

WORKING DRAFT

9/27/02

Newark Bicycle Plan

**Prepared by
WILMAPCO
and the
Newark Bicycle Subcommittee**

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Newark Bicycle Plan Update

INTRODUCTION

Bicycling is an important form of transportation and recreation in the Newark area. Used by college students, children, university employees and others who live and work in the City, bicycling should be a convenient, safe way to travel. Newark is recognized as one of the most “bicycle-friendly” communities in Delaware due to its extensive network of facilities, high levels of cycling, and strong institutional and community support. Based on the 1990 US Census, Newark was the 65th most bicycled city in the country, with 3.3 percent of the population bicycling to work (and additional 16.4 percent walked to work). The percentage of people who bicycle to work has since declined, with only 1.6 percent of the population bicycling to work based on the 2000 Census (and 13 percent walking to work).

Improving bicycling conditions and expanding available facilities will encourage more trips by bicycle and improve the travel experience for those already cycling. Increasing the number of trips by bicycle will, in turn, reduce roadway congestion, reduce the demand for vehicle parking, and improve air quality. Recreational cycling facilities provide a low cost exercise option for residents while attracting visitors to Newark, without bringing additional traffic.

The *Newark Area Bicycle Interim Report* was completed November 1996 by the Delaware Department of Transportation and WILMAPCO as a supplementary report to the *Newark/Elkton Intermodal Transportation Plan*. The report provided information about existing conditions and a preliminary inventory of bicycle facilities in the City of Newark and surrounding area, proposed preliminary recommendations for improving bicycling infrastructure, and raised issues that needed to be resolved to before developing a final Bicycle Facility Needs Plan.

Since the adoption of the Interim Report, great strides have been made to improve bicycling in Newark. A Newark Bicycle Subcommittee was formed to advise the City, and through their leadership and advocacy, a multiuse path is under construction along the Amtrak corridor and the first section of the Pomeroy Line path has been built.

The updated Newark Bicycle Plan will focus on the continued development of the bicycle network within the City of Newark and will also identify desired links between destinations outside the City including Elkton, Pike Creek, White Clay Creek State Park, Churchmans Crossing, Brookside, and Old Baltimore Pike. WILMAPCO and the Newark Bicycle Subcommittee are developing the plan in cooperation with the City of Newark and the Delaware Department of Transportation. While this plan focuses on identifying capital improvements, it also recognizes the importance of improved maintenance and continued education, encouragement and enforcement.

OBJECTIVES

The Newark Bicycle Plan seeks to make bicycling a safe, attractive alternative to driving in Newark. The plan will propose a coordinated network of bicycle facilities, accessible for all Newark residents. Detailed objectives of the plan are as follows:

Coordinated Network. Develop a coordinated network of bicycle facilities.

- Identify links to complete the system through Newark. Use off-street corridors where available. Where off-street corridors are not available, create connecting on-street bikeways. On-road facilities should be appropriate to the street classifications, traffic volume, and speed.
 - Pomoroy line (partially constructed, remainder under study by DelDOT)
 - Main Street/Delaware Avenue corridor westbound facility (under study)
 - Jenny's Run
 - Western Newark Mason/Dixon loop
 - White Clay Creek/MBNA Connector
 - Reservoir Loop (funded for construction)
- Plan for the development of bicycle facilities and programs as a viable alternative to the automobile to provide high quality and safe opportunities for all people in Newark to bike to work, school, or play.

Enhance Access to Network. Provide good access to bicycle network for all residents.

- Provide access within 1/4 miles of network for all residents.
- Recommend improvements to the street network for bicyclists by providing access across barriers providing access to destinations along arterials where warranted by land use, improving local networks including creating bicycle and pedestrian "short cuts", and accommodating bicycles on bridges and underpasses.
- Identify access to East Coast Greenway network.
 - The East Coast Greenway is a planned nonmotorized pathway linking towns and cities from Maine to Florida. Through Newark, the proposed route uses the existing sidepath along Route 4 and then connects to Elkton along Elkton Road. Once the Amtrak/Parks Trail has been constructed, Newark should consider relocating the route to include this.

Transit linkage. Improve bicycle access to transit.

- Recommend locations where adequate and secure bicycle parking should be provided at rail stations and bus stops.
- Identify safe and convenient bicycle routes to and from transit stations and stops.
- Work with transit providers to install bicycle racks on buses.

Parking. Encourage adequate and secure bicycle parking at all major trip destinations.

- Review bicycle parking requirements in zoning codes and recommend revisions as needed.
- Identify locations where bicycle parking should be provided along Main Street.
- Review and coordinate with existing Newark bicycle parking ordinances.

Safety. Promote safe design, maintenance, and enforcement practices.

- Recommend safe design and maintenance practices for all bikeways and shared-use facilities, including lighting and signage.
- Recommend measures to support enforcement of the rights and responsibilities of bicyclists and drivers. Target violations that cause the most injuries and fatalities for selective enforcement.
- Encourage the region to make available bicycle and pedestrian training to local enforcement agencies.
- Develop signage aimed at motor vehicle drivers to improve awareness of the needs and rights of bicyclists.
- Develop appropriate residential and commercial street designs to control vehicle speeds.
- Clean and maintain bicycle lanes and paths.

Planning. Incorporate bicycle elements into transportation and development actions.

- Consider bicycle accommodations in local development review procedures, and encourage incentives for bicycle accommodations.
- Integrate the consideration of non-motorized facilities into all planning, design, construction, and maintenance activities of DelDOT and Newark Public Works departments.
- Encourage the appointment of municipal non-motorized coordinator.

Develop implementation plan.

- Seek adequate resources to achieve the goals of this plan. Resources include financing training, technical assistance and others.
- Improve non-motorized mode's competitiveness for transportation funding.
- Encourage regional and state agencies to make funding available for this purpose and apply for funding when available.
- Identify target areas with the highest need and benefit. Use prioritization factors such as connectivity between existing facilities; high-hazard roadways near the University, schools and employment centers; opportunities for major links (railroad right-of-ways, utility lines, etc.); other high-hazard roadways which can be improved for bicycle travel in conjunction with the Transportation Improvement Program and Long-Range Transportation Improvement Plan.
- Develop plan to maintain and improve the quality, operation, and integrity of bikeway network facilities.
- Provide for integration and coordination of bicycle planning between state and local jurisdictions.

Community involvement. Involve the Community in the Planning and Implementation of the Bicycle System.

SCHEDULE AND SCOPE OF WORK

Schedule	Task
March – May 2001	1. Data collection and review <ul style="list-style-type: none"> A. Review existing reports and identify changes to the existing system since the completion of the Newark Area Bicycle Interim Report B. Map existing and funded bicycle network C. Develop draft goals and objectives
June-December 2001	2. Identify issues, opportunities and constraints <ul style="list-style-type: none"> A. Identify and map major trip origins and destinations including the University, schools, businesses, shopping, transit stops and stations, and parks. B. Identify and map high accident locations. C. Take site tour and photo essay D. Hold public workshop in conjunction with Newark Community Day and on-line hearing to refine goals and objectives and review trip origins and destinations E. Identify existing or potential groups that would have an interest and/or concern for bicycle planning and implementation
January-May 2002	3. Bicycle Master Planning <ul style="list-style-type: none"> A. Identify additional and improved links needed to create a complete and safe travel network. B. Identify other appropriate system improvements including parking, signing, lighting, and pavement condition.
June 2002	4. Hold public workshop and on-line hearing to refine proposed network.
July – November 2002	5. Prepare report and implementation plan <ul style="list-style-type: none"> A. Develop prioritization process B. Prioritize needed facilities C. Identify funding sources D. Present implementation plan at Newark Community Day and on-line hearing

ISSUES AND OPPORTUNITIES

Issues

- 85 bicycle crashes from 1997-2000, many along Elkton Road (16), Delaware Avenue (13), Main Street (14) and College Avenue (13)
- Many crashes are clustered around several intersections: Elkton/Casho Mill Road, Elkton/Veterans Lane, Elkton/Apple Road, Elkton/Amstel Road, South College/Park Place, South College/Main Street, South College/Delaware Avenue, South College/Academy, and South College/Haines Street
- No bicycle facilities along Main Street
- Little bicycle parking along Main Street
- No bicycle parking at bus stops
- For travel to/from south of Newark on Rt. 896, I-95 ramps are a barrier
- For travel to/from south of Newark on Rt. 72, bicycle path and lane not maintained
- Right turning traffic on Delaware Avenue uses bicycle lane as turn lane
- Right turn lanes interrupt bicycle lane on Rt. 72, College Avenue, and New London Road (?)
- Proposed traffic calming on Park Place may narrow road width, making this route less friendly for bicyclists
- Route 4 bicycle path poorly maintained
- Off-road routes preferred by inexperienced cyclists and children but are expensive and require right of way
- Rules of road pertaining to bicyclists difficult to enforce
- Striping for bicycle lanes quickly becomes faded
- Speeding traffic on area roads makes conditions more dangerous for cyclists

