWARD

For several years Newark has been continually faced with a need to provide both a recognition and a safe means for the use of bicycles throughout our community. As increasing numbers of students and adults have turned to bicycling as a means of transportation and recreation, it behooves us to provide a system of bicycle routes. This Master Plan, therefore, has been prepared to meet such a need and reflects the efforts of a committee comprised of representatives from the City, University of Delaware, Newark School District, and interested citizens.

THE NEED FOR A PROTECTED BICYCLE SYSTEM

In analyzing the problem of accommodating pedestrian, bicycle and motor vehicular traffic use within a community transportation network, it is oftentimes difficult to determine the safest and most efficient place for the bicycle. Typically, traffic regulations have "tolerated" the bicyclist between the pedestrian and vehicular traffic, resulting in an unsafe situation. Moreover, the bicycle rider has been held at a disadvantage by being thought of as a type of traffic more related to motor vehicles rather than to pedestrians. Thus it is worthwhile that these three modes of travel -- pedestrian, bicycle and motor vehicular -- be made a conscious part of a total transportation system. This can be done by careful planning and we should strive to achieve such an accommodation on existing thoroughfares.

The City of Newark, and the surrounding community, could benefit greatly from a network of bicycle routes. With the constant increase in traffic on confined City streets, bicycling and walking become hazardous undertakings in many areas. Students in the Newark schools, in a number of instances, must ride a bus to school, even though they live well within walking or biking distance. Citizens of all ages, aware of the benefits of physical fitness and good health derived from bicycling, are often jeopardized by the automobile when taking a leisurely ride. Youngsters, for whom the bicycle is the only means of transportation, have no safe way to travel to the playgrounds and parks which have been provided for their use.

By providing a system of bikepaths and bikeways in Newark, many of these problems can be eliminated. Although it would require very few concessions from motorists and the general public, the opportunity it will bring to cyclists in greater Newark will many times exceed any temporary inconvenience. The situation definitely cannot be ignored. Since urban development has traditionally been centered around the automobile, which has provided greater mobility to our society, we have not tended to consider very seriously other solutions to serve the needs of our total community. Consequently, bicycling with its indispensable role, must be emphasized as it never has before.

TRAVEL DESIRE PATTERNS

Those roadways typically carrying the major automobile traffic are usually classified as arterial routes.¹ These roadways are the thoroughfares which provide the primary means of entering and leaving Newark's central core, such as Main Street, South College Avenue, Elkton Road, South Chapel Street, and New London Road. They are also the most convenient means of travel through the City for University students and public school children. Thus, these arterials are from time to time congested by pedestrians, bicyclists and automobiles. In light of these patterns of travel, it is obvious that there is a necessity for the establishment of an efficient and safe method of travel for the bicyclists if they are to be accommodated on the City streets as a specific mode of travel.

¹Arterial streets are generally considered to be primarily for fast or heavy traffic; Collector streets, on the other hand, carry traffic from minor or local streets to the arterial system.

BIKE USER CLASSIFICATIONS

A system of bikeways would serve two basic types of cycling activities. They are: 1) "Utilitarian" or activity-centered bicycling; and, 2) "Recreational" and "Physical Fitness" bicycling. These two significant bicycle uses are discussed below in fuller detail.

"Utilitarian" or Activity-Centered Bicycling

This classification represents the most community-oriented type of bicycling and includes the use of bicycles for such activities as daily commuting to and from work or school, for running errands, and for transportation to specific activity centers such as the business district, parks, playgrounds, and other community facilities. This classification generally has the largest and most extensive daily bicycling ridership within the community since travel is mostly intra-city in character. Therefore, a bicycle route system must be planned and designed to be practical in facilitating this major bicycling classification. Since bicyclists under this category are generally motivated to reach a specific destination, there is a general aversion to any significant out-of-direction travel. Therefore, meandering or inconveniently situated bicycle routes or paths will not normally be selected or used on a daily basis except under coincidental circumstances. Experience has shown and observation indicates that many, if not most, bicyclists under this classification predominantly use "collector" and "arterial" streets on a regular basis to and from activity centers. Therefore, the concept

of selecting and designating certain urban streets categorized as "collectors" and in some instances "arterials" for use as bicycle routes not only appears desirable but essential in serving the needs of most bicycle riders.

"Recreational" and "Physical Fitness" Bicycling

This second bicycling classification includes the following general activities: a) sightseeing, b) touring, and c) racing. These activities by their very nature and character are more regionally-oriented and may involve extensive inter-city and county travel routes. Bicyclists under the "sightseeing" and "touring" categories generally prefer and select meandering, scenic, and visually interesting streets, roads, and highways that have low volumes of automobile and truck traffic. For these activities, a time-saving between an origin and destination does not necessarily appear to be a relevant route selection criterion. Bicyclists under the "racing" category generally prefer and choose streets, roads, and highways with reasonably good and smooth riding surfaces, low volumes of automobile and truck traffic, and "loop-routes" wherever available. "Physical Fitness" bicycling represents perhaps the most local type of bicycling and it comprises the adult population desirous of or striving for physical fitness. Bicyclists involved in this activity are, therefore, not expected to select or use the established bicycle routes or paths to a significant degree except under circumstances related to the local orientation of their activities. The extent of bicycling activity of this type is particularly



difficult to determine because of general variations in the schedules and habits of these bicyclists.

URBAN ROUTE BICYCLE SYSTEM

Background

During 1972 the City Planning Department invited various agencies and citizens to begin discussions concerning the possibility of developing a comprehensive system of bike routes. This Ad Hoc group became known as the Bikeways Planning Committee and comprised representatives from the City departments of Public Works, Police, and Parks and Recreation; the University of Delaware's Departments of Planning and Security; the Newark School Districts' Planning Department; and several concerned citizens.

