ms consultants, inc.

# City of Delaware Thoroughfare Plan

**Adopted on February 25, 2002**
**by the Delaware City Council**

Prepared for...

The City of Delaware, Ohio
1 South Sandusky Street
Delaware, OH 43015

**August 16, 2001**

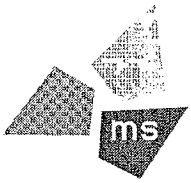
# City of Delaware
# Thoroughfare Plan

Prepared for

**The City of Delaware**
1 South Sandusky Street
Delaware, OH 43015

(740) 369-2608 (Phone)
(740) 369-2659 (Fax)

Prepared by




**ms consultants, inc.**
**engineers • architects • planners**
2221 Schrock Road
Columbus, OH 43229-1547
(614) 898-7100 (Phone)
(614) 898-7570 (Fax)

# Table of Contents

**I.** Executive Summary ..... I-1
**II.** Background/History ..... II-1
**III.** Purpose and Need ..... III-1
**IV.** Project Overview ..... IV-1
**V.** Existing Transportation Conditions ..... V-1
**VI.** Land Use Forecasts ..... VI-1
**A.** Forecast Years ..... VI-1
**B.** Study Area ..... VI-1
**C.** Methodology ..... VI-3
**D.** Land Use Review ..... VI-5
**1.** Population ..... VI-6
**2.** Residential Development ..... VI-7
**3.** Retail Development ..... VI-8
**4.** Office Development ..... VI-9
**5.** Industrial Development ..... VI-10
**6.** Employment ..... VI-11
**E.** Summary ..... VI-14
**VII.** Transportation Model ..... VII-1
**A.** 1995 Base Model Network ..... VII-2
**B.** 2020 Existing plus Committed Model Network ..... VII-3
**VIII.** Road Network Alternatives ..... VIII-1
**A.** Preliminary Road Network Alternatives ..... VIII-1
**B.** Final Road Network Alternatives ..... VIII-3
**IX.** Functional Classification ..... IX-1
**X.** ROW & Cross Section Standards ..... X-1
**XI.** Existing Condition Upgrades/Improvements ..... XI-1
**XII.** Cost Estimates and Potential Funding Sources ..... XII-1
**A.** Federal Funds - US Dept. of Transportation (USDOT) ..... XII-4
**B.** Other Federal Programs ..... XII-4
**C.** Ohio Dept. of Transportation (ODOT) ..... XII-5
**D.** Other State of Ohio Programs ..... XII-5
**E.** Local Programs ..... XII-6
**XIII.** Five-Year Increment Model Results ..... XIII-1
**A.** Possible Future Traffic Signal Locations ..... XIII-2
**B.** Roadway Lane Additions ..... XIII-3
**C.** Summary ..... XIII-9

**XIV.** Prioritization of Improvements ..... XIV-1
**XV.** Geographic Information System (GIS) ..... XV-1
**A.** MORPC Data ..... XV-1
**B.** MORPC Exhibits ..... XV-1
**C.** **ms consultants, inc.** Data ..... XV-1
**D.** GIS Deliverables ..... XV-2
**XVI.** Public Involvement Program ..... XVI-1
**A.** City Transportation Task Force ..... XVI-2
**B.** Delaware County Regional Planning Commission (RPC) ..... XVI-4
**C.** Public Open House Sessions ..... XVI-5
**D.** ODNR, ODOT, City of Columbus, Zoo, Metro Parks Open House Sessions ..... XVI-8
**E.** Regional Workshops for Public Officials ..... XVI-8
**F.** Final Public Meeting ..... XVI-9
**G.** City of Delaware Planning Commission ..... XVI-10
**H.** Delaware County Commissioners ..... XVI-10
**I.** Delaware City Council ..... XVI-10
**J.** Summary ..... XVI-11
**XVII.** Access Management Guidelines ..... XVII-1
**XVIII.** Traffic Impact Study (TIS) Standards ..... XVIII-1
**XIX.** Transportation System Management ..... XIX-1
**XX.** Traffic Calming Guidelines ..... XX-1
**XXI.** Conclusion ..... XXI-1

## List of Tables

E1 2020 Delaware Thoroughfare Plan Project Priority Assessment - County Alternatives ..... I-5
E2 2020 Delaware Thoroughfare Plan Project Priority Assessment - City Alternatives ..... I-6
1 Population and Jobs in Central Ohio, Delaware County, and Delaware City; 1995 - 2020 ..... VI-4
2 Delaware City Area Land Use Variables: 1995-2020 ..... VI-5
3 Population in Delaware City, 1995-2020 ..... VI-6
4 Housing Units by Sub Area 1995-2020 ..... VI-7
5 Retail Space by Sub Area 1995-2020 ..... VI-8
6 Office Space by Sub Area 1995-2020 ..... VI-9
7 Industrial Space by Sub Area 1995-2020 ..... VI-10
8 Employment by Sub Area 1995-2020 ..... VI-11
9 Comparison of Population, Housing and Employment between Year 2020 and Build-Out Scenarios by Delaware City Sub-Areas ..... VI-12
10 Comparison of Industrial, Retail and Office Square Feet between Year 2020 and Build-Out Scenarios by Delaware City Sub-Areas ..... VI-12
11 Basic Design Elements for Arterial Street Functional Classification ..... X-1

12 Basic Design Elements for Collector Street Functional Classification ..... X-1
13 Basic Design Elements for Local Street Functional Classification ..... X-6
14 Desirable Right-of-Way Requirements at Intersections ..... X-6
15 Recommended Delaware County Roadway Lane Additions and Width Upgrades..... XI-2
16 City of Delaware Roadway Suggested Lane Additions for 2020 with Existing Transportation System..... XI-3
17 Delaware County Geometric Deficiencies..... XI-4/5
18 Delaware County Possible Future Traffic Signal Locations..... XI-6
19 City of Delaware Possible Future Traffic Signal Locations ..... XI-7
20 County 2020 Roadway Network Alternatives Cost Estimates ..... XII-2
21 City 2020 Roadway Network Alternatives Cost Estimates ..... XII-3
22 2020 Delaware Thoroughfare Plan Project Priority Assessment - County Alternatives ..... XIV-2
23 2020 Delaware Thoroughfare Plan Project Priority Assessment - City Alternatives ..... XIV-3
24 Public Involvement Meeting Schedule ..... XVI-1
25 Access Category Description and General Guidelines ..... XVII-1

## List of Figures

E1 Delaware Thoroughfare Plan Functional Classification of Roadways ..... I-3
E2 Delaware Thoroughfare Plan Functional Classification of Roadways - City of Delaware Region ..... I-4
1 Delaware Thoroughfare Plan Project Location..... II-2
2 Delaware County Population and Employment..... II-3
3 Powell Road (SR 750) & SR 315 Traffic Growth ..... III-2
4 Delaware Thoroughfare Plan Study Area ..... IV-2
5 Delaware County Existing Transportation Conditions ..... V-2
6 City of Delaware Existing Transportation Conditions..... V-3
7 Southern Delaware County Thoroughfare Plan 1987 ..... V-4
8 City of Delaware Existing Functional Classification of Roadways..... V-5
9 Delaware City Traffic Analysis Zones..... VI-2
10 Population by Sub Area 1995 - 2020 ..... VI-6
11 Housing Units by Sub Area 1995 - 2020 ..... VI-7
12 Retail Floor Space by Sub Area 1995 - 2020 ..... VI-8
13 Office Floor Space by Sub Area 1995 - 2020 ..... VI-9
14 Industrial Floor Space by Sub Area 1995 - 2020..... VI-10
15 Employment by Sub Area 1995 - 2020..... VI-11
16 Comparison of Population, Housing and Employment between the Year 2020 and the Build Out Scenario..... VI-13
17 Comparison of Industrial, Retail and Office Square Feet in the Year 2020 to the Build Out Scenario..... VI-13
18 Traffic Analysis Zone Overlaid upon Model Network..... VII-2

19 MORPC Modeling Area ..... VII-4
20 Delaware County 1995 Representative Average Daily Traffic Volumes ..... VII-5
21 1995 Representative Average Daily Traffic Volumes - City of Delaware Region ..... VII-6
22 Delaware County 2020 Base Existing plus Committed (E+C) Network ..... VII-8
23 Delaware County 2020 E+C Average Daily Traffic Volumes ..... VII-9
24 2020 E+C Average Daily Traffic Volumes - City of Delaware Region ..... VII-10
25 2020 Average Daily Traffic Volumes with All Road Network Alternatives ..... VIII-5
26 2020 Average Daily Traffic Volumes with All Road Network Alternatives - City of Delaware Region ..... VIII-6
27 Alternative 1 Recommended Study Corridor ..... VIII-11
28 Delaware Thoroughfare Plan ..... VIII-12
29 Delaware Thoroughfare Plan - City of Delaware Region ..... VIII-13
30 Delaware Thoroughfare Plan Functional Classification of Roadways ..... IX-2
31 Delaware Thoroughfare Plan Functional Classification of Roadways - City of Delaware Region ..... IX-3
32 Minor Arterial Road Typical Cross Section With Curb and Sidewalk and No Parking. X-2
33 Major Arterial Road Typical Cross Section With Curb and Sidewalk and No Parking. X-3
34 Local and Collector Road Typical Cross Section With Curb and Sidewalk ..... X-4
35 Local and Collector Road Typical Cross Section Without Curb, Gutter and Sidewalk. X-5
36 Delaware Thoroughfare Plan Public Meeting Locations and Dates ..... XVI-6

## Appendices

1 A. Delaware County Road Width, Lanes, Bridge Location and Route Designation
B. Delaware County and City of Delaware Accident Data
2 Delaware County Traffic Analyses Zone Information
3 MORPC Expanded Model Network
4 A. Road Improvement Assumptions for the 2020 E+C Transportation Model
B. Five-year Increment Traffic Volume Maps - City of Delaware
5 A. Preliminary Road Network Alternative Model Maps and Results
B. Combined Model Network Results
6 Delaware County and City of Delaware Road Inventory - Alphabetical Listing
7 A. Cost Estimate Inventory and Typical Prices
B. Funding Information
8 Public Involvement Program
A. Task Force Organizational Outline
B. City of Delaware Public Hearing Agenda and Meeting Minutes
C. List of News Articles Regarding the Delaware Thoroughfare Plan
D. Public Open House Typical Invitations, Advertisements and Flyers
E. ODNR, ODOT, City of Columbus, Columbus Zoo, Metro Parks Open House Session Meeting Minutes and Attendance List
F. Regional Workshops Summary of Comments
9 Access Management Guidelines

10 Traffic Impact Study Guidelines
11 Traffic System Management Guidelines
12 Traffic Calming Guidelines

T:\msword\10\10281\report\CITY_DRAFT RPT\table of contents_woleaders.doc

# *Section I*

*Executive Summary*

## I. Executive Summary

The need for a comprehensive Thoroughfare Plan in Delaware County and the City of Delaware is becoming increasingly important. One of the fastest growing counties in the state, Delaware County has doubled in population over the past twenty years and is projected to more than double again by 2020. Employment is projected to more than triple between 1995 and 2020 in Delaware County, offering residents more opportunities to work in their home County. As a result of this rapid growth, traffic congestion on area roadways has increased and will continue to increase.

The existing Delaware County and City of Delaware Thoroughfare Plans were prepared over ten years ago. Both agencies saw the need to update their plans to address transportation issues which have developed and are forecasted to develop as a result of the recent and projected increase in population in Delaware County. To ensure continuity and connectivity between planned transportation improvements, the Delaware County Engineer's Office and the City of Delaware decided to update their respective Thoroughfare Plans as a joint effort. The effort of concurrently updating the Thoroughfare Plans for both the City and County not only provides a consistent transportation plan but has the additional benefit of providing a common land use and transportation facility data base which results in cost saving and consistency. Benefit accrues to the public in that the two agencies are working together toward the common goal of planning for future roadways while enlisting cooperation between townships, cities and villages throughout the County. The uniform set of standards and guidelines contained in the Delaware Thoroughfare Plan will assist in continuing this cooperative effort, allowing agencies to make appropriate decisions regarding land use and transportation projects in the manner desired by the communities.

There are three steps involved when planning for future roadways: Step One is the preparation of a Thoroughfare Plan; Step Two is a Corridor Study; and Step Three is the preparation of Final Design and Construction Plans. The detail involved in the study of a possible future road progresses with each step. All steps require extensive public involvement. The Delaware Thoroughfare Plan, as Step One in this process, is a conceptual document showing an overall transportation network intended for use as a planning tool. It provides a functional network of roadways in the County to accommodate the traffic projected to occur 20 years in the future. The lines indicating proposed new roadways on this and any thoroughfare plan indicate a connection between two roadways – a transportation "link" -which must be further studied in the next step to determine where or if a preferred alignment may exist for a road. Although some or possibly many of the road network additions may not be built in the next 20 years, it is important to show the proposed corridors now and preserve right-of-way to avoid the future cost associated with congestion.

The base year for the Delaware Thoroughfare Plan is 1995, chosen due to the large amount of available land use and transportation data. The study year is 2020. Traffic volumes for the base year and the study year were projected through a travel demand model developed specifically for Delaware County by MORPC. The travel demand

model was utilized as a tool to provide traffic information to include in an assessment of road network additions and improvements proposed for inclusion in the Thoroughfare Plan. Information provided by the model also assisted in prioritizing the Plan recommendations.

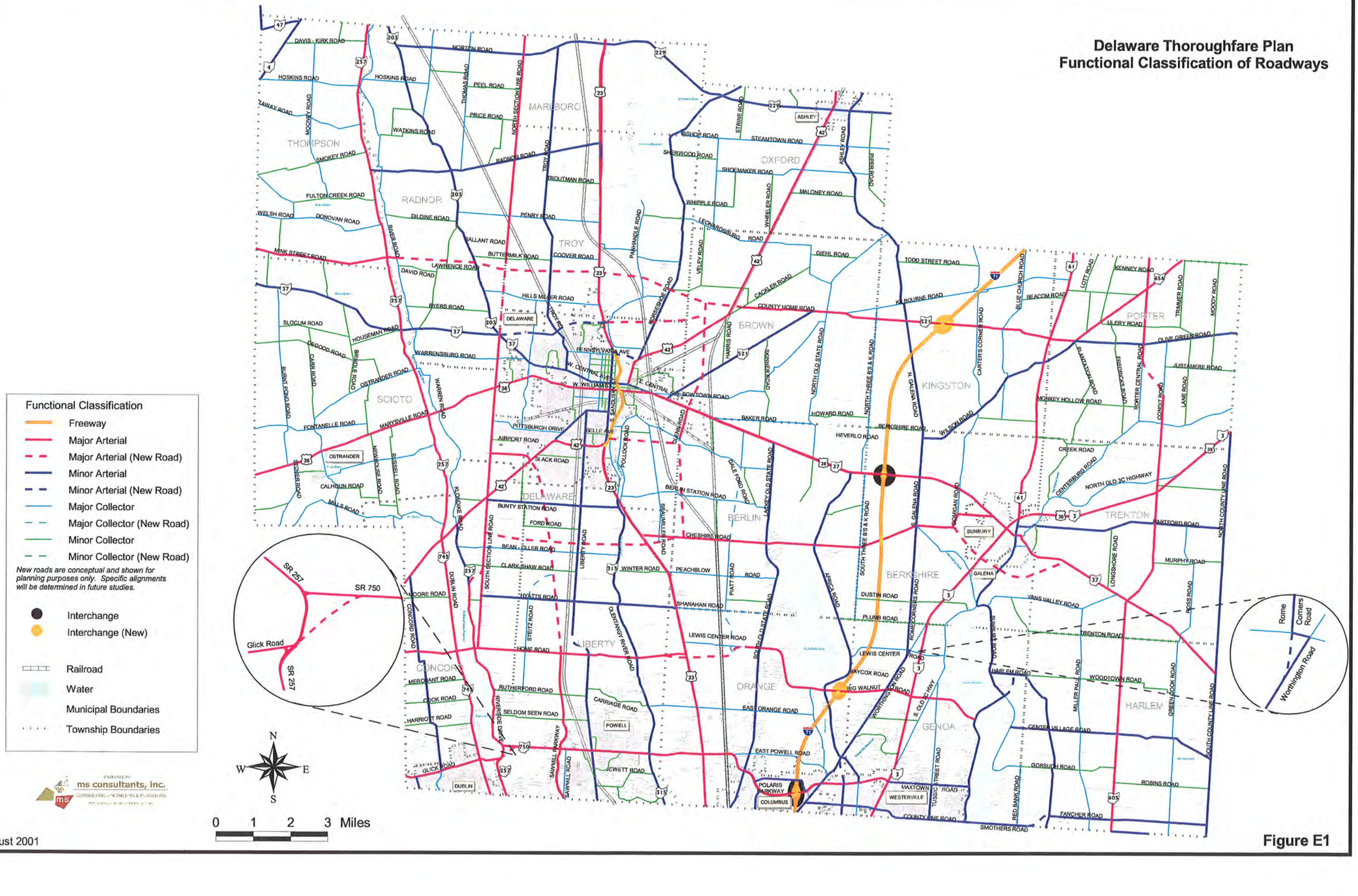
New routes were identified for inclusion in the Delaware Thoroughfare Plan by both the County and City based on their vision of future transportation needs. The County road network additions, or "alternatives" were developed to provide improved road continuity, provide additional access to the major arterial and freeway system, and relieve congestion primarily in the southern portion of the County. The City road network additions were developed to address concerns such as congestion on downtown streets, high truck percentages on the major routes through town and additional roadways to support the rapidly developing west-side of the City. The selection of a reasonable set of road network alternatives was a challenge for both agencies due to the number of railroads, reservoirs and rivers extending primarily north-south throughout the County which act as barriers to east-west travel.

Prior to their inclusion in the Delaware Thoroughfare Plan, the recommended future roadways underwent a modeling and review process which included a general assessment of items such as terrain, the location of railroads, rivers, existing intersections and roadways and ecological and historic sites. Public input was continually sought through each phase of study to provide a plan that was responsive to and reflects community transportation needs.

The final set of road network additions chosen for inclusion in the Delaware Thoroughfare Plan were assigned a functional classification and functional classifications for existing County and City roads were reevaluated. The functional classification of roadways is the most fundamental and essential element of a thoroughfare plan. This classification system is the foundation for right-of-way, design and policy guidelines that are included in the Thoroughfare Plan. Typical right-of-way standards and cross-sections specified for each functional type of roadway are contained in the Delaware Thoroughfare Plan. Further details regarding the development of the Delaware Thoroughfare Plan road network additions along with cost estimates and potential funding sources are also contained in the report. **Figure E1** shows the new and existing routes in Delaware County and their functional classifications. **Figure E2** presents a closer view of the functional classifications of existing and proposed roadways in the City of Delaware area.