Opportunities

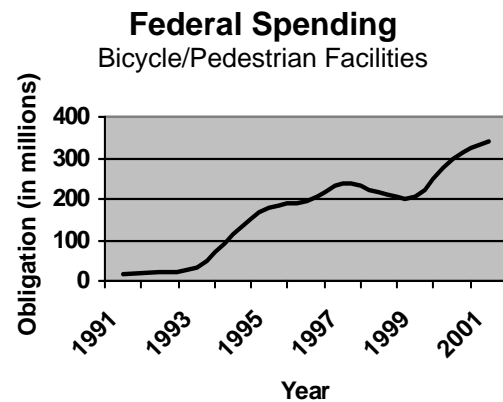
- Funded Hall Trail and partially completed Pomeroy Line Trail begin to create a bicycle/pedestrian off-road “beltway” around Newark
- Many low volume, residential streets link neighborhoods with the University and downtown
- According to the 2000 Census XX% of Newark commuters work within the City, thus having a commute distance that is easily made by bicycle
- Also, according to the 2000 Census, XX% on Newark commuters who work within the City currently commute by bicycle and thus, have an interest in improving bicycle facilities in the City
- DelDOT, Newark City Council, and WILMAPCO have expressed an interest in making Newark a model for bicycle facilities in Delaware and the region
- Proposed East Coast Greenway alignment would link Newark to Elkton, Churchmans Crossing, and points beyond

EXISTING PLANS AND POLICIES RELATED TO BICYCLING

This section summarizes existing Federal, regional, state and local plans and policies related to bicycle facility planning and development.

Federal Transportation Policy

The Intermodal Surface Transportation Efficiency Act (ISTEA), passed by Congress in 1991, established a revolutionary transportation policy to create an integrated, intermodal system that provides people with travel choices. ISTEA recognizes the important role of bicycling and walking and required the consideration of non-motorized users in planning a developing transportation projects and programs. Also, ISTEA including new opportunities for funding bicycling and pedestrian improvements. Since the passage of ISTEA, federal spending for bicycling has increase dramatically.



The National Bicycle and Walking Study, published by the U.S. Department of Transportation in 1994, translated Federal policy into two specific goals.

- ◆ Double the current percentage of total trips made by bicycling and walking from 7.9% to 15.8%
- ◆ Reduce that number of crashes involving pedestrians and bicyclists by 10%

In 1998, the Transportation Equity Act for the 21st Century (TEA-21) further integrated pedestrian and bicycle considerations into the overall transportation planning process. TEA-21¹ requires that safe accommodation of non-motorized users be considered in all state and regional transportation plans and in the development and construction of all Federal-aid transportation projects.

¹ Section 1202 of TEA-21 and 23 C.F.R. Part 652

Newark Urban Route Bicycle System - Master Plan

1973

The Urban Route Bicycle System Master Plan identified the need for a network of bicycling routes for students, recreational riders, adult commuters, and children. According to the Plan, “although [a bicycle network] 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 Plan goes on to say “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.”

Two classifications of users are identified. Utilitarian or activity-centered – commuting, school, errands, etc.—require predominantly direct routes along collector and arterial corridors. Recreational users bicycle for sightseeing, touring, racing, or exercise. These users prefer scenic less direct routes and loop routes.

Four criteria were used for identifying a prioritized bicycle route system. These included:

- Travel patterns around city
- Routes used by UD students and public school kids from home to school
- Existing roads which can accommodate bikes safely
- Other issues such as on-street parking, congested areas

Using these criteria, the Plan included an implementation plan to complete the system over five years.

- Stage 1, a total of 6.7 miles, was completed in 1973. This included minor improvements such as sidewalks, signs and painted bicycle lanes.
- Stage 2, which was to include 3.3 miles and be completed in 1974, included striped bicycle lanes on West Park, Academy Street, McKees Lane and New London Road. With the exception of New London Road, none of this has been implemented.
- Stage 3, also to be completed in 1974 with 3 miles of bicycle facilities, called for bicycle lanes on South Chapel, East Park, South College Avenue connecting to Rittenhouse Park. With the exception of South Chapel Street, these facilities have not been completed.
- Stage 4, to be completed in 1975 with 2.3 miles, was to have included a striped bicycle lane on Main Street, Paper Mill Road, Cleveland Avenue, and North College Avenue. These routes are simply “Share the Road” today.
- Stage 5 was completed with the realignment of South Chapel Street and construction of Wyoming Road

Newark Area Bicycle Interim Report

November 1996

The Newark Area Bicycle Interim Report was developed by WILMAPCO and the Delaware Department of Transportation. The report details existing conditions, inventories bicycle facilities, proposes preliminary recommendations and raises issues that must be resolved to develop a Bicycle Facility Needs Plan.

Engineering and non-infrastructure recommendations include:

- Barrier and hazard removal
 - Replace or retrofit drainage grates to bicycle-safe grates
 - Retrofit railroad crossing with flangeway filler strips
 - Selectively restrict and/or remove on-street parking
- Signing and pavement marking
 - Install new signage and pavement marking to accommodate through-movement of bicycles where there are designated right-turn lanes for vehicles
 - Install new signage communicating rights-of-way, speed limits, etc. (especially on campus), installing additional signs and signals at crosswalks
 - Installing new or upgraded signs and pavement markings indicating dedicated bicycle facility space on the roadway
- Maintenance
 - Improve routing maintenance practices as part of existing programs aimed at clearing shoulders, gutters, and bridge decks and maintaining off-road facilities, railroad crossings and consistent shoulder pavement quality
- Non-infrastructure recommendations
 - Establish a comprehensive education program about the benefits of safe cycling, enforce motor vehicle and bicycle laws and promote bicycle transportation as a travel option in Newark

Goal:

- To develop a complete bicycle system that recognizes bicycling as an important transportation mode; and provides for safe and efficient bicycle access throughout the community emphasizing those community areas that have the greatest potential to generate bicycle trips.

Objectives:

- Promote a sustainable transportation system by encouraging bicycling as an alternative to single occupant vehicles
- Provide bicycle access between residential, commercial, employment, recreational and university locations
- Provide safe bicycle facilities that meet or exceed accepted design practices

- Provide connections between bicycling and other transportation modes such as buses, carpools, vanpools and trains
- Include encouragement, education (both motorist and bicyclist), and licensing/registration programs as part of the overall plan and recommendations
- Provide bicycle facility maintenance particularly by removing debris and overgrown vegetation
- Provide for traffic law enforcement affecting bicycle transportation

Newark bicycle planning problem statement

- University town with bicycling providing practical and economical transportation for students
- Community realizes the benefits of bicycling – reduced congestion, air pollution and auto parking needs
- In encouraging bicycling, new problems are created regarding roadway safety and the compatibility of bicycles with motor vehicles and pedestrian
- Bicycle facilities do not always provide direct connections to desired destinations
- Mix of facility types exist in Newark and current design and designation creates confusion and inappropriate or unsafe behavior

Existing conditions: [Those that have been addressed are shown in *italics*]

- Bicycle on shoulder/shared use are predominant facilities
- Signage is inadequate and inconsistent
- Marking on pavement and shoulders are inadequate and inconsistent
- Bicycle lane widths are inadequate and inconsistent
- Parking conflicts impede travel for cyclists
- Debris/vegetation encroaches on shoulders
- Grates are not bicycle-safe
- Numerous curb cuts, signalized intersections and right turn lanes pose hazards for cyclists
- Crosswalks provide minimal protection for pedestrians and cyclists
- Inadequate maintenance and/or design of shoulders, curbs, gutter pans, ditches and grates pose hazards
- Overpass on S. College Avenue over NE Corridor is too narrow to accommodate cyclists
- Parking conflicts on S. College Avenue cause bicycle lane to abruptly end on the northbound side
- Underpass on Casho Mill Road is too narrow and cars do not yield to cyclists
- Underpass on Paper Mill Road is narrow and bicycles are forced to stay in street very close to traffic
- *Separated facility on Christina Parkway dips behind roadway, out of sight, creating a security problem*