For many months the committee was to be engaged in a variety of research activities including an analysis of how other communities have developed bike route systems, and a careful review of Newark's transportation system and how it could be utilized for bikes. (In effect it was agreed that the City should be presented with a comprehensive approach to providing bike routes. This was to be accomplished through a Master Plan for an Urban Route Bicycle System.)

System Criteria

The chief emphasis of the Master Plan was to evaluate basic criteria that would be the foundation for ultimate implementation of any bike route system. As a result, four noteworthy considerations were considered as a starting point:

1. Travel patterns of people around the City;
2. Routes used by University students and public

- school children in transition from home to school;
3. Existing roadways which from a design and safety viewpoint could accommodate bikeways; and,
 4. Consideration of other problems such as on-street parking and congested areas that create vehicular-pedestrian points of friction thereby posing safety hazards.

Terminology

There are four major terms or designations used throughout the Master Plan that reflect specific functions of the Urban Route Bicycle System and are defined as follows:

Urban Route Bicycle System is used to define the entire system of bike paths and routes, or the composite transportation system allocated to bicycle use either exclusively or as part of other modes of travel.

Bicycle (or Bike) Path refers to a specific section or segment of the entire system that is specifically set aside or marked as a right-of-way for bicycle use. Signs, painted lines (or raised dividers at some future time) will denote the location of paths.

Bicycle (or Bike) Route refers to any segment of the Urban Route Bicycle System and includes either bike paths or bike ways.

Bicycle (or Bike) Way refers to a specific section or segment of the entire system that is designated by signs for bicycle use.

Master Plan Stages

Since the automobile has dominated all transportation planning in the City, it would be impossible to completely isolate bicycle routes from automobile routes. Therefore, a compromise was reached, whereby the bicycle would be given a section of those travel routes already used by cars and pedestrians, (namely streets and sidewalks). Along those roads where traffic is extremely heavy, or where existing street design constraints do not permit, it was believed necessary to take the bikeway onto sidewalks.² The complete system, designed to include all major routes of travel in the City, and will provide much safer and more pleasurable means of bicycling, whether it be utilitarian or recreational.

The Master Plan includes five stages as more fully described below and as shown in Figure 1. It should be clear, however, that while such a proposal may at this time be thought of as an ultimate or ideal plan, which is feasible, the possibility of revision should not be negated. That is to say, the Master Plan should proceed

²During September 1973, Stage One became operationalized with certain sidewalks designated as a bike path in accordance with this concept. However, it should be pointed out that bike paths on a sidewalk are not as practical as originally anticipated. Thus this situation is currently under re-evaluation.

through implementation by stages in order to evaluate its efficiency on a continuing basis. For example, after each stage has been completed, a six month time period (approximate) has been allotted to review its usefulness and validity. Thus adjustments can be made before the next stage is completed. Such a procedure is both indicative of the concept of sound planning -- which can truly be responsive to community needs -- as well as eliminate unnecessary physical improvements.

The Stage One Plan shown on Figure 2, has been implemented and has included those route segments that required only minor preparation, such as signs and painted paths. The total linear measurements of this stage is approximately 6.7 miles. Stage Two (see Figure 3) is suggested to be accomplished by Spring, 1974, and equals about 3.3 miles. Stage Three (shown on Figure 4) is planned for Fall, 1974, and measures 3 miles. Stage Four totals only 2.3 miles and is planned to be operational by Spring, 1975, and is depicted on Figure 5. Stage Five, designated as a tentative stage on Figure 1, corresponds -- in planning principle -- to the proposed realignment of South Chapel Street, the extension of Delaware Avenue, and related improvements.

After Stage Four is completed it would be desirable at that time to consider specific improvements that can be made along the stream valleys of the White Clay Creek and Christina River to establish a series of scenic-recreational bike routes and trails. Although details are not included at this time, the general concept of stream valley bikeways is viewed as an important long

range element in a comprehensive urban route bicycle system and is therefore proposed to be more thoroughly analyzed.

Stage One Description

The First Stage of the Master Plan became operational in September, 1973, and includes the following areas:

South College Avenue:

Bike Path (sidewalk) - from the University Stadium to Main Street on east side of street;

Bikeway - from South College Avenue on Main Street, running west to Church Lane on north side of street;

Bike Path - Church Lane (west side) to Darlington Lane (south side) to South College Avenue.

North College Avenue

Bike Path - from Main Street to Cleveland Avenue (both sides);

Bikeway - from Cleveland Avenue to Ray Street (both sides).

Delaware Avenue

Bike Path - from South College Avenue to Newark High School (south side);

Bike Path (sidewalk) - from Chapel Street to South College Avenue.

