

GLOUCESTER CITY MASTER PLAN

TRANSPORTATION and CIRCULATION ELEMENT

Transportation in its broadest sense includes the movement of people and goods over land, water or through the air.

Since Gloucester City has no airport and is not likely to require such a facility in the foreseeable future, this plan will limit itself to vehicular, train and waterborne transportation.

I. VEHICULAR TRANSPORTATION

Supporting auto, bus and truck traffic, the road network serving the City of Gloucester consists of: Interstate Highways; State Highways; County Highways and City Streets.

While the City has no jurisdiction over Interstate, State or County highways, it can exercise its right to intergovernmental cooperation when it feels the City's interests can be better served by a road improvement, a signalization change or a modification in operational or maintenance policies. Therefore, while the prime focus of the City Master Plan may properly be directed toward City-owned streets, it cannot fail to consider the needs of the City as they relate to State and County Highways.

A. HIGHWAY TYPES

The major roadways serving the City of Gloucester and their respective traffic volumes are shown below:

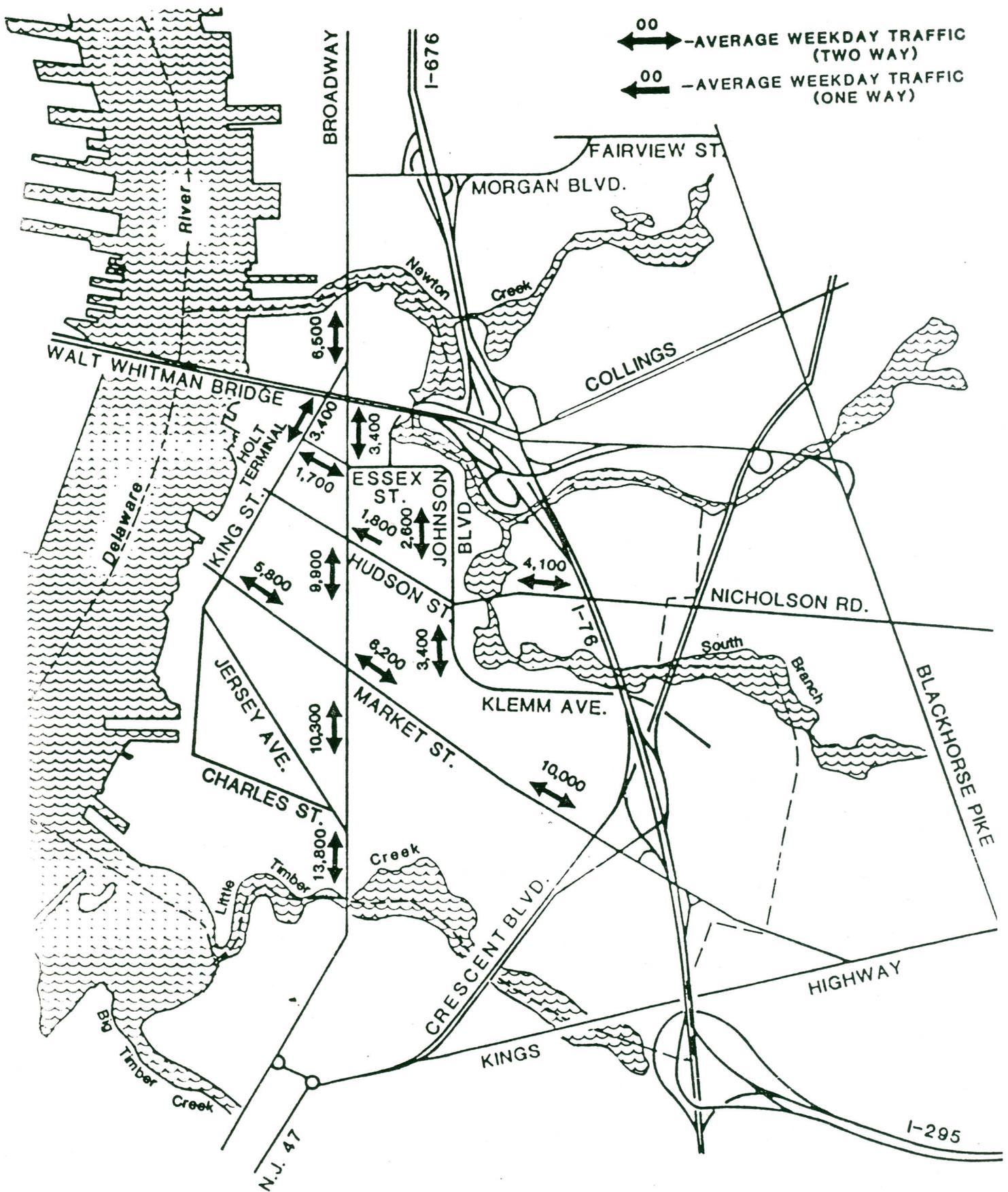
<u>ROADWAY</u>	<u>JURISDICTION</u>	<u>HIGHWAY TYPE</u>	<u>AVGERAGE. ANNUAL DAILY TRAFFIC</u>
Rt. 42	State	Freeway	117,420
Rt. 130	State	Major Arterial	24,800
Broadway	County	Minor Arterial	9,500-13,840
Market St.	County	Minor Arterial	5,5000-10,200
Nicholson Road	County	Minor Arterial	3,820
King St.	County	Local Collector	3,200
Jersey Avenue	County	Local Collector	Not Available
Monmouth Street	City	Local City	(Est.) 2,500+
Hudson Street	City/County	Local Collector	2,420
Johnson & Klemm	City	Local Collector	Not Available

