NEWARK-ELKTON INTERMODAL TRANSPORTATION PLAN
LONG-RANGE ANALYSIS

Prepared for:

Wilmington Area Planning Council

Participating Agencies:

Delaware Department of Transportation
Maryland Department of Transportation
New Castle County
Cecil County
City of Newark
Town of Elkton
University of Delaware

Prepared by:

Lehr & Associates, Inc.
Garmen Associates
A-Tech Engineering, Inc.

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EXECUTIVE SUMMARY

The Newark-Elkton area will continue to experience significant population and employment growth through the year 2020. Related to this growth are numerous transportation and land use issues which this study has identified. These issues involve traffic flow in the Newark and Elkton downtown areas, impacts of truck and rail freight traffic, availability of convenient parking in the downtown areas, constraints to bicycle and pedestrian travel, traffic flow along key travel corridors, access to public transit service and ridesharing opportunities, and the computability of land use and design patterns with all travel modes. These issues present challenges and opportunities to managing future growth in a manner that supports the goals of WILMAPCO's Metropolitan Transportation Plan (MTP).

The main goal of the Newark-Elkton Intermodal Transportation Plan (NEITP) long-range analysis is to provide a strategic direction for developing an intermodal transportation system that will provide effective and efficient movement of people and goods and preserves the character of Newark and Elkton as livable communities. This study evaluated numerous alternatives for addressing the issues, and it recommends several different types of strategies and actions. The following paragraphs provide a brief summary of recommendations in each category.

One category of recommendations is **land use and growth management** strategies. These strategies will help to provide land use and design patterns that are compatible with all travel modes, and to better integrate land use planning with transportation decision-making. The study also recommends promoting **travel demand management** (TDM) activities, such as ridesharing and vanpooling, especially through expanded efforts of the Transportation Management Association (TMA) of New Castle County, with cooperation of the major employers in the study area.

Another category of recommendations is **bicycle and pedestrian circulation.** The study recommends implementing proposals to develop a network of bicycle routes throughout the study area, in order to facilitate safe and efficient bicycle travel. Also recommended is enhancing bicycle and pedestrian linkages as part of revitalization efforts in the Newark and Elkton downtown areas. The study also recommends expanding the network of **public transit services** in the study area. Recommendations include new services along key corridors, a Newark-Elkton local bus service, Elkton-Wilmington express bus service, and increased circulator service in the

Newark and Elkton CBDs. Other transit recommendations include strengthening linkages to transit services through support facilities such as transit centers in downtown Newark and Elkton, park-ride facilities at outlying locations, and improved facilities at other bus stop locations. Also, the study recommends further evaluation of extending commuter rail service in the study area.

The next category of recommendations is **roadway operations and systems management** to improve the efficiency of travel. The study recommends converting New London Road to 2-way operations between Cleveland Avenue and Main Street, designating a new truck route for DE 896, modifying several intersections, and developing parking management plans for the Newark and Elkton downtown areas. The study also recommends further analysis of alternatives for minimizing the impact of the CSX rail line upon downtown Newark. The final category of recommendations is **increased roadway connections in New Castle County**. The study recommends a feasibility study for a new roadway connection to the north of downtown Newark. This connection could serve to alleviate congestion in the CBD, as well as at the eastern end of the downtown area. The study also recommends converting the former Pomeroy Branch rail line into a multi-modal travel facility (roadway with bicycle and pedestrian paths) and expanding the existing Casho Mill Road underpass to provide an additional travel lane for automobiles. These recommendations would improve the connectivity of the local roadway network.

In sum, the recommendations recognize the link between land use and transportation, and they provide a package of strategies and actions that emphasize developing linkages and connections among and between different modes of travel. The goal is to develop an integrated transportation network that will support the role of Newark and Elkton as intermodal centers of commerce and culture, facilitate efficient and safe travel along the key travel corridors, and increase mobility and access for all transportation system users throughout the Newark-Elkton area.

INTRODUCTION

WILMAPCO's Metropolitan Transportation Plan (MTP), adopted in 1996, establishes the following six goals:

- Better planning, with land use and transportation linked
- Healthy and growing economy that is built on our geographic advantage and the skills of the population
- Improved quality of life, emphasizing a sound environment, less congestion, better use of land, sense of security, and better education
- Re-emergence of traditional communities and municipalities as the location of commerce and culture for the area
- Improved mobility and transportation alternatives to provide for efficient people and goods movement
- More effective intergovernmental relations, especially between the state and local levels, and better public/private communication on issues of development and transportation-linked development

The primary objective of the MTP is to reduce single occupancy vehicle trips (SOVs) by 10% between the years 1995-2020. The MTP proposes five key types of strategies:

- Link Transportation and Land Use -- use Transportation Investment Areas, community design criteria
- Improve Mobility -- provide multiple travel options, especially by improving public transit services. Focus on reducing automobile use and providing transit in most congested areas.
- Manage Transportation System -- promote new travel patterns through community design, maintain existing system and improve efficiency with technology
- Protect Natural Resources -- develop greenways / bikeways system. Use country road classification
- Improve Commerce -- improve goods movement and business travel

As part of its efforts to implement the MTP, WILMAPCO is conducting several studies. One of these studies is the Newark/Elkton Intermodal Transportation Plan (NEITP). In May 1996, WILMAPCO issued a report on the short range analysis for the NEITP. The purpose of that report was to identify transportation issues, investigate alternative solutions, and recommend a short term action plan for the study area. The NEITP short range analysis established three basic goals:

- Reduce traffic congestion
- Improve mobility
- Enhance and promote Newark's attractiveness as a livable community by making full use of intermodal transportation opportunities.

The NEITP short range analysis investigated the immediate or short-term transportation needs of the Newark area. The analysis identified and analyzed alternative solutions, resulting in a program of short-term recommendations for implementation. Some of the recommendations are already in the process of implementation.

Project Approach

The basic objective of this project was to conduct the long range analysis for the NEITP, thereby providing strategic direction for transportation and land use decision-making in the region. The project had the following three main tasks:

I. Confirm the characteristics and magnitude of the transportation and land use situation

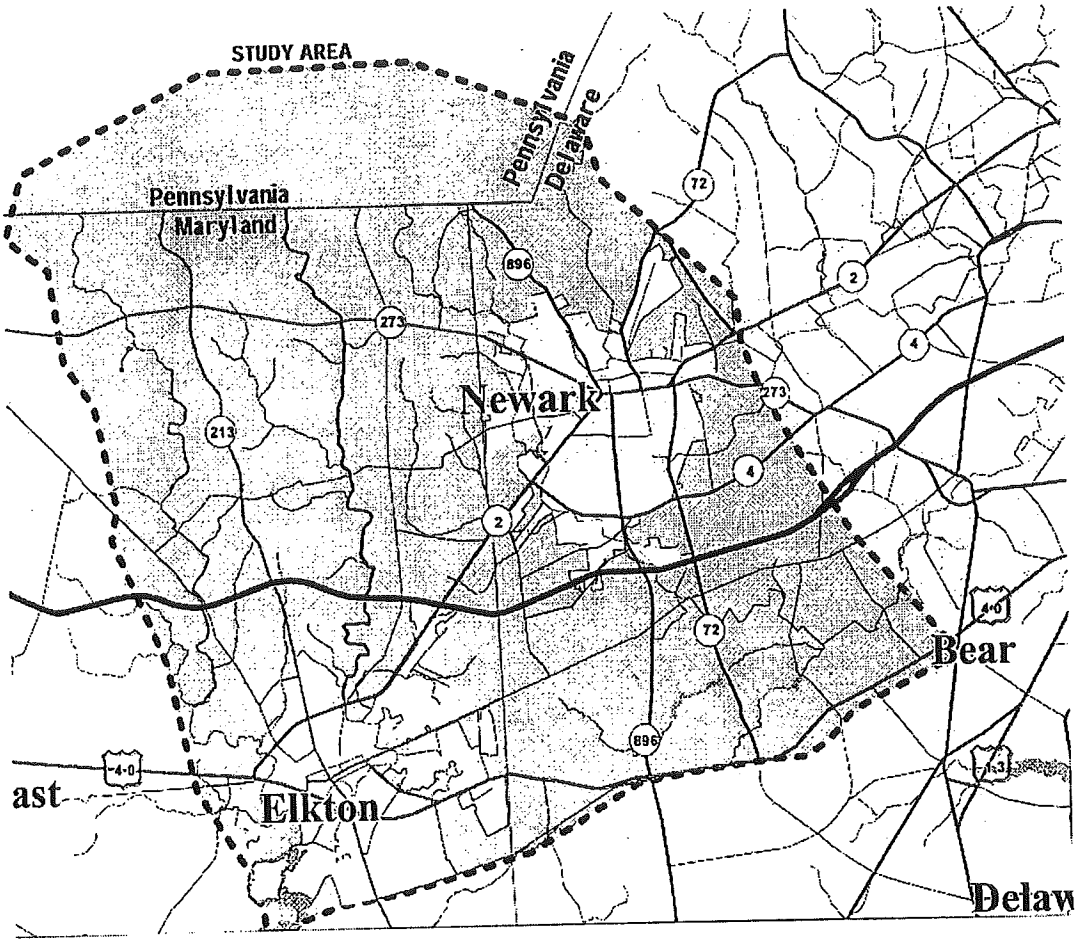
II. Determine appropriate strategies and projects for addressing the transportation problems

III. Recommend specific strategies and projects, as appropriate

Under Task I, the consultants assessed the land use and transportation conditions in the study area (see **Figure 1**). During this initial phase, the consultants collected and reviewed information and data from various sources, including previous studies, and conducted interviews and focus groups with key stakeholders. The first public workshop (September 1997) assisted the consultants in identifying key issue areas for further analysis. At the second public workshop (February 1998), the consultants presented a summary of the assessment of key land use and transportation issues, and the public provided additional input on these issues.

The second main task was to evaluate alternative strategies and actions for addressing the key issues. At the February 1998 public workshop, the consultants also presented a list of alternatives, and the public discussed these alternatives with the consultants in small group sessions. The methodology for evaluating the alternatives included a wide range of technical analysis and public involvement techniques. The technical analysis included analyzing population and employment projections, projecting future traffic volumes, and assessing the potential effectiveness of proposed transportation facilities and services. The public involvement activities included discussions with agency representatives and public workshops. At the third public workshop (May 1998), the consultants presented scenarios of proposed alternatives, and the public provided feedback on these scenarios and alternatives. Based upon public input from this meeting and additional technical analysis, the consultants developed a list of preliminary recommendations, presented at the final public workshop (June 1998). Finally, based upon public comments and additional review, the consultants prepared the final report.

FIGURE 1
Location of Study Area



Final Report

Chapter I of this report provides a summary of the assessment of land use and transportation conditions in the study area. The final section of Chapter I provides a summary of key issues, which served as the basis for identifying and evaluating alternatives. Next, Chapter II presents the final recommendations, organized into six categories. These recommendations provide an inter-related package of strategies and actions which emphasize intermodal connections and access to all modes of travel. Chapter III provides a plan for implementing the recommendations. This plan emphasizes the roles of public agencies in implementation, and it includes estimated time frames for implementation. Finally, the Appendices provide various background and documentation materials that serve to support the findings and recommendations of this study.

I. LAND USE AND TRANSPORTATION CONDITIONS

The first main task of this project was to assess land use and transportation conditions in the study area. This task had three key objectives: determine medium and long-term land use trends, determine travel patterns, and determine travel volumes. Work activities for this task included data collection and analysis, interviews and focus groups, public workshops, and surveys and field observations.

A. Existing Conditions

General Land Use Patterns

Within the study area, the sections with the greatest concentrations of households are the city of Newark, areas to the west and southeast of Newark, and sections in and around Elkton (see **Figure 2**). The greatest existing concentrations of employment are in Newark; areas to the immediate southeast, east and northeast; and in Elkton and surrounding areas (see **Figure 3**). The following sections provide more background information on existing land use patterns.

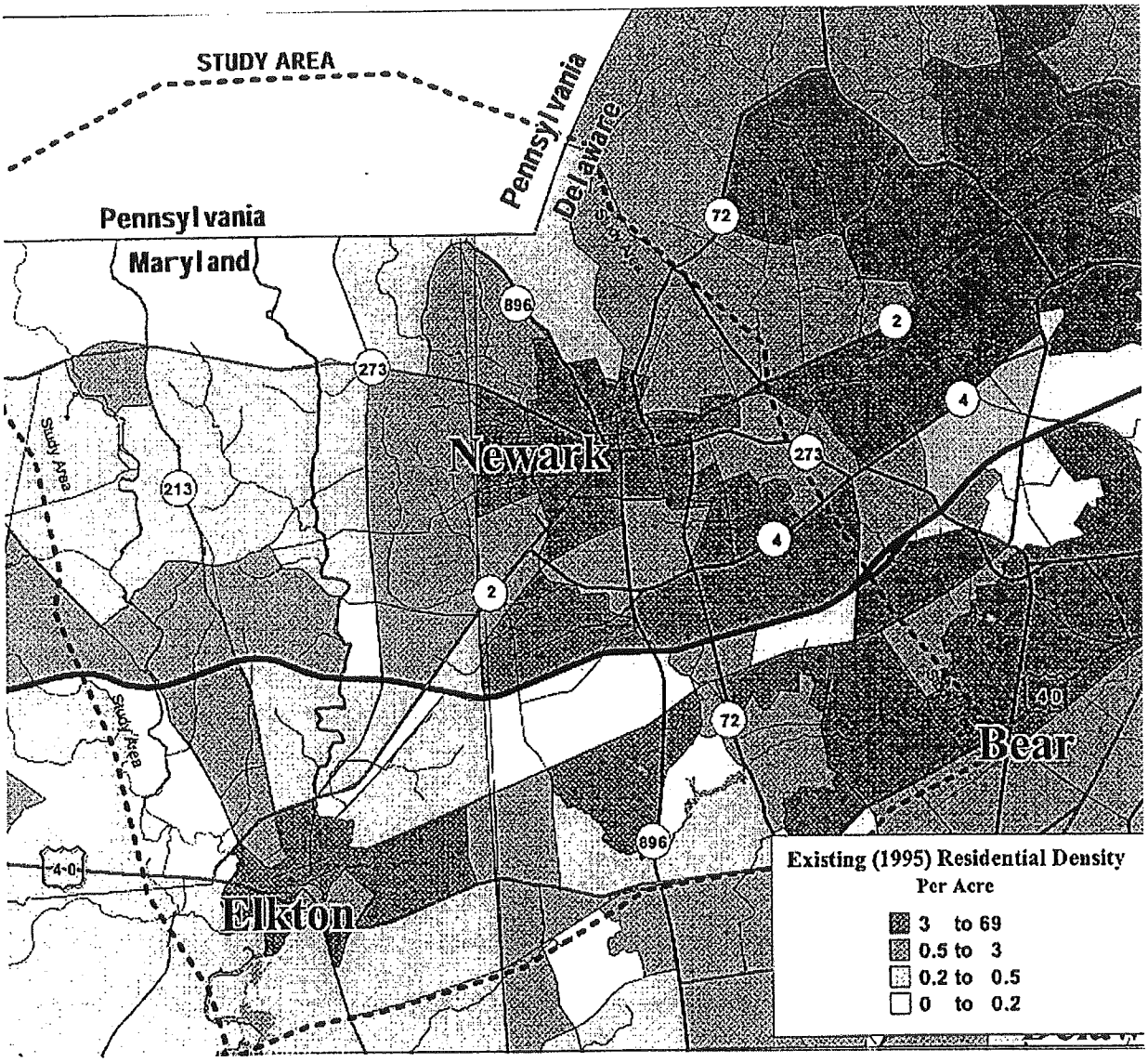
Greater Newark Area

Newark has long been a residential and commercial center, and the MTP identifies the City as an "intermodal center of commerce and culture, hub area." The City covers 9 square miles and has a population (1990 census) of 26,463. The rate of population growth has slowed in recent years, but the City still has significant amounts of institutional, commercial, and industrial development. In the past few years, the Main Street central business district (CBD) area has experienced substantial new commercial and residential development.

An important element of land use in Newark is the University of Delaware, whose main campus is located adjacent to the central business district. The University owns nearly 1,000 acres and over 300 buildings in the Newark area, and it employs over 3,300 people. The University is by far the dominant land use in the downtown area. In addition, University students are a major component of the city's population. U.S. Census data include on-campus students as part of the city's population, while off-campus students who live in the city are not included in the population. In 1997, about 7,200 students lived on-campus, while about 2,700 lived off-campus.

The Newark area is home to several other large employers, including Chrysler, MBNA, DuPont Rodel, Gore, and Avon.

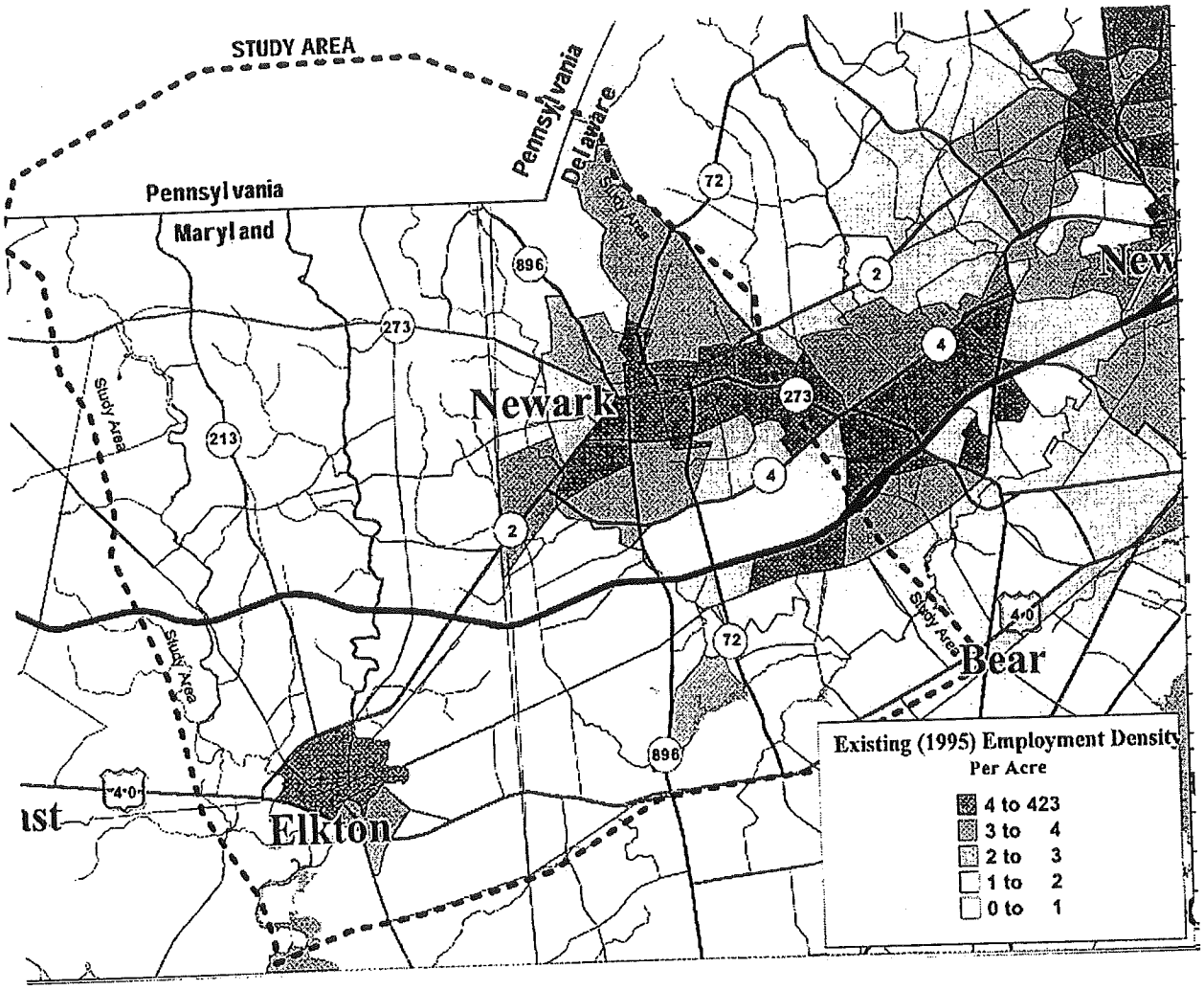
FIGURE 2
Current Residential Densities



Note: This map shows the residential densities by traffic analysis zone in 1995.