Tyre Avenue

Bikeway - from Delaware Avenue to Main Street (east side)

Amstel Avenue

Bike Path - from Elkton Road to Orchard Road (north side)
and from Orchard Road to South College Avenue (south
side)

Elkton Road

Bike Path - from Amstel Avenue to City limits (both sides)

Barksdale Road

Bike Path - from Elkton Road to Casho Mill Road to Blue
Hen Ridge Road (both sides)

Casho Mill Road

Bike Path - from Barksdale Road to Vassar Drive (both sides)

Dallam Road - Baylor Drive - Casho Mill Road

Bikeway - from Hillside Road to Baylor Drive (both sides);
Vassar Drive to Casho Mill Road (both sides)

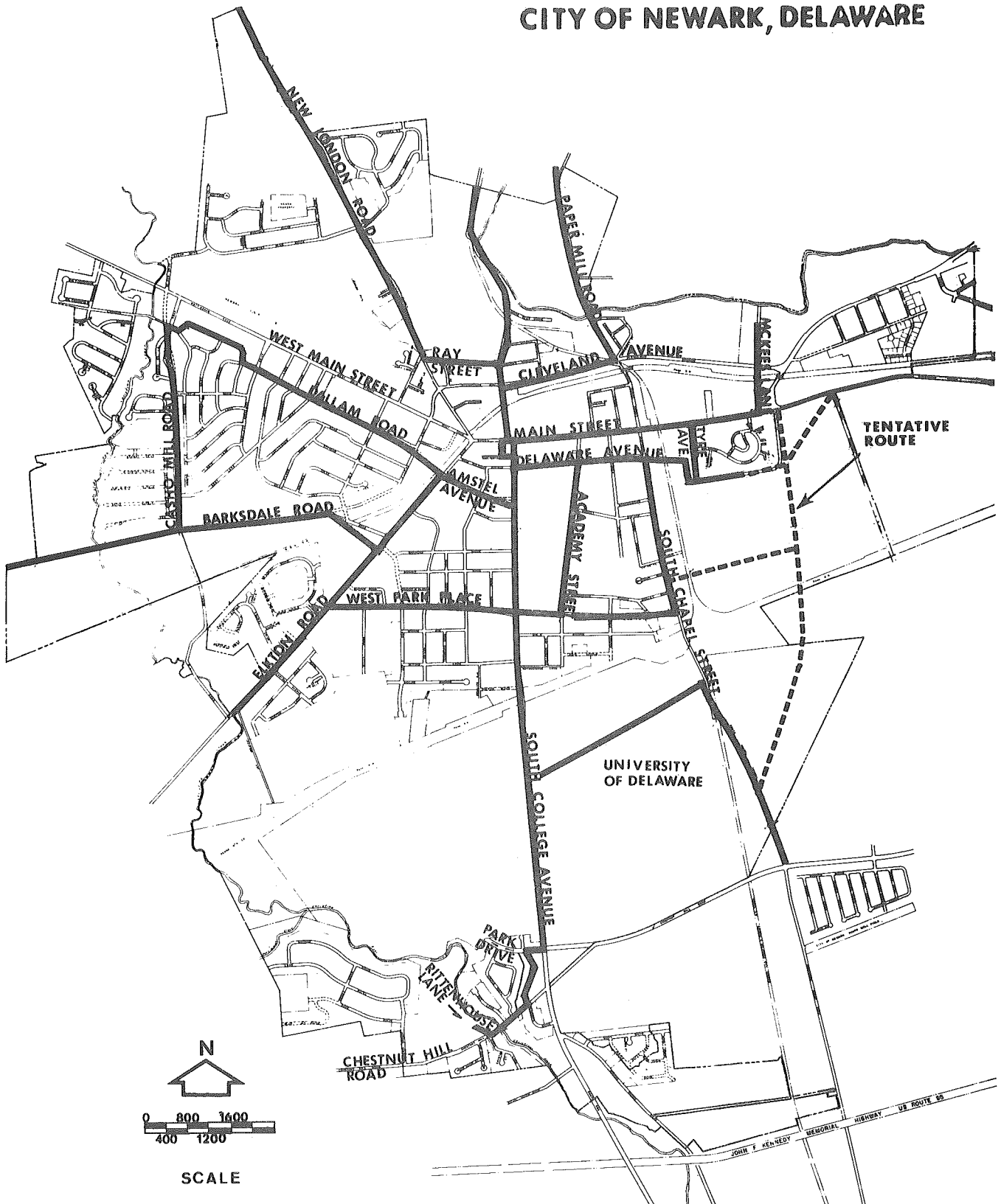
Hillside Road

Bike Path - from Barksdale Road Bridge to Dallam Road
(west side);

Bikeway - from Dallam Road to Barksdale Road (west side)