1) Source: Delaware Valley Regional Planning Commission.

Each type of highway serves a specific traffic carrying function. The definitions for each type are listed below:

Freeways Having limited access, no grade crossings and no traffic stops, these highways are designed to provide high speed links between regional centers.

Major Arterials Having minor access controls, channelized intersections and signals at major grade crossings, these highways generally have no parking permitted.



Estimated Average Weekday Traffic Volumes
 CITY OF GLOUCESTER CITY

Major Arterials provide a unified traffic link through contiguous urban areas.

Minor Arterials

These highways serve as feeders to the major arterials and freeways, serving as a link between these larger highways and local collector streets. Minor arterials typically are through roads where side streets are regulated by **STOP** signs or electronic signals where traffic so warrants.

Collector Streets

These streets serve to provide a ready link between local streets and minor arterials and typically have interacting streets controlled by **STOP** signs.

Local Streets

These streets provide basic access between houses and the larger collector streets.

The city has some 32 miles of local or collector streets under its jurisdiction, of which approximately 8 miles are devoted to a collector function. Because of the staged growth pattern of the city over a 200 year period, the street network, which is a basic grid, is intersected by diagonal streets in several locations. Certain portions of the grid are juxtaposed so that natural conflicts in traffic patterns have been created. The city has attempted to deal with certain of these conflict laden intersections (such as Hudson Street and Broadway with Paul Street) by creating One-Way Streets.

B. THE EXISTING STREET SYSTEM

The primary purpose of a local street is to carry traffic to or from the uses which are located along that street. Collector streets gather the traffic generated by local streets and channel it onto minor or major arteries for movement to other communities or neighborhoods.

Because the City of Gloucester is quite old, it has certain residential streets which now serve a triple function of local street, collector street, and minor arterial. Such streets include King Street, New Jersey Avenue, Monmouth Street, Broadway, Market Street, Hudson Street and Nicholson Road.

Once a local street gives way to becoming a collector or minor arterial road, it loses its ability to effectively and safely serve the functions of a residential service street. Increased traffic erodes the normal safety factor found on residential streets.

Increased volume also takes a toll on the normal ability of a residential street to handle on-street parking since increased volumes and speed make normal parallel parking and car door opening activities hazzardous to lives and property.