Source: WILMAPCO

FIGURE 3
Current Employment Densities



Note: This map shows the employment densities by traffic analysis zone in 1995.

Source: WILMAPCO

Central Pencader -- the southeast portion of the study area is part of the area of New Castle County commonly known as Central Pencader. The main land uses in Central Pencader are suburban large-lot residential development, along with some large-scale commercial strip development and a few manufacturing areas. Residential development in this area has been rapidly increasing, and the estimated 1995 population of the portion of Central Pencader within the study area was 19,000.

Northeast Cecil County -- the area of northeast Cecil County, extending from the MD 213 corridor east to the Maryland-Delaware state line, north of I-95, comprises the northwest portion of the study area. This area has mostly rural, agricultural land uses with some low-density residential development. The area has limited public sewer service, the exceptions being in the Meadowview area near the I-95 / MD 279 interchange and along the MD 213 corridor in the Cherry Hill area. The 1995 population of this area was about 7,000.

Elkton area -- The MTP also designates Elkton as an "intermodal center of commerce and culture, hub area". The Town of Elkton covers 8.1 square miles, and it had a 1990 census population of 9,073. The Town experienced major residential growth during the 1980s, averaging an annual 4% population increase. The Town is the county seat of Cecil County, and the major employment centers in the downtown area are the county courthouse, state office building, and Union Hospital. The downtown has relatively limited retail space, but the Town is undertaking a coordinated revitalization effort. In addition, numerous commercial and retail activities are located along MD 213 (Bridge Street) and US 40, including several shopping centers.

One additional area that is not part of the study area but has an important effect upon land use and transportation in the study area is *Churchman's Crossing*, located just to the east of the study area. This area influences travel patterns and traffic volumes in the study area due to its role as a regional employment and retail center. The area of Churchman's Crossing north of I-95 is a major employment center with large businesses including MBNA, Christiana Medical Center, J.P. Morgan, and Provident Mutual Insurance; and the area south of I-95 is a commercial center, anchored by the Christiana Mall.

Travel Patterns / Traffic Volumes

An important indicator of travel patterns is journey-to-work data, as reported by the U.S. Bureau of Census. The 1990 census data indicate that Newark is a major employment destination, as well as a significant "importer" of jobs. While the City has 11,662 residents who work, only 5,163 work in the City, and a total of 27,876 people work in Newark. This indicates a daily influx of over 22,500 commuters into Newark. Of this total, about 16,000 workers live in parts of Delaware outside of Newark, and about 6,500 live in Maryland, Pennsylvania, or other states. The majority of Newark residents who work outside the City work in Wilmington or other locations in Delaware.

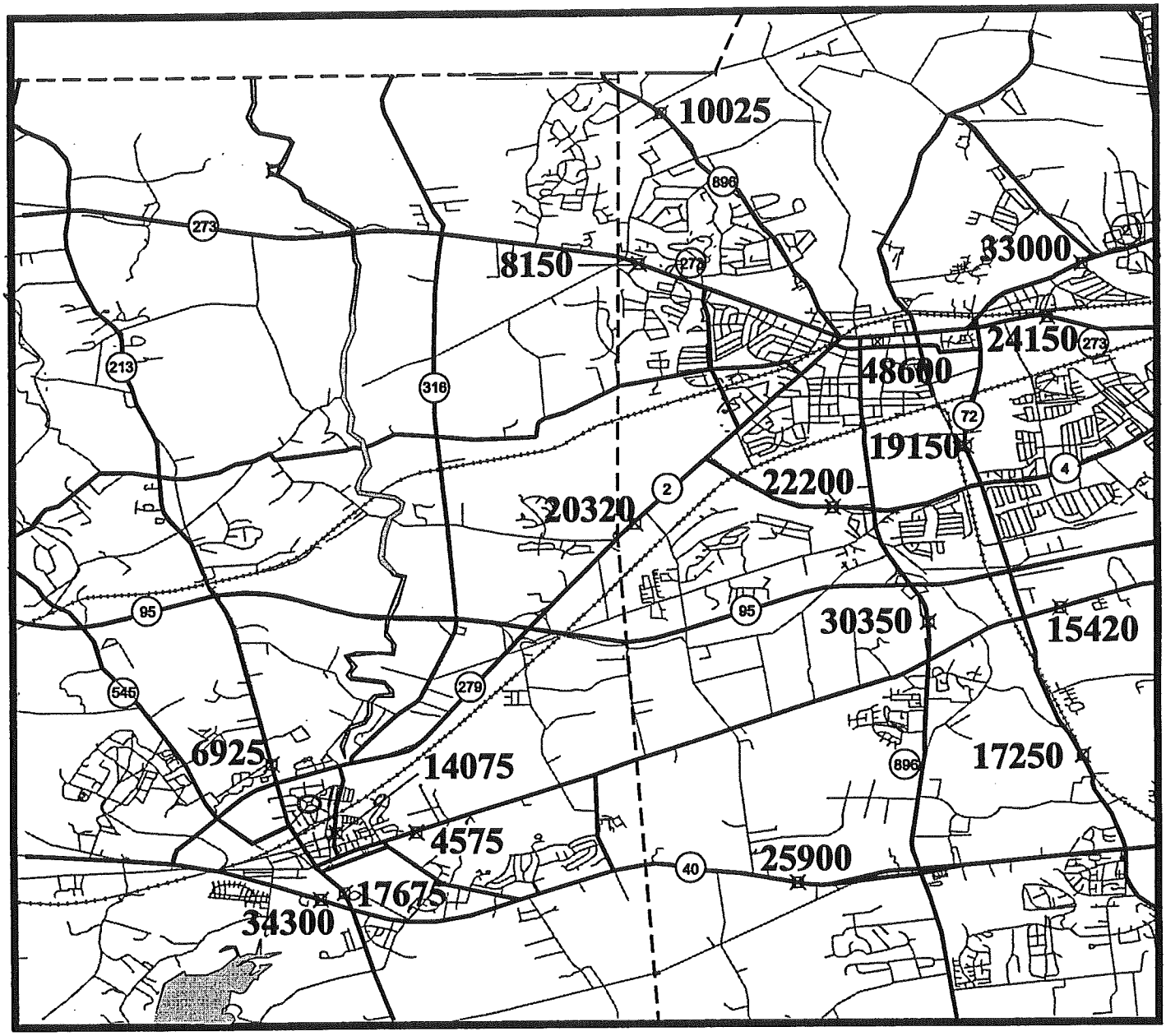
These data indicate a heavy flow of commuter traffic along roads to the south and east of the Newark, with lesser volumes along roads to the north and west. The major roads serving Newark are DE 896 to the south, DE 2/72 to the north and east, DE 72 to the south, DE 273 to the east, and DE 4 to the east. **Figure 4** shows the location of the major study area roadways and annual average daily traffic (AADT) volumes at key locations. These data clearly show that the bulk of traffic in the study area is in the eastern and southern portions.

It should be noted that work trips are not a large portion of overall travel. Trips for other purposes include shopping, recreation, and other personal matters. The Newark area has several large commercial and retail areas including the Main Street CBD, and the College Square, Suburban Plaza, Fox Run, and People's Plaza shopping centers. In addition, the University of Delaware is a major trip generator, including special events such as football games.

Traffic on the local roadway system also includes "through" traffic, i.e., vehicle trips that neither start nor end in the study area. Previous studies have found that the proportion of through traffic to total traffic in the Newark area is about 25%. A portion of this traffic is people who live in Maryland or Pennsylvania and travel to work at locations east and south of Newark, particularly in Churchman's Crossing. Vehicles from Maryland and Pennsylvania currently account for about 20% of through traffic in the Newark area.

Like Newark, Elkton is a major employment center. The 1990 census data showed that the Town had 4,228 residents who work, and 1,440 residents work in the Town. A total of 7,482 people work in Elkton, meaning that over 6,000 people commute to work into Elkton. Of this total, about 4,500 live in other parts of Maryland; 1,000 live in Delaware; and the rest live

FIGURE 4
Regional Roadway Network
and Annual Average Daily Traffic (AADT)
at Selected Locations



⊠ 25900 Count Location / AADT

Sources: 1996 Traffic Summary, DelDOT, and Cecil County Traffic Volume Map, 1996, MDOT. Numbers are rounded.

Maryland; 1,000 live in Delaware; and the rest live elsewhere. Of the Elkton residents who work outside the Town, nearly 60% work in Delaware. The key roads serving Elkton are US 40 from the east and west, MD 213 from the north and south, and MD 279 from the east. The main commercial and retail locations include the Elkton CBD and areas along US 40 and MD 213, including the Big Elk Mall. **Figure 4** also provides volume data for these roadways and others in Cecil County.

Public Transit

A small portion of travel in the study area is by public transit. Of the Newark residents who travel to work, less than 3% commute by public transit. Several public transit services serve the study area, including the following:

DART First State --- Six routes of the DART First State North District fixed-route service operated by the Delaware Transit Corporation (DTC) serve the study area. These routes (Routes 6, 16, 33, 34, 40, 55, 59, 60) generally focus on providing service between Newark and areas to the east, particularly Wilmington.

UNICITY -- The City of Newark and the University of Delaware operate this free service, with funding assistance from the state. The system has three routes which provide limited weekday service within the city.

UD Transit -- The University of Delaware provides free shuttle bus service to students, faculty, and staff during the academic year (September to May).

Cecil Mid-Day Transit -- Cecil County initiated this service in February 1998, and it provides mid-day service along two fixed-route loops through downtown Elkton and the immediately surrounding area, including the US 40 corridor.

SEPTA R-2 Regional Rail -- the R-2 regional rail line of the Southeastern Pennsylvania Transportation Authority (SEPTA) provides commuter rail service between Newark and Philadelphia via Wilmington along AMTRAK's Northeast Corridor line. A new commuter rail station is located on the south side of the tracks between College Avenue and the Chrysler plant.

Several paratransit operations also provide service in the study area, including DART First State Paratransit and the Elkton / Cecil Senior Circulator. Also, the study area has three park-and-ride areas officially recognized by DelDOT. These areas are at the following locations: intersection of SR 896 and SR 4, intersection of SR 4 and SR 72, and at the People's Plaza shopping center near the intersection of US 40 and DE 896 in Glasgow.

Bicycle and Pedestrian Facilities

Newark has a relatively high rate of bicycle and pedestrian activity, but bicycle usage and pedestrian traffic account for a relatively small percentage of travel within the study area. The 1990 U.S. Census journey-to-work data show that 35% of Newark residents who work in the City walk to work and 7% bicycle to work. Pedestrian volumes are high in the Newark downtown area, particularly due to the University of Delaware. Volumes are especially high at the Main Street – College Avenue intersection, immediately before and after class changes.

Bike routes include bikeways, bike lanes, or shared use roadways. The study area has one off-road facility (bikeway), the bike path along Route 4 / Christina Parkway, and DelDOT has officially designated several bike lanes. The suitability of other roadways for bicycle use is dependent upon many factors, including width, shoulders, and pavement type. The main pedestrian facilities are sidewalks, trails, and overpasses/underpasses.

Rail Freight

Rail freight lines are an important means of carrying goods through the study area. The following three rail freight lines operate in the study area:

- CSX Philadelphia Subdivision --- this line is a single-track line which runs cross-state and is the main connection between Ports of Philadelphia and Baltimore. The line currently carries 20-24 trains per day, including low-speed intermodal trains and moderate speed general freight trains. Passing through Newark, the line has three at-grade crossings: at Main Street, New London Road, and College Avenue.
- Northeast Corridor --- AMTRAK owns this line whose primary use is for intercity rail passenger service. Conrail has freight operating rights over this line, and it now moves about 3-5 freight trains daily. The Chrysler Yard is used by up to 200 car carriers daily, and Conrail also uses it as a switching yard to assemble trains for other destinations.
- Conrail Delmarva Secondary This line starts at the Northeast Corridor and runs south through Delaware. It is a single-track line which carries 4-8 trains daily.

In addition to the above active lines, one abandoned line provides the potential for future use for transportation purposes. A 3.5-mile segment of the Pomeroy Branch of the old Pennsylvania Railroad ran between the Pennsylvania border to the Northeast Corridor, opposite the junction with the Delmarva Secondary. Conrail abandoned this line in 1982. Several uses for the corridor have been proposed, including use for a light rail system or for a bicycle / pedestrian path.

B. Projected Conditions

WILMAPCO's population and employment projections by traffic analysis zone (TAZ) for 2020 provided the basis for assessing future land use conditions in the study area. The consultants analyzed the projection data for the TAZs in the study area and immediately surrounding areas, and the following sections provide a summary of the analysis.

Population

Between 1995 and 2020, the number of households in the study area is projected to increase by over 8,700 households, or a 29% increase. The greatest increases will occur in the southeastern portion of the study area, near the US 40 corridor **(see Figure 5)**. The portion of Central Pencader within the study area will have an increase of over 40%. Most new residential development in this area is projected to be at low densities (0.5-1.5 du/gross acre). Another area of residential growth will be in Elkton and surrounding areas, especially areas to the west along the US 40 corridor.

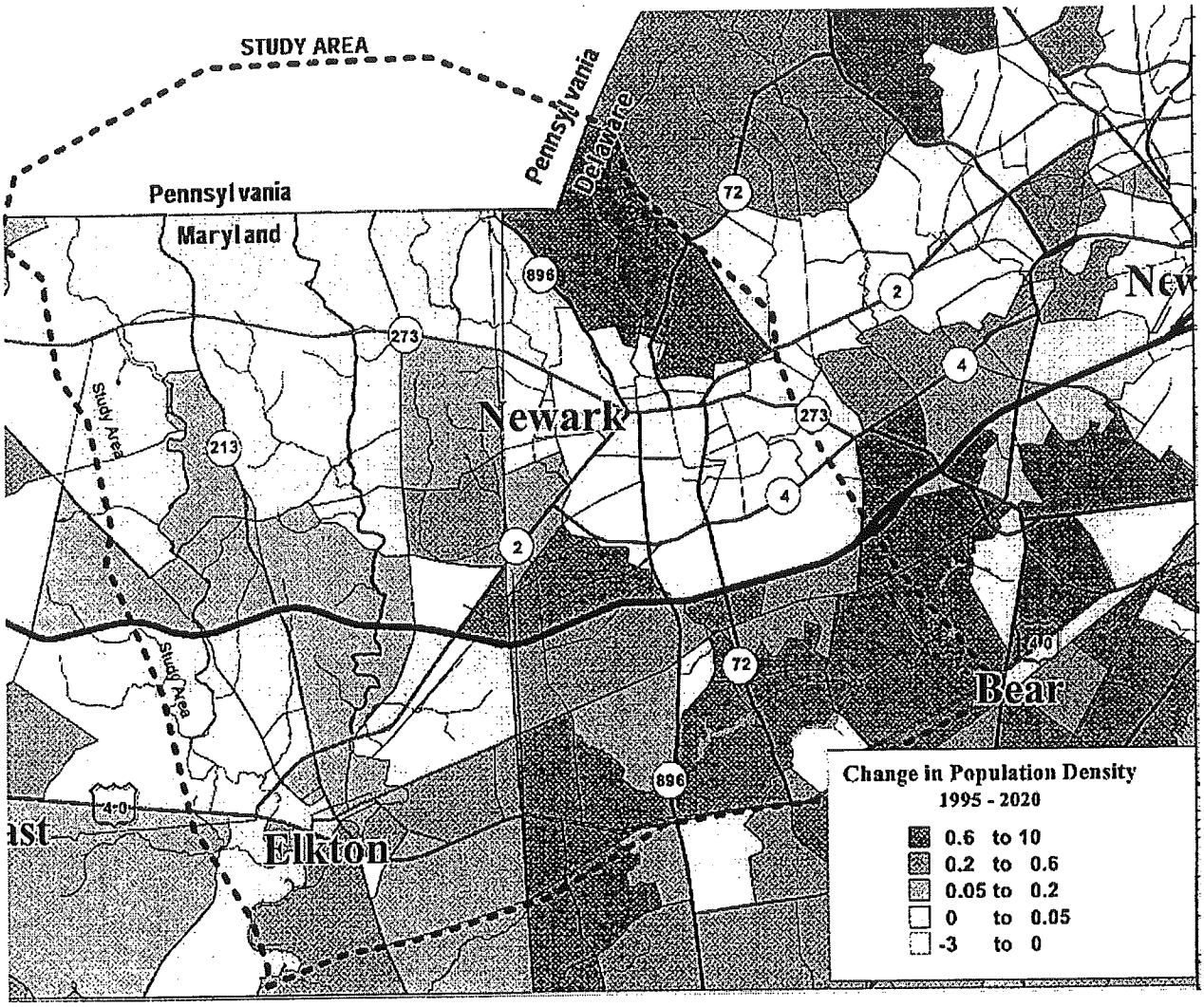
There will also be areas of significant growth to the north of Newark, including in Chester County, Pennsylvania. The southeastern portion of Chester County (the Avon-Grove area) is a rural / suburban area that has been experiencing significant residential growth in recent years. The PA 896 / DE 896 corridor provides access for residents of this area to employment locations in Newark and to the east. The two municipalities in the southeastern corner of the county – Franklin Township and London Britain Township -- had the highest rates of population growth in the county between 1990 and 1995. Between 1995 and 2020, Chester County projects significant future growth in this area, as shown in the following table.

Projected Population Increases in Southeastern Chester County, 1995-2020

Municipality	Area	1995 pop	2020 pop	Increase
London Britain Twp.	9.86	2800	6850	145%
New London Twp.	11.84	3180	6910	117%
London Grove Twp.	17.25	4070	8090	99%
Penn Twp.	9.58	2460	4380	78%
Franklin Twp.	13.17	3100	5020	62%

Source: Chester County Planning Commission.