Priorities for the road network additions shown in the above two maps were evaluated based on their ability to maintain the existing transportation system, reduce congestion, financial and technical feasibility. Alternatives were ranked for each the County and the City based on their specific transportation goals. **Table E1 and E2** supply the priority ranking for roadway additions for Delaware County and the City of Delaware, respectively. The alternatives are listed alphabetically or numerically in each priority group, not according to any additional ranking of importance. The prioritization shown in

# Delaware Thoroughfare Plan
# Functional Classification of Roadways




Prepared by:
ms consultants, inc.
CONSULTING ENGINEERS & PLANNERS

August 2001

**Figure E1**

# Delaware Thoroughfare Plan
## Functional Classification of Roadways
## City of Delaware Region

BUTTERMILK ROAD
COOVER ROAD
LAWRENCE ROAD
DAVID ROAD
HILLS MILLER ROAD
BYERS ROAD
TROY RD
HORSESHOE ROAD
VELEY R
CACKLER ROAD
COUNTY HOME ROAD
DELAWARE
BROWN
HARRIS ROAD
SKINNER ROAD
NORTH OLD STATE ROAD
NORTH THREE B'S & K ROAD
N. GALENA ROAD
WARRENSBURG ROAD
PENNSYLVANIA AVE
W. CENTRAL AVE
W. WILLIAM ST
E. CENTRAL AVE
BOWTOWN ROAD
S. SANDUSKY ST
Scioto River
WARREN R
HOWARD ROAD
BAKER ROAD
BERKSHIRE ROAD
HEVERLO ROAD
PITTSBURGH DRIVE
BELLE AVE
AIRPORT ROAD
POLLOCK ROAD
GLENN ROAD
SLACK ROAD
Olentangy River
DALE FORD ROAD
LACKEY OLD STATE ROAD
DELAWARE
BERLIN STATION ROAD
BERLIN
BUNTY STATION ROAD
FORD ROAD
SECTION LINE ROAD
LIBERTY ROAD
BRAUMILLER ROAD
CHESHIRE ROAD
BEAN - OLLER ROAD
CLARK-SHAW ROAD
WINTER ROAD
S. GALENA ROAD

Functional Classification
- Freeway
- Major Arterial
- Major Arterial (New Road)
- Minor Arterial
- Minor Arterial (New Road)
- Major Collector
- Major Collector (New Road)
- Minor Collector
- Minor Collector (New Road)

*New roads are conceptual and shown for planning purposes only. Specific alignments will be determined in future studies.*

- Interchange
- Interchange (New)
- Railroad
- Water
- Municipal Boundaries
- Township Boundaries

Prepared by: ms consultants, inc. CONSULTING ENGINEERS & PLANNERS

N W E S

0 0.5 1 1.5 Miles

August 2001

Figure E2

## Table E1. 2020 Delaware Thoroughfare Plan Project Priority Assessment – County Alternatives*

| | Alternative No. | Description |
|---|---|---|
| **HIGH PRIORITY** | B | Extension of Glick Rd east from SR 257 to connect with Powell Rd west of Wellington Blvd. |
| | C | Relocate Liberty Rd north of Home Rd southeast to align with Liberty Rd south of Home Rd |
| | E | Extension of Sawmill Parkway from Home Rd north past Bunty Station Rd, continuing northwest to intersect with US 42 between Owen-Fraley Rd and Slack Rd. |
| | J | Extension of Home Rd east from US 23, crossing the railroad tracks connecting to Lewis Center Rd east of Lewis Center and west of South Old State Rd |
| | M | New interchange with IR 71 at Big Walnut Rd |
| **MEDIUM PRIORITY** | K | Extension of Piatt Rd north from Cheshire Rd to align with Roloson Rd at Curve Rd and extension of Piatt Rd south from Shanahan Rd, intersecting Lewis Center Rd approximately midway between the railroad and South Old State Rd. |
| | N | Connector road extending east from Domigan Road, intersecting SR 3 between Sunbury and Galena, continuing east to connect with SR 37 between Walnut Rd and Longshore Rd. |
| | R | Extension of Cleveland Ave north from Maxtown Rd to connect with Worthington Rd. |
| | S | Extension of Rome Corners Rd south to connect with Worthington Rd. |
| | V | Extension of Fancher Rd from Harlem Rd southwest to Smothers Rd. |
| | G | Extension of South Section Line Rd north from SR 37 to align with North Section Line Rd at Buttermilk Hill Rd and a connection between South Section Line Rd and SR 257 south of Bean-Oller Rd |
| **LOW PRIORITY** | F | Extension of Steitz Rd north from Hyatts Rd to connect with the extension of Sawmill Parkway (Alternative E/2) between Hyatts Road and Clark-Shaw Road. |
| | Q | Realignment of SR 605 northwest from Centerburg Rd connecting with Porter Central Rd south of Olive Green Rd. |
| | T | Extension of Sunbury Road north from Red Bank Road east of the Hoover Reservoir northeast to connect with Harlem Road. |
| | X | New interchange at IR 71 and SR 521. |
| | Y | Extension of Mink Street from River Rd east to County Home Rd at its intersection with US 42 and a new interchange at IR 71 and SR 521. |
| | Z | Extension of Shanahan Road east from Piatt Road to South Old State Road. |

* The recommended additions to the roadway network are ranked as either high, medium or low priority to provide direction regarding their importance to the transportation network as a whole. The alternatives are listed alphabetically or numerically in each priority group, not according to any additional ranking of importance.

## Table E2. 2020 Delaware Thoroughfare Plan Project Priority Assessment – City Alternatives*

| | Alternative No. | Description |
|---|---|---|
| **HIGH PRIORITY** | 2 | Extension of Sawmill Parkway north past Bunty Station Rd to connect with US 42 |
| | 3 | Connector Road extending from the intersection of Glenn Rd & Curve Rd south to Cheshire Rd |
| | 4 | Pennsylvania Avenue extension east from US 23 to the intersection of US 42 & Horseshoe Rd |
| | 7 | Extension of the committed connector road between Houk Rd and Troy Rd east to align with the existing intersection of US 23 & Panhandle Rd. |
| | 13 | Modification of the Pennsylvania Avenue interchange with US 23 to provide for all movements. |
| | 16 | Extension of US 42 east from US 23 to Alternative 3, the extension of Glenn Road. |
| **MEDIUM PRIORITY** | 5 | North/south route connecting from the intersection of Alternative Y & Horseshoe Road/Kelly McMaster Rd south to intersect with US 36/SR 37 between Glenn Rd and Sweeney Rd ***AND*** the extension of Panhandle Rd east to connect with this north/south route between Horsehoe Rd and US 42. |
| | 6 | East/west connector road from the existing intersection of SR 37/203 & South Section Line Rd east to the committed Houk Rd extension. |
| | 9 | Extension of Lexington Blvd south to SR 36. |
| | G | Extension of South Section Line Rd north from SR 37 to align with North Section Line Rd at Buttermilk Hill Rd and a connection between South Section Line Rd and SR 257 south of Bean-Oller Rd |
| **LOW PRIORITY** | 1 | East/West connector beginning at S. Section Line Road, connecting with Cheshire Road at its intersection with US 23. |
| | 8 | Extension of River Oaks Dr west from Stratford Rd, aligning with the intersection of US 23 & Cottswold Dr. |
| | Y | Extension of Mink Street from River Rd east to County Home Rd at its intersection with US 42 and a new interchange at |

* The recommended additions to the roadway network were ranked as either high, medium or low priority to provide direction regarding their importance to the transportation network as a whole. The alternatives are listed alphabetically or numerically in each priority group, not according to any additional ranking of importance.

these tables does not preclude roadways of a lower ranking moving forward or higher on the list due to the availability of funding or changes due to development. Cost estimates and potential funding sources for the road network additions are provided in the Delaware Thoroughfare Plan document.

In summary, the purpose for updating the Delaware Thoroughfare Plan is to:

- reassess transportation needs to provide a functional network of streets to handle existing and future traffic with safety and efficiency.
- protect and aid in right of way acquisition for future road corridors
- serve as a guideline for public agencies and developers when establishing future access points and roadways in the County and the City
- coordinate County and Township transportation plans with transportation plans for the City of Delaware and adjoining municipalities and with the State and Federal Highway System
- allow better integration between transportation and land use planning

The Delaware Thoroughfare Plan provides the following:

- an inventory of existing transportation and land use conditions in the County and the City
- 2020 projections for land use in the County and the City
- 1995 traffic volumes and 2020 traffic projections
- general locations for new roadways
- functional classification of roadways
- right-of-way standards
- recommendations on upgrades to the existing road network
- cost estimates for the identified improvements
- prioritization of roadway improvements

Traffic Impact Study standards, Access Management guidelines, and Traffic System Management guidelines are also provided as supplements to the Thoroughfare Plan. Traffic Calming guidelines are provided as a supplement for the City of Delaware. The Delaware Thoroughfare Plan is provided in both text and digital Geographic Information System (GIS) format. The GIS format supplies an information base that can be easily accessed, updated, and revised.

The key to providing for future transportation needs is to identify current and future problem areas, recommend solutions and coordinate with all involved parties to act on the adopted plan. The Delaware Thoroughfare Plan Update Project will identify the problem areas and ultimately provide a coordinated final plan to address future transportation needs in the County and the City. Through the joint implementation of the plan by the County and City and through the extensive public involvement program, it also lays the base for public agencies and constituents to continue working together to implement the

transportation improvements the region is seeking. Information and maps regarding the Delaware County Thoroughfare Plan can be viewed on the County Engineer's website at www.co.delaware.oh.us

# *Section II*

*Background/History*

## II. Background/History

An increasing number of people view Delaware County, **Figure 1**, as a desirable location to reside or conduct business while still in relatively close proximity to the City of Columbus, the state capitol and largest employment base in central Ohio. As a result, Delaware has become the fastest growing county in Ohio according to the U.S. Census Bureau, doubling in population over the past twenty years and projected to more than double again by 2020, as shown in **Figure 2**.

As a result of this rapid growth, Delaware County and the City of Delaware are experiencing growing pains. Those residing in Delaware County are adjusting to a suburban life style in areas that, not all that long ago, were quite rural. City of Delaware limits are expanding to accommodate new housing tracts, retail and industrial centers while citizens work to maintain the vitality and old town flavor of their central business and historic district. Public agencies are adjusting to the relatively quick shift from an almost exclusive farming community to meeting the demands associated with rapid development. Although there have been some recent additions and improvements, the existing transportation system will be inadequate in many areas to accommodate the traffic volumes projected to occur due to this population growth. Realizing the opportunity to plan for future roadways and improvements may diminish as development pressures continue, the City of Delaware in a joint venture with the Delaware County Engineer's office contracted **ms consultants, inc.** and the Mid-Ohio Regional Planning Commission (MORPC) to update their Thoroughfare Plans. The present Delaware County Thoroughfare Plan was prepared in 1987 while the current City of Delaware Thoroughfare Plan was adopted more than ten years ago. Both are overdue for an update to provide for future transportation needs.

The effort of concurrently updating the Thoroughfare Plans for both the City and County was undertaken primarily to ensure continuity and connectivity between the City and County transportation models but also has the added benefit of providing a common land use and transportation facility data base which results in cost savings and consistency. Benefit accrues to the public in that the two agencies are working together toward the common goal of planning for future roadways while enlisting cooperation between townships, cities and villages throughout the County. The Ohio Department of Transportation, District 6, has been highly supportive of this endeavor as it not only identifies and prioritizes future transportation projects which will be of benefit to state routes, but will incorporate and support the Access Management Plan for US 23, a major transportation corridor in the County.

The Delaware Thoroughfare Plan is a conceptual document intended for use as a planning tool. As such, it does not address specific alignments for new roadways, detailed design for existing road upgrades, or detailed analysis of intersection and road operation. It serves as the first step toward planning for a functional network of roadways in the County to accommodate the traffic projected to occur 20 years in the future. Prior to implementation of any of the recommendations contained in this plan, detailed design and alignment studies must be conducted which involve intensive public involvement

# DELAWARE THOROUGHFARE PLAN
## Project Location

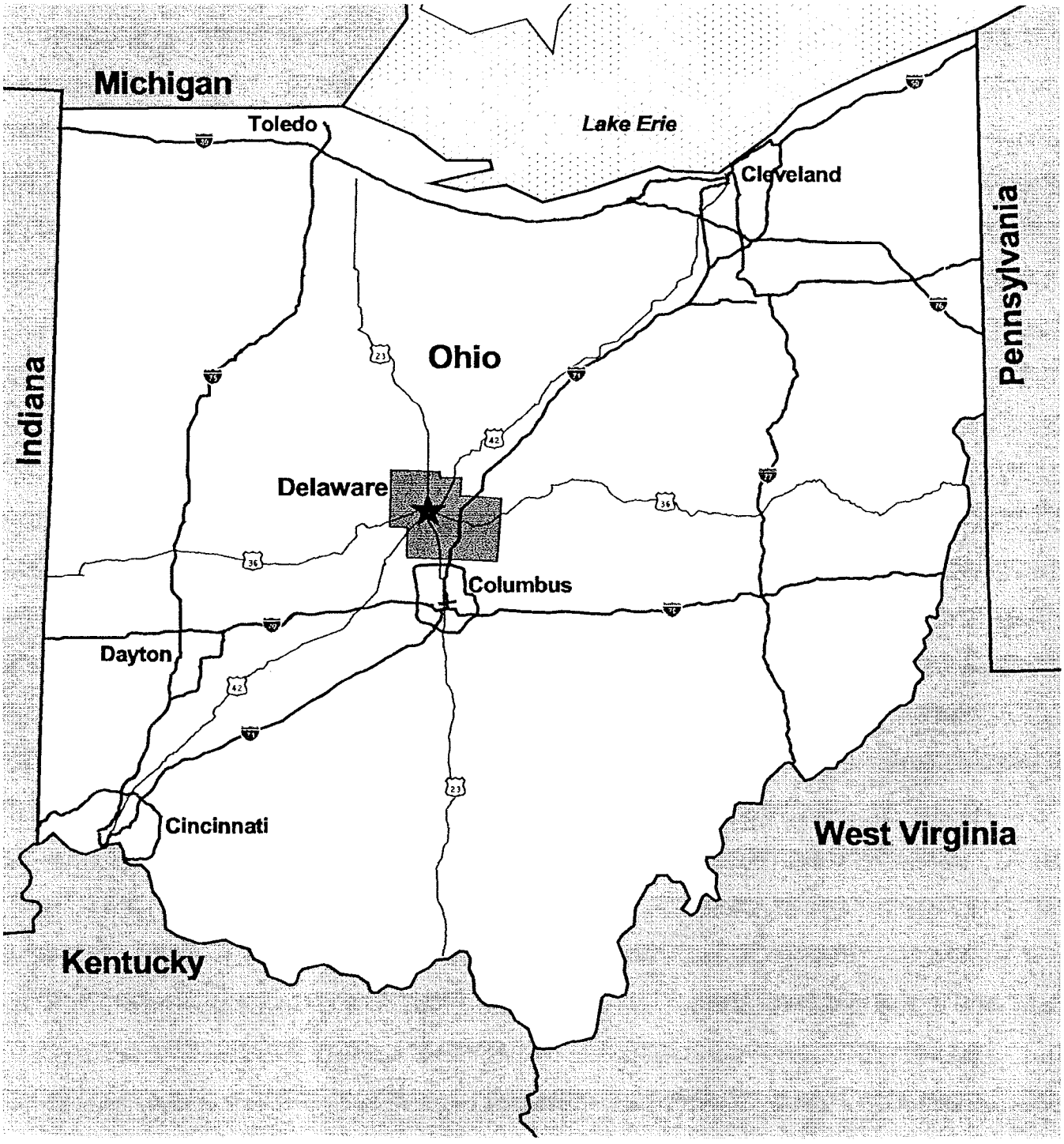
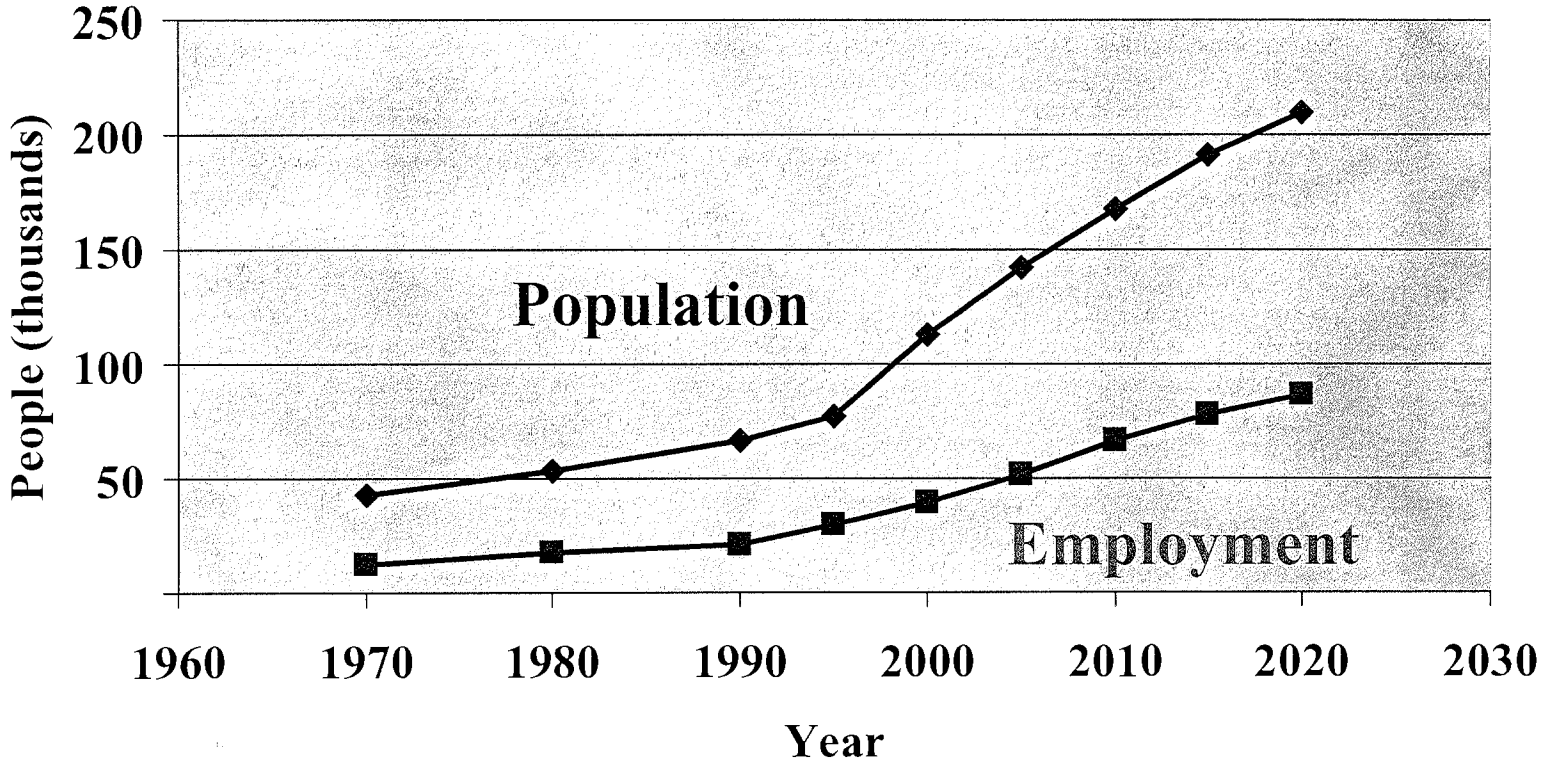



Figure 1

# Figure 2. Delaware County Population and Employment



programs to provide input and allow comment regarding all aspects of a specific road project. Although some or possibly many of the road network additions may not be built in the next 20 years, it is important to show the proposed corridors now and preserve right-of-way to avoid the future cost associated with congestion.