Additionally, many of the local streets in Gloucester City have cartway (i.e., curb-to-curb) width of 30-feet or less with parking permitted on both sides and with two-way traffic flow. This results in some occasional conflict when two or more motorists traveling in opposite directions attempt to use the same street segment when vehicles are parked along both sides. There is also some potential conflict near intersections with one vehicle waiting to cross or turn onto the more major street and with another vehicle attempting to enter the minor street. Since many of the local streets are primarily residential in nature, it would be difficult to limit parking to one side of the street. However, if such prohibitions are feasible along certain street segments, they should be considered.

C. STANDARDS OF ADEQUACY

In looking at the present street system, as well as in contemplating any future system, it is important that a well-thought out set of standards should be utilized to guage the adequacy and safety of any present or future systems.

For this purpose it is important to distinguish "as is" conditions from those which are yet to be created or modified. Such standards should be based on those proposed by recognized national bodies such as

- The National Committee for Traffic Safety
- The Institute of Traffic Engineers
- The National Association of Home Builders
- The American Association of State Highway Officials

These groups or agencies share a common concern for motorist and pedestrian safety as well as the preservation of neighborhood liveability and convenience. As such, they have adopted design standards which cover:

1. Driver and pedestrian visibility,
2. The maintenance of roadways,
3. The maintenance of reasonable and safe driving speeds,
4. The provision of adequate width traffic lanes,
5. The segregation of non-residential traffic from neighborhoods,
6. The buffering of neighborhoods from the noise and vibration of heavy traffic,
7. The provision for parking and storage of autos in a reasonable and safe manner,
8. The regulation of intersecting traffic to prevent accidents.

The recommended design standards for local streets are shown below:

STREET DESIGN	FOR TRAFFIC SAFETY	TRAFFIC ENGINEERING	NAT'L ASSOC. OF HOME BUILDERS
STREET WIDTH	50 feet	60 feet	50 feet
PAVEMENT WIDTH (2-way)	26 feet	32 feet	(See Below)
No. Pkg. on St.	N/A	N/A	18 feet
Partial Parking - One Side	N/A	N/A	20 feet
Total Parking - One Side	N/A	N/A	26 feet
Total Parking - Both Sides	N/A	N/A	32 feet
CURBS	Straight	Vertical	Varied
SIDEWALKS			
Width	4 feet min.	5 feet	4 feet
Setback - (w/o trees)	3 feet	6 feet	2 feet
Setback - (w/trees)	7 feet	N/A	N/A
Sight Distance At Intersects	200 feet	200 feet	200 feet

For any new development, the standards proposed by the National Association of Home Builders (above) should be satisfactory.

D. RECOMMENDATIONS FOR EXISTING STREETS

In evaluating the adequacy of the existing city streets, recognized standards must be modified somewhat in the interest of practicality. Thus, while the N.A.H.B. standard of 9 feet for a traffic lane and 8 feet for a parking lane make a great deal of sense for new development, they might prove to be a bit rigorous as standards for existing small city streets.

A standard of 7.5 feet for a parking lane and 8.0 feet for a traffic lane would appear to be a more realistic measure of whether an existing cartway should be widened or regulated more stringently as to "on-street parking" or "one-way" traffic flow.

A schedule of widths for each combination of parking and travel direction is shown below:

<u>2-WAY STREET</u>	MINIMUM WIDTH
No parking on street	16 feet
Total Parking - one side	24 feet
Total Parking - both sides	31 feet
<u>1-WAY STREET</u>	MINIMUM WIDTH
No parking on street	10 feet
Total Parking - one side	16 feet
Total Parking - both sides	23 feet

An application of these standards to the streets of Gloucester City makes it possible to outline a general prescription of how the existing streets should be regulated based on their current cartway width as shown below:

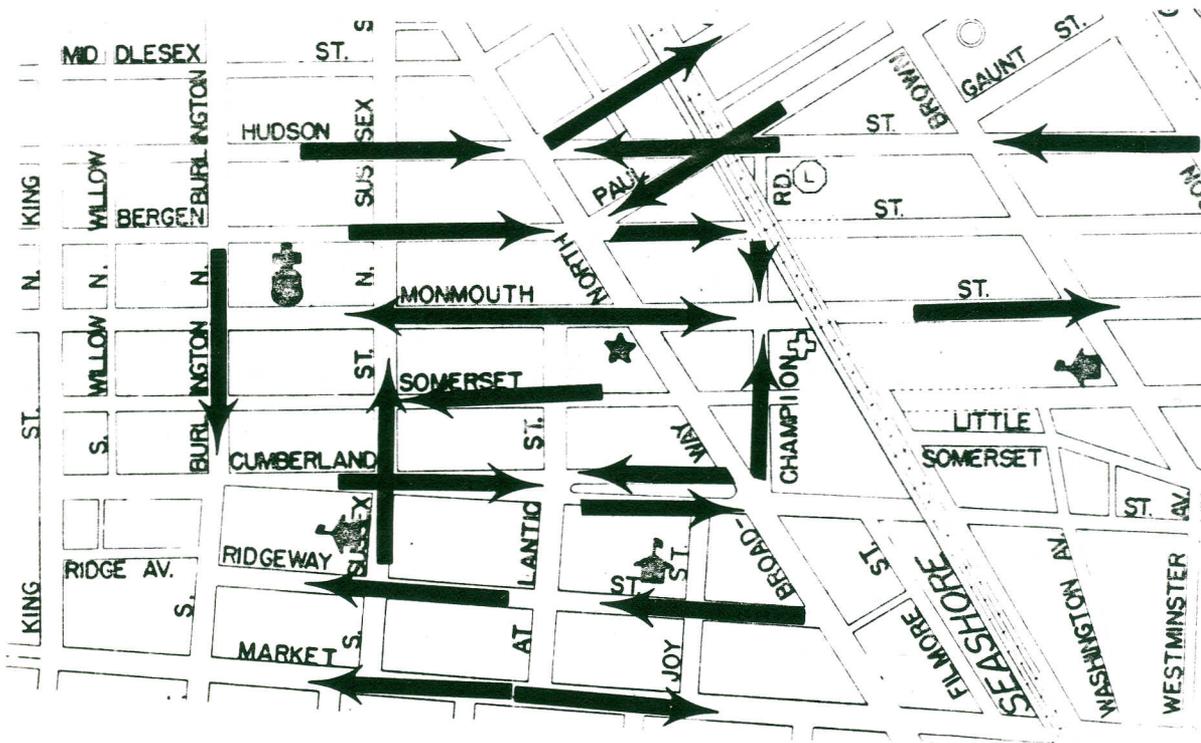
<u>EXISTING CARTWAY WIDTH</u>	<u>REGULATORY OPTIONS</u>
Under 8 feet	No vehicular traffic
8 to 15 feet	ONE WAY - no parking
16 to 22 feet	2-WAY or 1-WAY w/pkg. 1 side
23 to 31 feet	2-WAY w/parking 1 side or 1-WAY w/parking both sides
32 feet and up	2-WAY w/parking both sides

An application of these options to each of the streets in the City inventory is shown in exhibit "A", with recommendations.

E. THE "ONE-WAY" STREET SYSTEM

The relatively small lot sizes in the old section of the city in many cases do not permit homeowners to park off the street. The city has attempted in some cases to lessen the apparent conflicts between traffic and parking needs by resorting to a series of "one-way" streets, especially on the narrower streets, by reducing traffic to a one way pattern. Thus, the ability of the street to handle on-street parking in a safe manner is enhanced.

Unfortunately, the "one-way" pattern is not coordinated and so one problem, that of parking, is being solved at the expense of the streets primary function, that of convenient access. A good example of this is Hudson Street which is "one-way" in opposite directions on either side of Broadway, creating no small amount of confusion and inconvenience as may be seen below:



The "one-way" streets in the city should be rerouted and organized to provide this form of easy flow system with the following guidelines in mind:

- one-way streets should be designated as one-way 'pairs' so that two adjacent streets are not both operating in the same direction (this would help minimize inconvenience to motorists)
- the designation of only a few blocks of a longer street for one-way flow should be avoided
- appropriate signing and markings must be provided to inform motorists of any one-way designations.