Existing conditions on Campus:

- Numerous types of bicycle racks exist although policy recommends ribbon racks for new installations
- Over 1700 bicycle rack spaces on campus
- Racks overflow and cyclist use fences and other posts
- Mall is wide and accommodates 2-way traffic without directional signage
- Crosswalks provide minimal safety

- Paths are wide and numerous
- Intersections of multiple pedestrian/bike paths lack directional signage or other design features to indicate proper movement
- Damaged and/or vandalized bicycles remain on racks

Off-road facilities:

- One existing (Route 4) and four proposed off-road facilities
- Proposed facilities:
 - Pomeroy Branch
 - Amtrak – Wyoming
 - ***Wyoming – Delaware Ave.***
 - Delaware Ave. – North campus
 - ***Iron Hill Bikeway – Iron Hill Park to College Avenue***
 - Gender Road Connector
 - Windy Hill Park connector

Newark Bikeway Proposal

April 1997

- ***Amtrak Corridor Pathway***
- East and West from Park & Shop shopping center along Winslow or Sunset to campus
 - Strip bicycle lanes
- East and West from UD central campus
 - Dallam and Radcliffe (Nottingham Green) – Amstel/Elkton Road – stripe lane
 - Forest Lane – parallel bikeway on UD land to Elkton Road
 - Amstel from Elkton Road to campus
 - 2-way bikeway with one-way traffic/2 side parking or two-way traffic/1 side parking
 - Amstel/College to Lovett/Chapel – strip or sign Lovett
 - Chapel/Lovett to Newark Library
 - Follow perimeter of DelChapel to cut through to Pomeroy
- East and West from North College to Nanatum Mills
 - ***Delayed due to public concerns, continued public outreach is now taking place to address issues***
- North-south between Suburban Plaza and Winslow/Sunset or Amstel – stripe bike lane
 - Elkton Road from Suburban Plaza to Gravenor or Casho Mill Road
- North-south along Orchard from the NEC to Amstel – stripe or sign lane
 - Phillips – Ritter – Orchard – Amstel – Delaware Ave.
- North-south between Laird Campus and Amstel
 - Existing paths to North College
 - Stripe/sign North College to Main St.
 - Existing bike path adjacent to Trabant Center
 - Pave bikeway on College from Delaware to Amstel
- North-south between downtown and trail station
 - Academy from Main Street to Train Station stripe and sign
- ***Pomeroy Line***
 - ***Complete between Wyoming and Delaware Avenue***
 - ***Delaware Ave. to Main Street being designed as part of transit hub***
- Main UD campus and downtown to new train station and the Ag campus
 - NEC pathway to NEC tracks – install bridge or tunnel
 - Septa station to Bob Carpenter Center – existing path /stripe through parking lots

A City of Newark Off-road Bicycle Trail

March 2001

- *Hall Trail – imminent*
- *Pomeroy line – built/planned*
- *UD Experimental Watershed – planned*
- *White Clay Creek State Park connection – Creek Road – Closed to traffic on weekends*
- WCC – MBNA Connector – needs further study
- Jenny’s Run – planned
- *Reservoir loop – in construction*

EXISTING CONDITIONS

Many already bicycle in Newark, both for commuting to work and class and for recreation. Also, because of the extensive planning that has been done in past studies, many bicycling facilities already exist. Newark has an extensive network of on-road routes yet few off road facilities have been built (*Map 1*). It is important, however, to evaluate existing conditions of the roads and bikeways to develop bicycle enhancements to the existing system and build upon it. Consideration of existing conditions include evaluating the bikeways, support facilities and safety.

Community members cited lack of bikeways, safety concerns, and lack of bicycle parking as obstacles to cycling. Many parts of the existing on-road network have low bicycle levels of service, based on analysis by DelDOT (*Map 2*). Numerous bicycle crashes occur on these routes; causes include heavy traffic and reckless behavior by cyclists and drivers (*Map 3*). WILMAPCO's congestion management system has found that many roads and intersections are congested; this leads to uncomfortable cycling conditions and shows the need to enhance alternatives to driving in congested corridors (*Map 4*). Limited end of trip facilities and parking is particularly a concern in downtown Newark; around the University, extensive bicycle racks and attractive pathways encourage cycling. Area cyclists would also like to see better maintenance of existing routes and more enforcement of and education about cycling laws.



Quiet, residential streets, like Orchard Road, are safe and enjoyable bicycle routes



The University has attractive pathways and bicycle parking, encouraging its students and staff to cycle



Delaware Avenue Bicycle Lane



Main Street lacks convenient bicycle parking



This intersection is property striped, however many intersections do not meet national design standards

Major Existing Constraints

The City of Newark is a major residential and commercial center in our region. According to the 2000 Census, Newark has a population of 28,547, an eight percent increase since 1990. Currently, the University has over 16,000 undergraduate students, 3,000 graduate students and 3,800 employees. In 1990, 22,500 of the 27,876 people employed in Newark (81 percent) lived outside the City. Work trips, however, represent only a small portion of the many trips on Newark's streets throughout the day; many other trips are for shopping, school, dining, recreation and through traffic.

Newark's attractive, residential streets are traveled by many cyclists but along major commercial streets facilities are limited. Delaware Avenue and Main Street are a one-way pair of streets through the downtown, yet only Delaware Avenue has a bicycle path. Many cyclists are uncomfortable riding with traffic along the crowded Main Street; this has resulted in people riding the wrong way in the bike lane on Delaware Avenue or riding on the sidewalk on Main Street. Route 4 has a sidepath for which some improvements have been funded, but this road does not serve the downtown. All major north-south commercial routes have incomplete bicycle lanes as well, and where bicycle lanes exist, they are not kept clean and are frequently interrupted by turn lanes. The bridge on South College Avenue over the railroad has a narrow bicycle lane and poor visibility, but is an important connection between the southern University Campus, the Septa Train Station, the main campus area, and residential areas.

Newark's cycling connections with surrounding areas are also limited. Access from the south of I-95 is difficult on both Route 896 and Elkton Road due to the ramp areas. Access from Kirkwood Highway is also difficult.



The bicycle lane on Elkton Road disappears in some locations



Because of heavy traffic, a narrow bike lane, and poor visibility, many cyclists opt to walk across the South College Avenue bridge