FIGURE 5
Increases in Residential Density



Note: The map shows the projected changes in population density by traffic analysis zone (TAZ) between 1995 and 2020.

Source: WILMAPCO

Employment

From 1995 to 2020, employment in the study area will increase by over 14,000 workers, or a 29% increase. Within the study area, the area of greatest employment growth will be the City of Newark, which will gain nearly 8,000 workers, an increase of close to 50% **(see Figure 6)**. The bulk of the new workers will be employed in professional service occupations. Other key areas of employment growth will be downtown Elkton and the Meadowview area near the I-95 / MD 279 interchange. Cecil County has designated this area as a growth district, and employment growth is projected due to a major expansion of Gore, as well as the possible construction of a casino. The Newark and Elkton downtown areas are both projected to have significant increases in retail employment.

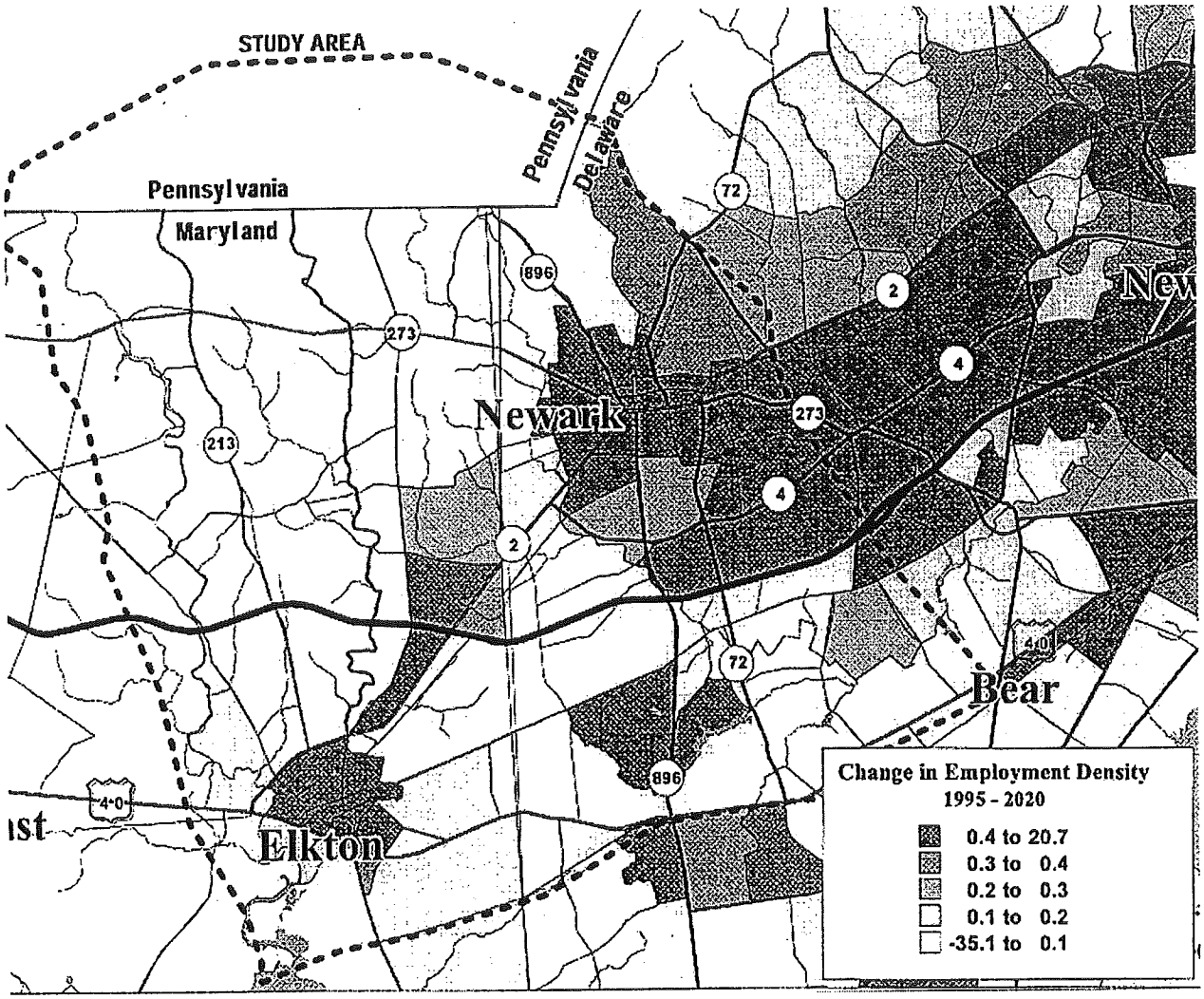
Some additional pockets of employment growth will occur south of Newark along the DE 896 and US 40 corridors, but otherwise there will be little increase in employment in the Central Pencader area. To the east of the study area, Churchman's Crossing will add over 10,000 jobs. The main growth industries in this area will be finance, insurance, and real estate; professional services, and retail.

Travel Patterns / Traffic Volumes

The projected population growth to the south of Newark coupled with the projected employment growth in Newark and to the east will lead to increased traffic volumes along roadways in the south and east of the study area. The growth of employment in Newark and Churchman's Crossing will also lead to increases in trips made to and through the Newark downtown. Downtown Elkton and the DE 2 / MD 279 corridor will also experience increases in traffic volumes as employment opportunities increase in these areas.

The consultants used projections of future traffic growth to analyze the future operations of key intersections in the study area. The consultants conducted capacity analysis to determine future levels of service (LOS), assuming a constant increase in automobile usage. This analysis indicated that numerous intersections will have levels of service below acceptable levels in 2020 **Appendix F** provides more details on the methodology, and **Figure** 7 shows the locations of the intersections that are projected to have a LOS of E or F in 2020.

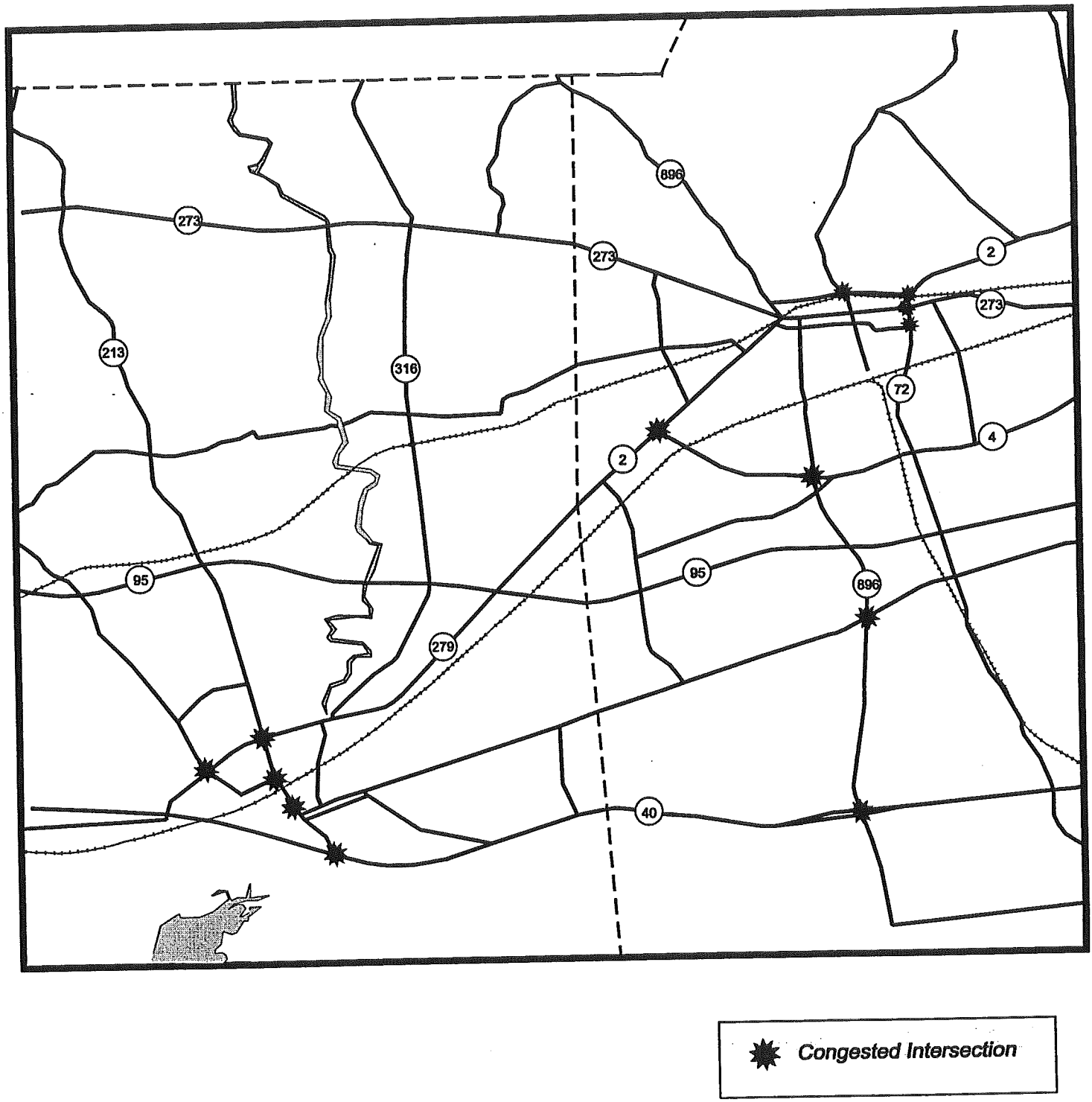
FIGURE 6
Increases in Employment Density



Note: The map shows the projected changes in employment density by traffic analysis zone (TAZ) between 1995 and 2020.

Source: WILMAPCO

FIGURE 7
Location of Congested Intersections
in Regional Roadway System, 2020



Note: Congested intersections are those projected to have a level of service of E of F in 2020.

C. Summary of Key Issues

In addition to analyzing the data presented in the previous sections, the consultants assessed land use and transportation conditions by conducting field observations, interviewing key stakeholders, and holding focus groups and public workshops. Based upon this work, the consultants identified the following key issues:

- Congestion in downtown areas
- Conflicts for bicyclists and pedestrians
- Lack of convenient parking in downtown areas
- Impact of truck and rail freight traffic
- Lack of availability of public transit
- Congestion along key corridors
- Impact of major employers
- Land use and design patterns

Congestion in Downtown Areas

Numerous concerns have been raised regarding traffic congestion in the downtown areas of Newark and Elkton. Traffic congestion results in longer travel times, safety hazards, and negative impact on commercial activity. Also, conflicts and delay on the main downtown streets may lead some motorists to divert onto adjacent residential streets, resulting in increased traffic volumes, increased vehicular speeds, and other hazards to bicyclists and pedestrians.

In Newark, conflicts result from the mix of automobile traffic, truck traffic, rail freight traffic, bicycle and pedestrian traffic, and on-street parking, among other factors. Due to the several major state roadways that converge in Newark, through traffic contributes to traffic volumes on the downtown street system. Furthermore, the evolution of the local street system has been constrained by the White Clay Creek, the CSX line, the Pomeroy Branch, and the Northeast Corridor, and as such, the city has a relative lack of interconnecting streets. Another important factor is the University of Delaware. The growth of the University and the dispersed location of its facilities, student housing, and parking areas, have contributed to traffic impacts upon the downtown area.

Elkton has similar concerns, although not on the same scale as Newark. An important through traffic issue involves Bridge Street (MD 213), a major north - south travel route through Elkton. During peak periods, intersections along Bridge Street become congested. In addition, during the

summer months, Bridge Street experiences a major weekend movement of vehicles traveling to and from the Chesapeake Bay area. The Town is also concerned about the efficiency of traffic flows, parking, and pedestrian circulation within the CBD.

Conflicts for Bicyclists and Pedestrians

The relatively high bicycle and pedestrian volumes have led to some concerns over the efficiency and safety of travel for bicyclists and pedestrians. Many roadways are not compatible with bicycle use, and few dedicated bike paths are available. On the other hand, many bicyclists do not follow traffic rules, e.g., they ride against traffic or on sidewalks.

The lack of adequate bicycle travel facilities creates potential safety hazards for bicyclists, notably conflicts with motor vehicles. Vehicle crash data for the City of Newark shows that crashes involving bicycles occur in three main areas: Main Street, College Avenue, and Elkton Road. Also, the data indicate that almost one-half of all crashes occur in September and October. This trend reflects conflicts between new and returning college students and vehicular traffic.

In downtown Newark, the location of University facilities and student housing is such that there is a high volume of students crossing Main Street and Delaware Avenue during weekdays when school is in session, particularly before and after classes change. The volume of pedestrian activity leads to conflicts at key intersections, particularly Main Street – College Avenue. These conflicts are especially evident each fall when classes resume, and this situation presents safety concerns for students and reduces the efficiency of vehicular movements in the downtown area.

Lack of Convenient Parking in Downtown Areas

The availability and location of parking is an important factor in downtown circulation patterns, as well as for business activity. Previous studies have found that both the Newark and Elkton CBDs have an adequate overall parking supply, but that convenient parking may not be available at certain locations.

Significant demand exists for on-street parking in downtown Newark – parking along Main Street between Chapel Street and Elkton Road is typically fully occupied during the day. While there is good enforcement of parking regulations, the previous studies have generally found the need to raise the parking rates and increase time limit enforcement for on-street parking, so as to ensure high turnover and increase the availability of on-street parking for short-term use.

In addition, while existing off-street parking was underutilized in the past -- in large part because of access and design issues -- recent improvements and development activity have caused an over-utilization of parking capacity in portions of the CBD. Some people have indicated that off-street parking areas are not easy to locate and are not convenient to their destinations. Further contributing to the parking crunch in Newark are the parking demands of the University of Delaware. The University provides relatively limited parking on its Main Campus, and it has restrictive parking policies for students and staff. The University owns numerous parking areas dispersed throughout the downtown area, and thus some "spillover" of University parking demand occurs in the downtown area.

In Elkton, the presence of both state and county government buildings generates a high demand for employee and visitor parking. These buildings have their own off-street parking areas, but visitor parking often spills over onto adjacent on-street parking areas. As in Newark, municipal off-street parking areas are available, but these lots are underutilized due to design issues.

Impact of Truck and Rail Freight Traffic

Goods movement activities have generated concerns in downtown Newark. The key concern over truck traffic is along DE 896. This road is an important truck route – an estimated 300 southbound trucks per day enter Newark via this route. Trucks sometimes create travel delays, and because DE 896 traffic travels through a residential neighborhood in western Newark, trucks have a negative impact upon the residential quality of life due to noise, vibrations, and fumes.

The key rail traffic concern is the CSX rail line which passes through downtown Newark. Trains create roadway travel delays especially at the Deer Park intersection, and they also pose safety hazards to motorists and pedestrians crossing the line. In addition, rail freight traffic along the CSX and Conrail lines negatively affect the quality of life for residents who live near these lines.

CSX and Norfolk Southern are planning to jointly acquire Conrail; under the current proposal Norfolk Southern will obtain all Conrail routes in Delaware. Norfolk Southern has indicated that it will provide new and more efficient service along these lines, including increased service to and from the Port of Wilmington and other intermodal service. Such increases in rail freight traffic along the Northeast Corridor and Delmarva Secondary lines would increase the impacts upon the study area.

Lack of Availability of Public Transit

There are some concerns that public transit does not adequately serve the study area. One concern is with the lack of services in portions of the area. Outlying areas of New Castle County and Cecil County do not have the density to support traditional fixed-route transit service, and consequently there is a lack of alternative travel options for residents of these areas. The lack of transit alternatives leaves the transportation needs of certain population segments (e.g., low-income persons and the elderly) unserved and contributes to roadway congestion. This situation suggests the need for non-traditional services such as "dial-a-ride" and route-deviation services.

Another concern is with the efficiency of existing services. Several public transit services serve Downtown Newark, but these services are not well-coordinated with each other, e.g., the University routes duplicate some services. Most routes of DART First State are oriented toward Wilmington as a peak hour destination. The UNICITY serves downtown Newark but with only limited peak hour service; there is no mid-day circulator service in the downtown. Furthermore, there is a need to upgrade support facilities such as bus stops and shelters, park-rides, and public information locations.

Congestion along Key Corridors

In addition to traffic congestion in the downtown areas, there is congestion at other locations along key travel corridors throughout the study area. Among the more congested roadway segments are DE 896 south of Newark, Paper Mill Road north of Newark, MD 213 (Bridge Street) through Elkton, and MD 279 between US 40 and MD 213. The intersections with higher levels of congestion include Cleveland Avenue – Kirkwood Highway and Main Street – Library Avenue at the east end of Newark, and US 40 – MD 213 in Elkton.

In addition to these locations, at least two other significant "bottlenecks" occur along the regional roadway system. One location is at the Newark toll plaza along I-95. Delays at the toll plaza can be lengthy during certain peak periods, e.g., summer weekends, causing some traffic to "divert" from the toll plaza in order to avoid waiting in line and/or paying the toll. This traffic uses local roadways, such as the Christina Parkway between the DE 896 exit and the MD 279 exit, in order to avoid the toll plaza. DelDOT has enacted weight restrictions on surrounding roadways to discourage trucks from diverting. Another bottleneck is at the Casho Mill Road underpass of the CSX rail line. The clearance of the underpass constrains the roadway to one travel lane, and this results in travel delays at this location, especially during the peak commuting hours.

Impact of Major Employers

The study area has several large employers, including the University of Delaware, Chrysler, MBNA, and Gore. Decisions by these employers relating to employment locations, operations, and work shifts have a significant impact upon travel patterns. Several large employers have been active in promoting commute options (e.g., ridesharing) for their employees, and some employers are members of the Transportation Management Association of New Castle County (TMA of NCC). Because such programs are voluntary, however, not all employers do participate. As a result, many workers in the study area have no options to the single occupant vehicle (SOV) as the primary means of traveling to and from work. As employment and surrounding residential development continue to grow and if additional travel options are not available, then traffic congestion on existing roadways will continue to grow.

Land Use and Design Patterns

Several persons have observed that land use and design patterns in the study area are not compatible with an efficient multi-modal transportation system. Much of the study area has been developed in a typical suburban sprawl fashion, i.e., low-density residential development, separated from other types of land uses, with a lack of interconnected street systems. These land use and design patterns make travel by public transit, bicycling, and walking difficult, making use of the automobile dominant for most trips and contributing to congestion on key arterials, e.g., US 40 and DE 896.

New Castle County recently updated its comprehensive plan and adopted a new unified development code (UDC). Cecil County has also adopted a comprehensive plan that incorporates growth management principles and is working to revise its development ordinances to fully implement the plan. Also, the City of Newark development ordinances include standards for "neo-traditional" land use design. While these documents provide a good planning framework, they may have limited application, because so much new development in New Castle County has already been approved under old regulations.