# *Section III*

## *Purpose and Need*

## III. Purpose and Need

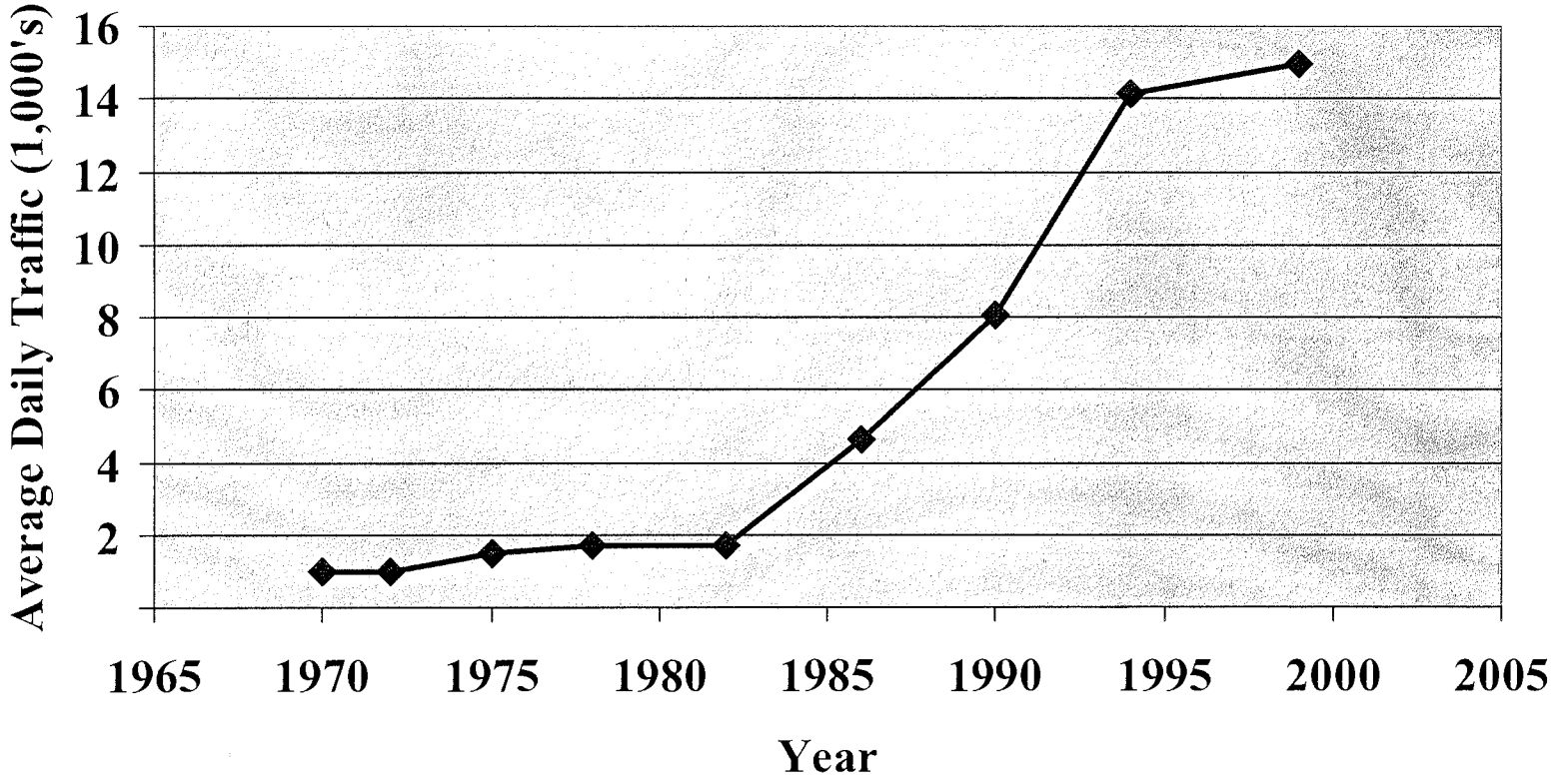
Transportation improvements have not kept pace with the rapid increase in development and congestion on Delaware County and City of Delaware roadways is on the rise. **Figure 3** gives one example of how congestion has increased on area roads by illustrating the growth in average daily traffic (ADT) over the past twenty years at the intersection of SR 750 & SR 315, located in Liberty Township, southern Delaware County, Ohio. Thoroughfare plans serve as the first step guide to plan for a transportation network to serve existing and projected land development. The magnitude of changes that have occurred in Delaware County and the City of Delaware since their last Thoroughfare Plans were prepared over ten years ago necessitates a re-evaluation of the transportation needs in southern Delaware County and the City of Delaware. The plan also requires expansion to include transportation concerns in the northern area of the County.

The Delaware County transportation system today consists largely of narrow, two-lane county or township roads designed to serve low traffic volumes and rural conditions. Many of the roadways are discontinuous with offset intersections which cause drivers to jog and perform additional turning movements to travel across the county. Farm equipment often mingles with conventional vehicles in this still primarily rural area. The main roads in the City of Delaware are lined with either residential units, office or retail buildings, the majority of which are close to the curb. Widening such roadways to accommodate the increase in traffic due to area growth would potentially result in a loss of structures and a change in the atmosphere of the town. A significant constraint on City traffic is the Point, where US 36 and SR 37 narrow to two lanes under a railroad overpass.

US 23, US 36/SR 37 and US 42 serve as the major transportation corridors in Delaware County. These corridors route truck and interstate traffic through the center of the City of Delaware and villages such as Sunbury and Ashley. Local traffic and commuters compete with the interstate travelers and truck drivers for use of these corridors, which provide the few continuous roads in Delaware County. As traffic volumes increase, the two lane rural county and township roads become congested as motorists utilize them as attractive alternatives to the major routes. Residential streets in the City become attractive short cuts to time conscious commuters. One of the primary purposes of updating the Thoroughfare Plan is to provide regional connectivity and additional road capacity by identifying future continuous roads which would serve as options to the major transportation corridors in the City of Delaware and Delaware County for commuters and local travelers. These new routes, along with identification of upgrades to the existing roadway system, provide a plan for a functional network of streets to handle existing and future traffic with safety and efficiency. In addition, the access management and traffic system management guidelines supply a base for exploration and implementation of options other than widening streets and building new roads to provide an efficient transportation system.

# Figure 3. Powell Road (SR 750) at SR 315 Traffic Growth

Liberty Township, Southern Delaware County




Information shown on this graph provide by the Mid-Ohio Regional Planning Commission

The importance of planning for future transportation projects cannot be understated. Even under the most judicious and cautious land use management, population and development in Delaware County and the City of Delaware will continue to grow. As an increasing number of developers press for permit and site plan approval, the County and City agencies fear that the opportunity to provide for an efficient future transportation system to support the projected area growth may slip through their fingers. As it is costly and disruptive to purchase property to make roadway improvements after building or redevelopment has occurred, area officials look to the updated Delaware Thoroughfare Plan as their tool to protect sensitive corridors where roadway improvements will be needed and to require the necessary right-of-way to be dedicated for public use. It will serve as a guideline for public agencies and developers when establishing future access points and roadways in the County.

The joint implementation of the update to the Delaware Thoroughfare Plan by the City and the County is of inestimable value. Coordination between the public agencies has resulted in a consistent and uniform set of directives which will benefit public officials, developers, and area residents as it minimizes confusion and expedites the plan submittal and approval process. The updated Delaware Thoroughfare Plan provides a document which allows development review agencies and transportation agencies to work together to create a balance between land use development and construction of an adequate roadway system. It can serve as a basis for requiring that a roadway improvement identified in the thoroughfare plan is funded before full development of an area takes place.

In summary, the purpose for updating the Delaware Thoroughfare Plan is to:

- reassess transportation needs to provide a functional network of streets to handle existing and future traffic with safety and efficiency
- protect and aid in right of way acquisition for future road corridors
- serve as a guideline for public agencies and developers when establishing future access points and roadways
- coordinate County and Township transportation plans with transportation plans for the City of Delaware and adjoining municipalities and with the State and Federal Highway System
- allow better integration between transportation and land use planning

# *Section IV*

## *Project Overview*

## IV. Project Overview

Delaware County and the City of Delaware contracted **ms consultants, inc.** to provide the engineering work and the Mid-Ohio Regional Planning Commission (MORPC) to provide the modeling work to update their Thoroughfare Plans. The project began in fall of 1999. The Thoroughfare Plan study area encompasses all of Delaware County. As shown in **Figure 4**, for the purpose of this plan, the study area for the City of Delaware is assumed to extend 1.5 miles beyond the limits in place in the base year of 1995. The study year for the Thoroughfare Plan is 2020. The update to the Delaware Thoroughfare Plan addresses the arterial and collector roadway system in the County and City. Smaller collector or local roads either existing or proposed in community plans are not included in the scope of the Thoroughfare Plan update and will not be shown on the plan.

The updated Delaware Thoroughfare Plan provides the following:

- an inventory of existing transportation and land use conditions in the County
- 2020 projections for land use in the County
- 1995 traffic volumes and 2020 traffic projections
- general locations for new roadways
- functional classification of roadways
- right-of-way standards
- recommendations on upgrades to the existing road network
- cost estimates for the identified improvements
- prioritization of roadway improvements

Traffic Impact Study standards, Access Management guidelines, Traffic Calming guidelines and Traffic System Management guidelines are also provided as supplements to the Thoroughfare Plan.

The base year 1995 and 2020 traffic volumes were projected through a travel demand model developed specifically for Delaware County by MORPC. The Delaware travel demand model is networked with the existing travel demand models for the MORPC planning area which encompasses Franklin County and parts of Licking and Fairfield Counties. The travel demand model was utilized as a tool to provide traffic information to include in an assessment of road network additions and improvements proposed for inclusion in the Thoroughfare Plan. Information provided by the model also assisted in prioritizing the Plan recommendations.

Public involvement is critical to the success of the Thoroughfare Plan project. Therefore, an extensive public involvement program was developed to continually seek consensus and public input for the for the Delaware Thoroughfare Plan update. By interfacing with individuals on all levels, ownership for the Thoroughfare Plan product is established.

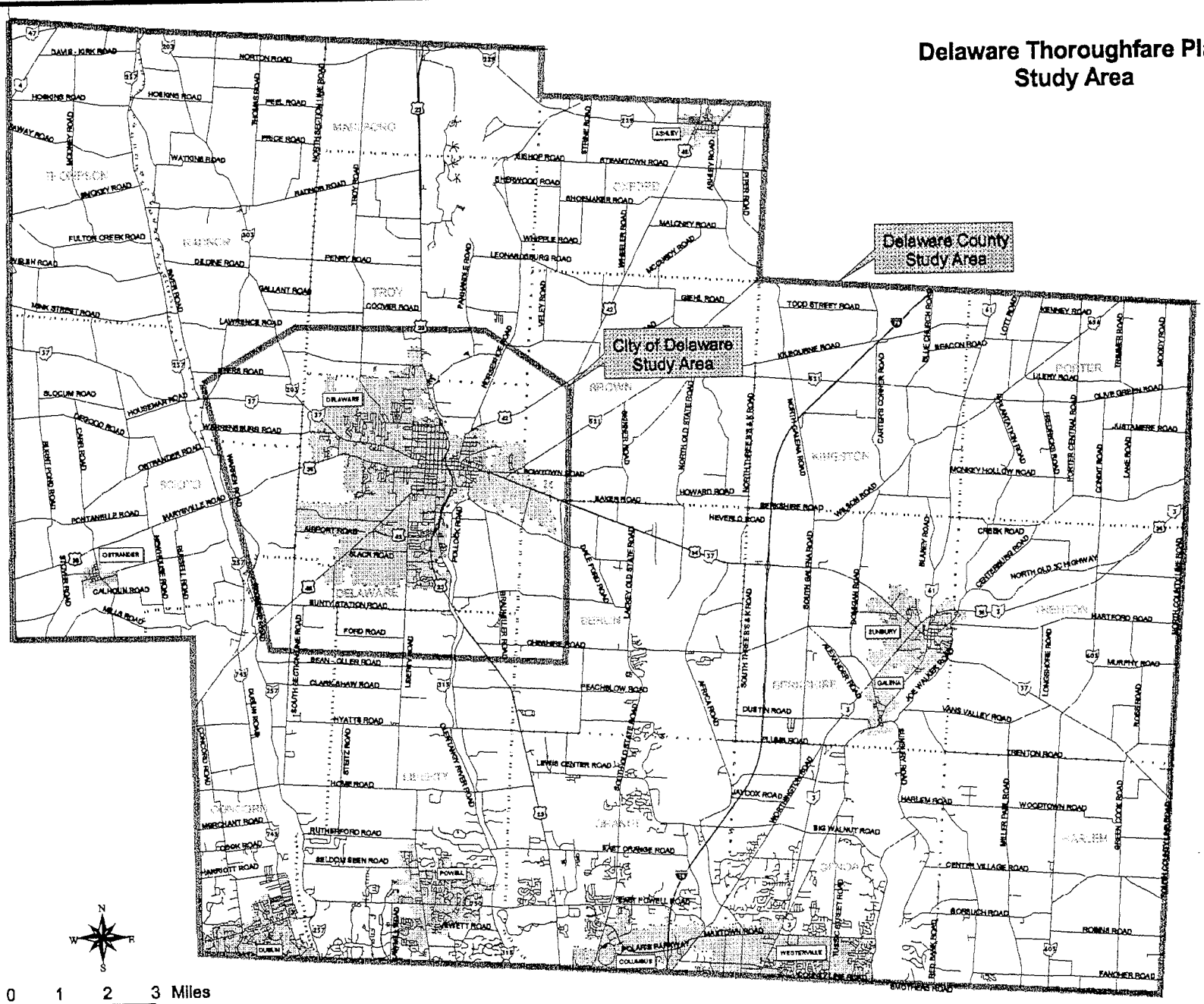

Delaware Thoroughfare Plan
Study Area
Delaware County
Study Area
City of Delaware
Study Area
N
W
E
S
0 1 2 3 Miles

Figure 4

The Delaware Thoroughfare Plan update is provided as a text report supplemented with a digital representation of the combined plan for the County and for the City in Geographical Information System (GIS) ARCView format. The GIS representation enables easy access via computer to information provided in the combined Thoroughfare Plan.

# *Section V*

## *Existing Transportation Conditions*

## V. Existing Transportation Conditions

The transportation conditions in Delaware County and the City of Delaware were inventoried for the existing year of 2000 for use in developing the transportation model and also to provide a base year transportation inventory for the Thoroughfare Plan in an easily accessible GIS ARCView format.

**Figure 5 and Figure 6** show the traffic signal and railroad crossing locations as provided by the Delaware County Engineer's office, City of Delaware, and the Ohio Department of Transportation (ODOT) along with the speed limits on Delaware County and City of Delaware roads as listed in the ODOT Bureau of Traffic Listing of Speed Limit Revisions as of January 30, 2000. Signal and railroad crossing locations and speed limits were verified by field reconnaissance where necessary.

The 1987 Southern Delaware Thoroughfare Plan, shown in **Figure 7** identifies the existing functional classifications of Delaware County roads. The existing functional classifications for City streets, as shown in **Figure 8,** was provided by the most recent Thoroughfare Plan for the City of Delaware which was adopted about 10 years ago.

The existing width of County roadways supplied by the most recent ODOT Listing of Local Roads Inventory Section dated April 6, 1999. Road widths were updated and verified via input from Delaware County Engineer's Office personnel and field reconnaissance where necessary. The existing right-of-way information utilized in the preparation of the Thoroughfare Plan was obtained from the Delaware Appraisal Land Information System (DALIS) Version 3.2 (January, 2000). The Delaware County 2000 Highway Map produced by the Delaware County Engineer's Office provided the County and Township road designations and the Delaware County Engineer's office provided the inventory of bridge locations. The roadway widths, route designations and bridge locations are contained in **Appendix 1.**

The Ohio Department of Highway Safety (ODHS) provided accident data for Delaware County from January 1996 through December 1999. ODHS receives this information from accident reports completed by local law enforcement agencies. This data assists in identifying the locations of intersections or roadway segments where safety improvements may be necessary and provides documentation of this data for future reference. Accident data for Delaware County and City of Delaware roadways is contained in **Appendix 1**.

# Delaware County
# Existing Transportation Conditions




## Legend

- Traffic Signals

Railroad Crossing Warning Type

- Buckeye
- Crossbucks
- Gates and Lights
- Lights Only
- Overhead

Posted Speed Limits

- 25 miles per hour
- 35 miles per hour
- 40 miles per hour
- 45 miles per hour
- 50 miles per hour
- 55 miles per hour
- Unposted (55 mph)
- Railroad
- Water
- Municipal Boundaries
- Township Boundaries

Existing 1999 Transportation Conditions

N W E S

0 1 2 3 Miles

ms consultants, inc.
CONSULTING ENGINEERS & PLANNERS

August 2001

**Figure 5**

# City of Delaware
# Existing Transportation Conditions

DELAWARE

DELAWARE

BROW

Olentangy River

**Legend**

Traffic Signals

Railroad Crossing Warning Type

- Buckeye
- Crossbucks
- Gates and Lights
- Lights Only
- Overhead

Posted Speed Limits

- 25 miles per hour
- 35 miles per hour
- 40 miles per hour
- 45 miles per hour
- 50 miles per hour
- 55 miles per hour
- Unposted (55 mph)