The following streets should be designated as part of the "one way system":

<u>STREET NAME</u>	<u>FROM</u>	<u>TO</u>	<u>SUGGESTED ACTION</u>
Bergen	King	Johnson	1 Way West
Burlington	Warren	Jersey	1 Way South
Center	Eighth	S. Broadway	1 Way West
Chambers	N. Broadway	Johnson	1 Way East
Cherry	Sixth	Ninth	1 Way East
Cumberland	King	Westminster	1 Way East
Daly	Powell	Market	1 Way South
Division	Broadway	Fifth	1 Way West
Ellis	Monmouth	Mercer	1 Way South
Fifth	Water	Market	1 Way South
N. Filmore	Hudson	Passaic	1 Way North
S. Filmore	Market	Cumberland	1 Way South
Fourth	Water	Market	1 Way North
Hudson	Ellis	Johnson	1 Way East
Hunter	Burlington	Broadway	1 Way East
Joy	Market	Cumberland	1 Way North
Linden	N. Willow	N. Broadway	1 Way West
Marlboro	Yale	Rt. 130	1 Way West
Mary	Market	E. Brown	1 Way South
Middlesex	Ellis	Johnson	1 Way West
Morris	King	Johnson	1 Way West
Ninth	Center	Charles	1 Way South
Orange	King	Burlington	1 Way East
Paul	N. Broadway	Johnson	1 Way West
Powell	Broadway	King	1 Way West

GLOUCESTER CITY MASTER PLAN
1985
PROPOSED ONE WAY STREET SYSTEM



<u>STREET NAME</u>	<u>FROM</u>	<u>TO</u>	<u>SUGGESTED ACTION</u>
R.R.Ave. E.	Sherman	Market	1 Way South
R.R.Ave. W.	Paul	Essex	1 Way North
R.R.Ave. W.	Cumberland	Monmouth	1 Way North
Ridge	Burlington	King	1 Way West
Ridgeway	Broadway	Burlington	1 Way West
Ridgeway	Sparks	Mary	1 Way West
Seventh	Market	Charles	1 Way South
Sherman	N.Broadway	Railroad	1 Way West
Sixth	Charles	Market	1 Way North
L.Somerset	Railroad	E.Brown	1 Way West
Somerset	Johnson	Washington	1 Way West
Somerset	Champion	King	1 Way West
Sussex	Market	Mercer	1 Way North
Thompson	Railroad	Hughes	1 Way West
Warren	King	Railroad	1 Way East
Washington	Somerset	Cumberland	1 Way South
Willow	Ridge	Salem	1 Way North
Monmouth	Johnson	Railroad	2 Way/Pkg N.Side Only
Sparks	Market	Baynes	2 Way/Pkg on 1 Side
Washington	Cumberland	Market	2 Way

F. RESIDENT PARKING

Where cartways are of insufficient width to provide for adequate traffic flow and parking, the city should explore converting available vacant ground into parking areas. This could be done through a municipal agency or through homeowners organizations using a condominium format.

The following streets should have parking limited to one side of the street in addition to those already having parking on one side:

<u>STREET NAME</u>	<u>FROM</u>	<u>TO</u>	<u>SUGGESTED ACTION</u>
Barlow	Princeton	Yale	Parking on 1 Side
Barnard	Railroad	Powell	Parking on 1 Side
Eighth	Jersey	Hunter	Parking on 1 Side
Fifth	Jersey	Charles	Parking on 1 Side
Fourth	Water	Jersey	Parking on 1 Side
Gehrig	Culdesac/Baetz	el	Parking on 1 Side
Jefferson	S.Bdg.Creek	Rutgers	Parking on 1 Side
Joy	Market	Cmbrlnd	Parking on 1 side
Katherine	E.Brown	Johnson	Parking on 1 Side