Projects Funded for Design or Construction

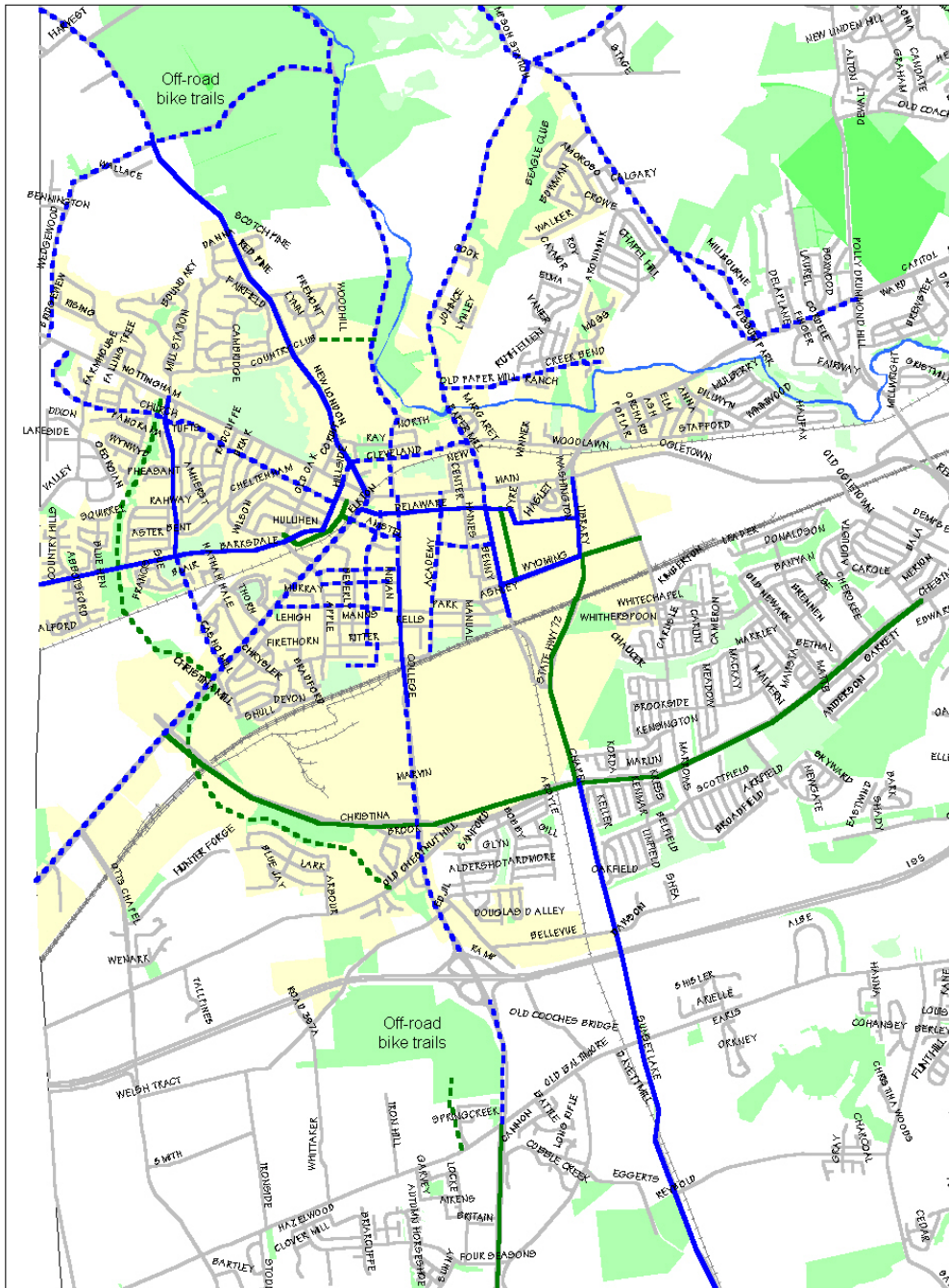
Pomeroy Pathway is the beginning of an off-road network through Newark



Over the past several years, Newark and the Bicycle Committee have been focusing on developing off-road routes in addition to improving the on-road facilities. An off-road facility along the Northeast Corridor rail line is currently under construction and will serve north-south trips through the City. Part of the Pomeroy Line has been built to serve east-west trips off-road, and another section between Main Street and Delaware Avenue is currently being planned as part of a transit hub site. A recreational loop path is currently under construction as part of the reservoir project off of Paper Mill Road.

DelDOT is currently planning the “Old Baltimore Pike Bikeway” project. This work would improve cycling conditions between Old Baltimore Pike, south of I-95, to Welsh Tract Road, north of I-95, along the Mason Dixon Trail.

Map 1: Existing Bicycle Routes



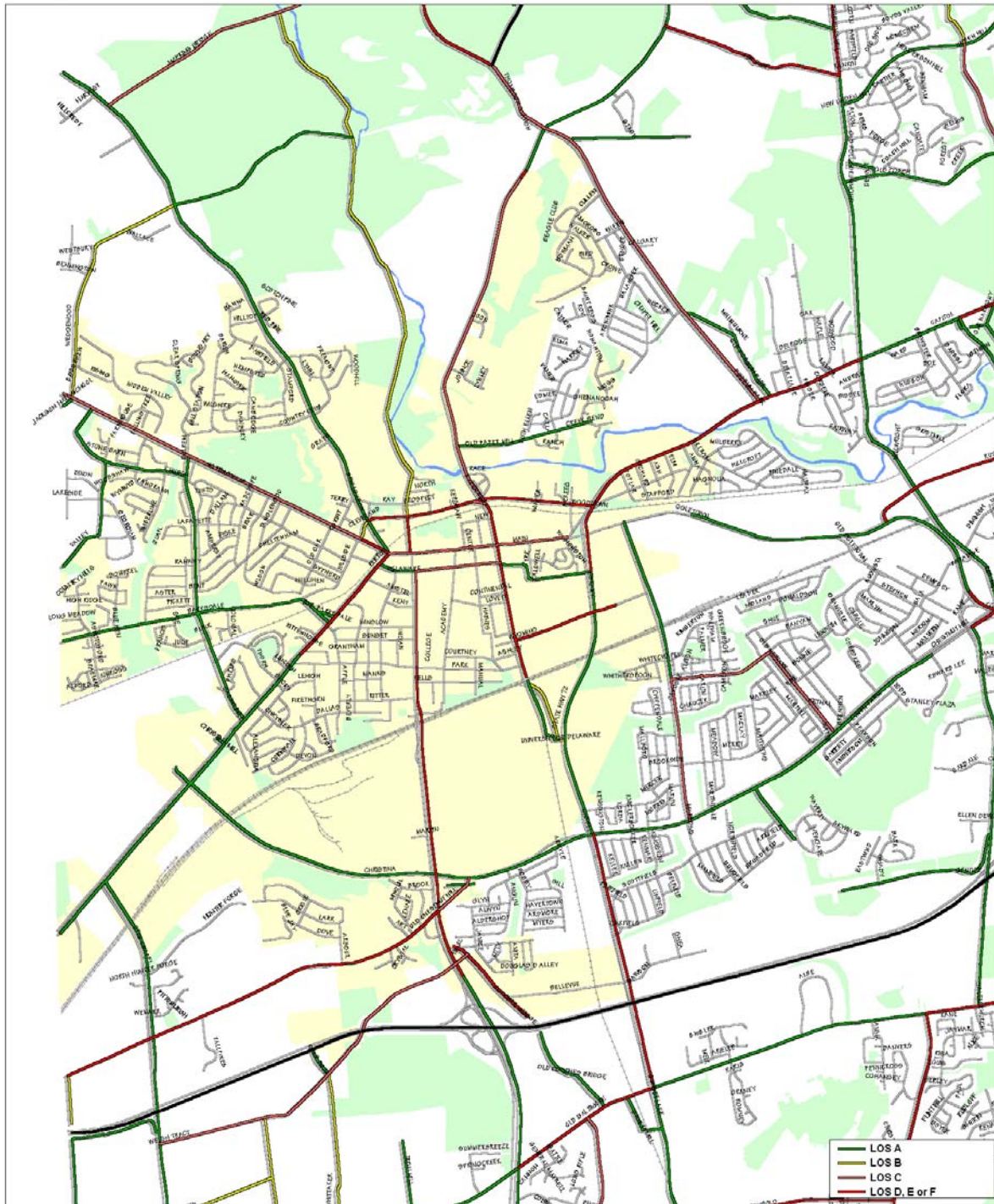
Newark Bike Facilities

- | | |
|--|--|
| — Off-road, paved | — Bicycle Lane |
| - - - Off-road, unpaved | - - - Share the Road |

Bicycle Level of Service

Bicycle Level of Service (BLOS) calculates the “bicycle friendliness” of a roadway based on factors including curb lane width, number of traffic lanes, traffic volume, percentage of trucks, and posted speeds. BLOS evaluation may be useful in several ways:

- A bicycle map can be produced for the public to assist them in route selection.
- The most appropriate routes for inclusion in the community bicycle network can be identified.
- "Weak links" in the network can be determined, and sites needing improvement can be prioritized.
- Alternate treatments for improving bike-friendliness of a roadway can be evaluated.
- Road project selection formulas can include a BLOS or BCI term to encourage implementation of bike planning goals.

Map 2: Bicycle Level of Service

Safety and Bicycle Crashes

Concern about accidents was identified by survey respondents as the second greatest reason for not bicycling more. Numerous crashes occur on arterial streets in Newark. Fear of accidents along these routes discourages people from bicycling to major destinations along these corridors. Though these streets have designated bicycle lanes, high traffic speeds and volumes can make cycling dangerous. Safety problems are made worse by improper bicycling behavior, especially riding the wrong way in the bicycle lanes.

From 1997 through 2000, there were 85 bicycle crashes in Newark, many along Elkton Road (16), Delaware Avenue (13), Main Street (14) and College Avenue (13). Clusters of crashes occurred around several intersections: Elkton/Casho Mill Road, Elkton/Veterans Lane, Elkton/Apple Road, Elkton/Amstel Road, South College/Park Place, South College/Main Street, South College/Delaware Avenue, South College/Academy, and South College/Haines Street. The most crashes occurred during October (14), June (11) and April (9); the most crashes occurred on Tuesdays (22), Wednesdays (14) and Thursdays (14).