II. SUMMARY OF RECOMMENDATIONS

A. Base Case Projects

Public agencies have already undertaken, programmed, or planned several projects for new or improved transportation facilities / services in the study area. The consultants have reviewed plans in order to identify currently programmed improvements and other short-term improvements that have been proposed. The consultants have assumed that these projects will be implemented and thus considered them to be a "Base Case" scenario of alternatives. In considering additional alternatives, the consultants sought to select ones that complement the base case projects. The following list outlines the projects in the base case scenario, and **Appendix E** provides more details on the individual projects.

Increase Roadway Capacity

- Widen DE 273 to 4 lanes
- Extend Wyoming Road to Marrows Road
- Upgrade Salem Church Rd between I-95 and US 40
- Implement Route 40 corridor improvements
- Expand capacity of US 40 – SR 72 intersection
- Upgrade Reybold Road between DE 72 and Salem Church Road

Increase Efficiency of Roadway Operations / Local Circulation

- Implement electronic toll collection along I-95
- Install new coordinated computerized signal system in Newark
- Implement statewide integrated transportation management system (ITMS)
- Revise Operations of Main – College intersection
- Modify DE 273 – DE 2/72 intersection
- Upgrade at-grade rail crossings
- Improve signage and access to off-street parking lots
- Reverse the 1-way flows of Main and Howard Streets in Elkton

Increase Access to All Travel Modes

- Upgrade public transit service in New Castle County
- Provide new park-ride facility near US 40 - DE 896 intersection
- Provide lane for bicycle and pedestrian traffic at Casho Mill Road underpass
- Add bicycle and pedestrian safety elements at downtown intersections
- Develop system of bicycle routes in Newark
- Implement safety precautions along CSX rail line

Based upon the assessment of land use and transportation conditions, the consultants presented a list of alternative strategies and actions at the second public workshop (February 1998). After this meeting, the consultants began to evaluate the potential effectiveness of the various alternatives.

The evaluation methodology involved a wide range of techniques including technical analysis and public involvement. Technical analysis included analyzing population and employment projections, projecting future traffic volumes and transit patronage levels, calculating roadway levels of service, identifying environmental issues, and considering the compatibility of alternatives with existing and proposed facilities and services. The key public involvement activities regarding the evaluation of alternatives were public workshops conducted in May 1998 and June 1998. Workshop participants had an opportunity to ask questions and provide comments on the alternatives, as well as to complete written questionnaires. The consultants used this information to assess the proposed alternatives presented at the workshops. **Appendix C** provides a summary of the public involvement process, and **Appendix F** provides more detailed information on the evaluation. Using the technical analysis and public input, the consultant team developed its list of final recommendations, shown in **Figure 8.**

The following sections provide a brief description of each recommendation. It is important to emphasize that these recommendations are in addition to those strategies and actions included in the "base case" scenario of short-term programmed projects. Also, one should view these recommendations as a comprehensive package of strategies and actions that complement each other. This package of recommendations provides a strategic direction for the Newark-Elkton area to develop a multi-modal transportation system that provides for good circulation in the downtown areas, efficient travel along the key corridors, and mobility and access for all persons throughout the study area.

FIGURE 8

Newark-Elkton Intermodal Transportation Plan

List Of Recommendations

Land Use Planning / Growth Management
- Promote Transit-Friendly Development
- Increase Preservation and Acquisition of Open Space
- Develop Access Management Plans
- Implement Traffic Calming Measures

Travel Demand Management
- Expand Scope of TMA Activities
- Increase TDM Efforts of Major Employers
- Provide Public Vanpool Services

Bicycle and Pedestrian Circulation
- Develop Regional Greenway/Bike Route System
- Develop an Integrated Bike Route System in the Newark Area
- Enhance Pedestrian Amenities in Downtown Areas
- Increase Level of Education and Enforcement

Public Transit Service
- Establish Transit Centers in Downtown Newark and Elkton
- Increase CBD Circulator Services in Newark and Elkton
- Implement Newark-Elkton Local Bus Service
- Implement Elkton-Wilmington Express Bus Service
- Evaluate Additional Service to and from Elkton
- Implement Demand-Responsive Service along US 40 Corridor
- Enhance Bus Stop Facilities
- Implement "Bikes on Transit" Service
- Improve Customer Orientation of Transit Services
- Develop New Park-Ride Locations
- Enhance Intermodal Connections at Newark Rail Station
- Evaluate Potential Extension of Commuter Rail Service

Traffic Operations / Systems Management
- Continue to Evaluate Alternatives for Deer Park Intersection
- Continue Parking Management Initiatives in Newark and Elkton
- Designate a New DE 896 Truck Route
- Modify Intersection Geometries / Signals
- Study Alternatives for CSX Rail Freight Line
- Evaluate Feasibility of ITS along US 40 and MD 213 Corridors

Increased Roadway Connections
- Evaluate Feasibility of Northern Connector Route
- Preserve Pomeroy Branch Corridor for Potential Multi-Use Facility
- Widen CSX Underpass at Casho Mill Road
- Evaluate Need to Widen Intersections

B. Recommendations

Land Use Planning / Growth Management

- Promote Transit-Friendly Development -- implement design regulations that promote interconnections between residential neighborhoods and other land uses, higher densities, and mixed use developments. The new New Castle County development code (UDC) includes land use design requirements that encourage biking, walking, and transit in traditional neighborhoods and villages, and Cecil County's comprehensive plan includes similar guidelines. Mixed use development, such as that occurring in the Newark downtown, can reduce reliance upon the automobile.
- Increase Preservation and Acquisition of Open Space -- in conjunction with promoting higher-density, mixed use development, seek to protect natural resources and open space. This strategy would not only provide recreational opportunities, but would also encourage development in existing growth areas. The key target areas for preserving open space should include the Sunset Lake and Beck's Pond areas.
- Develop Access Management Plans -- prepare jointly-developed plans that seek to preserve roadway capacity and increase safety along key corridors by pre-determining the location and design of new streets and driveways. Corridors that are good candidates for an access management plan include DE 2 / MD 279, US 40, DE 896, and DE 72.
- Implement Traffic Calming Measures -- use elements of roadway, street, and intersection design in order to slow vehicular speeds and provide a safer environment for bicyclists and pedestrians. Target locations for traffic calming include Elkton Road in Newark (under study by DelDOT) and local residential streets in the Old Newark area.

Travel Demand Management

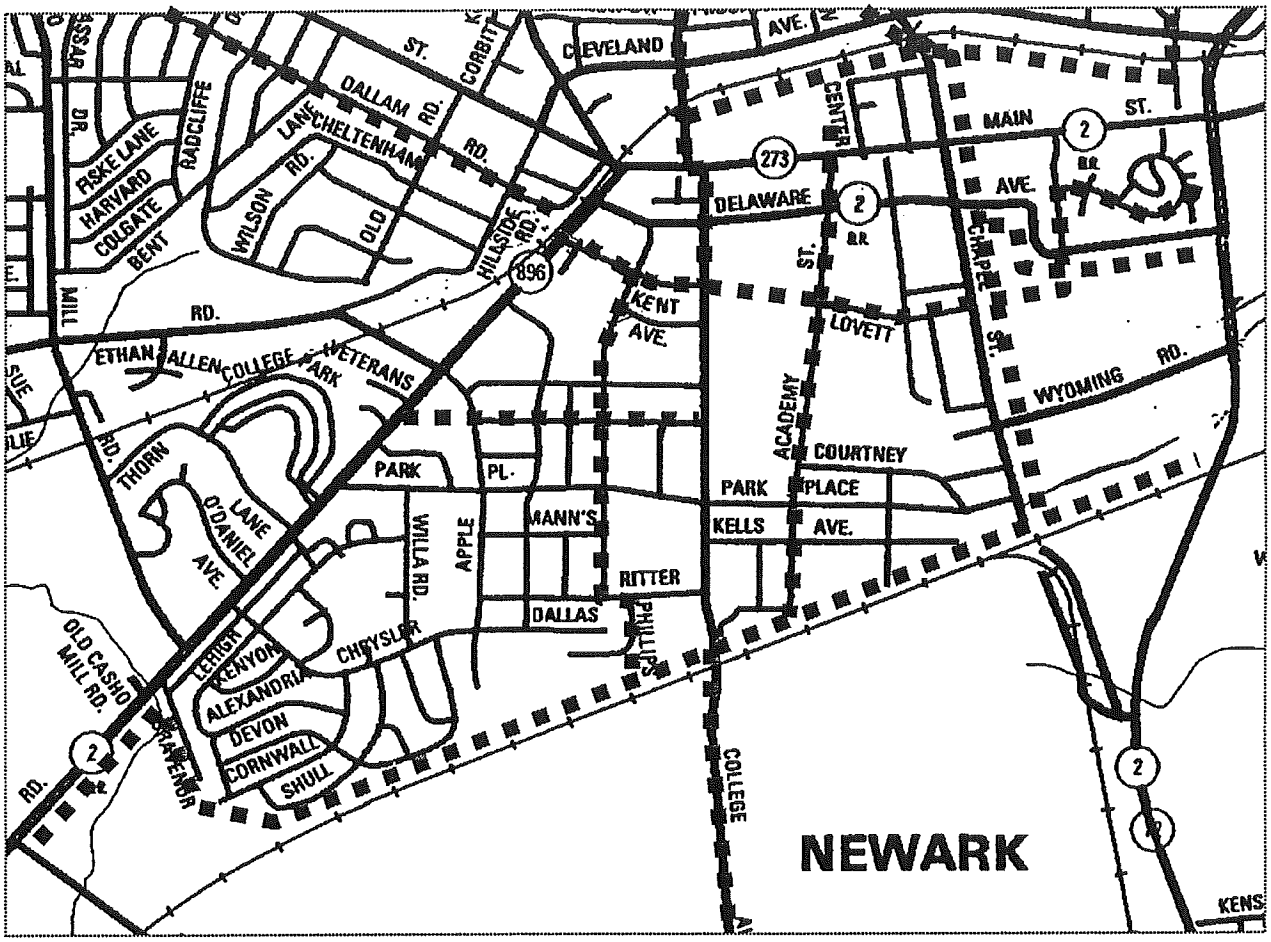
- Expand Scope of TMA Activities -- increase utilization of the services of the Transportation Management Association (TMA) of New Castle County to promote travel demand management in the study area. The TMA activities would include expanding the Rideshare Delaware ridematching database, promoting use of public transit services, and providing traveler information. The TMA would continue to work closely with major employers in the study area, especially the University of Delaware.

- Increase TDM Efforts of Major Employers -- provide incentives for major employers in the study area (in addition to working with the TMA) to provide additional activities and incentives for travel demand management (TDM). These activities would include implementing parking management, offering alternative work schedules, and providing incentives such as the TransitChek program.
- Provide Public Vanpool Services -- allocate public funding to support the formation of vanpools that would serve study area residents and businesses. Several options are available for vanpool service delivery, including operation by vendors, employers, commuters, or public agencies. Vanpools would work best for large centers of employment, and a previous study has identified potential target areas, e.g., the Ogletown Road corridor.

Bicycle and Pedestrian Circulation

- Develop Regional Greenway/Bike Route System -- building upon existing state and local efforts, create a system that includes both on-road and off-road facilities. The system would connect key activity centers in order to improve the convenience and safety of bicycling for both commuting and recreational trips throughout the study area.
- Develop an Integrated Bike Route System in the Newark Area -- develop a system of on-road and off-road facilities, emphasizing off-road bike trails to link with on-road routes. The system will serve the demand for bicycle travel in the Newark area and promote even greater bicycle usage. Key destinations would include the downtown area, the three main areas of the University campus, the major shopping centers, the high school, and the library (**Figure 9** identifies the proposed bicycle route system).
- Enhance Pedestrian Amenities in Downtown Areas -- provide more and better sidewalks, crosswalks, lighting, and landscaping and other amenities for pedestrians. Emphasize attractive pedestrian links between shopping areas, parking, and transit stops. The current redevelopment activities in the Newark and Elkton downtown areas provide a mechanism for implementing these enhancements.
- Increase Level of Education and Enforcement -- seek to increase compliance with traffic regulations by bicyclists, pedestrians, and motorists in order to improve safety for bicyclists and pedestrians, as well as maintaining efficient traffic flow. This strategy is especially important in downtown Newark which will continue to have high volumes of bicycle and pedestrian usage, largely due to activity related to the University of Delaware.

FIGURE 9
Proposed Bicycle Route System
for Downtown Newark Area



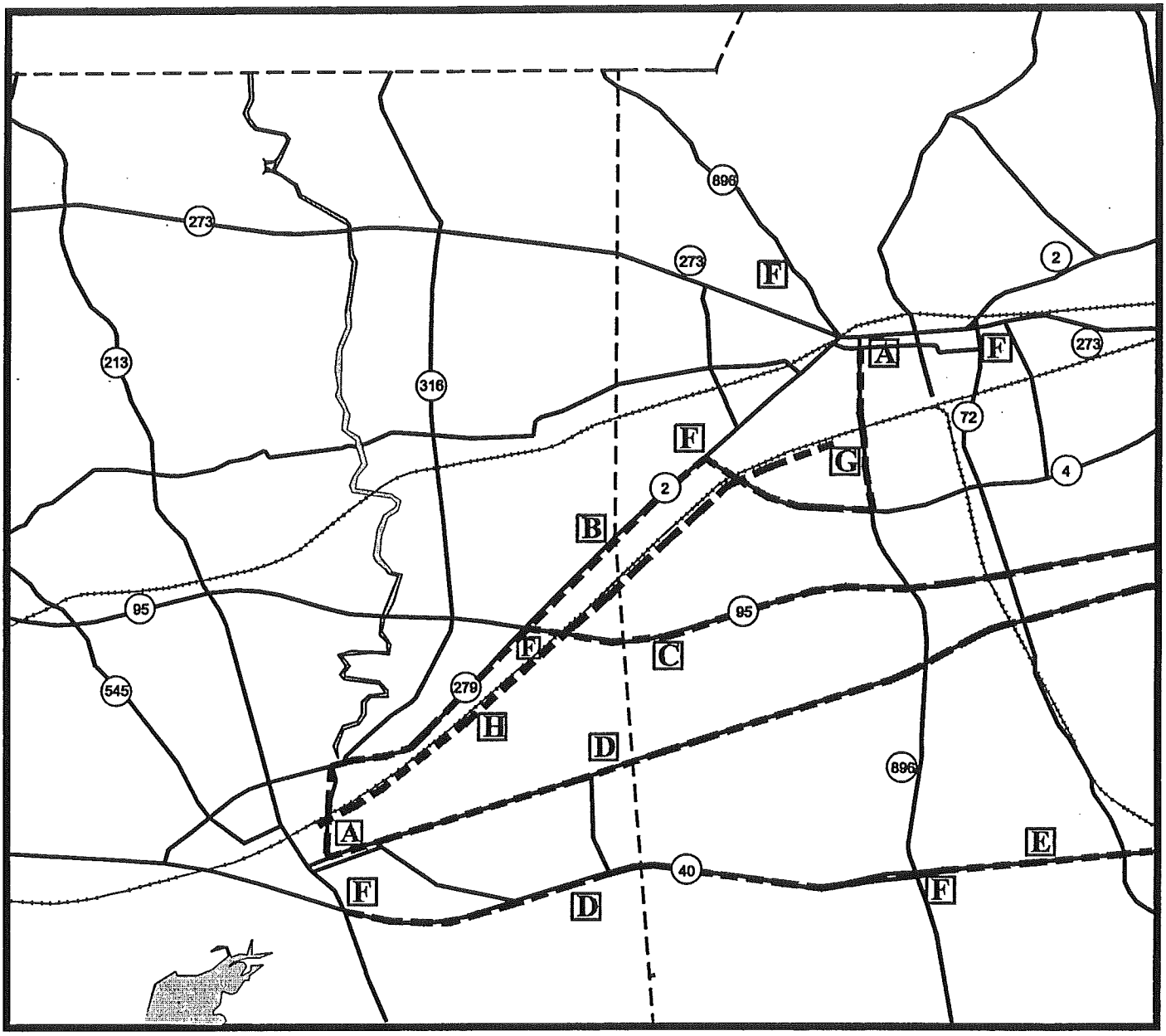
■ ■ ■ ■ ■ ■ Proposed Bicycle Route

Note: The proposed system was developed using information developed from previous projects including the following:
- Newark Area Interim Bicycle Report
- Newark Bikeway Proposal by the Alternative Transportation Working Group
- Report by the Off-Road Trails Working Group of the Bicycle Path Implementation Subcommittee of the Western Newark Traffic Relief Committee (now the Newark Traffic Relief Committee).

- Enhance Bus Stop Facilities -- supply bus stops with shelters and other amenities in order to provide a pleasant and safe environment for bus patrons, thereby promoting transit as a travel option. This strategy should be coordinated with improvements to pedestrian access to stops, and it could be especially effective in suburban areas, e.g., along the US 40 corridor where there is currently only one stop with a shelter.
- Implement "Bikes on Transit" Service -- equip buses with front-mounted racks for storing bicycles, as recommended by the *Newark Area Interim Bicycle Report*. Providing this intermodal connection between transit and bicycles would increase the feasibility of bicycling, increase transit ridership, and improve mobility for short-medium range trips, e.g., cross-town trips in Newark.
- Improve Customer Orientation of Transit Services -- implement measures such as improving scheduling regularity and providing more public information, especially regarding service changes. These actions would help to increase the public's knowledge of transit options and promote greater use of available transit services.
- Develop New Park-Ride Locations --- establish public park-ride locations with adequate facilities and amenities, especially at "intercept" locations served by public transit service. These locations could also serve to promote ridesharing opportunities. Proposed locations include Big Elk Mall, US 40/DE 896 in Glasgow, I-95 / MD 279, Suburban Plaza Shopping Center, Delaware Technology Park, and Fairfield Shopping Center.
- Enhance Intermodal Connections at Newark Rail Station -- ensure that bike routes and pedestrian pathways adequately serve the station, and provide adequate bicycle storage facilities. Also, re-institute transit shuttle service to and from the station. These actions would increase commuter rail patronage and ridesharing activities.
- Evaluate Potential Extension of Commuter Rail Service -- as part of assessing the performance of R-2 service to Newark and possible extension to a "Station West," evaluate the feasibility of extending R-2 service to Elkton and Perryville. Preliminary analysis has indicated low ridership potential for such an extension, but various factors could increase this potential, including opening of a Churchman's Crossing station and increased growth along the rail corridor.

Figure 10 shows the location of several of the above recommendations.