<u>STREET NAME</u>	<u>FROM</u>	<u>TO</u>	<u>SUGGESTED ACTION</u>
Lehigh	Newton Crk	E. Zone 11	Parking on 1 Side
Maple	Oriental	Market	Parking on 1 Side
Memorial	University	Haverford	Parking on 1 Side
Ninth	Water	Jersey	Parking on 1 Side
Oxford	Nicholson	Newton Crk	Parking on 1 Side
Seventh	Division	Jersey	Parking on 1 Side
Sixth	Jersey	Market	Parking on 1 Side
Stinson	Railroad	Hunter	Parking on 1 Side
Stites	Railroad	Market	Parking on 1 Side
Sussex	Market	Mercer	Parking on 1 Side
University	S. Bdg. Crk.	Nicholson	Parking on 1 Side
Walnut	Charles	Fourth	Parking on 1 Side
Yale	Nicholson	Newton Crk	Parking on 1 Side

Based on the field inventory of street surface conditions, the following action with regard to paving or widening should be undertaken:

<u>STREET NAME</u>	<u>FROM</u>	<u>TO</u>	<u>SUGGESTED ACTION</u>
Brick	Brick	Broadway	Paving
Cypress	N/S Frwy	Market	Paving/or Vacate
Ellis	Monmouth	Warren	Paving
Fern	Highland	D/E	Paving
Grove	Tenth	Charles	Paving
Ninth	Grove	Jersey	Paving
Oriental	Trailer Pk	Walnut	Paving
Fifth	Water	Jersey	Repave
Joy	Market	Cmbrlnd	Repave
Walnut	Charles	Fourth	Repave
Railroad	Monmouth	Cumberland	No Parking
John	S. George	N. George	Widen Cartway
John	S. Koehler	N. Koehler	Widen Cartway

G. TRAFFIC SAFETY CONSIDERATIONS

Given the grid pattern of the city street system and its numerous angled intersections, it is most important that every effort be made to reduce to a minimum any contributing factors to intersection hazards. Contributing factors to unsafe intersections include

- visibility blocked by vehicles parked too close to intersections;
- faulty or improperly timed traffic signals;
- stop signs which are not easily visible to traffic;
- intersection visibility blocked by shrubs, trees, buildings, poles or fences;
- poorly lit intersections at night;
- driveways which empty into an intersection beyond the control area of a stop light or sign;
- poorly designed driveways and/or parking lots which hamper easy access and cause backups into the roadway;
- intersection corners which have inadequate radii or stop lines which are too far advanced toward the intersection to permit safe turning movements by large vehicles;
- one-way streets which change direction from one block to the next causing driver hesitation and confusion.

Any one or a combination of these conditions can contribute to a hazardous intersection condition. Therefore, a plan should take into consideration both the alleviation of existing hazardous conditions and the prevention of future hazardous conditions.

An inventory and evaluation of those intersections in the city which have experienced three or more accidents per year over the past three years was undertaken with the assistance of the city police department and the city engineer's office. The results of this review highlighted conditions at 13 separate intersection locations within the City, as outlined on the following page:

<u>INTERSECTION STUDY NO.</u>	<u>LOCATION OF INTERSECTION</u>	<u>ACCIDENTS/YR.</u>
1	Essex and Broadway	5
2	Essex and King	3
3	Hudson and Broadway	4
4	Monmouth and Broadway	4
5	Monmouth and Burlington	3
6	Monmouth and King	3
7	Cumberland and Broadway	3
8	Market and Broadway	7
9	Market and Hughes	5
10	Koehler and Broadway	4
11	King and Jersey Avenue	3
12	Klemm Avenue & Route 130	5
13	Market Street & Rt. 130	34

In reviewing the accident information and opinions of cause offered by the police department, it is apparent that faulty or improperly timed traffic signals are the primary cause of accidents within the city. This condition was cited by the police department in 7 out of the 13 intersections studied (54%).