- Railroad
- Water
- Municipal Boundaries
- Township Boundaries

Existing 1999 Transportation Conditions

N
W E
S

ms consultants, inc.
CONSULTING ENGINEERS & PLANNERS

0 0.5 1 1.5 Miles

August 2001

Figure 6

# Southern Delaware County Thoroughfare Plan 1987

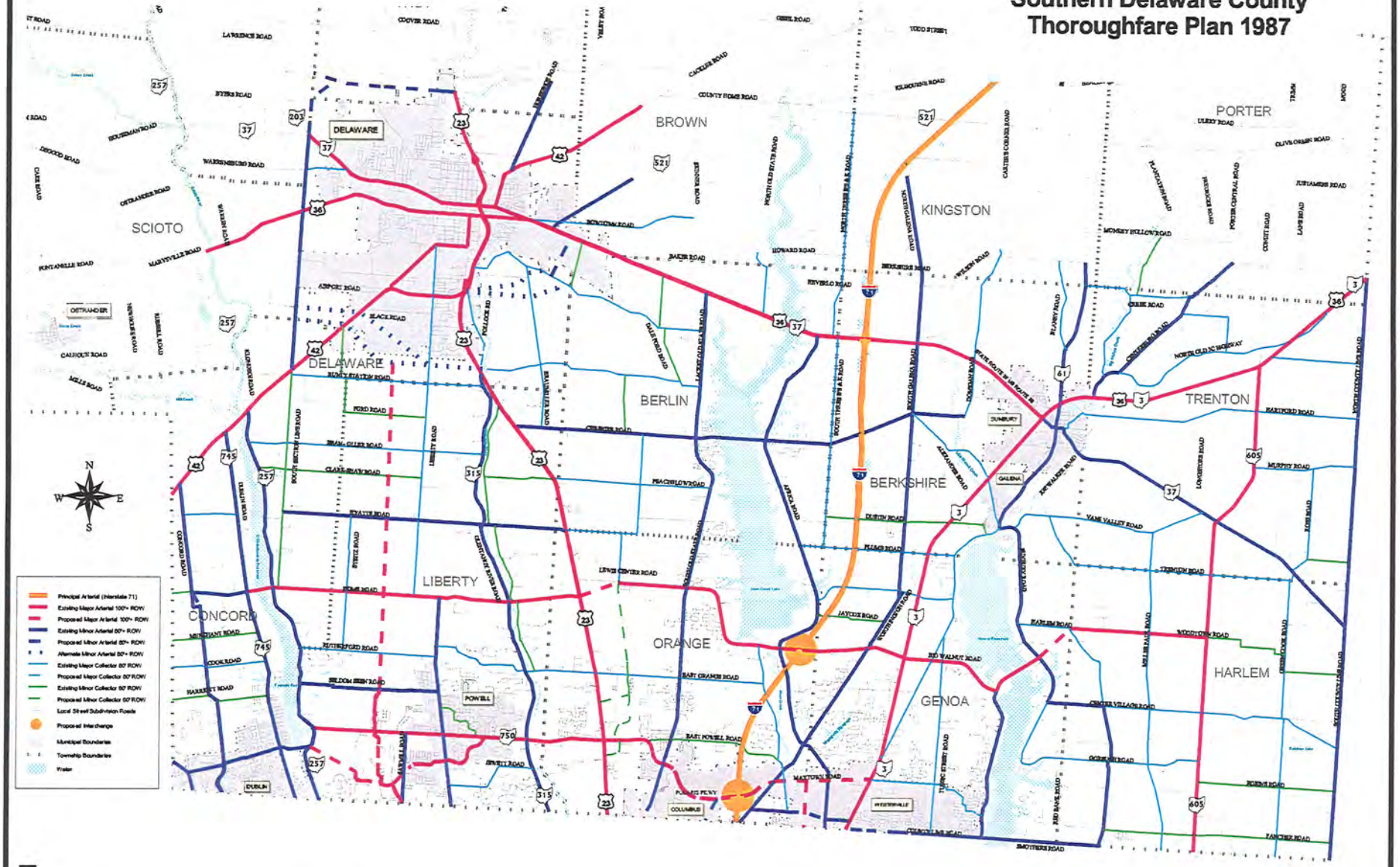
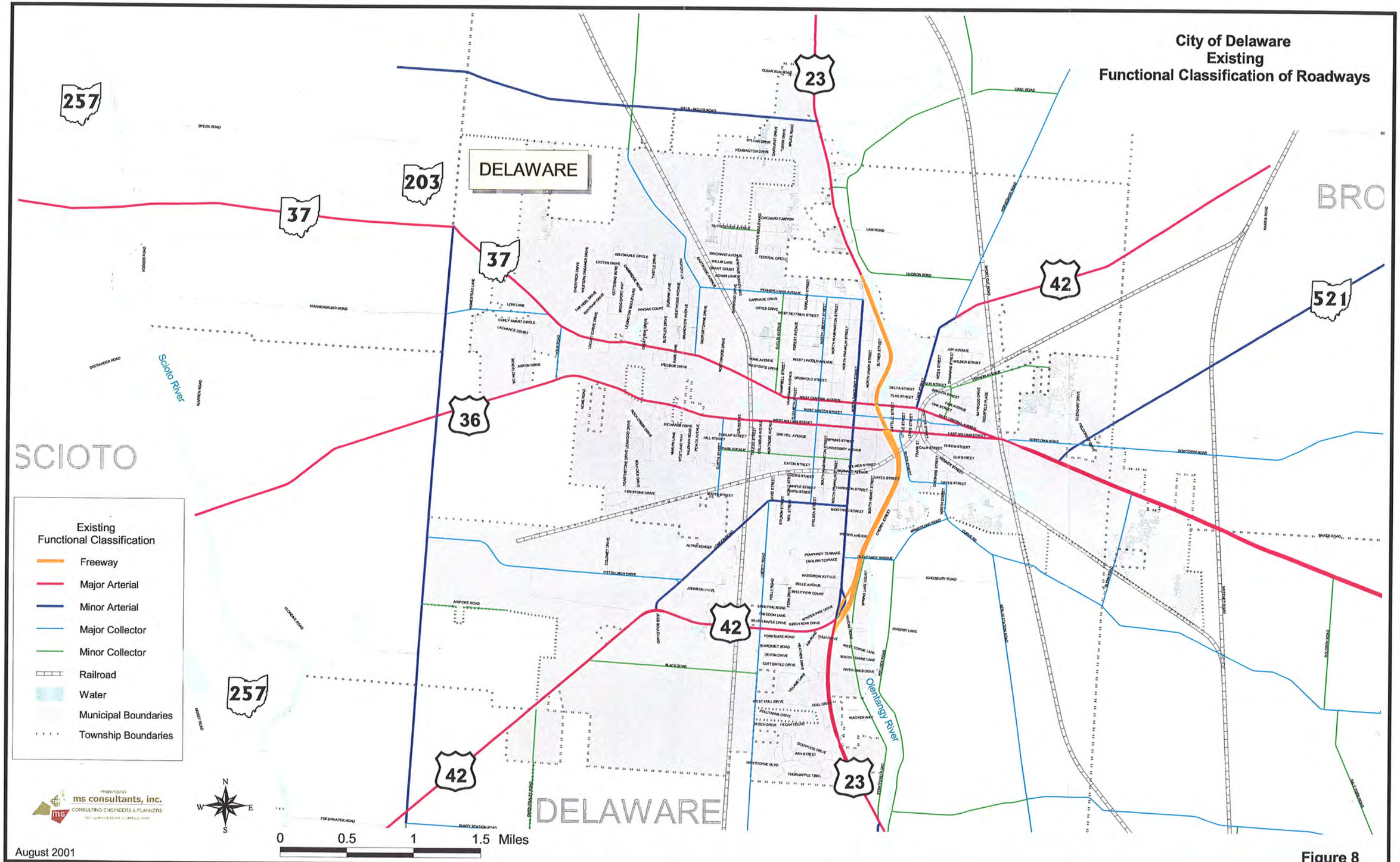



Figure 7

# City of Delaware
# Existing
# Functional Classification of Roadways




PREPARED BY
ms consultants, inc.
CONSULTING ENGINEERS & PLANNERS

August 2001

Figure 8

# *Section VI*

## *Land Use Forecasts*

## VI. Delaware City Land Use

Transportation and land use are closely related to each other. Access to the transportation system affects a property's economic value and function. The level of accessibility influences the intensity of development that a site might attract. At the same time, the type of land use that evolves influences the magnitude of improvements that might be necessary to maintain the integrity, safety and efficiency of the transportation system.

Projections for population, housing, employment, and square footages of retail, office and industrial uses were developed for the Delaware County Thoroughfare Plan. This set of land use data is the primary data set that is required by the Travel Demand Model for estimating future traffic volumes.

It is impossible to predict future land uses years with exact precision. The growth estimates in this study need to be reevaluated and the plan needs to be reviewed on a regular basis so that changes that reflect current land use trends can be incorporated into the plan.

### A. Forecast Years

Forecasts were made between 1995 and 2020 in five-year increments. An additional forecast was made for a complete built-out scenario of the study area. The 1995 base year was the last year that a comprehensive land use study was done that includes commercial and industrial square footage and employment. The "built out" scenario was developed to help decision makers prioritize needs for improvements with an eye toward longer term goals.

### B. Study Area

The area for which the city forecasts are reported includes the area bound by:

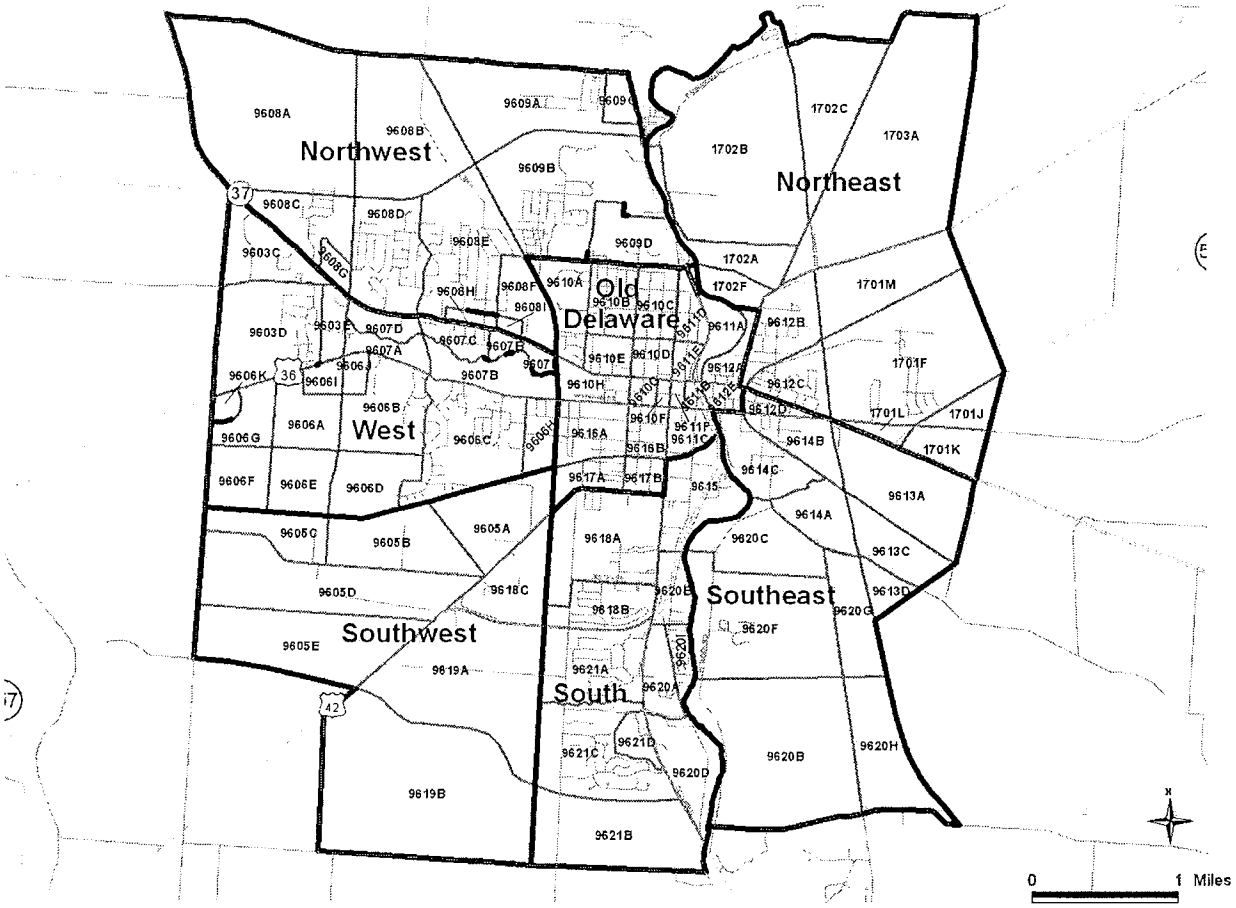
***West:*** South Section Line Road
***East:*** Norfolk & Southern Railroad
***North:*** Hills Miller Road/Panhandle Road
***South:*** Bunty Station Road/Braumiller Road

To more cohesively describe the land use assumptions made in the forecasts, the city area was divided into seven sub-areas. A discussion regarding the assumptions used each sub-area follows.

Delaware County is part of the central Ohio regional transportation study area as defined by the Federal Highways Administration. As the Metropolitan Planning Organization for central Ohio, the Mid-Ohio Regional Planning Commission (MORPC) prepares regional land use forecasts for the study area in which it has regulatory jurisdiction, including Franklin County, Delaware County, and western Licking and western Fairfield Counties. The land use forecasts developed for the Delaware City Thoroughfare Plan are a part of the land use forecasts developed for the central Ohio region.

The forecasts are made at a very local level of geography called Traffic Analysis Zones (TAZ) which is the geography recognized by the travel demand model. There are
1223 TAZ's in the MORPC study area, 310 in Delaware County and 109 TAZ in the Delaware City area. The boundaries of the TAZ are determined by a number of factors including travel barriers, such as rivers or railroads, the homogeneity of land use, and the size of the TAZ. There is no standard size for the TAZ, rather their boundaries are determined by the number of travel opportunities and the amount of potential traffic associated with them. The TAZ structure is displayed in **Figure 9.** A larger scale map of the TAZ structure is included in Appendix 1 with zone-specific land use data.

**Figure 9. Delaware City Traffic Analysis Zones**



## C. Methodology

The base year for the Delaware City Thoroughfare Plan is 1995, and the horizon year is 2020. The 1995 base year was chosen because it is the most current year for which comprehensive regional land use data is available, and the most recent year to which the regional travel demand model has been validated. The year 1995 population and housing were updated from 1990 census counts. Economic data including employment, square footage and acreage were collected during a county wide field survey that was conducted by the Mid-Ohio Regional Planning Commission in 1996.

The regional transportation planning horizon year was 2025 at the time of developing the Delaware County Thoroughfare Plan Update. As the horizon year for this Delaware plan is 2020, land use forecasts through 2020 were extracted from the MORPC regional land use data set.

Endpoint data sets were developed for the years 2000 and 2025. The intermediary year forecasts for 2005, 2010, 2015 and 2020 were interpolated based on growth rates assigned of population and growth of retail, office and industrial square footage. The growth rates were assigned to each TAZ for the individual five-year projection periods between the endpoints. The 2020 land use set from this regional forecast is used as the land use base for this thoroughfare plan.

An estimate of 2000 land use was developed from the 1995 base year data set, as results from the 2000 U.S. decennial census had not been released at this time of the development of this plan. As a surrogate to official Census data, population was updated from new housing building permits issued between 1995 and 2000, and employment and square footage was updated by adding known new commercial and industrial developments to the 1995 base. A comprehensive field survey to collect employment data was not conducted.

Future regional employment was driven by population projections. Population determines labor force that in turn determines employment. The population projection for the region was developed by assuming county growth rates that were tested for reasonableness against other projection sources including Delaware County Regional Planning Commission and the Ohio Department of Development. The regional population forecasts were used to determine future labor force and employment.

Employment was distributed into service, retail good, manufacturing and non-manufacturing sectors based on statistics from the Ohio Bureau of Labor Statistics. By assuming general employment densities for the various economic sectors, regional totals for square footage for the various sectors were calculated. The regional forecasts are balanced between economic and demographic segments of the economy to assure that sufficient labor is available to fulfill employment requirements, and employment opportunities are available to fulfill labor supplies.

People do not necessarily live in the county in which they work. County forecasts, for population and employment can not be done in isolation. Over one half of the labor of Delaware County travels to work in other counties, with over 40 percent of the Delaware County workers commuting to Franklin County (source: 1990 census file STF5A). Consequently, the land use forecasts for the Delaware City Thoroughfare Plan required a regional perspective for validity of the travel demand modeling process.

Shares of the regional population and economic growth were allocated to the city sub-areas finally to the TAZ's based on historic growth, the city's and adjacent townships' comprehensive plans, known developments, and input from local planning agencies. The Delaware County Regional Planning Commission and the Delaware City Planning office provided assistance in developing population forecasts for the city and the county.

Interviews with township trustees and officials were conducted in November of 1999 to gather input regarding active potential developments for the city area and the entire county. Local land use plans were collected and ideas and concepts from them were incorporated into the forecasts.

The plans used include:

- Delaware County Master Plan (1993)
- Delaware County Land Evaluation Site Assessment (LESA) System (1993)
- Delaware City Master Plan (1997)
- Berlin Township Comprehensive Plan, Draft (1999 )
- Genoa Township Comprehensive Plan (1999)
- Powell Village Comprehensive Plan (1995)
- Liberty Township Comprehensive Plan (1995)
- Orange Township Comprehensive Plan, Draft (1999)
- Sunbury Village Comprehensive Plan (1989)

The population and jobs in Central Ohio, Delaware County and Delaware City from 1995 to 2020 are shown in **Table 1.**

**Table 1. Population and Jobs in Central Ohio, Delaware County and Delaware City 1995-2020**

| Area | Population | | | | | Jobs | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1995 | 2020 | Change | 1995 share | 2020 share | 1995 | 2020 | Change | 1995 share | 2020 share |
| Region | 1,120,400 | 1,562,600 | 39% | 100% | 100% | 645,200 | 965,400 | 50% | 100% | 100% |
| Delaware Co | 77,100 | 206,200 | 167% | 7% | 13% | 29,900 | 94,000 | 199% | 5% | 9% |
| Delaware City | 19,700 | 47,900 | 143% | 2% | 3% | 11,700 | 22,800 | 93% | 2% | 2% |

## D. Land Use Review

The variables to be analyzed include population, residential development (measured in housing units), employment, and retail, industrial and office space (measured in square footage). As previously mentioned, the city was subdivided along TAZ boundaries into areas that represent the city neighborhoods to better illustrate the development in the Delaware City area.

Both residential and economic growth are projected for Delaware City. However, whereas historically the city has been the economic heart of the county, Delaware is competing with north Franklin County and southern Delaware County for commercial vitality. Consequently, Delaware is projected to experience residential growth at a disproportionate rate to employment growth.

Economic growth in Delaware is anticipated to occur primarily as commercial services to support the local population and patronage from outlying areas, and continued expansion of the industrial base that the city is currently promoting in the south west, and in the northeast in the longer term. No large-scale office parks are projected for the city.

Population is projected to more than double and an additional 13,300 housing units are forecast by the year 2020. Job growth is expected to nearly double, as 11,000 new jobs are forecast. Approximately 4.3 million square feet of industrial uses, 1.3 million square feet of retail and 250,000 square feet of new office are projected for the city by the year 2020. This represents an increase of 132 percent of the industrial floor area, 72 percent new retail, and 39 percent new office space. Totals for the city residential and economic sectors are listed in **Table 2** below.

**Table 2. Delaware City Area Land Use Variables: 1995-2020**

| Variable | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|
| Population | 19,667 | 24,542 | 30,359 | 36,774 | 43,988 | 47,895 |
| Housing Units | 8,193 | 9,276 | 12,363 | 15,382 | 18,945 | 21,319 |
| Employment | 11,852 | 16,663 | 18,145 | 18,997 | 20,210 | 22,849 |
| Industrial Square Ft | 3,250,242 | 3,860,742 | 4,754,099 | 4,804,099 | 5,427,515 | 7,544,137 |
| Retail Square Feet | 1,874,046 | 1,914,046 | 2,127,693 | 2,452,918 | 2,833,288 | 3,223,418 |
| Office Square Feet | 748,098 | 748,098 | 822,389 | 894,181 | 969,098 | 1,037,889 |

The next several pages are discussions of the important land use variables identified in Table 2. The discussions include the distribution of the land use and population into the seven sub-areas of Delaware City.

## 1. Population

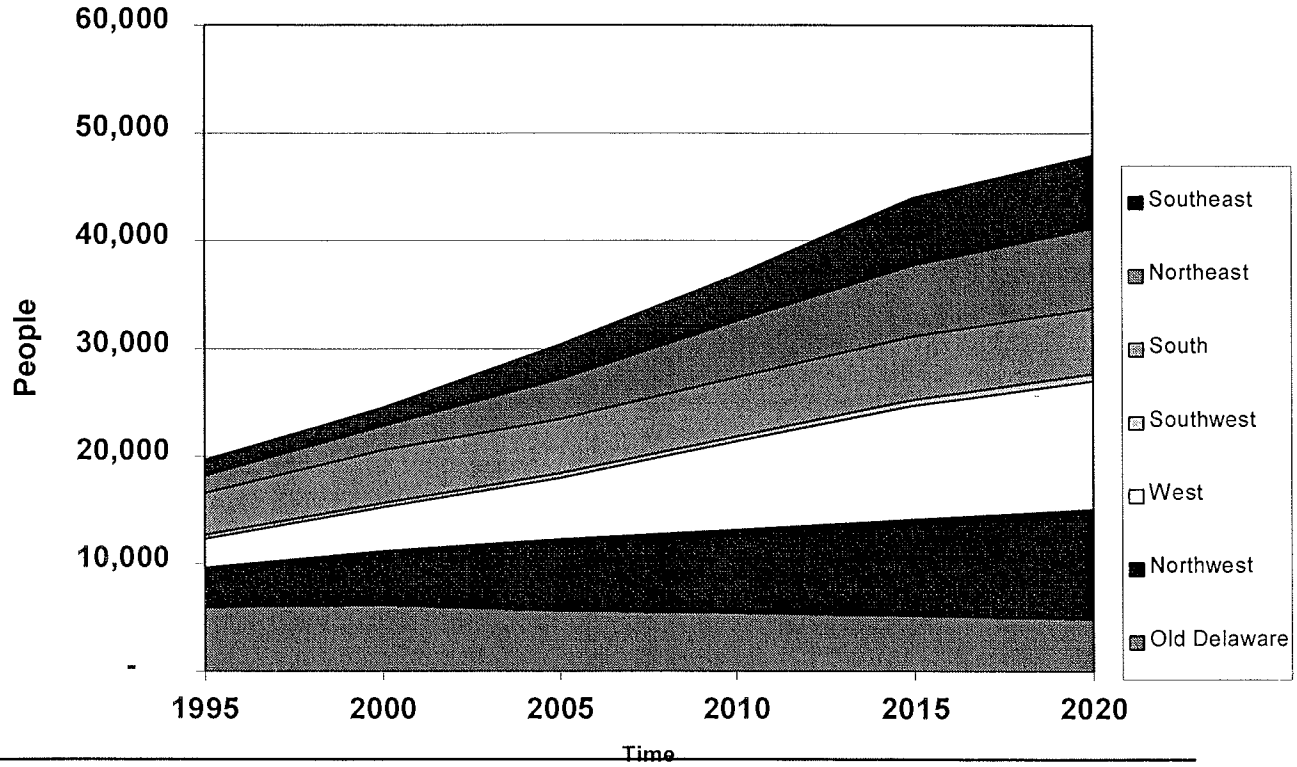
The population of Delaware City is expected to increase to approximately 48,000 people by the year 2020. Approximately 40% of this population is located in Northwest Delaware and West Delaware. A decrease in population is expected to occur in Old Delaware. Population forecasts for in the Delaware City are shown in the **Table 3** below. These numbers are dependent on the number of housing units projected for the area.