A study by the Pedestrian and Bicycle Information Center has identified common causes of bicycle crashes. When the motorist and bicyclist were on initial parallel paths, either in the same direction or opposing directions, the three most frequent categories of crashes were:

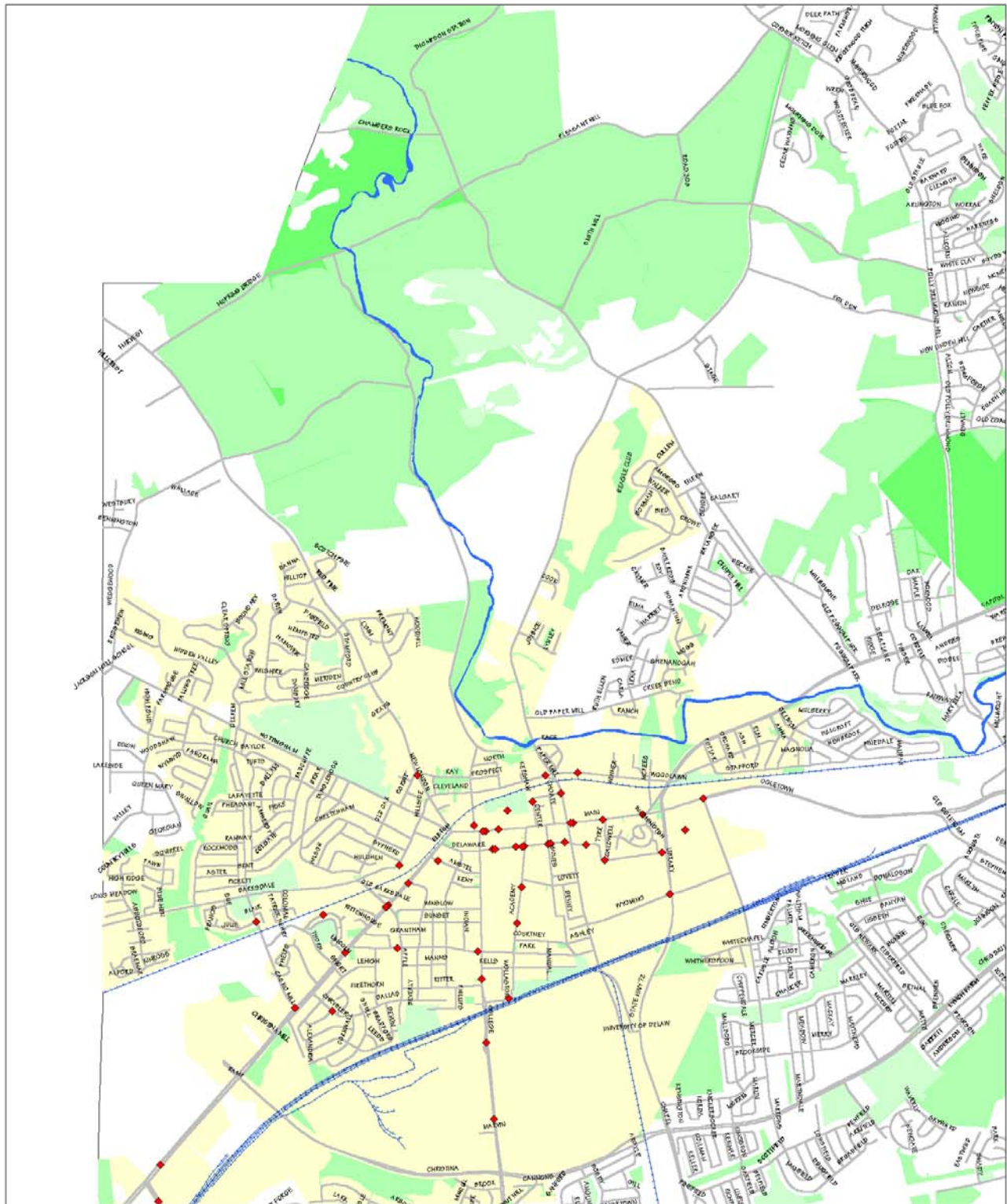
- Motorist turning or merging into the path of a bicyclist (12.1 percent of all crashes). Almost half (48.8 percent) of these crashes involved a motorist making a left turn in front of a bicyclist approaching from the opposite direction.
- Motorist overtaking a bicyclist (8.6 percent of all crashes). Of these crashes, 23 percent appeared to involve a motorist who misjudged the space required to safely pass the bicyclist.
- Bicyclist turning or merging into the path of a motorist (7.3 percent of all crashes). Within this category, 60 percent involved a bicyclist making a left turn in front of a motorist traveling in the same direction.

When the motorist and bicyclist were on initial crossing paths, the three most frequent categories of crashes were:

- Motorist failed to yield right-of-way at a junction (21.7 percent of all crashes). Of these crashes, more than a third (37.3 percent) involved a motorist violating the sign or signal and drove into the crosswalk or intersection and struck the bicyclist.
- Bicyclist failed to yield right-of-way at an intersection (16.8 percent of all crashes). Within this category, 38 percent involved a bicyclist who had stopped for a sign or flashing signal and then drove into the intersection and was struck by the motor vehicle.
- Bicyclist failed to yield right-of-way at a midblock location (11.7 percent of all crashes). Almost half of these crashes (43.4 percent) involved a bicyclist riding out into the roadway from a residential driveway.

For more information about crash types and how to avoid them, see Appendix A.

Map 3: Bicycle Crashes



Newark Bicycle Crashes 1998-2000

Source: Newark Police Department

Congestion

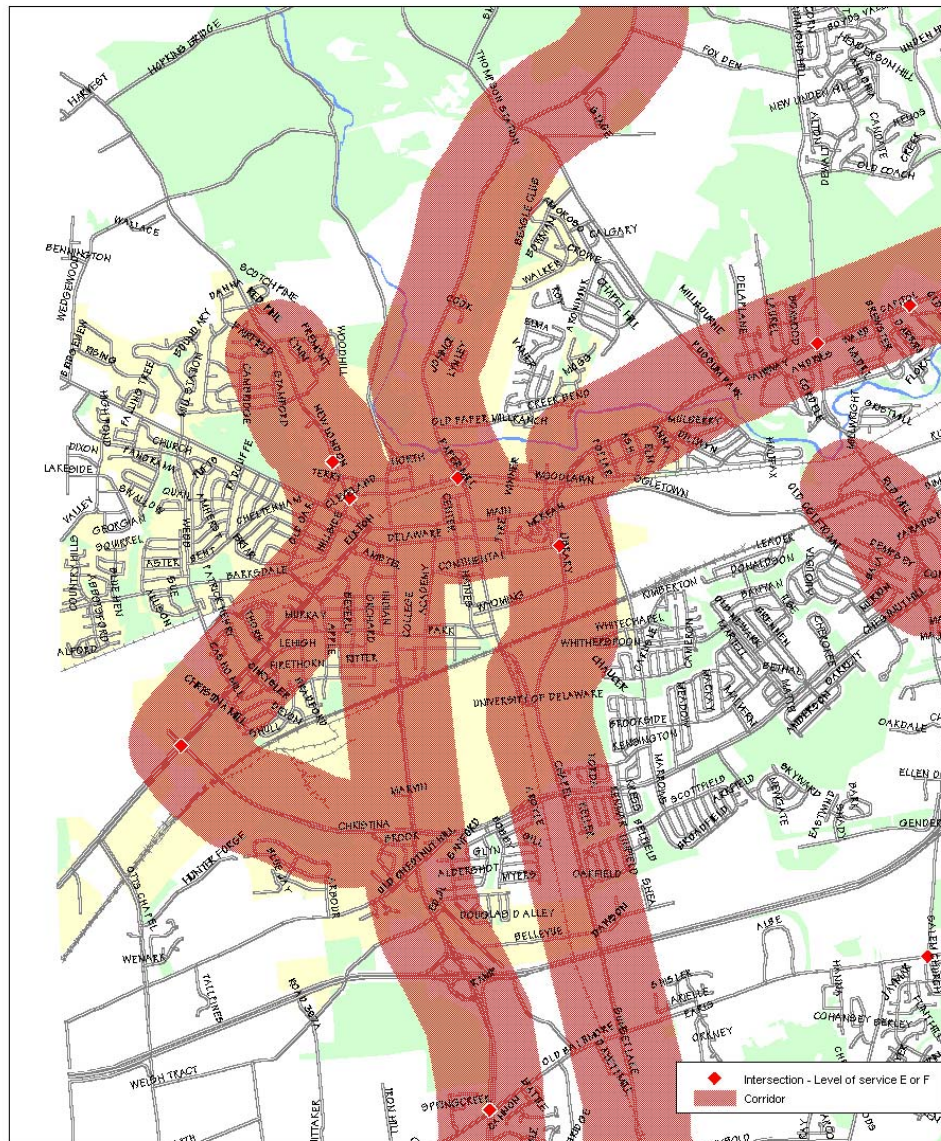
Five of the 13 corridors identified in the WILMAPCO 2002 *Congestion Management System* (CMS) are in or connected to Newark: Route 896, Route 72, Papermill Road, Routes 896/2/4, and Kirkwood Highway. The CMS identifies congested roadway segments to be addressed through WILMAPCO's regional planning process using five "top-down" strategies.