The next two (2) major contributions to hazardous conditions involved visibility. In 6 out of 13 cases (46%), the ability of drivers entering an intersection to see traffic approaching from a 90 degree angle to the intersection is impaired by parked cars, poles, signs or overgrown shrubs. Similarly, in 38% of the cases studied there were traffic signs or signals which were not readily visible to drivers entering the intersection.

In 23% of the cases studied, a hazardous condition was created by an improperly designed or placed driveway/parking area which causes traffic to back-up into the roadway.

A profile of the intersections involved with each problem type is outlined below:

<u>HAZARDOUS CONDITION</u>	<u>INTERSECTIONS AFFECTED</u>
- Visibility blocked by vehicles too close to intersections	1,2,6,9,11
- Faulty or improperly timed traffic signals	1,3,4,7,8,10,13
Traffic signs or signals which are not easily visible to traffic	4,5,9,11,12
- Intersection visibility blocked by shrubs, trees, buildings, poles, or fences	2,6,10
- Poorly lit intersections at night	5
- Driveways which empty into an intersection beyond the control area of a stop light or sign	3
- Poorly designed driveways and/or parking lots which hamper easy access and cause backups into the roadway	3,9,13
- Intersection corners which have inadequate radii or stop lines which are too far advanced toward the intersection to permit safe turning movements by large vehicles	8

HAZARDOUS CONDITION

INTERSECTIONS
AFFECTED

- One-way streets which change direction from one block to the next causing driver hesitation and confusion 3
- Inadequate traffic control measures 7

RECOMMENDATIONS FOR TRAFFIC SAFETY

A review of the data presented above suggests that the city should undertake the following actions related to traffic safety:

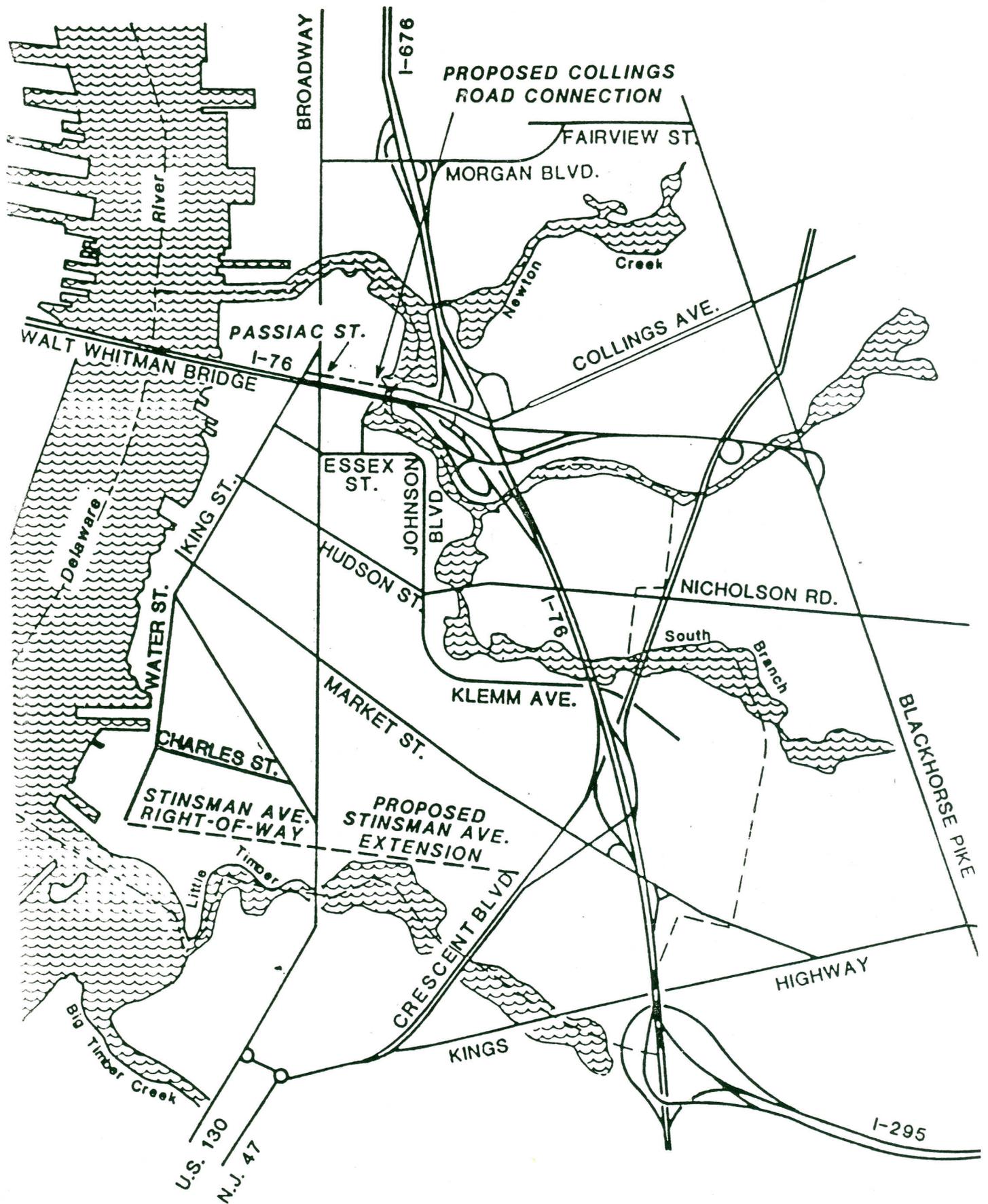
- Initiate a repair and replacement program of the electronic traffic signals located along Broadway which include placing new lights in an overhead position to traffic lanes; installing a "mutual red" sequence in the light timing so that intersections have an opportunity to clear before a lane is given the green signal; registering the lights with the state department of transportation and obtaining their approval on the timing sequence.
- Regulate by ordinance a "no parking" zone within 50 feet of an intersection to promote proper visibility of vehicles approaching an intersection at a 90 degree angle;
- Prohibit by ordinance the planting of any shrubs or the erection of any fence or visual barrier within 50 feet of an intersection;
- Prohibit by ordinance, the erection of any building within 30 feet of either street line on a corner property in order to maintain adequate lines of sight along intersecting streets for vehiclular traffic;
- Have the City Engineer work with the School Board to reorganize the entrance to the high school so that traffic exiting from the high school would be separated from the incoming traffic and would exit at a 90 degree angle to Market Street, 200 feet east of the existing