**Table 3, Population in Delaware City, 1995-2020**

| City Sub-Area | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|
| Northeast | 1,584 | 2,281 | 3,697 | 5,204 | 6,610 | 7,458 |
| Northwest | 3,719 | 5,107 | 6,709 | 7,825 | 9,030 | 10,181 |
| Old Delaware | 5,927 | 6,102 | 5,583 | 5,360 | 5,121 | 4,851 |
| South | 3,885 | 4,898 | 5,057 | 5,487 | 5,869 | 6,048 |
| Southeast | 1,467 | 1,678 | 3,208 | 4,255 | 6,243 | 6,748 |
| Southwest | 372 | 409 | 435 | 473 | 591 | 714 |
| West | 2,712 | 4,066 | 5,671 | 8,171 | 10,525 | 11,896 |
| **Total** | 19,667 | 24,542 | 30,359 | 36,774 | 43,988 | 47,895 |

**Figure 10** is a graph illustrating the data contained in Table 3. The sections that are expected to have the most population are northwest and west sub-areas of the city. The southwestern part of the city will remain the least populous into the year 2020.

**Figure 10. Population by Sub-Area 1995-2020**



## 2. Residential Development

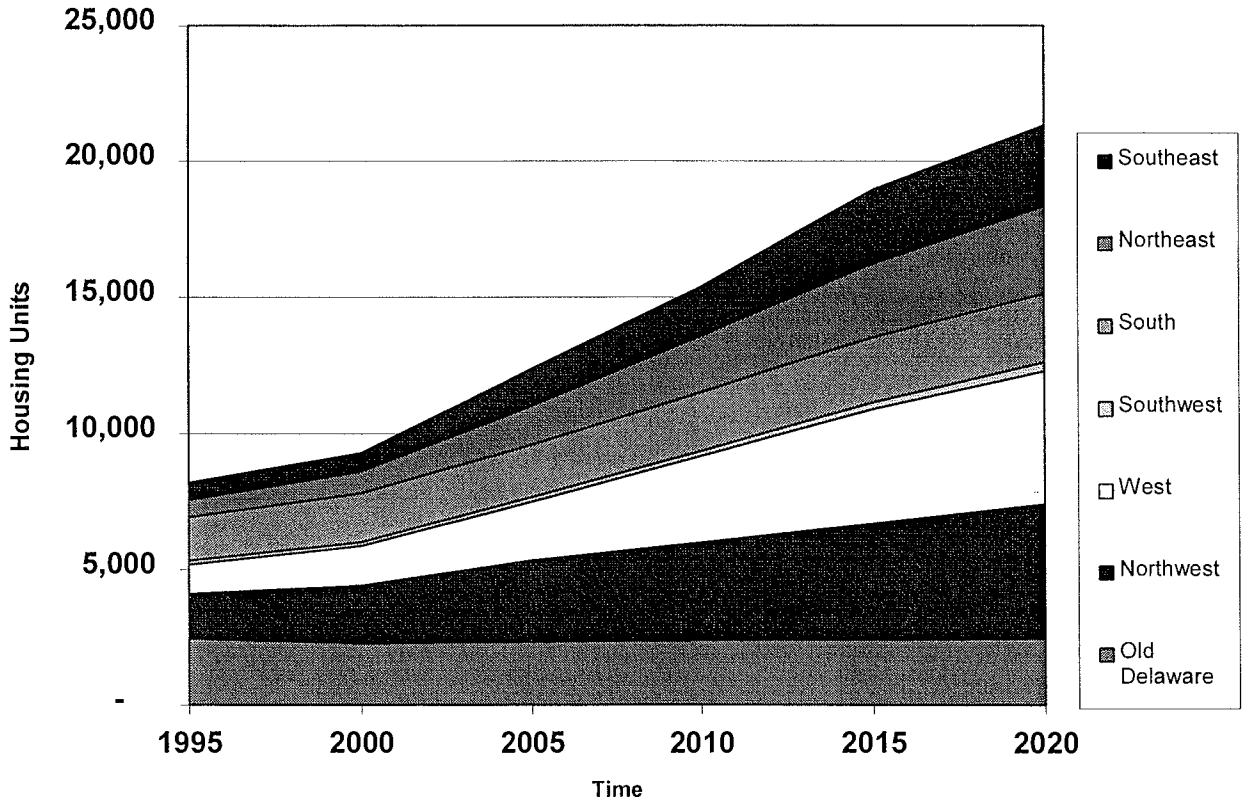
Residential development and population are dependent on each other. **Table 4** contains the number of housing units in Delaware City from 1995 to 2020.

**Table 4. Housing Units by Sub-Area 1995-2020**

| City Sub-Area | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|
| Northeast | 631 | 811 | 1,433 | 2,060 | 2,725 | 3,231 |
| Northwest | 1,669 | 2,121 | 3,006 | 3,617 | 4,289 | 4,962 |
| Old Delaware | 2,437 | 2,286 | 2,328 | 2,370 | 2,411 | 2,443 |
| South | 1,588 | 1,780 | 1,935 | 2,155 | 2,372 | 2,522 |
| Southeast | 644 | 671 | 1,347 | 1,816 | 2,701 | 2,964 |
| Southwest | 153 | 153 | 176 | 199 | 256 | 319 |
| West | 1,071 | 1,454 | 2,138 | 3,165 | 4,192 | 4,876 |
| **Total** | 8,193 | 9,276 | 12,363 | 15,382 | 18,945 | 21,319 |

**Figure 11** is an illustration of the table above. Note that the areas with the most number of housing units are also the areas that contain the highest population. As shown in the Population growth graph, residential development is expected to be lowest in Southwest Delaware City.

**Figure 11. Housing Units by Sub-Area 1995-2020**



### 3. Retail Development

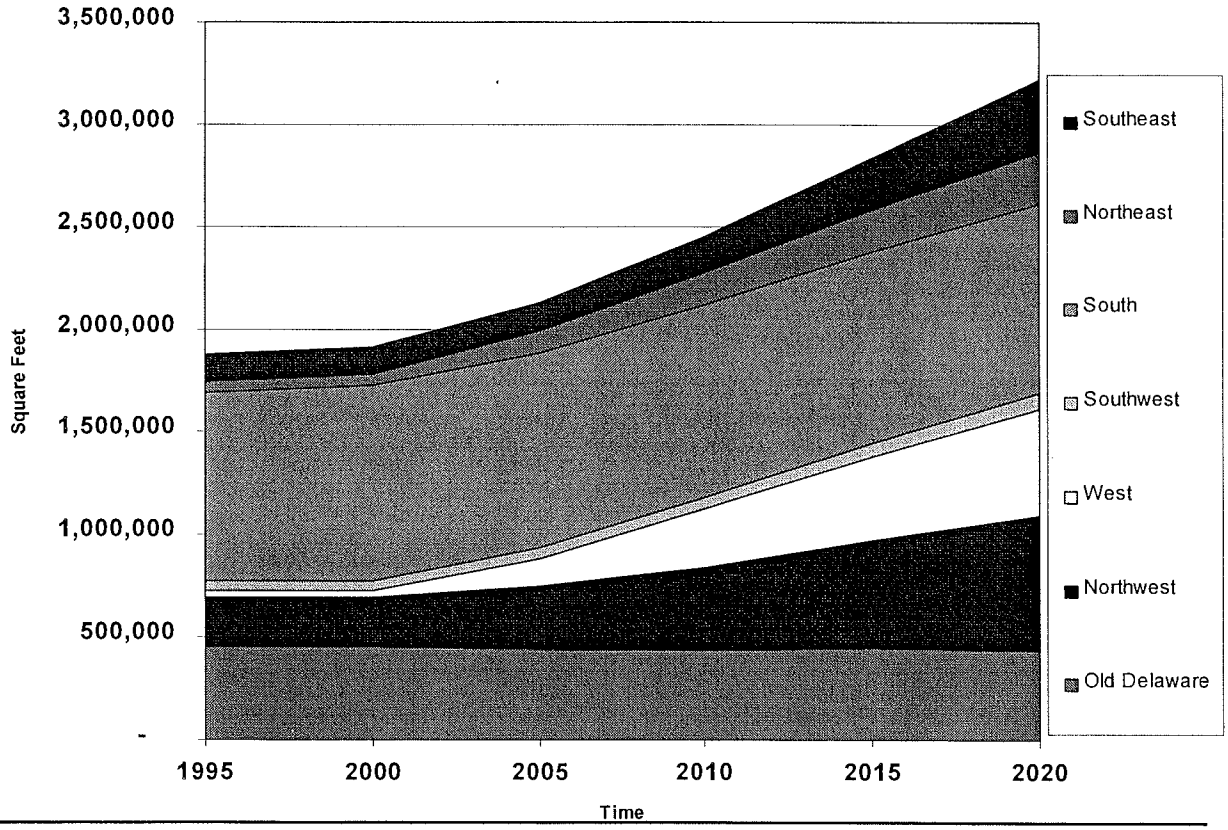
Retail developments provide goods and services to the people living in residential area. A mixture of retail and residential developments are desirable in well-thought-out urban plans. Retail development also occurs along major transportation corridors used in daily commutes by the people living in these areas. **Table 5** shows the retail square footage in each section of Delaware City from 1995 to 2020.

**Table 5. Retail Space by Sub-Area 1995-2020**

| City Sub-Area | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|
| Northeast | 54,756 | 54,756 | 104,756 | 154,756 | 204,756 | 254,756 |
| Northwest | 242,076 | 242,076 | 303,653 | 404,808 | 529,540 | 657,850 |
| Old Delaware | 451,381 | 451,381 | 442,701 | 434,021 | 444,159 | 435,479 |
| South | 917,069 | 957,069 | 949,069 | 941,069 | 933,069 | 925,069 |
| Southeast | 132,232 | 132,232 | 138,482 | 177,982 | 250,732 | 356,732 |
| Southwest | 47,013 | 47,013 | 52,013 | 59,263 | 69,013 | 75,513 |
| West | 29,520 | 29,520 | 137,020 | 281,020 | 402,020 | 518,020 |
| **Total** | 1,874,046 | 1,914,046 | 2,127,693 | 2,452,918 | 2,833,288 | 3,223,418 |

**Figure 12** is an illustration of the retail square footage by sub-area. Notice that the area with the highest amount of retail space is the Southern section of the city, which surrounds US 23, a major transportation corridor.

**Figure 12. Retail Floor Area (Square Feet) by Sub-Area 1995-2020**



**4. Office Development**

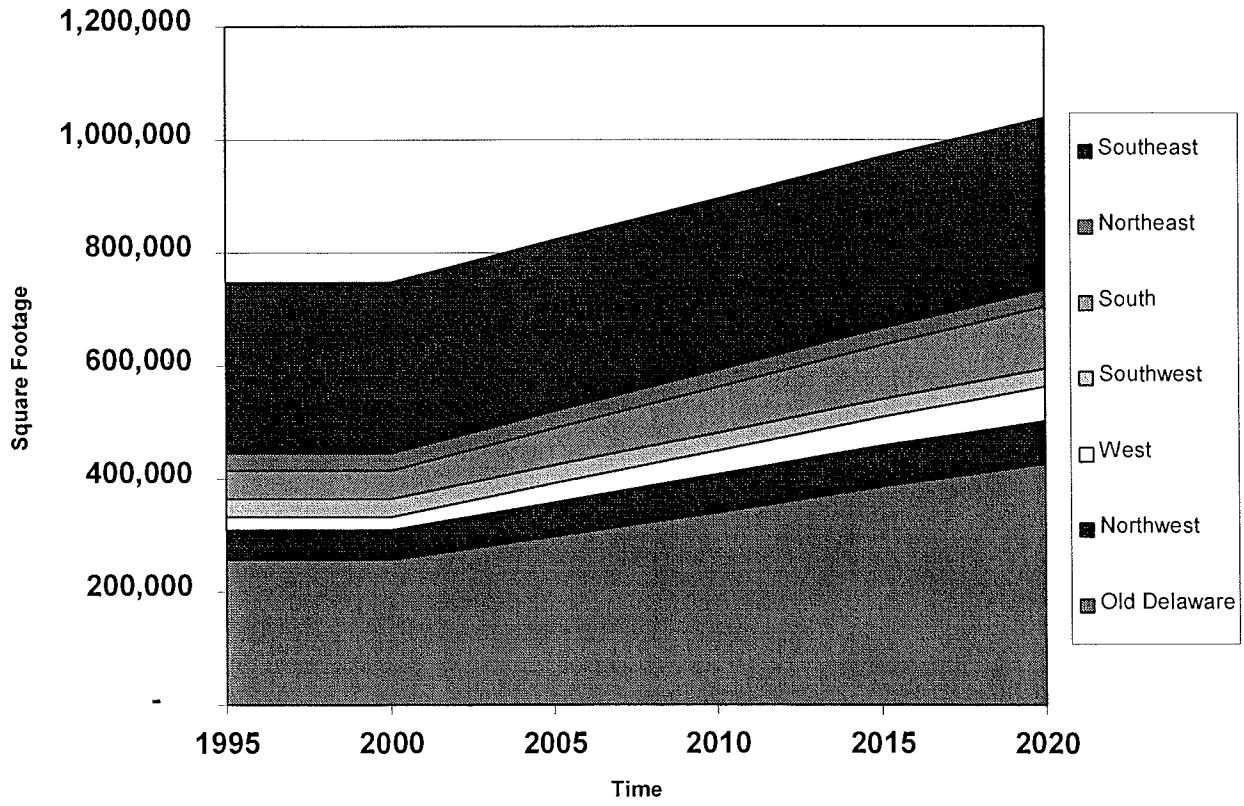
Office development occurs near major corridors and near retail centers where office support is required. **Table 6** shows the office space projected for Delaware City from 1995 to 2020.

**Table 6. Office Space by Sub-Area 1995-2020**

| City Sub-Area | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|
| Northeast | 30,331 | 30,331 | 30,331 | 30,331 | 30,331 | 30,331 |
| Northwest | 52,744 | 52,744 | 60,244 | 67,744 | 72,744 | 75,244 |
| Old Delaware | 256,867 | 256,867 | 298,158 | 339,450 | 385,367 | 426,658 |
| South | 50,288 | 50,288 | 65,288 | 80,288 | 95,288 | 110,288 |
| Southeast | 302,977 | 302,977 | 302,977 | 302,977 | 302,977 | 302,977 |
| Southwest | 31,840 | 31,840 | 31,840 | 31,840 | 31,840 | 31,840 |
| West | 23,051 | 23,051 | 33,551 | 41,551 | 50,551 | 60,551 |
| **Total** | 748,098 | 748,098 | 822,389 | 894,181 | 969,098 | 1,037,889 |

**Figure 13** illustrates the contents of the table above. Little to no increase in office space is expected between 1995 and 2020. The area that will experience the most increase will be Old Delaware, which includes the central business district of Delaware.

**Figure 13. Office Floor Space (Square Feet) by Sub-Area 1995-2020**



### 5. Industrial Development

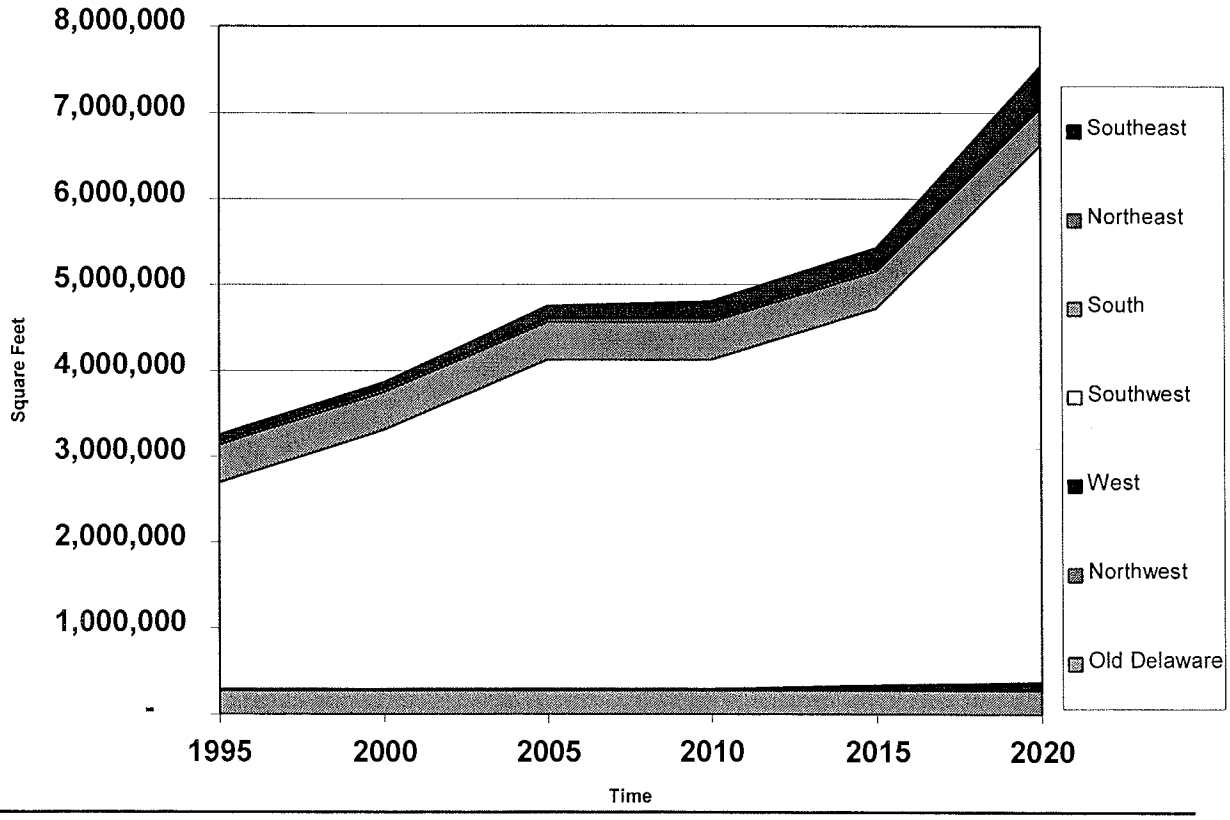
Access to a manufacturing site is of utmost importance when considering the location of an industrial development. Also, depending on the type of industrial activity, this type of development preferably occurs in areas where there is low residential development. **Table 7** shows the industrial space for Delaware City from 1995 to 2020.