FIGURE ONE

MASTER PLAN URBAN ROUTE BICYCLE SYSTEM CITY OF NEWARK, DELAWARE



NEWARK PLANNING DEPARTMENT

FIGURE TWO

STAGE ONE URBAN ROUTE BICYCLE SYSTEM CITY OF NEWARK, DELAWARE

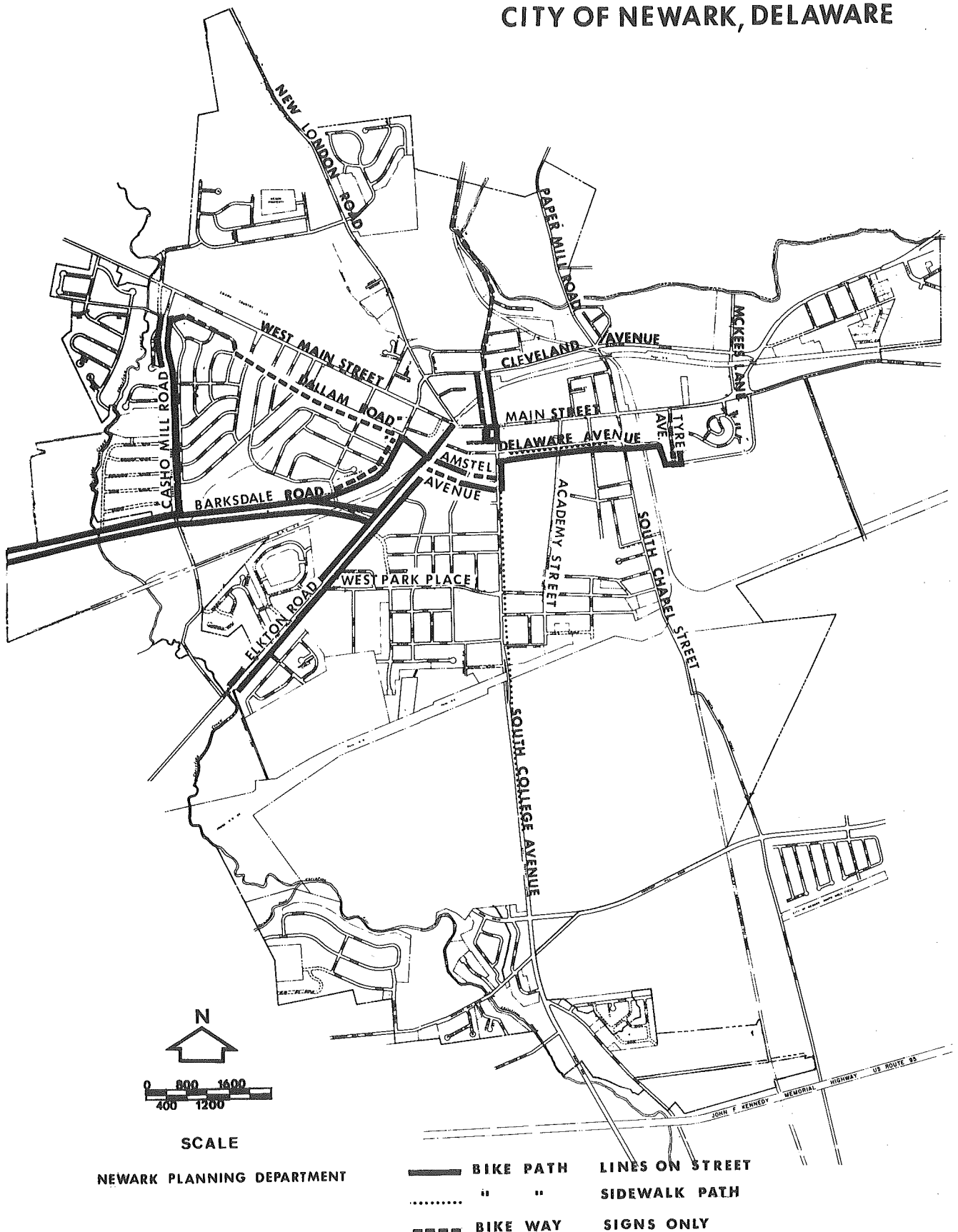
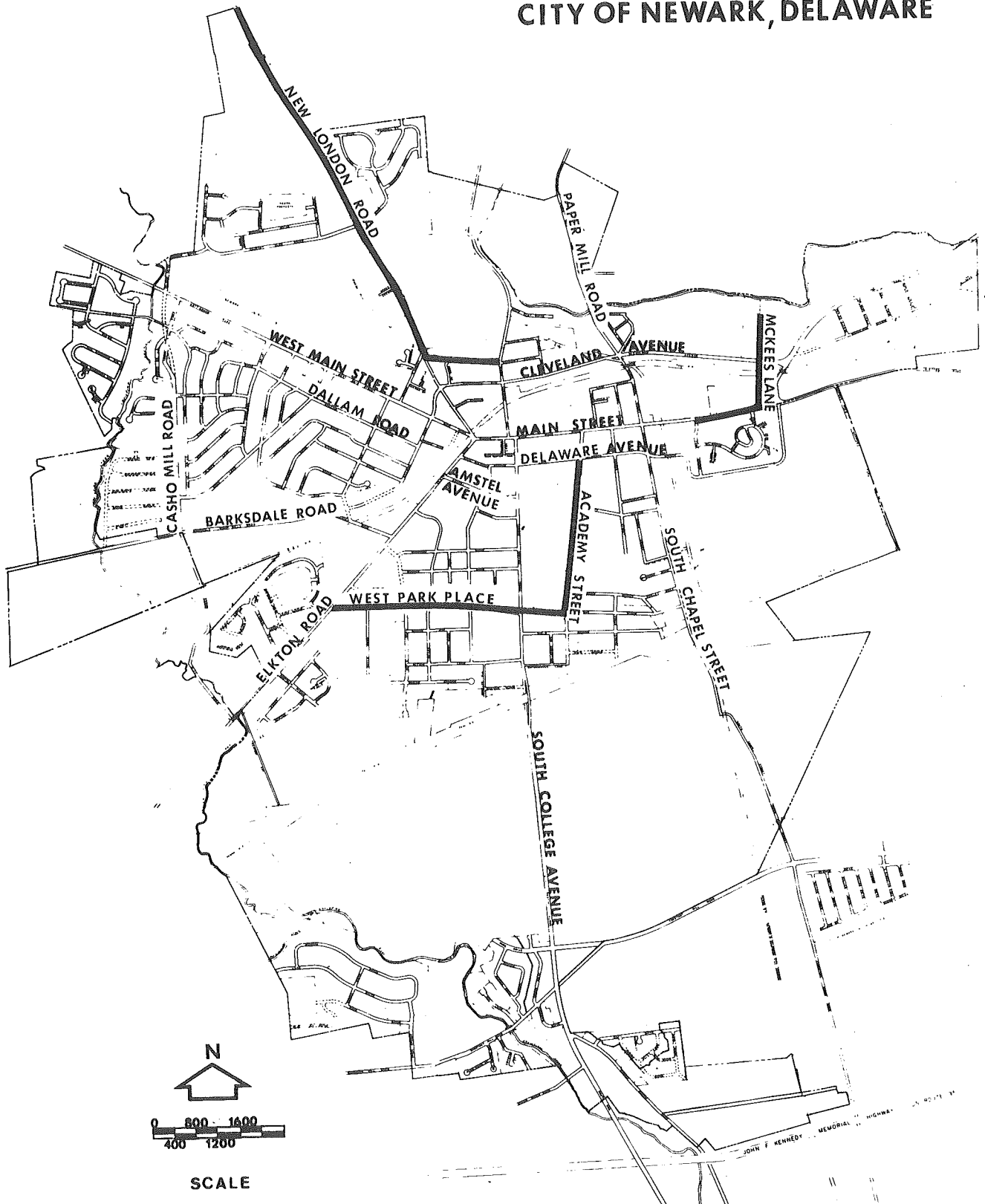