FIGURE 10
Regional Transit Network
Proposed Expansions



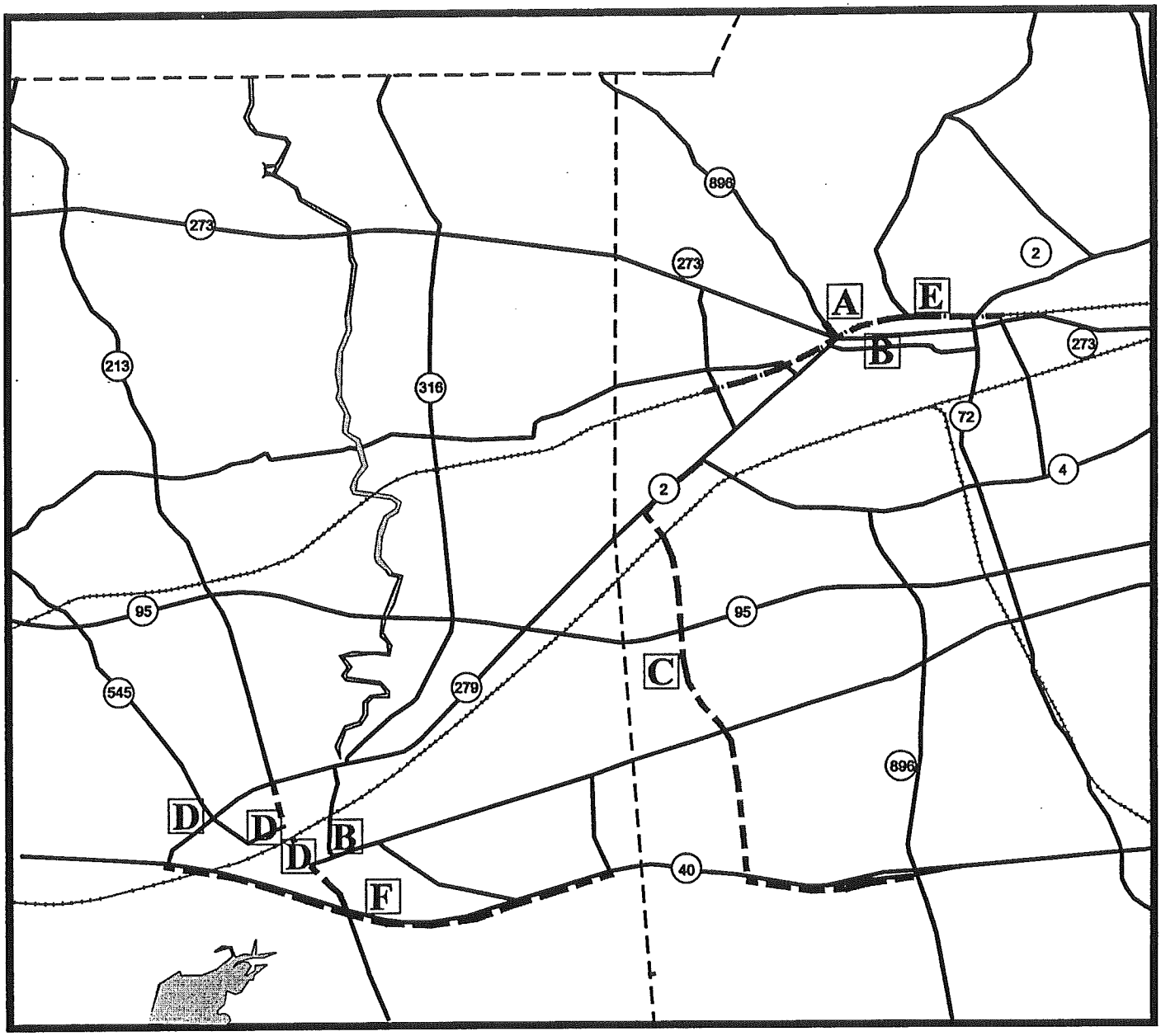
INDEX TO RECOMMENDATIONS

A. Transit Center and CBD Circulator
B. Newark-Elkton Local Bus Service
C. Elkton-Wilmington Express Bus
D. Additional Service to-from Elkton
E. US 40 Demand-Responsive Service
F. New Park-Ride Locations
G. Enhanced Intermodal Facilities
H. Extend Commuter Rail Service

Traffic Operations / Systems Management (see Figure 11)

- Continue to Evaluate Alternatives for Deer Park Intersection -- evaluate alternatives for improving traffic flow at the intersection of West Main Street, New London Road, and Elkton Road in Newark. DelDOT is currently studying alternatives. The optimal alternative from a traffic engineering perspective is to convert Elkton Road to 2-way operations between Delaware Avenue and Main Street and to convert New London Road to 2-way operations between Main Street and Cleveland Avenue, but this alternative creates some negative community impacts, especially along New London Road.
- Continue Parking Management Initiatives in Newark and Elkton -- in conjunction with current downtown revitalization efforts, implement parking management plans. These plans would seek to restrict on-street parking to short-term use and promote increased utilization of off-street parking for longer-term use. These efforts should include plans to consolidate and re-design off-street parking areas to provide for their most efficient use.
- Designate a New DE 896 Truck Route -- designate Ott's Chapel and Pleasant Valley Roads, instead of Christina Parkway, as the DE 896 truck route. This change would also involve designating portions of DE 2 and US 40 as part of the truck route. This action would enable consistent enforcement of the weight limit on Christina Parkway (DE 4) and reduce truck traffic on the Parkway between Elkton Road and College Avenue.
- Modify Intersection Geometries / Signals -- modify several intersections by adding turning lanes and/or changing signal timing. Assuming 1% annual traffic growth, these modifications will be necessary in order for the intersections to operate at acceptable levels of service in 2020. All modifications should be designed to ensure efficient and safe bicycle and pedestrian crossings. **Appendix E** provides more details on the analysis.
- Study Alternatives for CSX rail freight line -- evaluate the feasibility of various options for minimizing travel delays at at-grade crossings and enhancing safety in the area of the CSX rail line through Newark. These options include emphasizing night-time operations, routing CSX traffic to the Northeast Corridor (NEC) line around the CBD, expanding tunnel clearances in the Baltimore area, constructing overpasses or underpasses of the at-grade crossings in Newark, and constructing a trench to depress the CSX line through Newark
- Evaluate Feasibility of ITS along US 40 and MD 213 Corridors -- given existing physical constraints to expanding the capacity of these roadways in the Elkton area, consider the potential application of intelligent transportation system (ITS) technology to improving traffic flow along these corridors. One specific technique could be an adaptive traffic signal control system similar to that used by DelDOT along several key arterials in Delaware.

FIGURE 11
Traffic Operations and
Systems Management Recommendations



INDEX TO RECOMMENDATIONS

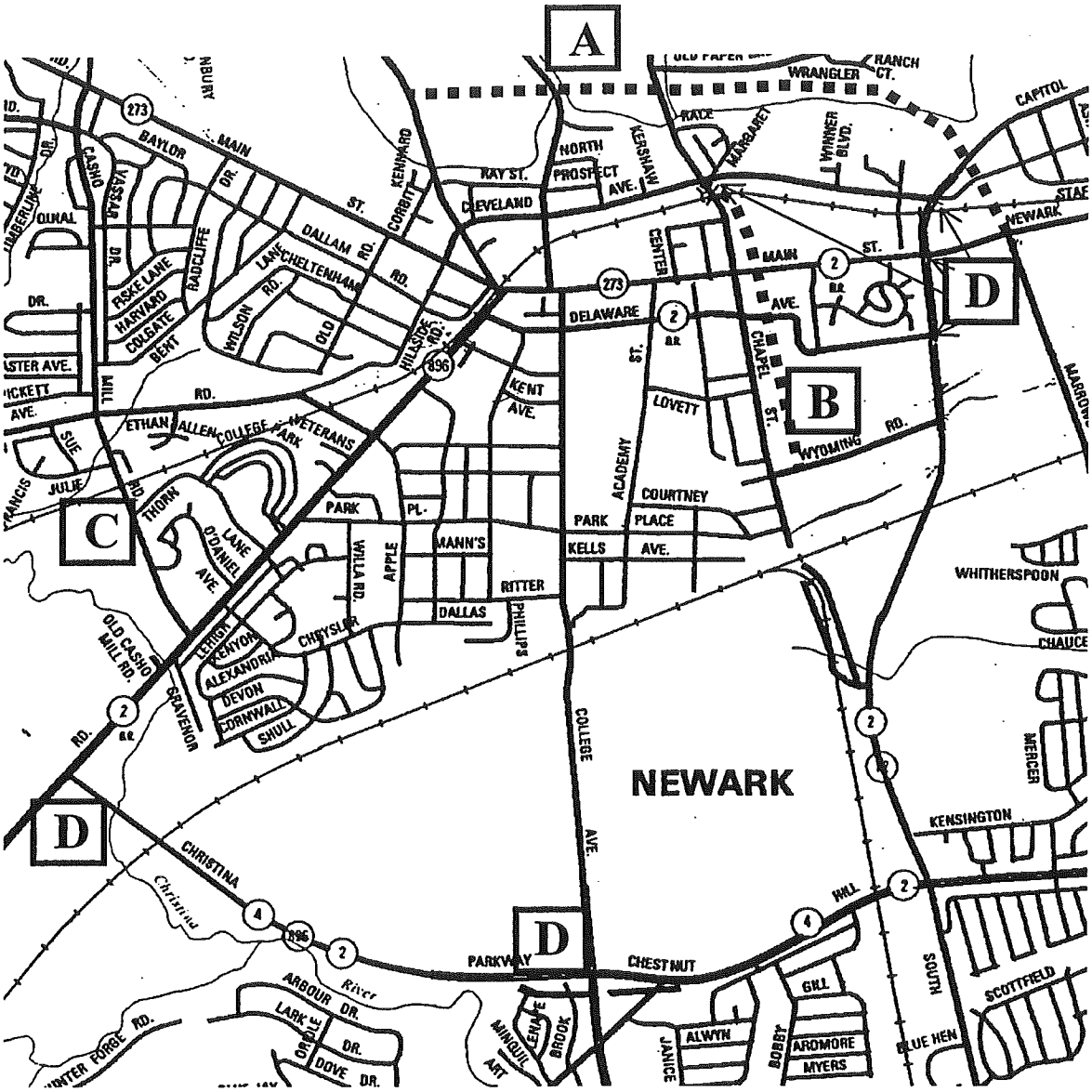
A. Convert New London Road to 2-Way
B. Parking Management
C. New DE 896 Truck Route
D. Modify Signalized Intersections
E. Alternatives for CSX Line
F. ITS for US 40 and MD 213 Corridors

Roadway Connections

- Evaluate Feasibility of Northern Connector Route -- conduct a study to evaluate the feasibility of widening Cleveland Avenue to four lanes between Chapel Street and New London Road or constructing a new road extending between DE 273 east of downtown Newark and DE 896 north of Cleveland Avenue. Preliminary analysis has indicated that expanding roadway capacity to the north of the downtown area would have the greatest impact in reducing traffic on Main Street and Delaware Avenue in the Newark CBD. The analysis also identified various potential negative impacts, for example, environmental impacts upon the White Clay Creek corridor. **Appendix F** provides more details on the preliminary analysis of these alternatives.
- Preserve Pomeroy Branch Corridor for Potential Multi-Use Facility -- preserve the right-of-way for future use by bicycles, motor vehicles, and pedestrians, as part of an access-enhancing one-way pair of multi-modal one-lane thoroughfares with the existing Chapel Street. This alternative would reduce congestion along Chapel Street at the intersections with Delaware Avenue, Main Street, and Cleveland Avenue, and it could also increase the parking supply, sidewalks, and dedicated bikeways in downtown Newark. The width of the Pomeroy Branch allows for design flexibility, which could include a dedicated bikeway/urban greenway. The design plans for the corridor should be coordinated with the proposed redevelopment projects for the former Budd site and the former Newark Lumber site.
- Widen CSX Underpass at Casho Mill Road -- construct an additional vehicular travel lane for only automobiles, maintaining the current height restrictions at this location. This project would complement the existing plan to install a safe, separate tunnel for bicyclists and pedestrians, and it would increase roadway capacity and enhance the viability of Casho Mill Road as a route for travel around the Newark downtown area.
- Evaluate Need to Widen Intersections -- based upon available data and assuming 1% annual traffic growth, the analysis found that expanding certain intersections may be necessary for the intersections to operate at acceptable levels of service in 2020. This analysis did not consider the impact of other roadway connection projects, e.g., a northern connector. Any expansion projects should not only provide additional vehicular capacity, but also assure bicycle and pedestrian compatibility through the scale of design. **Appendix F** provides more details on the analysis.

Figure 12 identifies the location of the above recommendations.

FIGURE 12
Proposed Roadway Connections



Index to Recommendations:

A. Northern Connector
B. Pomeroy Branch Roadway
C. Casho Mill Road Underpass
D. Evaluate Need to Widen Intersection

Assessment of Impact of Recommendations

The annual number of vehicle trips in the Newark-Elkton area is currently projected to increase by an estimated 100,000 trips between now and the year 2020. Based upon the goal of WILMAPCO's *Metropolitan Transportation Plan* to reduce new vehicle trips by 10%, the target reduction for the study area is 10,000 vehicle trips. Individually, no one recommendation will be entirely effective in meeting this objective. As a whole, however, the package of recommendations will comprehensively address the growing access and mobility requirements in the Newark-Elkton area through the year 2020.

The categories of recommendations with the greatest impact upon vehicle trip reduction will be land use planning / growth management, travel demand management, bicycle and pedestrian circulation, and public transit service. The recommendations in these categories will build upon existing strategies and actions in these areas, for example, the New Castle County and Cecil County comprehensive plans, the efforts of the Transportation Management Association of New Castle County, and the evolving bicycle route system in the Newark area. Furthermore, numerous recommendations are complementary with each other, for example, increased ridematching activities with increased carpool / vanpool and transit service.

In sum, these recommendations address the movement of people and goods by all modes, not just motor vehicles. The recommendations thus should enable the study area to reach its target in vehicle trip reduction and allow Newark and Elkton to enhance their attractiveness as livable communities.

III. IMPLEMENTATION PLAN

The final chapter of this report provides a plan for implementing the recommendations contained in Chapter II. The first part of this implementation plan focuses upon the public agencies and other groups that will be responsible for implementing the recommendations, and it provides a summary of each agency and its proposed respective role. The second part outlines a plan for each recommendation, including the responsible agencies and time frames for implementation.

A. Jurisdictional Responsibilities

Wilmington Area Planning Council (WILMAPCO) -- As the metropolitan planning organization (MPO) for the study area, WILMAPCO will continue to play an important role in the regional and state capital investment decision-making processes. In this regard, WILMAPCO will conduct technical studies and ensure that public involvement is obtained regarding proposed transportation investments. Through its Metropolitan Transportation Plan (MTP), WILMAPCO provides strategic direction for land use and transportation decision-making in the region. Also, WILMAPCO will continue to provide technical assistance to constituent government agencies regarding land use / growth management issues, and it could play a role in facilitating and promoting increased travel demand management activities in the study area. In addition, WILMAPCO should seek to enhance its working relationships with the Delaware Valley Regional Planning Commission (DVRPC), Chester County, and municipalities including London Britain and Franklin Townships, for issues involving Chester County, Pennsylvania.

Delaware Department of Transportation (DelDOT) -- DelDOT will continue to be the key agency for planning and implementing transportation facilities and services in the study area. It will conduct technical analysis of proposed projects, ensure public involvement in the capital investment decision-making process, and provide capital funding for key projects.

DelDOT will have an important role in implementing most categories of recommendations, especially roadway connections and traffic operations / systems management. It will also play a role in implementing access management and traffic calming, bicycle routes, and public transit services. With regard to the latter, DelDOT will work together with the Delaware Transit Corporation (DTC) in providing new transit services in study area.

Maryland Department of Transportation (MDOT) -- MDOT will play a similar role as DelDOT, but will not be involved in any roadway connection projects, since this study did not evaluate alternatives for increasing roadway capacity in Maryland. In the category of traffic operations / systems management, MDOT should be involved in modifying intersections and studying the feasibility of implementing intelligent transportation system technology. Also, Maryland's Mass Transit Administration (MTA) will play a role in supporting new public transit services in the Elkton area.

New Castle and Cecil Counties

The major emphasis for county involvement should be in the area of land use / growth management, particularly in implementing regulations that promote transit-friendly development and protect open space. Also, county efforts to develop parks and greenways could complement efforts to develop the recommended regional greenway system. In addition, Cecil County will have a role in managing transportation facilities and services. The county maintains over 500 miles of county roadways, and it currently administers the downtown Elkton transit service, which could lead to an expanded role for the county as a transit service provider. Furthermore, both Cecil and New Castle Counties could play an important role in increasing travel demand management efforts by targeting major employment centers.

City of Newark and Town of Elkton

As with the counties, the major emphasis of municipal involvement should be land use / growth management. Of particular relevance is the ongoing revitalization efforts in both communities. These redevelopment efforts are related to several of this plan's recommended strategies and actions, especially the ones for traffic calming measures, pedestrian enhancements, parking management initiatives, and transit service expansion. The municipalities could also assist in travel demand management efforts by developing working relationships with their major institutional employers, e.g., the University of Delaware in Newark, and the county and the state in Elkton. The City of Newark is considering becoming a member of the Transportation Management Association of New Castle County (TMA of NCC).

University of Delaware

The University is an integral part of the land use / transportation situation in Newark, and as such should be expected to collaborate with the City in implementing the recommendations discussed above. The University has been actively participating in the efforts of the newly-created Downtown Newark Partnership. One area of coordination should be in the area of parking management, due to the overlap in parking demand between the University and the downtown area. The University should also be involved in bicycle and pedestrian circulation issues, since these issues relate in large part to the activities of University students.. In addition, consideration should be given to having the University play a central role in promoting travel demand management (TDM) in the study area. The University, possibly in affiliation with the TMA of NCC, could conduct outreach to local employers in order to provide information and to coordinate TDM activities.

Transportation Management Association of New Castle County (TMA of NCC)

The TMA should be the key player in implementing the recommendations for travel demand management. The TMA should be provided with the authority, resources, and direction to expand the Rideshare Delaware ridematching database, conduct outreach to employers and employees, provide traveler information, and promote public transit and vanpool services. With regard to the latter activity, the TMA and DTC should develop a close working relationship for planning and implementing vanpool, shuttle, or transit services. As noted above, it also proposed that the TMA establish a working relationship with the University of Delaware to promote TDM activities in the Newark area.

Other Interests

In addition to the public agencies described above, several other interests should be represented in implementing the recommendations of this plan. For example, major employers will have an important role in working with the TMA to implement travel demand management activities. Employers should have adequate incentives to participate in TDM activities and to provide incentives to their employees to consider travel mode options. Another interest group is goods movement providers, such as trucking companies and rail freight operators. These groups should be involved in decision-making for implementing recommendations such as the new truck route and evaluation of operations of the CSX rail line.

B. Implementation of Recommendations

This section provides an implementation plan for each recommendation listed in Chapter II. For each recommendation is listed the main agencies for implementation, a brief description of key steps involved in implementation, and an estimated time frame for implementing the recommendation. In some cases, the implementation action is already underway (ongoing). The time frames are classified as follows: Short (2 years or less), Medium (2-5 years), Long (over 5 years).

Land Use Planning / Growth Management

Promote Transit-Friendly Development

Key Agencies: Delaware Transit Corporation (DTC), New Castle County, Cecil County, City of Newark, and Town of Elkton

Key Steps: The governing bodies and planning agencies should adopt and implement design regulations that promote interconnections between neighborhoods and different land uses, higher densities, and mixed uses.