**Table 7. Industrial Space by Sub-Area 1995-2020**

| City Sub-Area | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|
| Northeast | 38,223 | 38,223 | 38,223 | 38,223 | 38,223 | 38,223 |
| Northwest | 26,300 | 26,300 | 26,300 | 26,300 | 26,300 | 26,300 |
| Old Delaware | 269,752 | 269,752 | 269,752 | 269,752 | 269,752 | 269,752 |
| South | 439,745 | 439,745 | 439,745 | 439,745 | 439,745 | 439,745 |
| Southeast | 78,566 | 78,566 | 153,566 | 203,566 | 233,566 | 438,566 |
| Southwest | 2,397,656 | 3,008,156 | 3,826,513 | 3,826,513 | 4,379,929 | 6,251,551 |
| West | 0 | 0 | 0 | 0 | 40,000 | 80,000 |
| **Total** | 3,250,242 | 3,860,742 | 4,754,099 | 4,804,099 | 5,427,515 | 7,544,137 |

**Figure 14** is an illustration of the table shown above. The area with the highest amount of industrial square footage is expected be Southwestern Delaware City, where industrial developments are predicted to increase steadily into the year 2020.

**Figure 14. Industrial Floor Space (Square Feet) by Sub-Area 1995-2020**



## 6. Employment

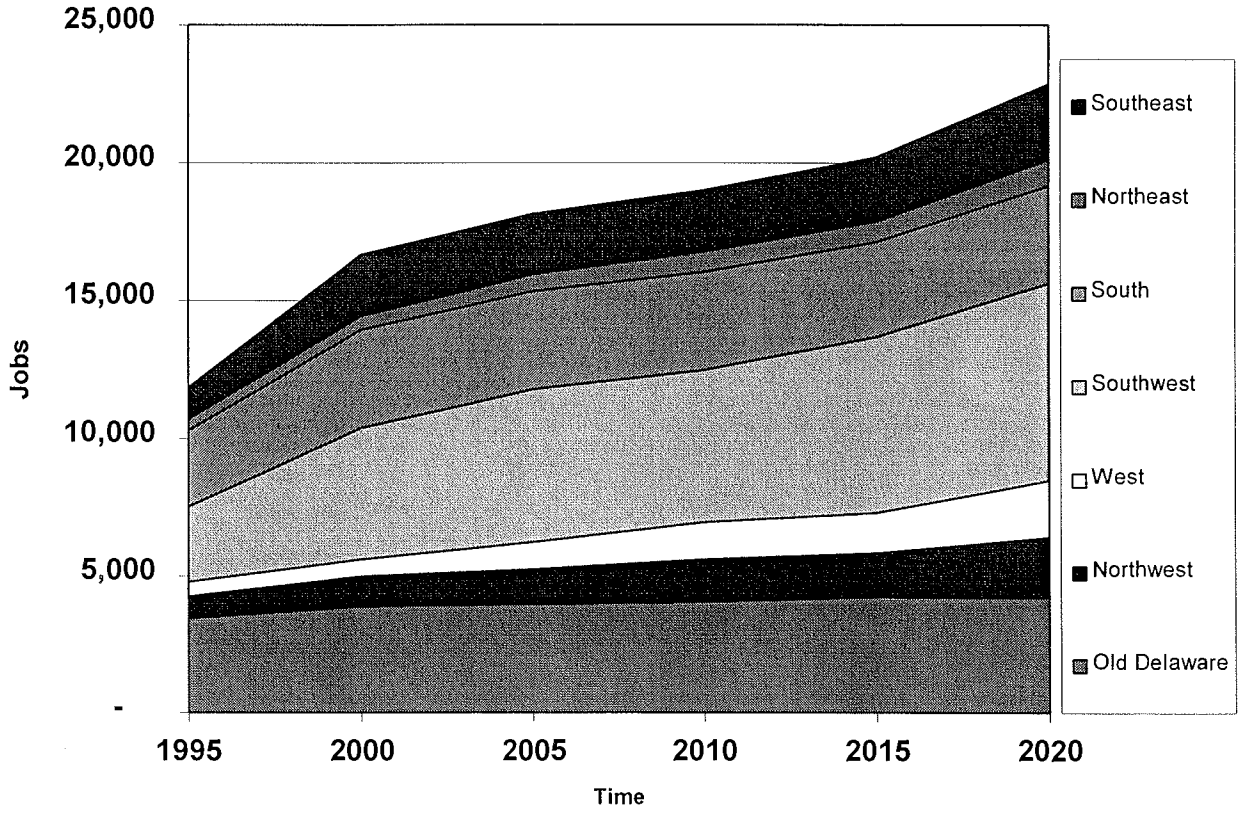
Employment is expected to double between 1995 and 2020. The number of people employed in an area depends on the amount of retail, office, and industrial developments. **Table 8** shows the number of people who work in the various sections of Delaware City.

**Table 8. Employment by Sub-Area 1995-2020**

| City Sub-Area | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|
| Northeast | 437 | 502 | 615 | 727 | 740 | 946 |
| Northwest | 821 | 1,104 | 1,287 | 1,562 | 1,629 | 2,222 |
| Old Delaware | 3,425 | 3,873 | 3,957 | 4,034 | 4,214 | 4,172 |
| South | 2,760 | 3,560 | 3,567 | 3,565 | 3,452 | 3,525 |
| Southeast | 1,135 | 2,214 | 2,183 | 2,228 | 2,330 | 2,740 |
| Southwest | 2,756 | 4,786 | 5,566 | 5,532 | 6,397 | 7,178 |
| West | 518 | 624 | 970 | 1,349 | 1,448 | 2,065 |
| **Total** | 11,852 | 16,663 | 18,145 | 18,997 | 20,210 | 22,849 |

**Figure 15** is an illustration of the data found in Table 8 above. The areas with a higher number of people employed are the same as those areas that are expected to have the highest amount of office, industrial, and retail space.

**Figure 15. Employment by Sub-Area 1995-2020**



## E. Full Build Scenario

A comprehensive land use data set was developed to represent a "full build" scenario of the city. The data set was developed at the TAZ level, and general assumptions regarding development patterns that were used in the 2020 land use data were carried forth to complete development of available developable acreage in the TAZ's. Commercial growth was added to account for additional residential development. Residential densities were held constant as those assumed for 2020, except in the TAZ's on the edge of the study area. In these areas, a density of 3 units per acre were assumed in the build-out scenario rather than the 1-2 units assumed for the year 2020. Higher densities were assumed to account for the expectation that eventually, these lands would be serviced by city sewer infrastructure that would support higher, yet relatively low development densities. Additional industrial growth was also assumed for the southwest region of the study area and along US 42.

A comparison between the year 2020 and build-out scenarios are listed in **Tables 9 and 10**. The scenario includes the assumption that nearly all of the available land (93 percent) is used for housing, commercial, or industrial uses. In comparison, approximately 60 percent of the land area is developed in the year 2020 scenario. As visible in the tables and graphs, the sub-areas at the periphery of the Delaware City study area show the greatest difference in development between the scenarios, as these sub-areas have more land available for development than the more densely developed areas including Old Delaware, the West, the South.

**Table 9. Population, Housing and Employment between Year 2020 and Build-Out Scenarios by Sub-Areas**

| City Sub-Area | Population | | | Housing Units | | | Employment | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2020 | Build Out | Change | 2020 | Build Out | Change | 2020 | Build Out | Change |
| Northeast | 7,458 | 22,439 | 14,981 | 3,231 | 9,500 | 6,269 | 946 | 5,557 | 4,611 |
| Northwest | 10,181 | 17,622 | 7,441 | 4,962 | 8,334 | 3,372 | 2,222 | 3,019 | 797 |
| Old Delaware | 4,851 | 5,389 | 538 | 2,443 | 2,661 | 217 | 4,172 | 4,333 | 162 |
| South | 6,048 | 9,601 | 3,553 | 2,522 | 3,940 | 1,418 | 3,525 | 4,029 | 504 |
| Southeast | 6,748 | 17,291 | 10,543 | 2,964 | 7,410 | 4,446 | 2,740 | 5,104 | 2,364 |
| Southwest | 714 | 10,643 | 9,929 | 319 | 4,380 | 4,061 | 7,178 | 15,347 | 8,169 |
| West | 11,896 | 13,699 | 1,803 | 4,876 | 5,509 | 633 | 2,065 | 3,305 | 1,239 |
| Total | 47,895 | 96,683 | 48,788 | 21,319 | 41,734 | 20,415 | 22,849 | 40,695 | 17,846 |

**Table 10. Industrial, Retail and Office Square Feet between Year 2020 and Build-Out Scenarios Sub-Areas**

| City Sub-Area | Industrial Floor Space | | | Retail Floor Space | | | Office Floor Space | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2020 | Build Out | Change | 2020 | Build Out | Change | 2020 | Build Out | Change |
| Northeast | 38,223 | 3,098,223 | 3,060,000 | 254,756 | 697,536 | 442,780 | 30,331 | 185,000 | 154,669 |
| Northwest | 26,300 | 26,300 | 0 | 657,850 | 827,850 | 170,000 | 75,244 | 127,744 | 52,500 |
| Old Delaware | 269,752 | 269,752 | 0 | 435,479 | 428,161 | -7,318 | 426,658 | 501,348 | 74,689 |
| South | 439,745 | 522,635 | 82,890 | 925,069 | 1,062,085 | 137,016 | 110,288 | 138,288 | 28,000 |
| Southeast | 438,566 | 853,566 | 415,000 | 356,732 | 839,627 | 482,896 | 302,977 | 537,977 | 235,000 |
| Southwest | 6,251,551 | 12,862,353 | 6,610,802 | 75,513 | 534,613 | 459,100 | 31,840 | 121,840 | 90,000 |
| West | 80,000 | 235,000 | 155,000 | 518,020 | 779,520 | 261,500 | 60,551 | 173,051 | 112,500 |
| | 7,544,137 | 17,867,829 | 10,323,692 | 3,223,418 | 5,169,392 | 1,945,974 | 1,037,889 | 1,785,248 | 747,358 |

The data in Table 10 above are displayed graphically below in **Figure16** and **Figure 17**. It is obvious that the substantial growth projected for the city by 2020 pales compared to the potential growth for this area.

**Figure 16:**
**Comparison of Population, Housing Units and Employment in the Year 2020 to the Build-Out Scenario**

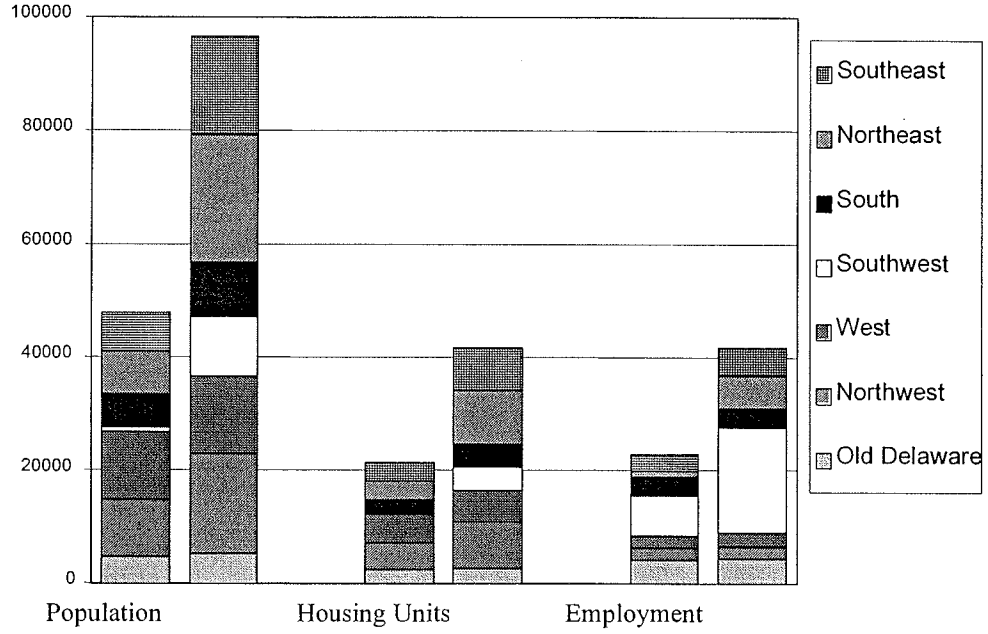
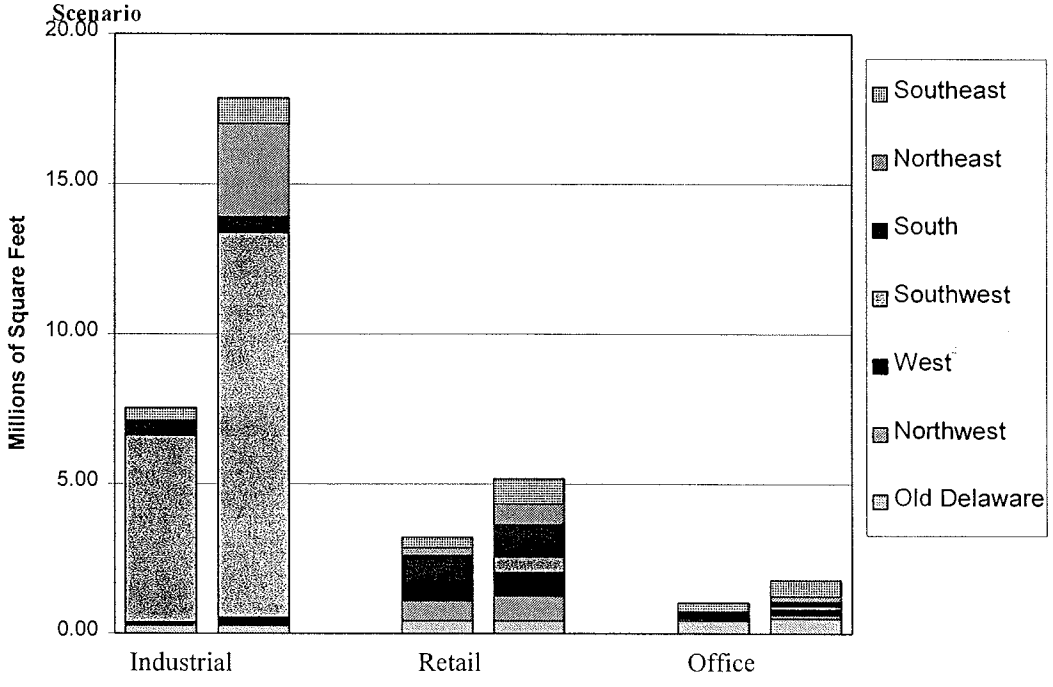



**Figure 17:**
**Comparison of Industrial, Retail and Office Square Feet in the Year 2020 to the Build-Out Scenario**



**F. Summary**

Delaware City will continue to experience a great amount of growth through the year 2020. The projections made for the city fit with the regional forecasts developed for central Ohio. Old Delaware is expected to retain a viable downtown, although some loss of residential uses and a shift from the retail goods to the retail service sector is projected. Residential growth will be greatest in the northwest and west areas of the city, and low in sections such as southwest Delaware City. South Delaware will experience the highest increase in retail space, while southwest Delaware City will have slight increases in shops and other retail space. Old Delaware City and southeast Delaware will continue to have the highest amount of office square footage, and the rest of the city will experience little to no increase with office-type developments. Industrial development will continue to increase primarily the southwest part of the city as a result to this city's efforts to develop its industrial park. The 2020 land use projections are slightly higher than one-half of what the city could experience in a full built scenario. Detailed information at the TAZ level is included as **Appendix 2**.

# *Section VII*

## *Transportation Model*

## VII. Transportation Model

An important consideration in the development of a thoroughfare plan is determining how much demand there will be to use particular roadway facilities. Transportation models are developed to estimate existing and future travel patterns to aid in assessing travel demands in a region. Information regarding the travel demand in a region helps to determine the need for road improvements or additional road connections to more effectively serve future traffic volumes. It also assists in assigning the appropriate functional classification to a roadway.

Travel demand modeling utilizes a blend of policy, urban activity, and highway and transit network inputs for its four-step process of trip generation, trip distribution, mode choice and ultimately network traffic volume assignment to provide planning level information about the transportation system. Each of the four steps are made up of several computer programs that actually implement the model:

### Step 1. Trip Generation

Trip generation relates data about socio-economic development patterns of an area to trip making. For example, areas with higher income households that own more cars tend to make the majority of trips by single occupant vehicle, whereas lower income urban residential areas tend to have more trips made on foot or with transit. MORPC's trip generation procedures were developed from travel survey data and are broken down by different trip purposes. Trip generation is performed at the traffic analysis zone (TAZ).

### Step 2. Trip Distribution

Trip distribution uses the trip generation output of TAZ trip activity levels and produces a table of TAZ to TAZ trip movements. Trip distribution is done using a "Gravity Model" in which travel time between TAZs and attractiveness of destination TAZs are components.

### Step 3. Mode Choice

Mode choice determines the mode of travel of each trip. Modes include single occupant vehicle, ridesharing, transit, and other modes, such as bicycling and walking, that are not directly calculated. Mode selection is based upon the relative costs and travel time for each mode between pairs of TAZs.

### Step 4. Traffic Assignment

Traffic assignment chooses the minimum time paths between zones. The model keeps track of the number of vehicles using each link of the system and recalculates the results based on this. The model performs iterative recalculation to minimize all travel times.

As described in Section VII, various land use and socio-economic data variables are aggregated by TAZ. This data is used in various parts of the four-step transportation modeling process. The TAZs range in size from a city block to several square miles

depending upon the density and type of development in the area. All travel from/to the zone is assumed to come from a single point, or the centroid of the zone. Zones are connected to the computerized representation of the road network via these centroids through fictitious roadway links called centroid connectors. **Figure 18** shows an example of the TAZ structure overlaid upon a model network.

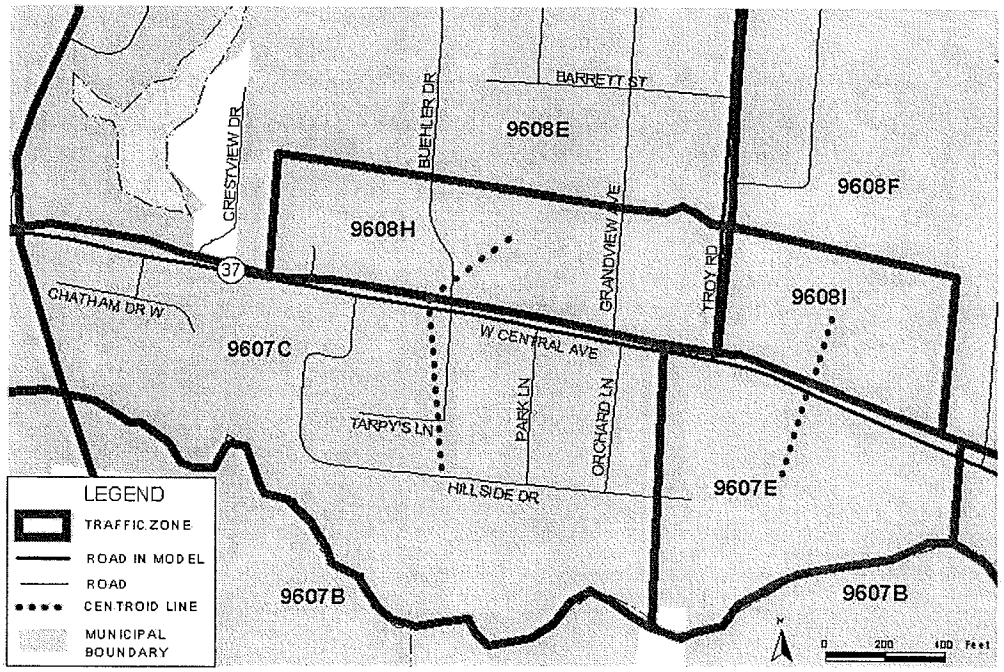



**Figure 18. Traffic Analysis Zone Overlaid Upon Model Network**

In regional model, only arterial and collector roads of regional significance are included in the network. These roads are represented through a series of links and nodes. Links are segments of roads that are described by characteristics of that road and nodes are points where characteristics on the street change or other roads (links) intersect. Link characteristics include such information as street width, number of lanes, and speed.