entrance, subject to the study of the Stinsman Avenue Extension.

- Request the County to conduct a traffic safety study for the Market and King Street intersection.
- Undertake a thorough review of all traffic signs within the city to ascertain that they are visible to traffic under all conditions and that the signs are easily readable;
- Prohibit by ordinance the construction of any driveways within the uncontrolled portion of an intersection;
- Amend the site plan ordinance to require that all new construction of driveways on collector or arterial roads have a deceleration lane to remove vehicles from the traffic flow while they are waiting to enter the driveway;
- Review the placement of all "stop lines" at intersections with stop lights or signs to ascertain that sufficient turning radii exist for large vehicles.
- There are presently a total of three pedestrian islands/refuges protected by 2-1/2 foot high concrete walls at selected intersections along Broadway (i.e., Mercer Street, Monmouth Street, Cumberland Street). The refuges do present some minor obstruction, located as they are in the center of Broadway, but they also provide protection for those pedestrians (particularly senior citizens and school children) who must cross Broadway. It is recommended that the pedestrian island/refuges be marked with reflectorized paint and "buttons" in order to maximize their visibility and to reduce the potential for collision.

H. PROPOSED NEW ROADWAYS

A review of the overall circulation system of the city points up an obvious deficit---that much of the traffic (including trucks) coming from Routes 42 or 130 is forced to proceed through residential neighborhoods in order to get to the west side of the city (west of Broadway). Two substantial opportunities exist to correct this problem by creating new road connections within the city which would bypass residential neighborhoods.



**Proposed Future Street
 Extensions/Connections
 CITY OF GLOUCESTER CITY**