Time Frame: Ongoing

Increase Preservation and Acquisition of Open Space

Key Agencies: State, County, and Municipal agencies

Key Steps: Identify target areas. Emphasize preserving open space in the southern section of the study area, especially including the Sunset Lake and Beck's Pond areas

Time Frame: Ongoing

Develop Access Management Plans

Key Agencies: State, County, and Municipal governments

Key Steps: Complete statewide re-classification of roadways (Delaware). Determine corridors that are good candidates for an access management plan. Establish working groups to develop plans

Time Frame: Medium

Implement Traffic Calming Measures

Key Agencies: State, County, and Municipal governments

Key Steps: Implement recommendations of DelDOT's study of the Elkton Road – Amstel Avenue intersection in Newark. Work with Old Newark Civic Association to identify

recommendations for Old Newark area. Include traffic calming considerations as part of revitalization work in downtowns of Newark and Elkton. Identify other target areas not covered by the above activities.

Time Frame: Short to Long

Travel Demand Management

Expand Scope of TMA Activities

Key Agencies: State of Delaware, Transportation Management Association (TMA) of New Castle County, University of Delaware, and other major employers in the study area

Key Steps: Provide funding for TMA marketing/promotion, conduct transportation fairs, promote use of all employee commute options, provide traveler information.

Time Frame: Short to Long

Increase TDM Efforts of Major Employers

Key Agencies: Delaware Transit Corporation (DTC), TMA of NCC, and major employers in the study area

Key Steps: Provide incentives such as the TransitChek program, permit use of alternative work schedules, implement parking management programs.

Time Frame: Short to Medium

Provide Public Vanpool Services

Key Agencies: State of Delaware, TMA

Key Steps: Re-evaluate previous analysis of vanpool feasibility, and identify target markets. Provide funding, technical assistance, and administrative support for vanpools.

Time Frames: Medium.

Bicycle and Pedestrian Circulation

Develop Regional Greenway/Bike Route System

Key Agencies: State, county, and municipal governments, University of Delaware, local interest groups

Key Steps: Continue and complete enhancements to on-road bicycle facilities, identify and develop off-road bike routes.

Time Frame: Ongoing

Develop an Integrated Bike Route System in the Newark area

Key Agencies: State, county, and municipal governments, University of Delaware, local interest groups

Key Steps: Continue and complete enhancements to on-road facilities, identify and develop off-road facilities.

Time Frame: Ongoing

Enhance Pedestrian Amenities in Downtown Areas

Key Agencies: State, county, and municipal governments, local revitalization groups (Downtown Newark Partnership and Elkton Alliance).

Key Steps: Identify key enhancements as part of revitalization work. Emphasize links between shopping areas, parking, and transit stops. Prepare final design for selected enhancements.

Time Frame: Ongoing

Increase Level of Education and Enforcement

Key Agencies: Municipal governments, University of Delaware, other educational institutions

Key Steps: Monitor bicycle and pedestrian activity at Main-College intersection and along Main Street in Newark. Update University pedestrian brochure and provide additional information to highlight hazardous crossings and emphasize safe behavior.

Time Frame: Ongoing

Public Transit Service

Establish Transit Centers in Downtown Newark and Elkton

Key Agencies: State and municipal governments, public transit providers

Key Steps: Work with transit providers to identify potential locations for centers. Identify appropriate scale, amenities, etc. of the facilities and prepare their design. Revise transit route schedules to provide coordination at the transit centers.

Time Frame: Medium

Increase CBD Circulator Services in Newark and Elkton

Key Agencies: State, county, and municipal governments, public transit providers

Key Steps: Assess areas of highest demand in the downtown areas, and design routes to serve these areas. In Newark, provide additional service through the UNICITY system. In Elkton, evaluate the operations of the County's existing mid-day service and determine if the County or another operator is the appropriate service provider.

Time Frame: Short to Medium

Implement Newark-Elkton Local Bus Service

Key Agencies: State and municipal governments, public transit providers

Key Steps: Resolve liability issues concerning interstate service. Develop route and schedule, and determine the appropriate service provider. Initiate marketing and promotion activities.

Time Frame: Short

Implement Elkton-Wilmington Express Bus Service

Key Agencies: State and municipal governments, public transit providers

Key Steps: Resolve liability issues concerning interstate service. Secure funding sources from public agencies. Develop route and schedule, and determine the appropriate service provider. Initiate marketing and promotion activities.

Time Frame: Medium

Evaluate Additional Service to and from Elkton

Key Agencies: State and local governments

Key Steps: Identify potential routes and target markets. Evaluate projected ridership and financial feasibility of route alternatives.

Time Frame: Medium

Implement Demand-Responsive Service along US 40 corridor

Key Agencies: State and local governments, public transit providers

Key Steps: Secure funding sources from public agencies. Develop route and schedule, and determine the appropriate service provider. Initiate marketing and promotion activities.

Time Frame: Medium

Enhance Bus Stop Facilities

Key Agencies: State transportation agencies, local governments, public transit providers, TMA, private shelter provider

Key Steps: Identify stops with the highest patronage. Determine jurisdictional authority. Consider potential agreement with private shelter provider to erect shelters in return for advertising space.

Time Frame: Ongoing

Implement "Bikes on Transit" Service

Key Agencies: Local governments, University of Delaware, public transit providers

Key Steps: Select routes for a pilot program. Install front-mounted racks on buses for storing bicycles. Conduct marketing and promotion activities.

Time Frame: Short to Medium

Improve Customer Orientation of Transit Services

Key Agencies: Public transit providers

Key Steps: Allocate resources to improve scheduling regularity and to increase marketing and promotion of public transit services.

Time Frame: Ongoing

Develop New Park-Ride Locations

Key Agencies: DelDOT, transit service providers, local governments

Key Steps: Identify locations for new facilities. Acquire land and design facilities. Seek to provide amenities.

Time Frame: Medium to Long

Enhance Intermodal Connections at Newark Commuter Rail Station

Key Agencies: DelDOT, Delaware Transit Corporation, Maryland Mass Transit Administration, City of Newark

Key Steps: Upgrade bicycle and pedestrian routes to and from the station. Provide additional bicycle storage capacity as needed. Implement transit shuttle service between the station and the Newark downtown area, and include station as a stop on the Newark-Elkton local bus service.

Time Frame: Short to Medium

Evaluate Potential Extension of Commuter Rail Service

Key Agencies: DelDOT, Delaware Transit Corporation, Maryland Mass Transit Administration, local governments

Key Steps: Evaluate potential ridership markets. Assess costs of extending service, and evaluate financial feasibility. Identify potential funding arrangements.

Time Frame: Short to Medium

Traffic Operations / Systems Management

Convert New London Rd to 2-way Operations

Key Agencies: DelDOT, City of Newark, FHWA

Key Steps: Review DelDOT analysis of alternatives for the Deer Park intersection. Assess the benefits and costs of revised traffic flow.

Time Frame: Short

Continue Parking Management Initiatives in Newark and Elkton

Key Agencies: Municipal governments, downtown revitalization groups

Key Steps: Maintain and, as necessary, increase enforcement of on-street parking regulations. Improve landscaping and pedestrian connections to and from the main off-street parking areas. Develop plans for re-designing and consolidating off-street areas.

Time Frame: Short to Long

Designate a New DE 896 Truck Route

Key Agencies: Federal and state agencies, trucking associations

Key Steps: Consult with DelDOT to determine procedures for re-designating DE 896. Receive input from shippers, trucking associations, and community groups, and agree upon the route.

Time Frame: Short

Modify Intersection Geometries / Signals

Key Agencies: State and municipal agencies

Key Steps: Verify the need to add turning lanes and/or change signal timing. Design appropriate modifications, including measures to ensure efficient and safe bicycle and pedestrian movements.

Time Frame: Short to Medium

Study Alternatives for CSX rail freight line

Key Agencies: Federal, state, and local agencies, CSX, private shippers / customers

Key Steps: Identify specific concerns and objectives relating to operations of the CSX line. Agree upon the range of potential alternatives, and evaluate the feasibility of these alternatives.

Time Frame: Medium to Long

Evaluate Feasibility of ITS along US 40 and MD 213 Corridors

Key Agencies: Federal and state agencies

Key Steps: Analyze traffic volumes and signal timing plans to determine roadway levels of service and signal progression. Review signal timing plans to determine potential improvements. Assess costs and benefits of potential ITS solutions such as adaptive signal control systems.

Time Frame: Short to Medium

Increased Roadway Connections

Evaluate Feasibility of Northern Connector Route

Key Agencies: Federal, state, and local agencies

Key Steps: Agree upon the potential alternatives for the feasibility study and conduct the analysis.

Time Frame: Short

Preserve Pomeroy Branch Corridor for Potential Multi-Use Facility

Key Agencies: DelDOT, City of Newark, Downtown Newark Partnership, local interest groups

Key Steps: Negotiate for and acquire the right-of-way for public use. Prepare preliminary design for a roadway to complement the designs of the proposed redevelopment projects for the former Budd site and the former Newark Lumber site. Incorporate bicycle and pedestrian paths and crossings into the design.

Time Frame: Short

Widen CSX Underpass at Casho Mill Road

Key Agencies: Federal Railroad Administration, DelDOT, City of Newark

Key Steps: Resolve regulatory issues concerning clearance, prepare preliminary design for second vehicle travel lane.

Time Frame: Medium

Evaluate Need to Widen Intersections

Key Agencies: State and local agencies

Key Steps: Analyze existing and projected traffic volumes, along with existing intersection and signal designs. Determine if minor modifications (add turning lanes, revise signal timing, etc.) will address congestion. Design appropriate expansions to intersection capacity, including measures to ensure efficient and safe bicycle and pedestrian movements.

Time Frame: Short to Medium

Summary

Implementing the recommendations of this plan will require the coordination and cooperation of several public and private agencies. It is envisioned that WILMAPCO will play an important role in establishing these institutional relationships and linkages. The appropriate agencies should seek to establish the working relationships identified by the implementation plan and maintain these relationships in considering future strategies and actions for the area's land use and transportation system.

APPENDICES

A. Acknowledgments

B. References

C. Public Involvement Activities

D. Land Use and Transportation Data

E. Base Case Projects

F. Evaluation of Alternatives

APPENDIX A
ACKNOWLEDGMENTS

ACKNOWLEDGMENTS

The consultant team received assistance and cooperation from numerous persons and agencies in preparing this report. The staff of WILMAPCO provided considerable assistance to the consultant team throughout the study process. G. Alexander Taft, Executive Director, provided overall guidance for the study. Anthony Di Giacomo, Senior Planner, served as the Project Manager, and he was the lead person in organizing data collection and public involvement activities. In addition, Bruce Allen* assisted in providing data and producing presentation graphics, Heather Ehrlich assisted in project administration including the public workshops, and David Saladino helped to prepare maps for the final report.

Several other public agencies participated in the project, either through representation on the project's Management Committee or by assisting in data collection and analysis efforts. The following is a list of participating agencies and staff members:

Delaware Department of Transportation -- Ralph Reeb, Michael DuRoss, Melissa Welch

Maryland Department of Transportation -- Michael Nixon

New Castle County -- Edward O'Donnell, Lorene Athey*, John Janowski

Cecil County -- Al Wein, Chris Rogers*, Sandy Edwards

City of Newark -- Roy Lopata, Maureen Roser

Town of Elkton -- Jeanne Minner

University of Delaware -- Rick Armitage

Transportation Management Association of New Castle County -- Roger Roy, Denise Verderosa

Chester County -- Lee Whitmore, Chad Dixson

Delaware Valley Regional Planning Commission -- Donald Shanis, Gail McFadden-Roberts

The consultant team extends its sincere appreciation for the cooperation and assistance of these agencies and staff members.

*/ No longer with this agency

APPENDIX B
REFERENCES

REFERENCES

An important element of the work activities for this project was to review other previous and current studies relating to the study area. Several studies were especially important in helping the consultants to assess land use and transportation conditions and to determine appropriate recommendations. These studies include the following:

- *Newark-Elkton Intermodal Transportaton Plan, Short-Term Action Plan,* prepared by Parsons-Brinckerhoff for WILMAPCO in May 1996.
- *Transit Service Needs Study* prepared by SG Associates, Inc. for WILMAPCO in December 1997
- *Regional Land Use and Parking Study* prepared by Edwards and Kelsey for WILMAPCO in July 1996.
- *Churchman's Crossing Study* prepared for DelDOT, WILMAPCO, and New Castle County in April 1997.
- *Regional Rail Study* conducted by Rummel, Klepper, and Kahl for DelDOT. The Phase III report was issued in June 1996.

The following is a list of other reports and studies reviewed by the consultant team.

Report	Prepared for:	Prepared by:	Date
Micro-Transportation Study	WILMAPCO	Vorhees	1977
Newark Area Transportation Study	DelDOT	VHB	1989
Truck Bypass Study	DelDOT	URS	1986
Route 896 Truck Route Study	DelDOT	URS	1995
Newark Truck Survey	DelDOT	DelDOT	1997
Delaware Turnpike Toll Study	DelDOT	URS Greiner	1997
Parking Technical Visit Report	City of Newark	National Main Street Center	1996
Downtown Parking Committee status report	City of Newark	Parking Committee	1997
K-site Safety Project	DelDOT	Whitman, Requardt, and Assoc.	1995
Newark Pedestrian Plan Pilot Project	WILMAPCO	U of Delaware, Dept. of Geography	1997
A Traffic Study of Selected Intersections in and around the University of Delaware	City of Newark	John D. Edwards	1997
Conversion of Main St. from 1-Way to 2-Way	Town of Elkton	Traffic Group	1997
High Street Closure	Town of Elkton	Traffic Group	1997
Traffic Survey	Old Newark Civic Association		1997
Elkton Road / Amstel Avenue Intersection	City of Newark	DelDOT	1997
Newark Area Bicycle Interim Report	WILMAPCO, DelDOT	Parsons-Brinckerhoff	1996
Newark Bikeway Proposal	Alternative Transportation Working Group		1997
US 301 MIS	WILMAPCO	JMT	ongoing

In addition to reviewing the above reports and studies, the consultants referred to several planning documents, including the following:

- Cecil County Comprehensive Plan (December 1990)
- Town of Elkton Comprehensive Plan (October 1991)
- City of Newark Comprehensive Plan (June 1987)
- WILMAPCO Metropolitan Transportation Plan (December 1995)
- WILMAPCO Transportation Improvement Program 1999-2001
- WILMAPCO 1997 Regional Congestion Management System Report
- DelDOT Capital Improvement Program 1999-2004 (December 1997)
- New Castle County Comprehensive Development Plan Update (January 1997)
- Maryland Consolidated Transportation Program 1998-2003
- Chester County Comprehensive Plan Policy Element (July 1996)

APPENDIX C
PUBLIC INVOLVEMENT ACTIVITIES

PUBLIC INVOLVEMENT ACTIVITIES

The scope of work for this project involved a wide range of public involvement activities, including interviews and focus groups, public workshops, and surveys. The input received from these activities was useful to the consultants in identifying key issues and assessing alternatives. This appendix provides a summary of the proceedings and comments at the four Public Workshops.

September 26, 1997

At this meeting, the consultants presented and discussed a preliminary list of key issues for the study area. The participants assisted the consultants in identifying issues for further analysis, and the following is a summary of comments by the participants.

Land Use

- analyze the student component of Newark's population
- address growth trends to the north and west of Newark
- consider the role of parkland in the land use analysis
- include analysis of Pennsylvania population and land use
- look at Chrysler's expansion plans, note that most of the workforce lives outside of Newark.

Travel Patterns

- assess the significance of modal split on travel patterns
- note that 80% of traffic on Christina Parkway is local
- look at other studies including Route 301 study, Route 40 study, and Regional Transit Analysis
- examine the extent of "reverse commuting," esp. in light of planned Gore expansion
- assess the impact of major employers
- consider the impact of the Avondale (PA) by-pass
- analyze travel patterns to Central Pencader, Churchman's Crossing, and Wilmington

Congestion

- look at congestion along US 40, especially related to development in western Cecil County and traffic along MD 272. Also, note congestion along Bridge St.
- analyze congestion on eastern side of Newark -- it's just as bad as on west side
- analyze pedestrian flows in downtown Newark -- they are major cause of congestion
- consider the impact of University traffic -- look at traffic when school is out
- look at traffic problems in south Newark, esp due to I-95 traffic in evening peak
- consider roadway limitations due to CSX line

Parking

- some people (esp. merchants, shoppers) perceive parking to be a problem in downtown Elkton
- look at the work of the Newark Traffic Committee -- study will be done shortly
- look at the impact of pricing policies
- identify specific points where University parking conflicts with other parking

Alternative Transportation Accessibility

- identify specific potential park-ride locations -- consider locations further north along 896
- consider the potential of additional commuter rail extensions
- consider the potential of providing non-traditional bus services in suburban neighborhoods
- include SEPTA in the study process
- consider the limitations of liability concerns for interstate service, eg DART to Elkton

Bike/Ped Facilities

- consider the demand by city residents, not just university students
- look at the issue of reducing vehicular speeds
- assess the extent of violations of traffic rules by bike/ped users
- refer to proposals from previous studies, current DelDOT plans, etc.

February 19, 1998

At the second public workshop, the consultants presented and discussed a summary of key land use and transportation issues, and the public provided additional input on these issues. The consultants also presented a list of potential alternatives, and the participants discussed these alternatives with the consultants in small group sessions. The following is a summary of comments relating to both issues and alternatives.

Alternate Modes of Travel

- Elkton-Newark Bike Path MD279-DE2
- Bike racks and bike racks on buses
- Bike paths thru University of Delaware campus connecting to city streets
- Commuter rail gap
- Smaller buses
- Economic incentives to promote transit use
- Re-educate people to travel in other ways
- Safety striping issue (bicycles)
  - enforcement
  - integrity of solid white line
  - visibility of bike lanes
- Safety crosswalks
  - enforcement
- Safety speed limits
  - enforcement
- Safety crosswalks – Old College/Trabant Center

Circulation

- Peak Hour Flows on Barksdale (Directional)
- Sidewalk Radius (Main St.)
- No Parking Main St. (One Side)
- Too much traffic – Hillside to Cleveland
- Farm Road (Reopened) Tracks South Campus

Congestion

- Pomeroy (One-Way, Parking)
- 4-Way Redlight for pedestrians (Campus)
- Timing on signals
- Access across R.R. behind Howard Johnson
- Rt. 40 & 213 (Accidents)

Environmental Preservation and Quality of Life

- Trucks off 896 -- heavy truck traffic along Route 4
- Better truck management
  - Beltway
  - Ramp Toll
  - Using Christiana Blvd. to avoid toll

Land Use Trends

- Impact of employment growth due to new silicon chip manufacturing, and growth along the US 40 corridor west of Elkton
- Corridor Preservation (Newark Beltway, CSX Line)
- Need for more roads -- growth in population requires more roads
- Problems with mass transit -- Population and work centers are not mass, people love cars
- Expanding Park 'n Rides may help to increase transit use
- HOV Lanes - may encourage carpooling
- Problems with zoning solutions -- Zoning doesn't drive development Land use design/regulations will be of little help Need political will
- Need to address peak hour -- flex hours may help, but would discourage ridesharing
- Employer van/car pools – large employers have been doing a good job in this area
- Close Main St. (Newark) -- Create pedestrian mall or one-way other direction
- Problem with trucks avoiding tolls by using Route 4

Intergovernmental Issues

- tax reciprocity
- I-95 tolls (local resident tickets)

University of Delaware Issues

- Disallow cars for Freshman
- Has great bus system
- Require University of Delaware to meet City land use and traffic impacts (requires Newark to request revision to legal charter of U of D)
- Address pedestrian overpasses (may not work because of steps), barriers for channeling, ramps, tunnels
- Traffic calming

Other Issues

- Consider feasibility of northern/eastern bypass. Hopkins Rd. & Thompsons Rd. currently used by many as bypass. Intersection is high accident location
- Trucks – should use existing roads renumber routed (896 to 41)
- Christina Parkway southbound should be consistently 4 lanes
- Exit tolls off I-95
- Road construction only on off-peak hours
- Bicycle lane striping is waste of money
- Lack of commuter discount on I-95 increases toll diversion

May 18, 1998

At this meeting, the consultants presented several "scenarios" of alternatives. The following is a summary of feedback on these scenarios and alternatives.