FIGURE THREE

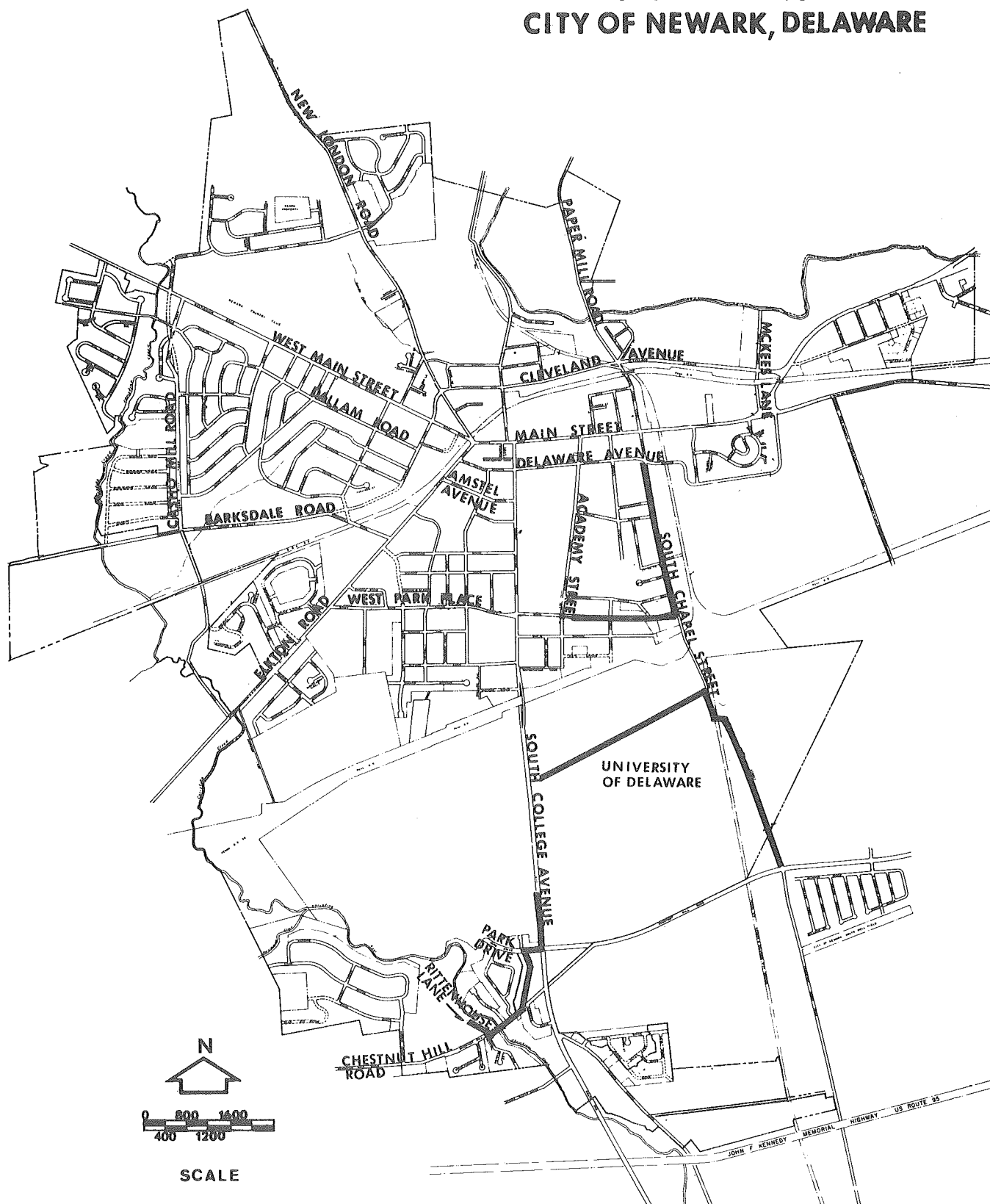
STAGE TWO
URBAN ROUTE
BICYCLE SYSTEM
CITY OF NEWARK, DELAWARE



NEWARK PLANNING DEPARTMENT

FIGURE FOUR

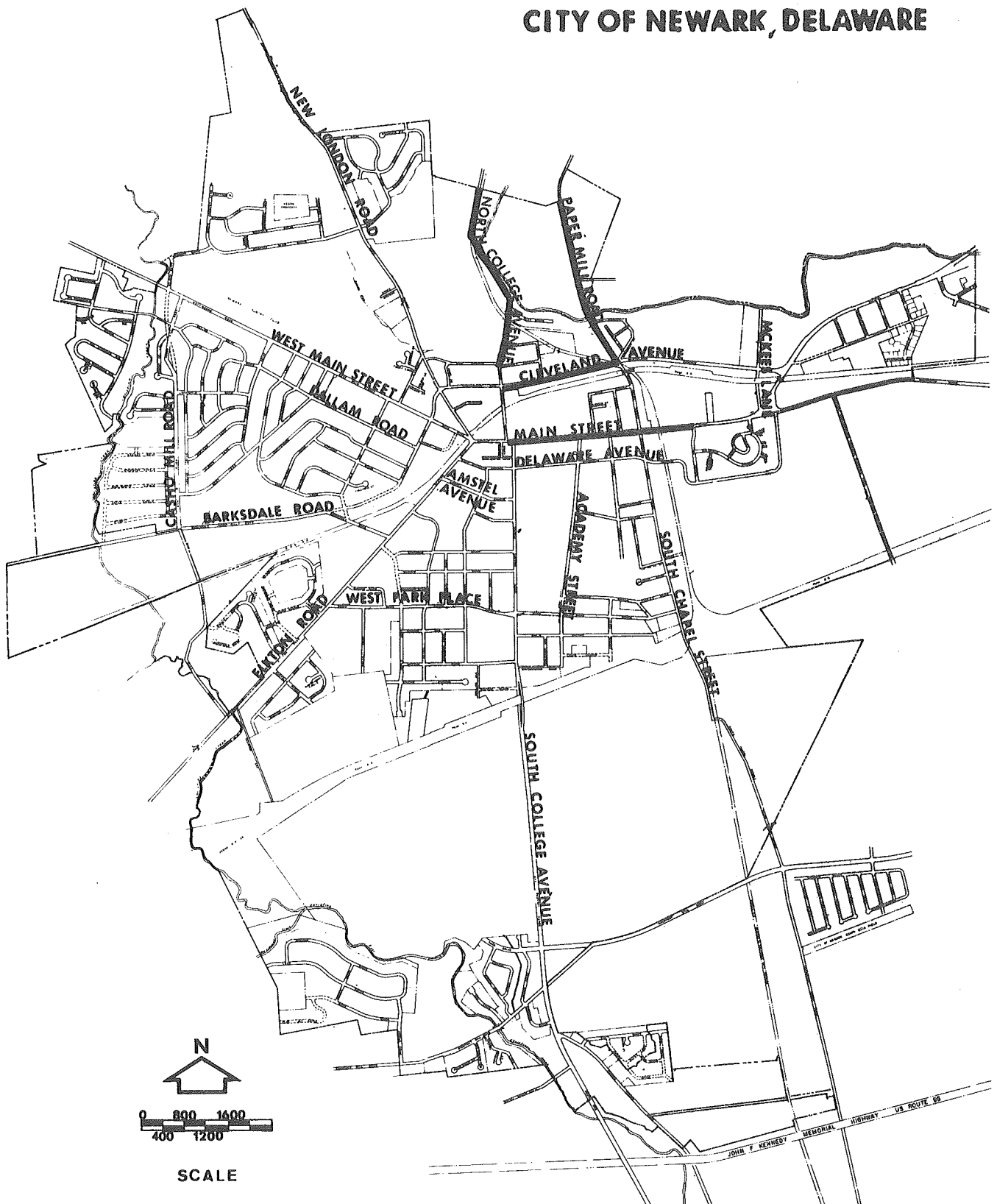
**STAGE THREE
URBAN ROUTE
BICYCLE SYSTEM
CITY OF NEWARK, DELAWARE**



NEWARK PLANNING DEPARTMENT

FIGURE FIVE

STAGE FOUR