## A. 1995 Base Model Network

Regional transportation models maintained and operated by the Mid-Ohio Regional Planning Commission and the Ohio Department of Transportation were augmented and employed for used in preparing the Delaware Thoroughfare Plan. The models incorporated the land use information for Delaware County and the City of Delaware described in Section VI of this report.

Prior to this thoroughfare plan study, the modeling network maintained by MORPC included Franklin County, portions of Fairfield and Licking Counties,

and only the southern townships in Delaware County adjacent to the Franklin County line. At the impetus of this study the modeled network was expanded to incorporate all of Delaware County. The MORPC modeling area is shown in **Figure 19.** More information on the process of expanding the model is in **Appendix 2.**

The expanded model network was established for the base year of 1995 because of the large amount of land use and transportation data available. To add Delaware County and the City of Delaware into the model network, data was extracted from the existing regional model and, using GIS, combined with information provided by the Delaware County Engineer, the City of Delaware, ODOT Office of Technical Services, ODOT Office of Traffic and aerial photographs.

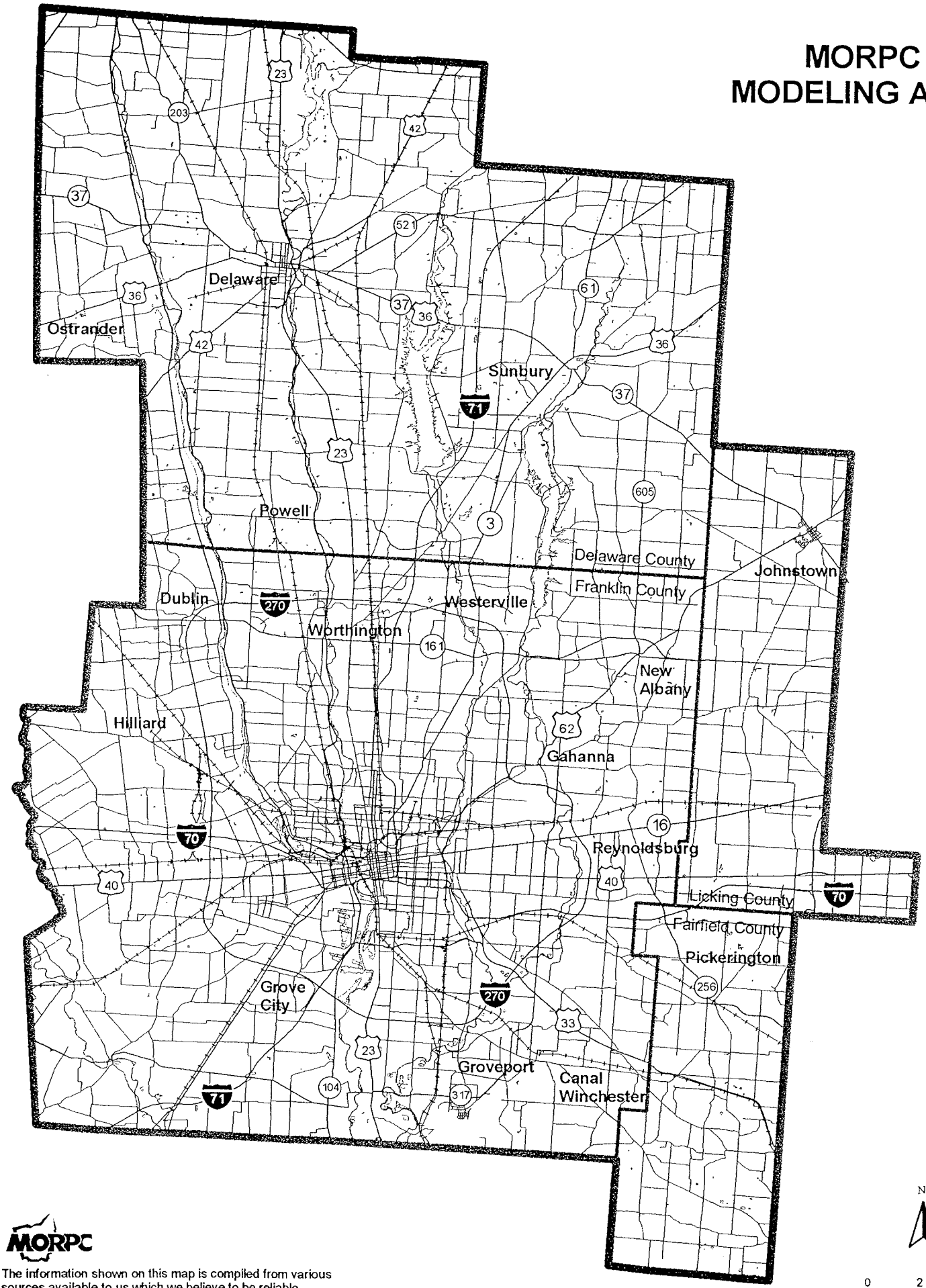
Once the 1995 model network was established, daily traffic counts from various sources, including "MORPC's Average Daily Traffic Book" and ODOT's "Traffic Survey Report of the State Highway System", were added to the model to establish a baseline of 1995 Average Daily Traffic volumes (ADT). The land use information noted in Section VII of this report was used to create a 1995 trip table which was added into the expanded model. The trip tables estimate the trips generated by each traffic analysis zone (TAZ). Trip distribution determines what their origins and destinations are. Base year 1995 traffic volumes were then generated for the region.

The primary purpose of establishing a base year network is to ensure the predictive quality of the modeling effort is adequate. The procedure used to ensure the predictive quality of the modeling effort is adequate is called validation and calibration. The model had been preliminarily calibrated for the Franklin County portion of the network. Further refinements to the model were required with the newly developed TAZ structure for Delaware County and the City of Delaware. Cordon and screen lines were established to further enhance the validation process. The base year traffic volumes resulting from the model were compared against ADT ground counts. The model chain was then adjusted to improve its predictive capabilities. The goal of validation is for the traffic volumes generated by the model to replicate as closely as possible traffic volumes in the field. The final validated 1995 expanded network volumes can be seen in **Figure 20** with a closer view of the City volumes shown in **Figure 21**.

### B. 2020 Existing plus Committed Model Network

Using the validated 1995 data as a starting point, a 2020 model was prepared that includes the existing transportation system along with any new or upgraded roadways that are firmly committed as being in place by in twenty years. All projects that will add capacity to the system and are proposed for construction over the next five years have been identified. This includes road projects which will add pavement width. This 2020 model network is referred to as 'Existing

# MORPC MODELING AREA




MORPC

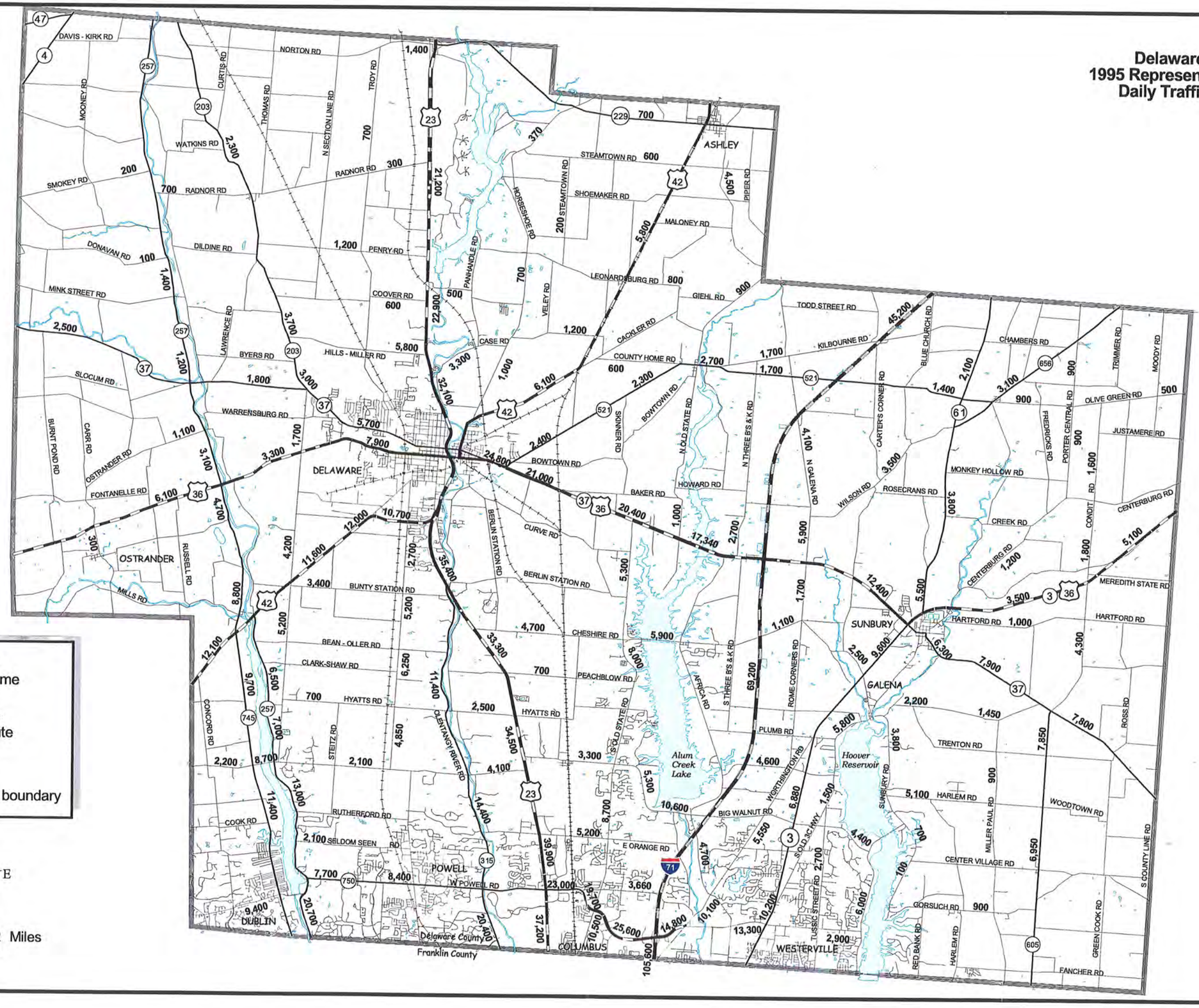
The information shown on this map is compiled from various sources available to us which we believe to be reliable.
n:\arcview\dalis\morpc_plan.apr March 2001

N

0 2 4 Miles

**Figure 19**

# Delaware County
# 1995 Representative Average Daily Traffic Volumes




August 2001

Figure 20

# 1995 Representative Average Daily Traffic Volumes City of Delaware Region

LEGEND
2,300 1995 Volume
Highway
US Route
State Route
Road
Railroad
Municipal boundary

DELAWARE

0 0.5 1 1.5 Miles

N W E S

August 2001

Figure 21

plus Committed' or 'E+C'. For modeling purposes, the assumption is made that future traffic patterns will emulate those occurring in 1995. Travel decisions will continue to be based primarily upon the attractiveness of destinations and travel time. As it is not possible to glimpse into the future and collect traffic ground counts for validating a 2020 network, parameters from the 1995 validated model are transferred to a 2020 expanded file to begin its creation.

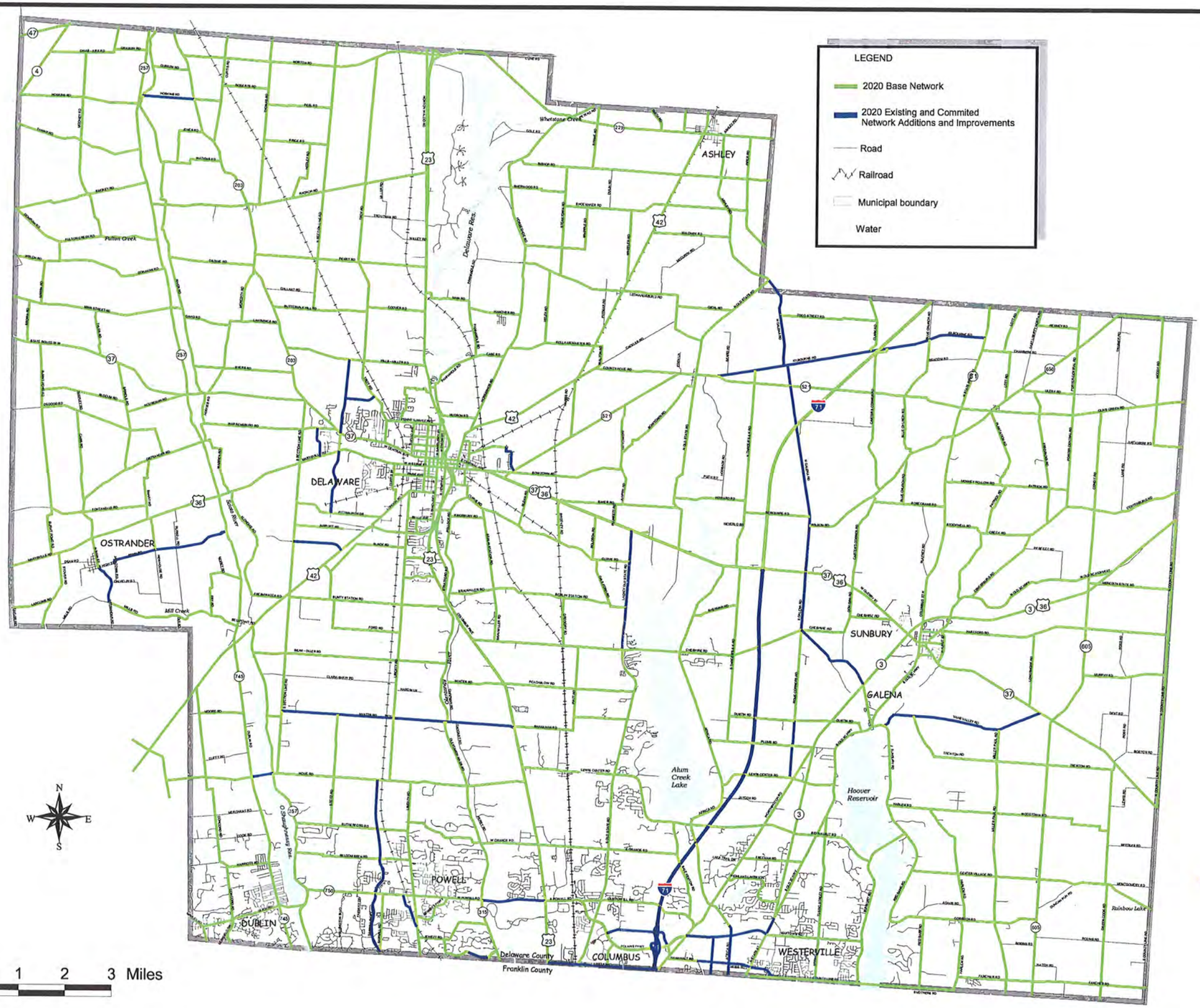
The 2020 E+C model includes, in addition to the 1995 highway network:

- all projects constructed between the years 1996 and 2000 (existing projects)
- all projects identified in the MORPC FY 2000-2003 Transportation Improvement Program (TIP) as having funds committed to them (committed projects)
- other projects identified by Delaware County and City of Delaware officials as having a high likelihood of being constructed between the years 2000 and 2020 (committed projects).

**Figure 22** shows, in a color-coded format, a map of the 2020 Base Existing plus Committed (E+C) Network which includes projects built between 1996 and 2000, as well as projects that are expected to be in place by the year 2020. A list of additional road assumptions included in the development of the E+C model network is contained in **Appendix 4.**

A trip table was created using the 2020 land use projections and was assigned to the 2020 E+C model. The 2020 E+C model network in conjunction with the 2020 trip table generated projected traffic volumes for the region. These 2020 E+C model network volumes are shown in **Figure 23 and Figure 24** for the County and City, respectively. Traffic volumes at five year increments from 2000 to 2020 along with full build out were developed for the City of Delaware area to assist in prioritizing improvements. Maps showing these traffic volumes are contained in **Appendix 4.**

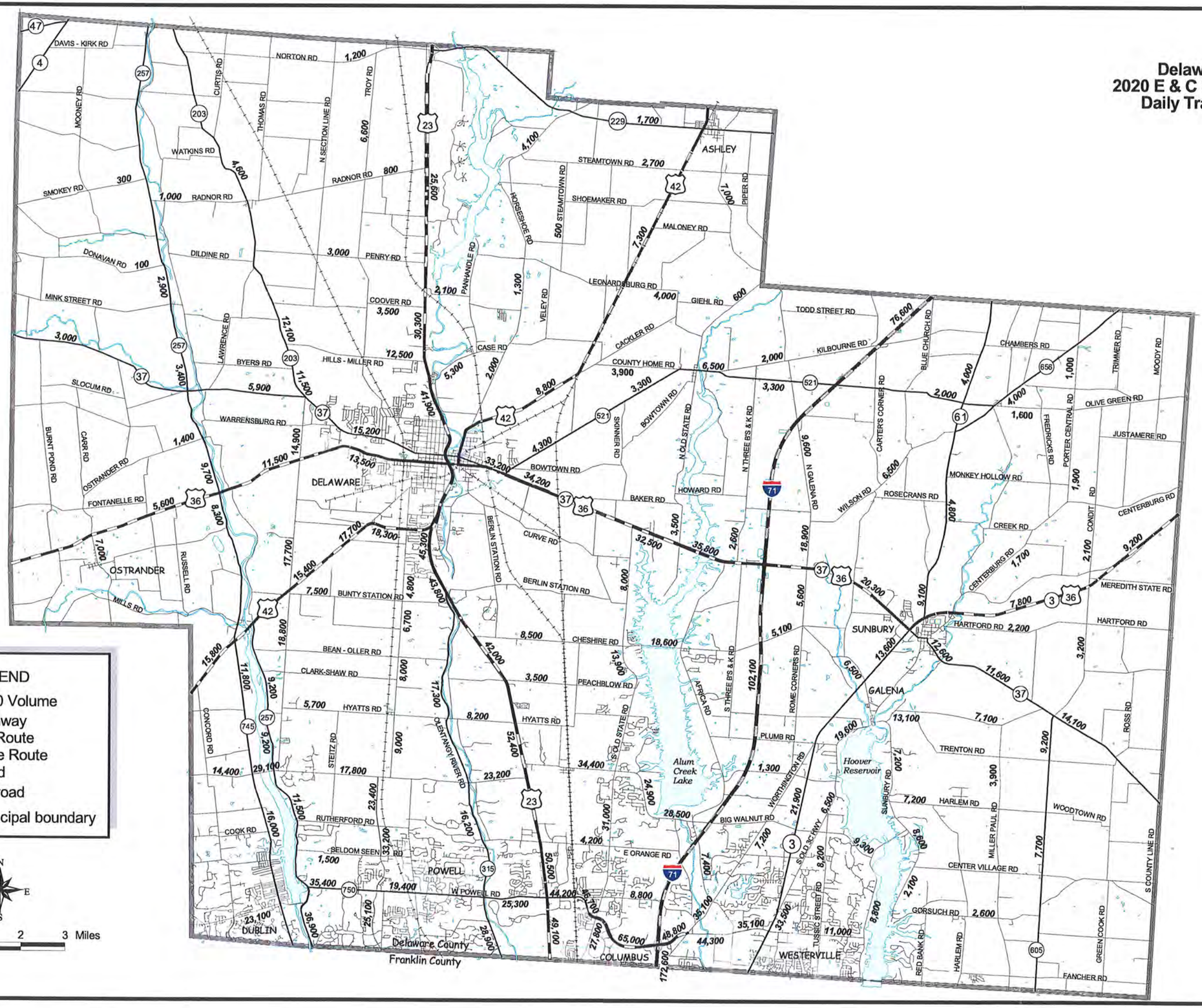
# Delaware County
# 2020 Base
# Existing + Committed
# (E+C) Network




August 2001

**Figure 22**

# Delaware County
# 2020 E & C Network Average
# Daily Traffic Volumes




July 2001

Figure 23

# 2020 E & C Network Average Daily Traffic Volumes City of Delaware Region

LEGEND
4,200 Traffic Volume
US Route
State Route
Road
Railroad
Municipal boundary

0 0.5 1 Miles

N W E S

July 2001

Figure 24

# *Section VIII*

## *Road Network Alternatives*

## VIII. Road Network Alternatives

The information provided by the travel demand model assisted in identifying new road network alternatives. The road network alternatives developed in this planning level study indicate the location of a "corridor" and not a specific roadway alignment. The connection between two roadways and the resultant transportation demand for such a connection is the key issue in thoroughfare planning. A thoroughfare plan is the first step toward planning a future road network to address transportation goals and concerns for a region. Identified roadway connections which address these issues are included in the Thoroughfare Plan. Specific details regarding where or if such a connection is feasible are addressed in subsequent detailed design and alignment studies.