- Do not convert the old **Pomeroy Branch** into a roadway for vehicular use; rather, convert it to a greenway/bikeway or reserve it for future transit use. A bikeway could help to provide a link to the nearby Newark HS and/or proposed redevelopment at the old Budd site.
- Do not **re-align North and South College Avenues**, because this would impact the historic Old College.
- There is a need to "target" certain locations, e.g., Chrysler, to minimize **truck traffic**. The bulk of truck traffic in town has Newark as an origin or destination.
- Promote **traffic calming measures**. Can police radar be used to slow incoming traffic? Emphasize the importance of attitude/atmosphere regarding pedestrian safety, and identify **high pedestrian flows and key crossings**.
- Develop **off-road bicycle facilities**. DelDOT is currently working on the Frasier Field route, and that the new Bond Bill includes $600,000 for additional facilities in the Newark area. Also, a current project is developing a signing/striping plan for on-road facilities in the Newark downtown area. Link a future bikeway to the high school. There are some problems with obtaining necessary rights-of-way for proposed paths.
- What will be the long-range effects of implementing **intelligent transportation systems** (ITS)?. There is potential effectiveness of ITS providing "real time information" for transit riders. On the other hand, ITS technologies could help to make vehicular travel more desirable.
- Recognize the **impact of University traffic** on the downtown. Note the influence of the culture of the automobile; there is unnecessary student travel and "stashing" of autos. Provide incentives for students not to bring autos to Newark. The University already has fairly restrictive policies regarding student parking on-campus.
- What is the potential for mixing new commercial development into existing residential development? **Mixed-use zoning** is one land use alternative being considered.
- What about a second travel lane to the **Casho Mill Road underpass**? One person commented that the current road generally works OK as it is, and the new lane would probably fill up with traffic after it was built. Another person commented, however, congestion is a problem that sometimes leads her to travel into the downtown area to avoid it.
- We should not assume a **future level of traffic growth** based only upon trend land use projections. It was agreed that land use alternatives could play an important role in minimizing the rate of traffic increases in the study area.

June 29, 1998

Based upon public input from the May meeting and additional technical analysis, the consultants developed a list of preliminary recommendations. At this meeting, the consultants presented their draft recommendations. The participants provided input through comments at the meeting and/or completing surveys. Based upon the input, the consultant team identified several key areas for revising the preliminary recommendations. Several of the comments reflected the need for more details, some of which was included in the Implementation Plan. The following is a summary of key issues and responses:

Land Use / Growth Management – the public indicated general support, with no specific opposition, for these recommendations. A few responses pointed to the need for more local roads to interconnect different land uses. The final plan addresses need for roadway interconnections and provides more details about traffic calming.

Travel Demand Management -- the public also indicated general support for these recommendations. A few responses noted the importance of employer participation, and a few suggested the need to identify specific incentives for participation. The final plan provides more details on specific recommended strategies and actions

Bike-Ped -- the public also indicated general support for these recommendations. One written response raised two concerns. One concern is that bike route signing raises legal issues – does signing ensure the safety of the route? The second concern is that off-road bikeways are expensive to build and maintain. The final plan provides more description and explanation regarding the suitability of local roadways for bicycle travel.

Public Transit -- the public indicated general support for these recommendations, although a few persons were skeptical about some elements, eg, Elkton-Wilmington bus, downtown transit centers, and demand-responsive service. Also, a few persons questioned the conclusion to reject extending commuter rail service. The final plan does not reject the commuter rail extension, but rather recommends that additional evaluation be conducted.

Roadway Operations / Systems Management -- Some persons stated the need to remove the I-95 toll, in order to minimize "diversion" from the Newark toll plaza. A few suggested the need for additional measures to remove trucks from downtown Newark.

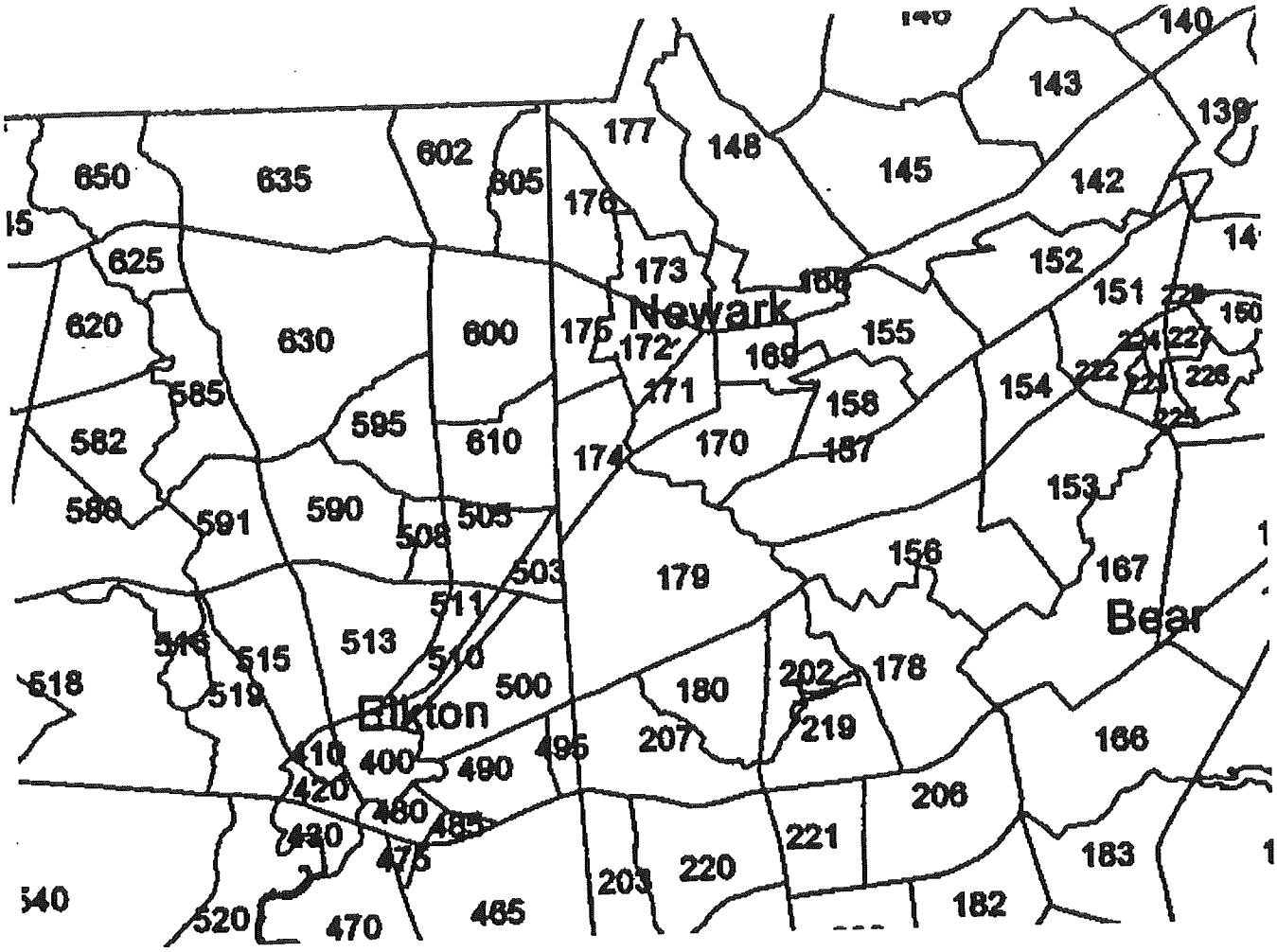
Increase Roadway Capacity -- a few persons questioned rejecting the Christina Parkway extension, while a few supported this recommendation. Several persons expressed concern about the impact of the potential "northern connector," including its environmental impact and its effect upon downtown businesses. A few persons are opposed to converting the Pomeroy Branch into a roadway. One person suggested widening Library Avenue between Wyoming Avenue and Christina Parkway. The final plan emphasizes that the consultants are recommending only further evaluation of the northern connector, and other proposed roadway projects will also require more detailed analysis.

APPENDIX D

LAND USE AND TRANSPORTATION DATA

1. Map of Traffic Analysis Zones (TAZs)
2. Population and Employment Projections
3. Traffic Volume Data

Traffic Analysis Zones (TAZ)
in Newark-Elkton Area



Newark-Elkton Intermodal Transportation Plan							
Household Projections							
Study Area TAZs							
sorted by 1995-2020 increase							
	area	1995		2020		Increase	
TAZ	sq mi	hh	hh/sq mi	hh	hh/sq mi	number	in density
156	2.87	1985	692.1	3256	1135.3	1271	443.2
178	2.63	2985	1133.3	4210	1598.3	1225	465.1
148	3.05	884	289.6	1978	647.9	1094	358.3
219	1.30	123	94.8	945	728.0	822	633.3
179	4.52	1510	334.2	2284	505.5	774	171.3
177	2.13	113	53.0	711	333.6	598	280.6
207	1.94	212	109.4	722	372.5	510	263.2
202	0.99	386	389.9	774	781.8	388	391.9
157	2.90	2646	911.8	2862	986.2	216	74.4
503	0.41	20	48.4	227	549.8	207	501.3
180	1.56	1408	903.1	1606	1030.1	198	127.0
610	1.52	459	301.3	640	420.1	181	118.8
490	1.21	1003	828.0	1182	975.8	179	147.8
400	0.84	984	1175.6	1088	1299.9	104	124.3
600	2.54	290	114.2	384	151.3	94	37.0
155	1.72	1130	656.6	1222	710.1	92	53.5
176	1.14	616	539.9	702	615.2	86	75.4
174	1.09	543	499.1	623	572.6	80	73.5
590	1.91	322	168.5	382	199.9	60	31.4
495	0.32	173	546.8	231	730.1	58	183.3
171	0.72	1097	1530.0	1151	1605.3	54	75.3
168	0.87	1203	1389.1	1252	1445.7	49	56.6
630	5.05	282	55.9	327	64.8	45	8.9
513	2.05	150	73.3	193	94.3	43	21.0
500	2.03	188	92.5	228	112.2	40	19.7
175	0.83	928	1118.1	967	1165.1	39	47.0
605	1.04	443	427.9	476	459.8	33	31.9
480	0.39	67	170.6	98	249.6	31	78.9
505	0.87	305	351.7	330	380.6	25	28.8
172	0.86	1650	1914.2	1668	1935.0	18	20.9
485	0.18	121	679.8	137	769.7	16	89.9
508	0.45	6	13.3	21	46.6	15	33.3
170	1.63	518	317.2	532	325.8	14	8.6
635	4.22	105	24.9	119	28.2	14	3.3
595	1.41	141	100.2	154	109.4	13	9.2
602	1.76	112	63.7	122	69.4	10	5.7
511	0.56	39	69.9	48	86.1	9	16.1
173	0.99	784	795.9	791	803.0	7	7.1
510	0.38	11	28.6	12	31.2	1	2.6
169	0.74	519	704.2	518	702.8	-1	-1.4
158	1.11	3176	2863.8	3171	2859.3	-5	-4.5
	64.71	29637	458.0	38344	592.6	8707	134.6
% increase						29.4%	

Newark-Elkton Intermodal Transportation Plan

Employment Projections

Study Area TAZs

sorted by 1995-2020 increase

										1995-2020	
		1995				2020				incr in	incr in
TAZ	area	retail	dens	total	dens	Retail	dens	Total	dens	retail #	total #
169	0.74	213	289	6083	8254	285	387	9586	13007	72	3503
171	0.72	229	319	3045	4246	307	428	4844	6754	78	1799
505	0.87	8	9	590	678	11	13	1589	1826	3	999
168	0.87	1516	1751	2769	3198	2021	2334	3666	4234	505	897
173	0.99	297	301	1411	1432	395	401	2168	2200	98	757
148	3.05	290	95	3927	1286	387	127	4673	1531	97	746
202	0.99	52	53	1337	1350	89	90	1950	1969	37	613
157	2.90	791	273	5796	1997	1056	364	6406	2207	265	610
400	0.84	323	385	4605	5482	438	521	5170	6155	115	565
158	1.11	423	381	1356	1222	565	509	1832	1651	142	476
155	1.72	926	538	6105	3547	1234	717	6571	3817	308	466
172	0.86	242	281	944	1095	323	375	1403	1628	81	459
180	1.56	9	6	630	404	14	9	1057	678	5	427
480	0.39	676	1733	807	2069	914	2344	1098	2815	238	291
170	1.63	28	17	2342	1434	36	22	2596	1589	8	254
156	2.87	71	25	1666	581	95	33	1919	669	24	253
610	1.52	24	16	167	110	33	22	381	251	9	214
511	0.56	330	589	580	1036	447	798	786	1404	117	206
179	4.52	22	5	593	131	30	7	728	161	8	135
174	1.09	277	255	2374	2182	369	339	2488	2287	92	114
490	1.21	148	122	324	268	201	166	430	355	53	106
503	0.41	271	661	271	661	367	895	367	895	96	96
178	2.63	0	0	63	24	0	0	99	38	0	36
595	1.41	48	34	104	74	64	45	136	96	16	32
590	1.91	41	21	269	141	55	29	299	157	14	30
176	1.14	6	5	139	122	8	7	168	147	2	29
513	2.05	0	0	115	56	0	0	142	69	0	27
207	1.94	0	0	14	7	0	0	33	17	0	19
510	0.38	0	0	46	121	0	0	64	168	0	18
600	2.54	12	5	42	17	16	6	57	22	4	15
219	1.30	16	12	18	14	26	20	30	23	10	12
175	0.83	7	8	29	35	9	11	37	45	2	8
630	5.05	49	10	72	14	66	13	77	15	17	5
635	4.22	0	0	48	11	0	0	50	12	0	2
485	0.18	5	28	5	28	6	33	6	33	1	1
605	1.04	0	0	25	24	0	0	26	25	0	1
602	1.76	0	0	30	17	0	0	31	18	0	1
177	2.13	0	0	2	1	0	0	3	1	0	1
495	0.32	0	0	0	0	0	0	0	0	0	0
500	2.03	0	0	0	0	0	0	0	0	0	0
508	0.45	0	0	0	0	0	0	0	0	0	0
total	64.72	7350	114	48743	753	9867	152	62966	973	2517	14223
% incr										34.2%	29.2%

Traffic Volumes on Study Area Roadways				
Cecil County				
		1990	1996	avg incr
Portals				
MD	Rt 896 in MD	7,000	9,250	4.8%
DE	Rt 896 in DE near MD line	8,883	10,024	2.4%
MD	Rt 273 west of Fair Hill	6,350	6,750	1.2%
DE	Rt 273 in DE near MD line	9,574	8,137	-3.2%
MD	MD 279 near state line	15,325	17,575	2.3%
DE	DE 2 at state line	19,455	20,327	0.9%
MD	US 40 west of MD 213	26,475	34,300	4.4%
MD	US 40 in MD near DE line	20,550	21,375	0.7%
I-95				
MD	west of MD 272	52,000	70,850	5.3%
MD	near state line (MD)	56,700	63,150	1.8%
DE	at state line (DE)	56,896	65,215	2.8%
Cecil County				
	MD 277 west of Elk Mills	2,500	3,275	4.6%
	MD 273 east of Appleton	7,900	7,850	-0.1%
	MD 279 east of MD 316	11,325	12,425	1.6%
	MD 316 north of MD 281	10,300	14,075	5.3%
	MD 279 east of MD 213	11,025	7,900	-5.4%
Bridge St.				
	MD 213 south of I-95	5,150	6,925	5.1%
	MD 213 north of MD 281	16,475	17,375	0.9%
	MD 213 north of US 40	13,900	17,675	4.1%
		1985	1996	avg incr
US 40 - MD				
	west of 213	23,000	34,300	3.7%
	east of 213	19,775	31,800	4.4%
	east of Delancy	16,430	21,375	2.4%
MD 279				
	east of 545	6,700	7,725	1.3%
	south of I-95	9,100	12,425	2.9%
	north of I-95	13,600	17,575	2.4%

New Castle County				
		1985	1995	avg incr
US 40 - DE				
	MD line to Pleasant Valley	17,200	26,565	4.4%
	Pleasant Valley to 896	17,200	25,890	4.2%
	896 to 72	15,800	27,619	5.7%
Newark CBD				
	Main-Del betw Elkton-Colleg	40,700	54,771	3.0%
	Main-Del betw College-Chape	38,600	48,633	2.3%
	Main-Del betw Chapel - 72	31,000	36,027	1.5%
Christina Parkway				
	DE 4 betw DE 2 - DE 896	13,600	22,203	5.0%
	DE 4 betw DE 896 - DE 72	11,300	27,134	9.2%
	DE 72 betw DE 4 - Del Ave	13,800	19,525	3.5%
DE 2				
	MD line to Rt 4	15,700	20,188	2.5%
	Rt 4 - CBD	17,400	21,375	2.3%
			1,994	
DE 72				
	us 40 to OBP	10,000	15,335	4.9%
	OBP to 4	17,300	22,862	3.1%
	4 to Del	13,800	19,133	3.7%
	Del to 273	35,200	35,303	0.0%
DE 896				
	us 40 to OBP	16,400	20,157	2.1%
	OBP to 95	26,900	30,349	1.2%
	95 to 4	23,100	40,284	6.4%
	4 to Del	11,200	21,375	7.4%
I-95				
	betw MD line and DE 896	41,500	65,215	4.6%
	betw DE 896 and DE 273	67,800	114,312	5.4%

APPENDIX E
BASE CASE PROJECTS

BASE CASE PROJECTS

Strategy: Increase Roadway Capacity

Widen DE 273 to 4 lanes Over the past several years, DelDOT has overseen projects to reconstruct and partially re-align DE 273 to transform it into a 4-lane divided highway east of Newark between Marrows Road and I-95. The last major phase of this project, widening the road from Marrow's Road to the AMTRAK bridge, is currently under construction. This project will improve roadway capacity and safety, but it also could aggravate existing congestion at the intersection of DE 273 and DE 2/72.