URBAN ROUTE
BICYCLE SYSTEM
CITY OF NEWARK, DELAWARE

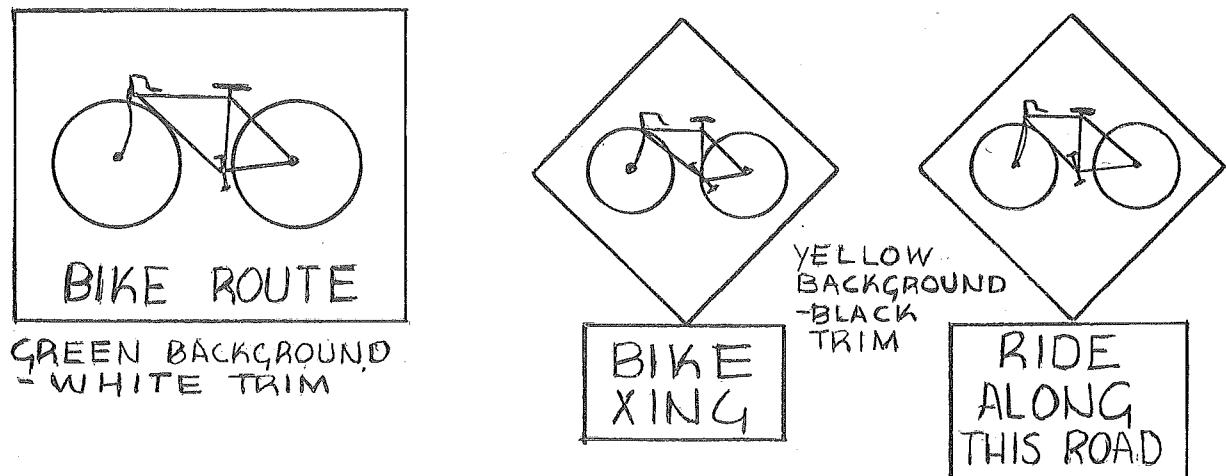


NEWARK PLANNING DEPARTMENT

CONSTRUCTION ELEMENTS

Bicycle Signs:

Bicycle signs, which would designate a route and its direction, are of standard designs, and are used around the country as shown in the three illustrations below:



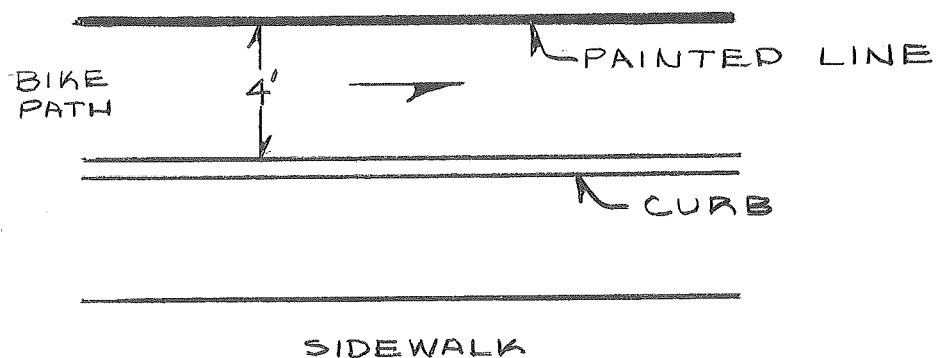
The above sign types will be used in different variations along the route to notify both motorists and bicyclists.

Although the signs can be placed at almost any interval, it is estimated that Stage One will require approximately 150 bicycle signs. The final determination of where signs are specifically placed will have to be made during and after the field implementation of the route system.

Bicycle Paths

A leading source recommends a minimum path width of five feet for one-directional riding and a desirable width of eight feet for two-directional movements. Moreover, in heavily used areas, "There is no problem in riding a 24-inch strip so long as the rider keeps his attention on riding that strip."²

For the City of Newark an appropriate and safe width for bicycle paths has been judged to be a minimum of four feet generally, for one-directional travel.³ This is based upon a) the need to provide a safe travel way and, b) existing street designs which can reasonably accommodate a bicycle path with vehicular traffic.



²Walter L. Cook, "Bike Trails and Facilities: A Guide to their Design, Construction, and Operation", (New York: Bicycle Institute of America, n.d.), p. 4.

³On those bike paths where two-directional riding might at some time in the future be allowed, the minimum path dimension should be six feet.

Corrective Measures

Many of the existing streets in the City upon which bike paths are proposed exhibit certain physical problems. Among these include the present positions of the grates covering storm drainage catch basins. Since the grates are usually parallel with the paved surface of the roadway, it is possible that bicycle tires could become caught, thus posing a safety problem. It is therefore imperative that the grates be replaced or corrected in such a manner that will not be hazardous.

Secondly, there are many ruts, pot holes and bumps which should also be viewed as a potential hazard and of course receive attention.

Finally, after the route has been laid out, the path area should be surveyed for possible danger from overhanging tree limbs and branches, that might not be pruned out of the way of the bicyclist.



PUBLIC AWARENESS PROGRAM

It is quite apparent that for the Urban Route Bicycle System to be successful it must be used by the general community. Consequently, combined efforts by the City, the Newark School District, the University of Delaware, and interested groups and individuals must work together to educate bicycle riders -- be they children or adults -- about the functioning of the system and the "rules of the road". The general thrust of a public awareness program is proposed as follows.

Through the auspices of the Driver Educational Program carried out in the Newark School District, provisions are included for members of the Newark Police Department to give lectures and slide presentations on an individual classroom basis throughout the school year. Such activities have served to inform both youngsters and older students on the safety aspects of automobile and bicycle usage. The Police Department through the Traffic Division, continually evaluates the effectiveness of its safety-education program. With the implementation of this Master Plan, the Traffic Division's responsibilities and involvement in an on-going public awareness program will take on added significance.

The Department of Parks and Recreation is expected to play a significant role in assisting the Police Department in its public education programs. Moreover, the Parks and Recreation Department can serve as a coordinating agency for providing bike route and

bicycle safety information to the general public. The Department can keep the public informed through City publications such as quarterly and annual reports of any changes or new developments that would affect the operation of the Urban Route Bicycle System.

The Traffic Division of the City Police Department is expected to coordinate with the Security Department of the University of Delaware to develop an information program that can be conducted on the campus.



SYSTEM IMPLEMENTATION

On March 13, 1973, the City Planning Commission unanimously recommended to City Council adoption of the preliminary Urban Route System Master Plan as released in February. By May 29th, City Council took favorable action on the four recommendations as contained in the preliminary proposal:

- 1) On May 29th, Council appropriated \$6,188 for construction of stage one of the Master Plan and established a permanent bikeways policy committee;
- 2) On June 11th, the Council adopted a new Chapter 6 to the Code of the City concerning rules and regulations for bicycles. The full text of the adopted ordinance appears in the Appendix;
- 3) On September 10th, Council passed Ordinance 73-36, amending the Comprehensive Development Plan for the City, "by including as City policy the Urban Route Bicycle System Master Plan as promulgated by the Newark Planning Department and the Bikeways Planning Committee (February, 1973), and any subsequent amendments thereto that may be adopted from time to time by this Council."