- Strategy #1: Eliminate person trips or reduce VMT during peak hours
- Strategy #2: Shift Trips from Automobile to Other Modes
- Strategy #3: Shift Trips from SOV to HOV Auto/Van
- Strategy #4: Improve Roadway Operations
- Strategy #5: Add Capacity

This "top-down" approach evaluates solutions that would eliminate or shift auto trips or improve roadway operations before adding roadway capacity. For the five Newark corridors, recommendations include:

- ◆ improve and expand the bicycle network with on-road facilities, pathways and greenways
- ◆ provide safe and secure places for bicyclists to store their bicycles

Corridors are shown in pink on the following map; red triangles indicate intersections with vehicle level of service E or F. As improvements to these corridors and intersections are considered in other plans, attention should be given to improving bicycle and pedestrian conditions.

Map 4: 2002 Congestion Management System

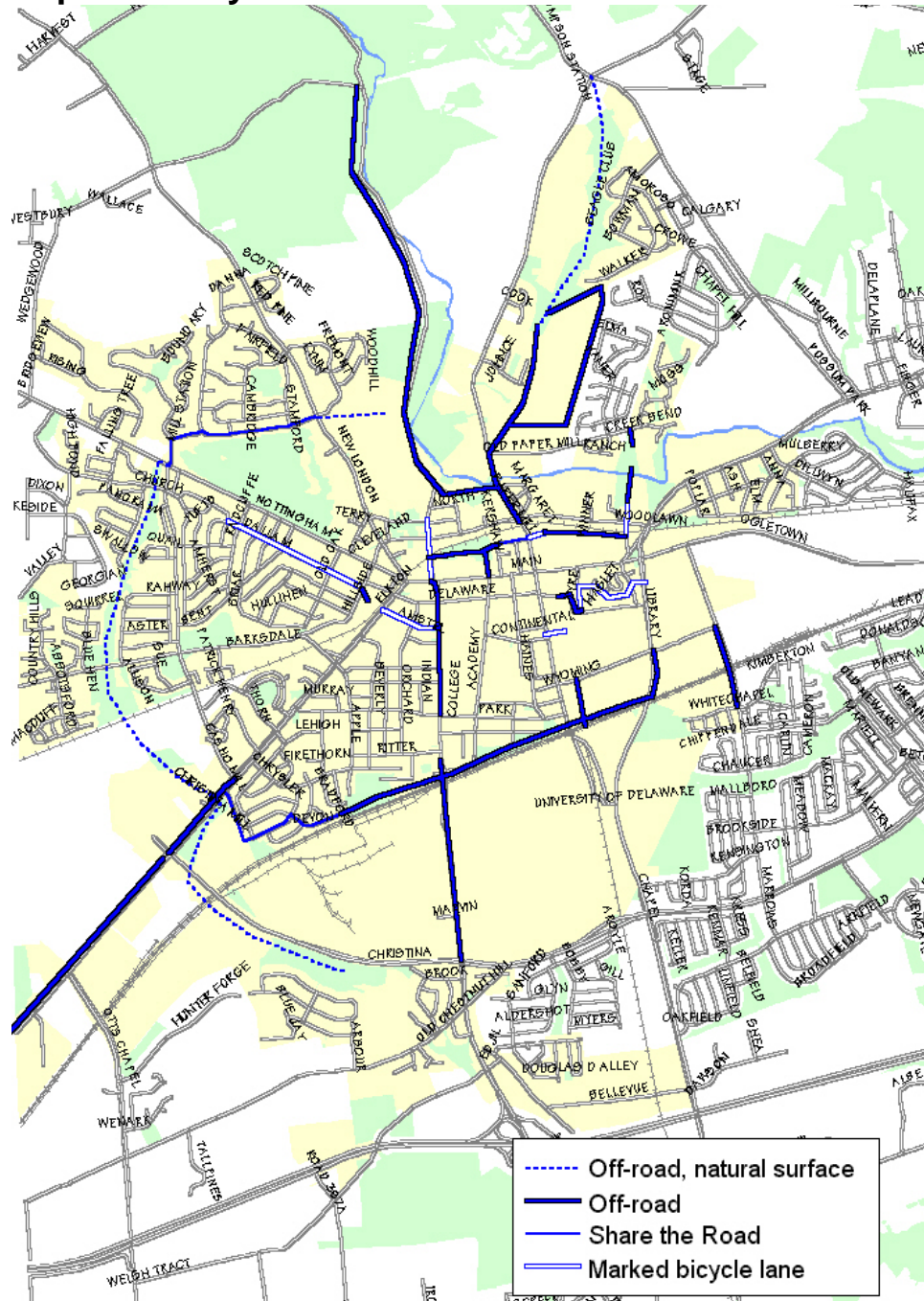
Source: WILMAPCO Congestion Management System, 2002

RECOMMENDED IMPROVEMENTS

Coordinated Bicycle Facility Network

Map 5 shows the proposed additions to Newark's bicycle network. It includes a combination of off-road facilities, natural surface trails for recreational use, and on-road bicycle and share the road routes along residential streets.

Map 5: Proposed Bicycle Routes



Major proposed projects include:

Pomeroy Line Pathway – The Pomeroy Line is an abandoned rail corridor that runs north-south from the Northeast Corridor rail line, through the University Courtyard Apartments, to Main Street by Newark Shopping Center, and then north to the University Laird Campus and White Clay Creek State Park. A section between Wyoming Road and Delaware Avenue was constructed as part of the University Courtyard Apartments. Between Delaware Avenue and Main Street, the greenway is currently being designed by DART First State as part of a transit hub. Funding for the transit hub has been proposed by DelDOT for the FY 2004-2006 Transportation Improvement Program.

Frazer Field Pathway – The lack of a bicycle lane along Main Street discourages bicycle trips to downtown Newark. The Frazer Field Pathway is currently being studied as an off-road way of reaching Main Street and Newark Shopping Center. The proposed route runs through University property to the north of Main Street. It would begin at Carpenter Sports Building, use an existing gated lot driveway, before connecting to a new path behind the University tennis courts and out to New Street. The route would follow New Street to South College Avenue and terminate at Newark Shopping Center. Connections between the proposed route and Main Street exist at North College Avenue, Old College, the parking lot at Wilmington Trust, Center Street and North College Avenue.



Frazer Field connection to Main Street by Wilmington Trust



Existing Pomeroy Line between Main Street and Delaware Avenue



Pomeroy Line, University Courtyard

Jenny's Run – The proposed Jenny's Run route would parallel Paper Mill Road between Possum Park Road and the Reservoir loop at Old Paper Mill Road. While DelDOT has funded improvements to the Paper Mill Road Bicycle Lane, this project would provide an off-road alternative for reaching downtown Newark. The route would be located on Newark parkland.

Improvement to existing facilities include:

East Coast Greenway Improvements - The East Coast Greenway is an off-road, nonmotorized trail connecting towns and cities from Florida to Maine. Regionally, the route will connect Philadelphia, Wilmington, New Castle, Churchman's Crossing, Newark, Elkton, Perryville and Baltimore. When routes are designated, signs will be added to identify the route. Newark should also consider adding tourist destination signs to direct travelers to Main Street, the University and the train stations. In Newark, an "Express Route" will follow Route 4 to Elkton Road; the "Scenic Route" will follow go from Route 4 to Route 72 and then will use the Amtrak-Parks pathway currently under construction to connect to Elkton Road.