Extend Wyoming Road to Marrows Road This project involves constructing a new 2-lane road between DE 2/72 and Marrows Road. The project will provide access to the Delaware Technology Park and could serve to reduce congestion at the intersection of DE 273 and DE 2/72. The project has been planned for several years, and construction is currently scheduled to begin in FY 1999 (July 1998-June 1999).

Upgrade Salem Church Rd between I-95 and US 40 DelDOT has scheduled projects to widen the roadway and shoulders of Salem Church Road, add turning and bypass lanes, make intersection improvements, reconstruct a bridge, and improve drainage facilities. The section between Reybold Road and US 40 is currently under reconstruction; DelDOT has scheduled construction for the section between Old Baltimore Pike and Reybold Road in FY 1999; and design for the section between Old Baltimore Pike and I-95 will begin in FY 1999. These projects will increase the efficiency of Salem Church Road as an important north-south collector road in the study area.

Implement Route 40 corridor improvements DelDOT is planning various projects in order to implement the US 40 corridor study recommendations. They will design 4-R type projects and other projects to complement multi-modal activity centers. Intersection improvements will be designed for School Bell Road, Walther Road, et al.

Expand capacity of US 40 – SR 72 intersection In addition to other Route 40 corridor improvements, DelDOT is currently working on a project that will add turning lanes along DE 72, extend the left turn lanes along US 40, and resurface the entire intersection. This project will allow for easier and safer turning movements.

Upgrade Reybold Road between DE 72 and Salem Church Road This project involves upgrading the roadway with an overlay mix, slope stabilization, drainage improvements, and minimal widening. DelDOT has currently scheduled the project for FY 2001. This project will help to enhance the use of Reybold Road for local circulation between the Old Baltimore Pike and US 40 corridors.

Strategy: Increase Efficiency of Roadway Operations / Local Circulation

Implement electronic toll collection along I-95 DelDOT has been working to improve the efficiency of traffic flow along I-95, particularly at the Newark toll plaza. Four new toll lanes were added in 1997. In 1998, DelDOT plans to implement the EZ pass electronic toll collection system. Vehicles with electronic tags and pre-paid accounts will be able to travel through express lanes at the toll plaza without coming to a complete stop. This alternative will be attractive to motorists who want to save time and money.

Install new coordinated computerized signal system in Newark DelDOT is currently working on implementing a new computerized coordinated signal system that will coordinate all the timing of all traffic signals in the Newark area. Such systems have been found to decrease travel time by 8-10%, as well as helping to decrease vehicle emissions. The benefits of such a system are somewhat limited because much travel delay in urban areas is attributable to non-recurring events, e.g., accidents and construction. To that end, DelDOT is also currently working to develop a statewide Integrated Transportation System as discussed under the next action.

Implement statewide integrated transportation management system (ITMS) ITMS includes such measures as adaptive signal systems, electronic toll collection, variable message signs, traveler advisory radio, and incident response teams. DelDOT is working on a ITMS that it will implement through a Transportation Management Center (TMC). The TMC will aim to reduce congestion delays, improve traveler safety, and save system users time and money.

Revise Operations of Main – College intersection -- A recent report conducted for the City recommended re-activating the signal at Main – South College and coordinating this signal with the one at Main – North College. The new signal timing plan will have 3 phases including a "pedestrians only" phase. The report also recommended moving the crosswalk from west of North College Ave to the east side, installing a right turn lane for westbound traffic, and installing

pedestrian barriers. Implementing these recommendations would enable this intersection to operate efficiently from a roadway capacity / traffic standpoint. Existing problems with traffic delay resulting from uncontrolled pedestrian movements at this intersection will continue, however, unless pedestrian flows are controlled.

Modify DE 273 – DE 2/72 intersection -- This intersection currently has a LOS of D during the evening peak hour, and it is the highest accident location in Newark. DelDOT has scheduled a project to provide traffic calming and improve the safety of this intersection. The project includes removing pavement, adding pavement markings, revising signals, and installing a right turn lane for entering the post office. DelDOT has scheduled this project for FY 2000. The project will improve safety, but will do little to address the intersection's capacity problem.

Upgrade at-grade rail crossings -- DelDOT has scheduled two projects to upgrade the at-grade crossings of the Delmarva Secondary rail freight line at Christina Parkway and US 40. These projects involve removing the existing crossing and replacing it with precast concrete, as well as upgrading detection equipment.

Improve signage and access to off-street parking lots The existing activities of revitalization groups in Newark (Downtown Newark Partnership) and Elkton (Elkton Alliance) are addressing issues relating to off-street parking. In Newark, the downtown parking committee has considered re-designing lots, adding side entrances to lots, improving advertising and promotion, and evaluating the feasibility of new lots and a parking structure. In Elkton, the downtown revitalization plan's recommendations included re-designing lots, installing high-powered lighting, providing regular maintenance and safety patrols, and evaluating the feasibility of a parking structure.

Reverse the One-way Flows of Main and Howard Streets in Elkton -- as part its revitalization activities, the Town had proposed to convert these streets from 1-way to 2-way operations because some viewed the current system as not conducive to commercial activity along Main Street. This change, however, would have required numerous changes to signal timings and lane markings, resulted in the loss of on-street parking spaces along Main Street, and reduced the efficiency of the signalized intersections of Main and Howard with Bridge St (MD 213). The Town has thus opted to keep a one-way system but to reverse the flow of traffic on Main Street

from 1-way westbound to 1-way eastbound and reverse Howard Street traffic from 1-way eastbound to 1-way westbound.

Strategy: Increase Access to All Travel Modes

Upgrade public transit service in New Castle County The DelDOT CIP includes funding for several projects to upgrade existing transit facilities and services, particularly those of DART First State. Among the various projects are retrofitting all bus stops to meet ADA requirements, expanding paratransit service, replacing and refurbishing transit vehicles, and adding new equipment such as video surveillance, voice enuniciators, and automated fareboxes.

Provide new park-ride facility near intersection of US 40 - DE 896 DelDOT has been studying potential areas for acquiring land and constructing additional park-ride facilities statewide. The current plans include a park-ride at the southeast corner of the US 40 – DE 896 intersection in Glasgow, across from the People's Plaza.

Provide lane for bicycle/pedestrian traffic at Casho Mill Road underpass DelDOT has scheduled a project to construct a bicycle/pedestrian lane within the CSX underpass. The project will include installing a five-foot walkway, drainage, and lighting, while traffic flow through the underpass remains limited to one lane.

Add bicycle and pedestrian safety elements at downtown intersections The DelDOT CIP indicates that funding is available for safety improvements at various intersections statewide. In addition, DelDOT has conducted an evaluation of the intersection of Elkton Road – Amstel Avenue and has made numerous short, medium, and long-term recommendations for improving the environment for bicyclists and pedestrians in this area.

Develop system of bicycle routes in Newark area The DelDOT CIP recommends funding for long-term bicycle improvements around the City of Newark in order to relieve traffic congestion. DelDOT is in the process of completing a bike route striping and signing plan for the downtown / University area, and it is considering plans for off-road bike paths which would be funded from the Non-Motorized Transportation Program.

Implement safety precautions along CSX rail line CSX Transportation has committed to several actions designed to improve safety along its rail line through Newark. It will install fencing in the area of the Deer Park intersection in order to deter pedestrians from entering the right-of-way, and it will also revise the signal detection equipment. In the meantime, CSX, the University, and the City have initiated a program to raise public awareness of the dangers of trespassing along the rail line. Police officers have set up checkpoints at locations where pedestrians cross illegally along the tracks, and they have issued warnings and safety brochures.

APPENDIX F
EVALUATION OF ALTERNATIVES

1. Evaluation of Roadway Connection Alternatives
2. Evaluation of Intersections

1. EVALUATION OF ROADWAY CONNECTION ALTERNATIVES

A major work activity of this project was to analyze the utility of accessibility and connectivity-enhancing roadway capacity expansion projects and strategies in New Castle County, including an extension of Christina Parkway within New Castle County. This appendix provides details on the evaluation methodology.

Public input early in the study process identified traffic congestion in the Newark CBD as an important concern. Continued traffic growth will have numerous negative effects, including travel delays, accidents, conflicts with bicyclists and pedestrians, and spillover traffic onto residential streets. Based upon preliminary analysis, the consultants selected the following three other potential roadway connections to evaluate:

- New northern connector route
- Widen Cleveland Avenue
- Upgrade northern roads

This analysis based its evaluation of alternatives upon the effect of each alternative upon the local roadway network, particularly traffic volumes along Main Street and Delaware Avenue in downtown Newark. Traffic projections generated by DelDOT's model show that traffic along Main and Delaware will be 23% greater in 2020 than in 1996, assuming no new roadway connections ("No Build" scenario). DelDOT's model also generated projections of traffic volumes in 2020 assuming each alternative were built ("Build" scenarios). The evaluation also included "select link" analysis which reviewed the different traffic patterns related to different alternatives. This analysis helped to explain the causes of changed traffic volumes, i.e., which trips shifted, as well as checking the compatibility of the changes with population and employment projections.

The evaluation focused on comparing the Build volumes for each alternative. In focusing upon the extent of changes among the different alternatives, the consultants did not evaluate whether the traffic volumes on the new connectors would be in themselves sufficient to justify that alternative. Also, the consultants did not evaluate the feasibility of specific route alignments, nor did they evaluate constraints or costs for each alternative. It is recognized that each alternative would involve certain environmental impacts and costs of construction, and this evaluation focused only upon the traffic impacts of each alternative.

Table F-1 shows the projected traffic impact of each alternative, and the following sections present a summary of the evaluation.

Table F-1
Summary of Projections for Roadway Connection Alternatives

	AADT on Main / Delaware in CBD			
	1996	2020 No-Build	2020 Build	Build v. No-Build
Extend Christina Parkway	36,400	44,800	43,100	-3.8%
New Northern Connector	36,400	44,800	35,600	-20.5%
Widen Cleveland Avenue	36,400	44,800	37,500	-16.3%
Upgrade Northern Roads	36,400	44,800	41,700	-6.9%

Source: Analysis of data provided by Division of Planning, DelDOT.

Extend Christina Parkway

This alternative is to extend Christina Parkway northward from its current terminus at Elkton Road to New London Road (DE 896). This route would provide a travel route around the downtown area for traffic traveling between the north and west and points to the south and east. Some have suggested extending the parkway only to Nottingham Road or to Barksdale Road. The analysis of the parkway to New London Road provides a "best case" scenario for assessing the impact of this alternative.

The evaluation found that this alternative would have minimal impact upon traffic growth in the CBD. The projections for this alternative find that east-west traffic in the CBD would still be 18% greater than in 1996. The Parkway extension has a limited effect on traffic in the CBD (4% reduction from No Build scenario) because DE 896 currently carries less than 25% of the total east-west traffic volume in the CBD. In other words, constructing a north-south bypass will have limited impact on east-west traffic flow.

This alternative would have its greatest impact in reducing traffic volumes on roads in Western Newark, including New London Road, West Main Street, Barksdale Road, and Casho Mill Road, as well as along College Avenue. On the other hand, it would *increase* traffic along several roads in South Newark, notably the Christina Parkway.

Northern Connector

This alternative involves constructing a new east-west road north of Cleveland Avenue. The road would extend from DE 273 at Marrow's Road east of downtown to DE 896 (and possibly to DE 273 west of downtown). This alternative would also require designing the intersections of the new road with DE 273, Kirkwood Highway, and DE 896 to ensure optimal efficiency of operations.

This alternative would have a major reduction in traffic along Main and Delaware Streets in the Newark CBD. In fact, it would mitigate all currently projected growth along Main – Delaware between 1996 and 2020. The great majority of trips using the new road would travel between Western Newark and areas to the east of the City, which are the same areas with greatest projected employment increases. This alternative would also reduce traffic volumes in Western Newark, notably along Barksdale Road and Casho Mill Road, and most roads in South Newark would have traffic decreases.

Widen Cleveland Avenue

This alternative involves widening Cleveland Avenue to four lanes between New London Road and Chapel Street. It would also involve modifying the intersections of Cleveland Avenue with New London Road, Chapel Street, and Kirkwood Highway in order to enable these intersections to operate at acceptable levels of service.

The analysis found that this alternative would generate nearly the same reduction upon traffic volumes in the CBD as the northern connector. On the negative side, it would increase traffic along Cleveland Avenue and require major expansions of the existing intersections.

Upgrade Northern Roads

This alternative is to upgrade Hopkins Road and Thompson Station Road north of Newark to facilitate greater use of these roads for travel around the downtown area. Public input indicates that many people currently use these roads for this purpose. The evaluation found that this alternative would have a limited impact on traffic in the CBD, likely due mainly to the distance of this route from the downtown area.

2. EVALUATION OF INTERSECTIONS

Another work activity was to assess the existing and future operations of key intersections in the study area. The consultants conducted capacity analysis of signalized intersections using HCM Cinema 3.06 software. The analysis is based upon several factors including intersection geometry, signal timing, and traffic volumes. The consultants used traffic volume data from various sources and projected the traffic volumes at each intersection for the year 2020, using a 1% annual growth rate applied to the current volumes in all directions. The capacity analysis calculates an average travel delay (in seconds) for each intersection. The average delay corresponds with an intersection level of service (LOS) ranging from A (good) to F (worst). A LOS of D is generally considered acceptable.

For current conditions, the evaluation found that the study area intersections generally operate at acceptable levels of service. For 2020, however, the evaluation identified numerous intersections projected to have an LOS of E or F (see **Table F-2**). For these intersections, the consultants sought to propose physical measures that would enable the intersections to operate at acceptable levels of service. The evaluation resulted in two categories of proposed actions. One category is to modify intersections by revising the signal timing, adding a turning lane, etc. The second category is to evaluate the need to expand the capacity of the intersection. The following is a summary of the proposed actions under each category.

I. Modify Intersections

MD 279 – MD 545 (Blue Ball Road) The evaluation found that installing a left turn lane for northbound traffic on MD 279, adjusting other lane configurations, and revising signal timing would enable the intersection to operate at an acceptable LOS in 2020. If the traffic growth rate is higher than projected, then additional expansion of the intersection may be necessary.

MD 213 - MD 545 (Elkton Avenue) This intersection currently has a separate turning lane for northbound left turns, but the signal timing plan does not include a separate phase for this movement. The evaluation found that revising the signal timing to add a separate signal phase for northbound left turns would enable this intersection to operate at an acceptable LOS in 2020.

Table F-2
Summary of Capacity Analysis for
Key Signalized Intersections in Study Area

	Existing LOS	2020 LOS
Main - Cleveland	C	D
New London - Cleveland	C	D
Cleveland - College	C	C
Main St - College	B	D
Delaware - College	B	C
Cleveland - Chapel	C	F
Main - Chapel	B	C
Delaware - Chapel	C	C
Cleveland - Kirkwood	D	F
Main - DE 2/72	D	E
Delaware - DE 2/72	C	F
DE 2 - DE 4	C	F
DE 896 - DE 4	E	F
DE 896 - Old Baltimore Pike	E	F
US 40 - DE 896	D	E
MD 279 - North St	B	B
MD 279 - MD 213	C	F
MD 279 - MD 545	C	F
MD 213 - MD 545	B	F
MD 213 - Railroad Ave	B	C
MD 213 - High St	B	F
MD 213 - Main St	C	C
MD 213 - Howard St	A	A
US 40 - MD 213	D	E
Main St - North St	B	B
North St - High St	B	C
Main St - Delaware Ave	B	C
Howard St - Delaware Ave	B	B

Notes: LOS denotes intersection level of service as calculated by HCM Cinema 3.06 software.

MD 213 (Bridge St) – High Street The evaluation found that adding a left turn lane and a lead signal phase for northbound Bridge Street traffic would enable this intersection to operate at an acceptable LOS. Depending upon the rate of traffic growth, it may also be necessary to convert one southbound lane to a right turn only lane.

MD 268 (North St) – High Street The evaluation found that this intersection will have an acceptable LOS in 2020. If, however, the rate of traffic growth is higher than projected, then it may be necessary to create a left turn lane and signal phase for southbound North St. traffic. This action would require removing on-street parking along the west side of North St.

II. Evaluate Need to Widen Intersections

This evaluation identified several intersections that are projected to operate at an LOS of E or F in 2020. The analysis did not consider the impact of implementing any new roadway connections. For these intersections, this study recommends more detailed analysis to determine the specific need, if any, for increasing the capacity of the intersection. The following summary of intersections notes potential capacity expansions that the consultants have preliminarily identified.

Cleveland Avenue – Chapel Street Given the existing roadway network, adding a second eastbound through lane would enable this intersection to operate at an acceptable LOS in 2020. Building the proposed Pomeroy Branch roadway, however, would require changing the configuration of this intersection.

Cleveland Avenue– Kirkwood Highway This intersection would require additional capacity for northbound left turns, eastbound left turns, and southbound through traffic in order to operate at an acceptable level of service in 2020.

Main Street – Kirkwood Highway The currently programmed DelDOT project will help the operations of this intersection somewhat. Adding capacity for southbound left turns may enable the intersection to operate at an acceptable LOS in 2020. For this intersection and the preceding two intersections, constructing the proposed northern connector route may eliminate the need to expand the capacity of the intersections.

Delaware Avenue – Library Avenue This intersection could operate at an acceptable LOS in 2020 if there are four lanes eastbound (2 lefts, through, and right) and a double left turn lane for westbound traffic from the shopping center.

Intersections of Christina Parkway (DE 4) with College Avenue and Elkton Road

Based upon the traffic volume projections and capacity analysis, both intersections will require significant capacity expansions in order to operate at acceptable levels of service in 2020.

Intersections of DE 896 with Old Baltimore Pike and US 40

DelDOT recently expanded DE 896 from two to four lanes between I-95 and US 40, and the US 301 Major Investment Study (MIS) is currently evaluating additional capacity increases in this corridor. Alternatives proposed by the MIS include increasing the capacity of DE 896 from 4 to 6 lanes, constructing frontage roads along DE 896, and building connecting roadways near the US 40 - DE 896 intersection.

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This project did not seek to propose any roadway or intersection capacity expansions in Cecil County. Nonetheless, this evaluation identified two intersections that may justify further analysis for potential expansion.

US 40 – MD 213 Capacity analysis finds that this intersection will operate at LOS of E in 2020. This study recommends that MDOT consider implementing Intelligent Transportation System (ITS) technology to improve traffic flow along the US 40 and MD 213 corridors.

MD 213 – MD 279 In the short-term, adding left and right turning lanes to all approaches would help to mitigate congestion at this intersection. In the long-term, however, these actions will not greatly improve the LOS at this intersection, and expansion may be necessary.

In addition, this analysis noted that future traffic growth will decrease the levels of service at the unsignalized intersections in downtown Elkton. It is proposed that the state, county, and town monitor the growth of traffic at these locations and, in conjunction with all signal warrants, determine if signalization is appropriate.