APPENDIX

BICYCLE RULES AND REGULATIONS

CITY OF NEWARK
DELAWARE

ORDINANCE NO. 73-27

An Ordinance Deleting the Present Chapter 6 Entitled "Bicycles", Code of the City of Newark, Delaware, and Substituting in Lieu Thereof a New Chapter 6 Entitled, "Bicycles", Which Provides for Regulations for Bicycles, Applicable Laws, and Use of Bicycle Routes and Paths

THE COUNCIL OF THE CITY OF NEWARK HEREBY ORDAINS:

That Chapter 6, Code of the City of Newark, Delaware, is hereby amended by deleting said Chapter in its entirety and substituting in lieu thereof the following:

"BICYCLES

- § 6-1. Purpose
- § 6-2. Definitions
- § 6-3. General Regulations for Bicycles
- § 6-4. Traffic Laws Applicable to Persons Riding Bicycles
- § 6-5. Use of Bicycle Routes and Paths

Sec. 6-1 Purpose

The purpose of this ordinance shall be to regulate the operation of bicycles upon any street or sidewalk, or upon any public path set aside for the use of bicycles, subject to those provisions stated herein. It shall further be the purpose of this ordinance to generally promote a more efficient and safer consideration of bicycle use, and recognize it as a serious alternative form of transportation. Any Bicycle Route or Path as defined by this ordinance or as constructed within the City of Newark shall be subject to all applicable bicycle and traffic restrictions and regulations at all times.

Sec. 6-2 Definitions

For the purposes of this ordinance, the following words and phrases shall have the meanings respectively ascribed to them below:

- (a) Bicycle: Any non-motorized, propelled, two- or three-wheeled vehicle, having that safety equipment which is prescribed herein.
- (b) Bicycle (Bike) Path: That section of any public or privately assigned thoroughfare specifically designated as a right-of-way by signs, a painted and/or paved path, and/or a raised divider or bumper, for the use of bicycles.
- (c) Bicycle (Bike) Route: Any segment of the Urban Route Bicycle System, including either bike paths or bike ways.
- (d) Bicycle (Bike) Way: Any specific segment of the Urban Route Bicycle System that is designated by signs for bicycle use.
- (e) Urban Route Bicycle System: A composite of routes, paths, ways and specifically designated locations to be considered as a transportation system allocated to bicycle use either exclusively or as part of other modes of travel through the City of Newark.

Sec. 6-3 General Regulations for Bicycles

It shall be the responsibility of any person to not do any act forbidden or fail to perform any act required in this Chapter. These regulations applicable to bicycles shall apply whenever a bicycle is operated upon any highway or thoroughfare or upon any path or route set aside for the use of bicycles.

- (a) No person shall operate a bicycle at a speed greater than is reasonable and prudent under ambient conditions.
- (b) Every bicycle when in use at nighttime shall be equipped with a lamp on the front which shall emit a white light visible from a distance of 500 ft. and with a red light and/or reflector on the rear that is visible for 500 ft.
- (c) Every bicycle shall be equipped with a brake(s) which will enable the operator to make the braked wheels skid on dry, level, clean pavement.
- (d) Every bicycle shall be equipped with a sound warning device such as a bell or horn.
- (e) No bicycle shall be used to carry more persons at one time than the number for which it is designed and equipped.
- (f) Every person operating a bicycle upon a roadway shall ride as near to the right side of the roadway as practicable exercising due care when passing a standing vehicle or one proceeding in the same direction.

- (g) Persons riding bicycles upon a roadway shall not ride more than two abreast except on paths or parts of roadways set aside for the exclusive use of bicycles.
- (h) No person while riding upon any bicycle shall attach the bicycle or himself to any vehicle upon any street or route.
- (i) No person operating a bicycle shall carry any package, bundle or article which prevents the rider from keeping at least one hand upon the handle bars.
- (j) No person shall park a bicycle in any manner or location that will unduly obstruct vehicular or pedestrian traffic.

Sec. 6-4 Traffic Laws Applicable to Persons Riding Bicycles

- (a) Every person riding a bicycle upon a roadway shall be granted all of the rights and shall be subject to all of the duties applicable to the driver of a vehicle by the laws of this State declaring rules of the road applicable to vehicles or by the traffic ordinances of this City applicable to the driver of a vehicle, except as to special regulations in this Chapter and except as to those provisions of laws and ordinances which by their nature can have no application.
- (b) All persons riding bicycles on streets or roads where there is no bicycle path or route shall be encouraged to ride on the roadway surface, subject to the following conditions:
 - (1) Where conditions are such that riding on the roadway endangers the safety of the rider, the rider shall be allowed to use sidewalks.
 - (2) Any rider under the age of twelve shall be allowed to use sidewalks.
 - (3) In those cases where riding on the sidewalk is permitted, all persons riding a bicycle on a sidewalk shall yield to all pedestrians. Where pedestrian use is extensive, a person upon a bicycle shall dismount and walk the bike.
- (c) Bicycles shall obey all traffic signals and upon approaching an intersection any person riding or operating a bicycle shall yield the right-of-way to all vehicles within or approaching such intersection. All vehicles making a left hand turn at an intersection shall not proceed into said intersection nor make such a turn without first yielding the right-of-way to all bicycles within or approaching said intersection and shall proceed only when it is safe to do so.

Sec. 6-5 Use of Bicycle Routes and Paths

- (a) In those areas of the City where an Urban Route Bicycle System, or any stage thereof, has been implemented, and paths have been provided for the use of bicycles, bicycle riders, after their twelfth birthday, shall use such paths and shall not use any portion of walkways reserved for pedestrian traffic except as provided in Section 6-4(b)(1) above.
- (b) A person shall ride a bicycle on a Bicycle Path in the direction so indicated by arrows on the paving surface or signs and shall ride on a public street in the direction of traffic movements.
- (c) Once having entered a bicycle path, no person riding or operating a bicycle shall leave such path except at intersections. Provided, however, that such person may leave a bicycle path upon dismounting from a bicycle, walking the same, and being subject then to all laws applicable to pedestrians. Provided, further, that such person may leave the bicycle path between intersections to turn into driveways on the right or left hand sides of the bicycle path. Upon leaving a bicycle path, the rider or operator of such bicycle shall yield the right-of-way to all vehicles and shall not leave the bicycle path until it is safe to do so."