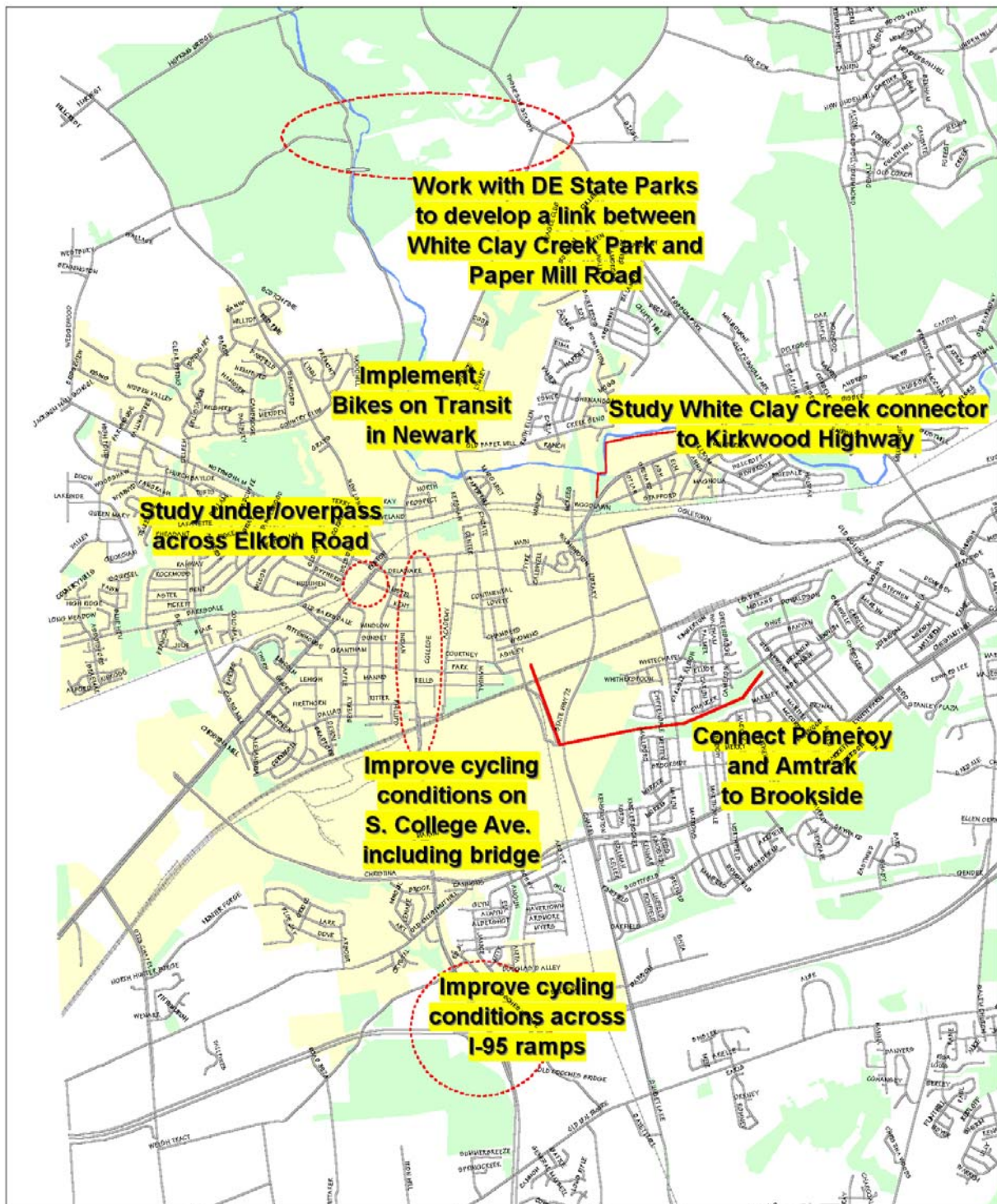
Elkton Road – Elkton Road is scheduled for reconstruction by DelDOT. The reconstruction project should include improvements to the bicycle improvements for Route 2 between the MD line and Main Street. Elkton Road between Gravenor Lane and Elkton is part of the planned East Coast Greenway Route and should be designed as an off-road, multiuse facility. Continuous bicycle facilities should be included from Gravenor Lane to Main Street. A blue colored bicycle lane is recommended to enhance visibility of the lane.

Delaware Avenue – Additional alternatives analysis should be done to select improvements to Delaware Avenue. Feasibility of a separated bicycle lane or a two-way separated bicycle lane should be studied and both sides of the roadway should be evaluated. Short term, the bike lane should be colored blue for better visibility. Also, more enforcement should be done of drivers traveling in the bicycle lane and cyclists traveling the wrong direction.

Main Street – Many have suggested eliminating parking on one side of the street to accommodate a bicycle lane, however this is not being recommended because of the potential it could hurt Main Street businesses. However, many cyclists wish to patronized downtown businesses, and need facilities to reach Main Street and convenient parking. Completion of the Frazer Field Path and improvement to Delaware Avenue will give bicyclists access to Main Street. However, additional bicycle parking is needed along Main Street and in Newark Municipal Parking Lots. Signs on Main Street should be changed from "No Bicycles on Sidewalks" to "Share the Road" or "Bikes Belong" to remind drivers to be courteous of cyclists.

Major issues needing additional study are shown on *Map 6*.

Map 6: Major Studies



Transit Improvements

The City of Newark should continue to work with DART First State to improve intermodal connections between transit and bicycling. Many transit riders reach the transit lines by walking and bicycling. Those who bicycle need storage facilities at transit stops. The joint planning of the transit hub and the Pomeroy line is an excellent example of how transit and bicycling can work together.

Newark and DART should also work together to implement bicycle racks on buses. This program has been successfully implemented in Kent and Sussex counties, as well as many other parts of the country. Racks on buses enable riders to take their bikes with them to reach destination on both ends of the transit trip. This program can be tried in New Castle County as part of the circulator buses that will serve the planned transit hub. If successful, bike racks should be installed on other bus routes serving Newark.



Bike racks on buses have been successful at Delaware's beaches

Currently, Septa service allows bicycles on board non-peak hour trains. Currently, only peak hour trains serve Newark's station. If additional Septa service is added to Newark, effort should be made to market the bikes on board policy.

Bicycle lockers exist at the Route 4/Route 896 Park and Ride and the Septa Train Station but are not well used. The Newark Transit Subcommittee or Bicycle Subcommittee should consider helping promote the use of the lockers.

Parking

Parking must be convenient to destinations and provide a secure way of locking bikes.



Acme Supermarket, Suburban Plaza. This is a good design, economical, and the lock can reach the frame, as seen in the picture right. As with any rack, it is imperative that the rider can lock the frame to the rack, as most bikes today come with quick release wheels/hubs.



Note the lock around the portion of the frame just behind the pedal. Both a wheel and the frame can be easily locked with this design.



Downtown Newark, next to Starbucks. This is well designed for locking the frame of the bike, a wheel, and anything else higher up, such as the saddle.



Suburban Plaza. This rack is probably seldom used given its distance to the mall. It is also a "wheel only" design and not recommended. Cyclists generally want their bikes parked near the storefront in which they are shopping, where there is greater witness potential in case of attempted theft.



The post design system



Note the ease in which a bike can be locked by the frame to this system, but a longer cable lock would be needed to secure the wheels if desired.



At the Newark Coop. This rack is well placed, within its own designated area, and easy to use except for the wheel only design which is not recommended.



Another standard design, wheel only. These racks were designed in the days when most bikes were sold with wheels bolted to the frame, and a simple loop through the wheel rim was secure enough to prevent theft in most cases. Note the blue bike parked alongside the rack to allow for frame locking.



Townhouse development behind Main Street. This is also an excellent choice for a rack design.



Another example of a “Wave/ZigZag” type rack. These are commonly found throughout Newark, as well as the post design. It is easier to lock the front and/or rear wheel plus the frame.



This is an older post design. Note the “trays” made of concrete, and the thinner posts.



Another example of the post design. Either these or the Wave/ZigZag rack design should be installed at regular intervals along main street and the shopping centers on Rt. 40, even if it's only a small number in any given place.

The City of Boulder, Colorado has designed clever bicycle racks that are welded onto downtown parking meters. Recycled automobile steering wheels attached to parking meters have been well utilized in Boulder's downtown area. These recycled automobile steering wheels aid in keeping the bikes upright and out of the pedestrian right-of-way. The different models of recycled steering wheels are from mid-70's to mid-80's cars. Funding for this project comes from parking meter revenues.



EDUCATION, ENFORCEMENT AND MAINTENANCE

Education

Newark Police Department and the Newark Bicycle Committee should work together to develop an education plan.

Enforcement

Motorists

Aggressive, inattentive and speeding motorists pose a tremendous threat to the comfort and safety of bicyclists. Many motorists are primarily looking out for other vehicles and may not even notice cyclists. Many have not been taught how to interact with bicycle traffic and some are not aware that bicyclists are justified to be sharing the road with them. A smaller number of motorists are intentionally aggressive toward bicyclists by passing too close or fast.

Police are responsible for stopping motorists who do not share the road safely with cyclists and such stops provide an opportunity for education as well as enforcement. Many motorists will be completely unaware of what they have done wrong and the officer, therefore, must make sure the motorist understands and appreciates the impact of behavior that causes danger to a bicyclist. If the driver seems to get the message, a warning may be all that is necessary. Some drivers, however, will steadfastly refuse to accept that a cyclist - any cyclist - should be on the road. Even if the officer wouldn't ride on that road themselves, they should help the driver understand that the cyclist has a legitimate right to be on the road and that riding in the gutter or on the sidewalk is likely much less safe. If the driver still fails to see the light, a ticket may be the only option.

Motorists may claim that "the cyclist was all over the road". While some cyclists do weave around and are unpredictable, more often, the cyclist is simply trying to avoid a pothole, dodge a rock or broken glass, or stay away from a crack in the road between the gutter and the asphalt. Cyclists are not required or expected to ride in the gutter, and are not required to get out of the way of motorists. Equally, a cyclist should not deliberately hold up a motorist when there is space for safe passing.

Use of technologies such as red-light cameras and photo-radar speed enforcement can also reduce violations without requiring additional staffing. Traffic calming measures are also effective at reducing the motor vehicle speeding that is so dangerous to bicyclists; traffic calming measures, however, need to be carefully designed so they don't present yet another safety challenge for cyclists. The *Old Newark Traffic Calming Plan* includes information about recommended techniques and City and DelDOT policy for implementing traffic calming

Areas of focus for enforcement at the motorist:

- Driving while impaired by drugs or alcohol
- Failing to yield the right-of-way
 - When turning left at intersections or at driveways
 - When turning right at intersections or at driveways
 - When entering roadway
- Speeding, particularly in neighborhoods and near schools.

- Overtaking bicycles in areas where it cannot be done safely

Bicyclist

Bicycle crashes often occur in part because of reckless cycling behavior. It is a bicycle rider's responsibility to follow the rules of the road and practice defensive riding.

Priority areas for enforcement include:

- Driving at night without lights or required reflectors
- Riding the wrong way in a traffic lane or on the wrong side of the road
- Running a stop sign or red light
- Failing to yield the right-of-way
 - Riding out mid-block
 - While turning right or left
 - Abruptly entering a crosswalk, too fast for the approaching motorist
- Failing to signal an abrupt turn.

It is as important for the Newark Police and University Public Safety to enforce reckless cycling behavior as it is to enforce reckless driving of automobiles. Reckless cyclists are putting themselves at risk and endangering others. However, the enforcement of dangerous cycling has numerous obstacles:

- Cyclists are highly mobile and may be difficult to stop by an officer using a motor vehicle. Bicycle patrols are more equipped to get the attention of, pursue, and stop cyclists and may be less intimidating to person stopped
- Cyclists are not required to carry identification and may not have a picture id with them. In these cases, there is a risk that the offender may give the officer false information. The officer should take down a full description of the person stopped and look for signs of hesitation that may indicate the person stopped is not being honest.
- Stopping a child who is riding recklessly is an opportunity to educate about dangerous behavior. Under some circumstances the officer should call the attention of the parent to the problem. Also, Delaware law requires any child under age sixteen shall not operate, ride upon, or ride as a passenger any bicycle unless wearing a properly fitted and fastened helmet. Any guardian who fails to cause his child to wear a bicycle helmet shall be fined for the first offense \$25, and for each subsequent offense \$50. The court may dismiss all charges if presented evidence that a violator has purchased or obtained a bicycle helmet meeting the standards mentioned above.
- Stopping reckless adult bicyclists also presents an opportunity to educate. The officer may choose not to ticket the offender but should always alert cyclists about their dangerous behavior.

The Newark Police and University of Delaware Public Safety should develop an enforcement plan to maximize its effectiveness and their efficiency. This may include periodic enforcement blitzes during periods when the highest number of crashes typically occur (i.e. April, June July, August and October).

Newark Police and the University of Delaware Public Safety can increase their level of enforcement by expanding the use of the existing bicycle patrols. Police patrols by bicycle are an efficient way to improve enforcement of safe bicycling. Ten to 15 bike officers can be fully outfitted for the cost of one patrol car. Police on bikes can travel faster than those on foot, and can reach areas inaccessible by car. Officers on bikes are more accessible to the community. Bike patrols legitimize the fact that bikes are entitled to share the road.

Also, Newark can learn from some innovative program that other communities have implemented:

Roseville, MN Police Department -The Roseville Police Department bike patrol officers provide an effective way to deal with the challenges of reducing bicycle crashes, injuries and fatalities. The Roseville bike patrol unit trains college students to educate people in the Roseville Community about safe bicycling. The bike patrol unit also is responsible for enforcing bicycle laws. The bike patrol officers serve as public relation agents for the police department. They conduct programs, bike rodeos, seminars, all while making bicycling fun and safe for riders of all ages. Local McDonald's restaurants have been active supporters of the Roseville Bike Patrol program for many years. Bike Patrol Officers present certificates for free ice cream cones to young bicyclists as rewards for safe bike riding habits.



The Roseville Bike Patrol also works closely with the city's park and recreation department on special activities and events. The bike patrol provides additional safety patrols of the Roseville extensive park trail system, which is not easily accessed by the police patrol vehicles. Bike patrol officers are extremely visible in the city parks and therefore act as a deterrent to vandalism and theft.

The Roseville Bike Patrol is a highly visible safety program in the Roseville community. City residents are enthusiastic in support of this valuable, multi-faceted program.

Cornell University, Ithica, NY - The Cornell Police bike patrol provides cycling education, community contact, and general and special patrol services.

Increasing the public's awareness of the importance of safely and considerately sharing the road is one of the Bicycle Patrol's most important responsibilities. Besides having a "bike's-eye view" of road, pathway, and bike-lane conditions, Cornell's bike officers are trained in bike handling skills, roadway usage and etiquette, and related techniques and tactics. Officers participate in bike rodeos, effective cycling classes, displays of bike safety awareness, and other educational outreach forums. Most recently, bike officers have begun monitoring areas where bicycle, vehicle, and pedestrian traffic coexist and to take problem-solving measures.

Cornell bike officers often perform special functions, such as escorting parades or providing security for visiting dignitaries. Bike officers are accessible to community members and usually can stop and talk without holding up traffic. They also can enter many areas inaccessible to cars, respond quickly even in the tightest traffic jams, and provide a safe and unobtrusive presence in crowds. Those advantages, along with the bike patrol officers' dedication to community education and policing, make the Bicycle Patrol a well-respected and integral part of Cornell Police.

University of Colorado, Boulder, CO - University police here are vigilant, issuing between 50 and 100 tickets to bicyclists in an average week, with the first two weeks of each semester as a "grace period" when students are only given warnings. Instead of paying the tickets, students can opt to attend a bicycle safety education class offered at Boulder County Municipal Court.

The International Police Mountain Bike Association provides a variety of training and resources for bicycle enforcement officers. www.ipmba.org

The Law Enforcement Bicycle Association exists to further the training, education, professionalism and unity of police bicycle patrol officers. www.leba.org

Maintenance

DelDOT, City of Newark and the Newark Bicycle committee must work together to develop recommendations to improve maintenance of bicycling facilities.

Future Planning and Implementation

The Newark Bicycle Committee should continue to meet on an ongoing basis to refine and advocate the implementation of bicycling improvements identified in this plan.