### A. Preliminary Road Network Alternatives

A preliminary set of road network alternatives was identified for both the County and the City based on their vision of future transportation needs. The County road network alternatives were developed to provide improved road continuity, provide additional access to the major arterial and freeway system, and relieve congestion primarily in the southern portion of the County. The City road network alternatives were developed to address concerns such as congestion on downtown streets, high truck percentages on the major routes through town and additional roadways to support the rapidly developing west side of the City. The selection of a set of road network alternatives was a challenge for both agencies due to the number of railroads, reservoirs and rivers extending primarily north south throughout the County, acting as barriers to east-west travel. Some road network additions from the existing Thoroughfare Plan or from comprehensive plans for jurisdictions within Delaware County were included in the preliminary set of alternatives to evaluate whether they were still viable and should be considered for analysis in the revised plan.

The preliminary set of road network alternatives developed for the County and for the City were also correlated with information and plans provided by ODOT, ODNR, City of Columbus and adjacent jurisdictions. To distinguish the originating public agency, the County alternatives are labeled with letters while the City alternatives are labeled with numbers. Alternatives with two corridor options are sub-labeled with a number or letter such as $Q_1$ and $Q_2$. The maps showing the preliminary set of road network alternatives for Delaware County and the City of Delaware are contained in **Appendix 5.**

This preliminary set of County and City alternatives were placed in the 2020 model network one at a time, or singly, to test their affect on the area transportation system. The results of these transportation model runs along with a general assessment of items such as topography, the number of scenic river or railroad crossings, estimate of costs, and major environmental impacts assisted in determining one set of alternatives to study in combination. This information was evaluated with County and City staff, public officials and the City Task Force. Comments were solicited from the public

regarding the alternatives. With this input, a Preliminary Draft Thoroughfare Plan, was developed combining both the City and County alternatives, with compromises made where overlaps in network additions occurred. For example, the preliminary set of alternatives chosen by the City of Delaware included connections north of the City limits which were curvilinear, connecting US 36/SR 37 east of town to US 23 and to South Section Line Road west of town, creating a northern City "bypass" of sorts. Two cross county road network additions, one north-south and one east-west, were included in the County's set of preliminary alternatives which provided the same connections as the City's curvilinear network choices, but in a regional grid layout. It was mutually agreed that a grid network was preferable to a curvilinear network in providing the continuity and safety desired by the City and County while meeting the same transportation needs. In the northwest quadrant of the City, Alternatives Y and G, the extension of Mink Street Road to County Home Road and the connection of South Section Line Road to North Section Line Road, respectively, were therefore chosen for further study in the combined model network. Alternative 5 on the northeast side of the City was also changed to a grid layout.

The extension of Sawmill Parkway north to connect with US 42 south of the City of Delaware is labeled on the Preliminary Draft Thoroughfare Plan map with both a letter and a number, Alternative E/2, as it is an important connection considered by both the County and the City in their respective sets of preliminary road networks. This alternative was also included in the previous Southern Delaware Thoroughfare Plan and has already been constructed north of Powell Road and expected to be constructed to connect with Home Road by the year 2002. Sawmill Parkway, when completed, will provide a much needed north south route connecting Franklin County and southern Delaware County with the City of Delaware. The connection of South Section Line Road and North Section Line Road proposed as Alternative G will further connect this route with the north region of Delaware County and with Marion County.

Choices were also made where more than one option was studied for a road network connection. The alignment of Home Road and Lewis Center Road at US 23 is an example of an alternative which acquired two options as a result of public suggestion. A connection from Home Road east from US 23, connecting with Lewis Center Road east of the railroad tracks was studied along with an option extending from Home Road at US 23 east to Big Walnut Road at its intersection with Lewis Center Road. As the transportation model results were similar for both options, the route which connected with Lewis Center Road just east of the railroad was chosen for further study as it was shorter and had less impact on existing structures and the environment. However, as with any proposed road network addition included in this Thoroughfare Plan, all possible alignments will be evaluated in the future, including both of these options, as part of the corridor study for this connection.

The Home Road and Lewis Center Road alignment, when implemented in the future, will provide a much needed east west route in the south region of Delaware County. This route also extends west into Union County connecting with State Route 4 and east into Licking County connecting with US 62 and SR 37 via Duncan Plains Road. Two options were considered as part of the preliminary road network set to further improve the connectivity and regional merit of this cross county route: Alternative T, which adds a shorter connection from the existing Sunbury Road bridge over the Hoover Reservoir to Harlem Road; and Alternative U, a new bridge over the Hoover Reservoir which provides a direct connection between Big Walnut Road and Center Village Road, allowing a straight route from Union County to Licking County across the southern region of Delaware. The transportation model results showed that the more attractive option was Alternative U due to the direct connection between Lewis Center Road, Big Walnut Road and US 62, a major route highly used by commuters to Delaware and Franklin County. This option, by this direct connection, also reduces the number of turns and potential conflict points necessary to obtain access to these major routes. Although the implementation of Alternative U would involve considerable expense due to the construction of a new bridge over the Hoover Reservoir, in the interest of good transportation planning and due to its considerable regional merit, this alternative was retained for further study as part of the preliminary draft Delaware Thoroughfare Plan.

Prior to making the final decision regarding one set of alternatives for further study in the combined model network, other alternatives were explored in the area of the City of Delaware due to concerns with congestion on Central Avenue (SR 37) and William Street (US 36) from the Point through downtown. This included a review of the feasibility of a one-way pair option for Central Avenue and William Street west of the Point. The transportation model used to develop the Thoroughfare Plan is a regional planning implement. The study of the one way pair option requires more detailed analysis of traffic patterns and turning movements at intersections which is better evaluated with other engineering tools. It was therefore recommended, and the City is pursuing, a separate detailed study of the practicality of the one way pair as an option to improving traffic flow on downtown City of Delaware streets.

After much discussion, careful thought, and review of public officials and citizen comments, a network of alternatives was jointly agreed upon as meriting further study and placement in the transportation model in combination. Summaries of the model results for each of the County and City preliminary road network alternatives and map are contained in **Appendix 5**.

## B. Final Road Network Alternatives

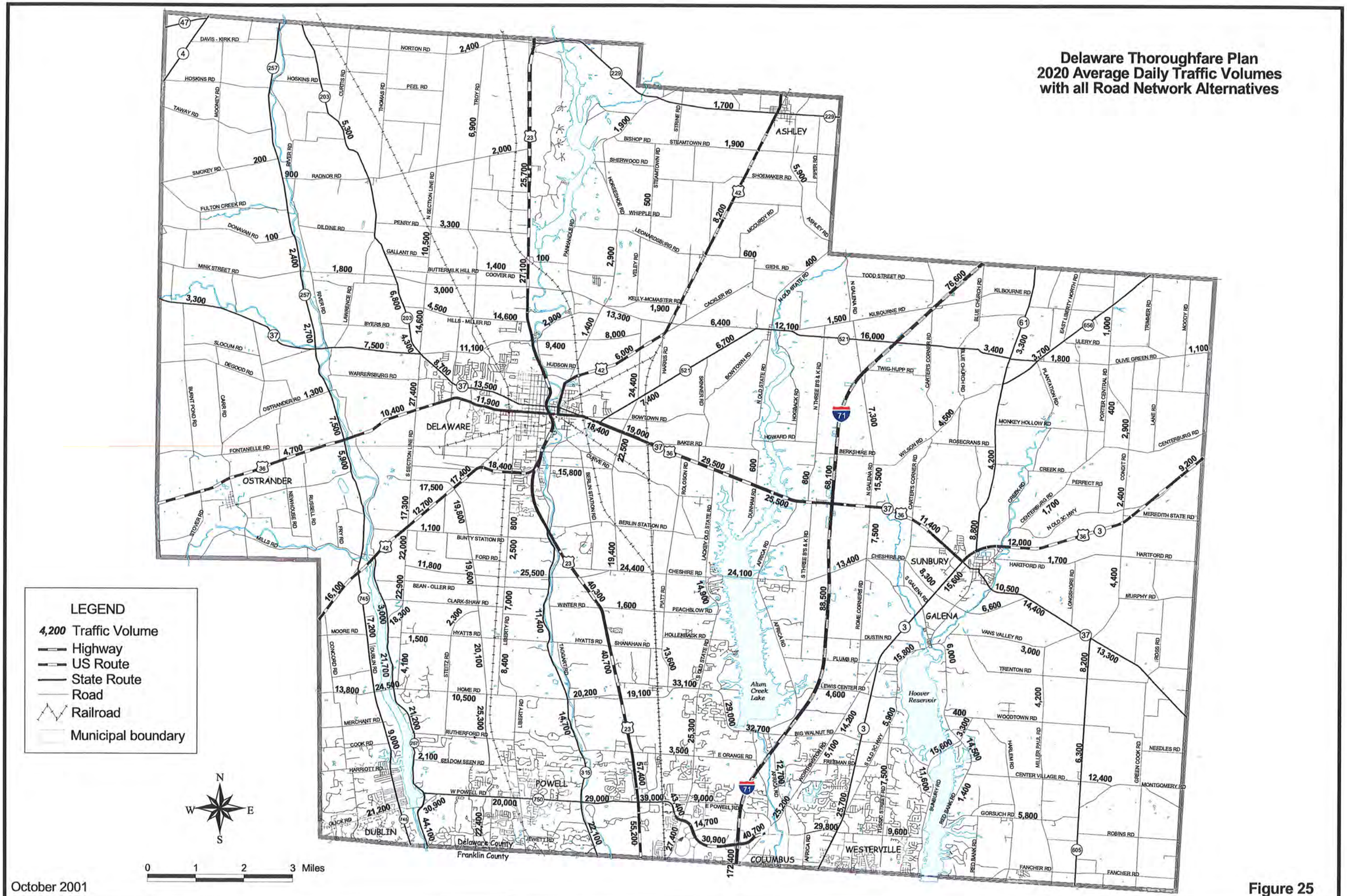
The alternatives suggested for further study as the preliminary draft Thoroughfare Plan were placed in the transportation model together to determine their combined affect on the County and City transportation system. A review of the model results

shows that the set of alternatives suggested for further study, when placed in the 2020 model together or in 'combination', perform as desired to meet City transportation goals and objectives. Traffic is redistributed due to the inclusion of the alternatives which improve existing or create continuous arterial roadways, providing relief to congested areas. The new I 71 interchange alternatives added to the model reduce traffic volumes at the already overburdened US 36/SR 37 and Polaris Parkway interchanges. Volumes on City streets are reduced with all alternatives in place, with the exception of Central Avenue and William Street in the downtown area between Elizabeth Street and Sandusky Street. This downtown area continues to attract local trips even with the addition of new roadways. The section of Central Avenue (SR 37) and William Street (US 36) between US 23 and the Point, an area of concern for the City, experiences a significant decrease in traffic volumes with all the road network alternatives in place. A more complete summary of the combined model network results is contained in **Appendix 5.** The 2020 Average Daily Traffic Volumes projected to occur in Delaware County with all alternatives added to the transportation network is shown in **Figure 25** with a closer view of the City of Delaware region shown in **Figure 26.**

All alternatives studied in the combined model network are recommended as remaining in the Delaware Thoroughfare Plan with the exception of Alternative A and Alternative P. As Alternative A, the connection of Manning Parkway to Churchill Drive, is a subdivision minor collector road, it is suited for inclusion in the Liberty Township Comprehensive Plan and is recommended not to be included in the Draft Delaware Thoroughfare Plan.

Alternative P, the addition of an interchange with I 71 at the proposed Cheshire Road extension east from South 3 B's & K Road, or Alternative N, was one of three new interchanges evaluated in the combined model network. Big Walnut Road and SR 521 were the other two I 71 interchange locations analyzed. There are two existing interchanges with I 71 in Delaware County: one in the south County area near the Franklin County Line at Polaris Parkway and one in the central County area at US 36/SR 37. Both experience congestion today and are projected to continue experiencing congestion in 2020 without instituting methods to reduce traffic volumes. The potential shown by the transportation model for the addition of the I71 & Big Walnut Road interchange to assist in alleviating congestion at the Polaris Parkway & I 71 interchange and provide alternate access to the interstate system in the rapidly growing south County area place this alternative high on the County's priority list of transportation improvement projects. The SR 521 location adds an interchange to I 71 in the north area of the County which is lacking convenient access to the interstate system. From a practical standpoint, due to costs and the existing and projected area land development, the proposed interchange at Cheshire Road is low on the priority list for improvement projects out of the three interchange locations proposed as part of the preliminary road network additions for the Delaware

# Delaware Thoroughfare Plan
# 2020 Average Daily Traffic Volumes
# with all Road Network Alternatives




October 2001

**Figure 25**

# 2020 Average Daily Traffic Volumes with all Alternatives City of Delaware Region

LEGEND
- 4,200 2020 Volume
- US Route
- State Route
- Road
- Railroad
- Water
- Municipal boundary

0 0.5 1 Miles

N W E S

October 2001

Figure 26

Thoroughfare Plan. In addition, the combined transportation model results show that, without the inclusion of the interchange, the extension of Cheshire Road, or Alternative N, continues to provide a reduction in traffic volumes on US 36/SR 37 and on its northbound diverge and southbound merge ramps. This is due to its attraction as an alternative continuous east west route in relatively close proximity to US 36/SR 37. Given this assessment, it was jointly agreed not to include Alternative P, the Cheshire interchange, as part of the Delaware Thoroughfare Plan at this time. However, this alternative should be considered in the future if land development patterns change significantly.

Alternative N was shown in the preliminary and combined set of road network additions as extending Cheshire Road east from South 3 B's & K Road to provide a more equidistant location between the two existing interchanges with I 71 in Delaware County for the proposed Alternative P, Cheshire Road interchange. Since the Cheshire Road interchange has been removed from the Thoroughfare Plan at this time, a connection requiring less new road construction and utilizing more existing routes was considered and evaluated in the combined transportation model network. As this connection provided similar traffic reductions and regional connectivity as the initially evaluated extension from South 3 B's & K Road, this option for Alternative N was included in the Delaware Thoroughfare Plan.

Alternative U provides a bridge over the Hoover Reservoir connecting Big Walnut Road to Center Village Road to allow a continuous east-west major arterial highway from Union County across into Licking County in the southern region of Delaware County. The results of the combined model network indicate a strong need for such a direct connection from the west to east side of the reservoir. However, it is understood there are difficulties involved in establishing such a crossing. Agreements would be required with City of Columbus, owner of the reservoir property in this region, along with the high project costs, impacts to existing structures and to the environment. Harlem Township, located on the east side of the Reservoir, at the particular time of this Thoroughfare Plan update, is not developing rapidly and is primarily farmland interspersed with single family homes. Given these difficulties and the existing and projected land development in the region, it was jointly decided to remove Alternative U, the Hoover Reservoir crossing, from the Delaware Thoroughfare Plan at this time. Given that the transportation model indicated a strong need for a continuous east west route in this region, future revisions or updates to the Delaware Thoroughfare Plan should include a reassessment of this alternative as land development patterns may change and alter area transportation needs. Given the removal of Alternative U from the network, it was mutually decided to re-enter Alternative T, which adds a shorter connection east from the existing Sunbury Road bridge over the Hoover Reservoir to Harlem Road in the Thoroughfare Plan network. This alternative reduces the turning movements and number of conflict points required when connecting with Harlem Road. It was studied as an option to

Alternative U in the set of preliminary road network alternatives. It was also included in the previous Southern Delaware Thoroughfare Plan and some right-of-way has already been purchased for its implementation.

In the northeast quadrant of the City of Delaware, the combination of the Alternative 5 grid network with Alternative Y, the SR 521 Cross County connection and Alternative 4 + 13, the extension of Pennsylvania Avenue with the modification of the US 23 interchange offer options for commuter and local trips other than the US 36/SR 37 route through the Point and onto US 23. Traffic volumes on Lake Street (US 42) between Central Avenue and the City limits decrease and traffic volumes on Central Avenue and William Street between US 23 and the Point are projected to reduce substantially with all proposed alternatives in place. The Alternative 5 grid utilizes the existing Panhandle Road bridge, one of two bridges over the Olentangy River north of the City of Delaware.

The northwest quadrant is the most rapidly developing area of the City of Delaware. Commercial and residential units are filling in available space west of US 23 to SR 203, north of Central Avenue. Alternative 6 and 7, which provide an east west link between Section Line Road and US 23 north of Pennsylvania Avenue, along with the connection of South Section Line Road to North Section Line Road (County Alternative G) provide nearby routes other than the downtown streets for local and commuter trips on the northwest side of town. With these alternatives and the other alternatives included in the network model, average daily traffic volumes decrease on roads in the northwest area of town. Average daily traffic volumes on Troy Road, Executive Boulevard and Pinecrest Drive are projected to decrease with the alternatives added to the 2020 road network. Average daily traffic volumes on Hills-Miller Road with all alternatives in place are also projected to decrease.

Development in the City of Delaware will proceed at the slowest pace in the southwest quadrant, according to land use projections. Future plans for the southwest area include expansion of the industrial park south of William Street and east of Section Line Road which places importance on access to major arterial roads. Alternative E/2, the Sawmill Parkway extension, the Alternative 1 connection to US 23, and Alternative G, the connection of South Section Line to North Section Line Road all affect traffic patterns in this quadrant of the City. Houk Road and its planned extension south to Pittsburgh Drive provides access to William Street (US 36) and Central Avenue (SR 37) to the north. In general, traffic decreases on existing roads in the southwest area of the City with the inclusion of all alternatives. Average daily traffic volumes on Pittsburgh Drive, London Road and US 42 are projected to decrease with all alternatives in place in 2020. Traffic volume on Central Avenue and William Street are projected decrease between Houk Road and Elizabeth Street. Trips on Sandusky Street south of William Street and on Curtis Street are not projected to significantly change with the network additions in place in 2020. The

2020 ADT projected for Houk Road is projected to decrease due to the inclusion of Alternative 9, which provides and additional link between William Street and Central Avenue.

The southeast quadrant of the City of Delaware, east of US 23 and south of William Street (US 36) is projected to develop with a mix of commercial and residential uses. This region, when compared with other areas of the City, is projected to develop last. The southeast quadrant of the City of Delaware lacks direct north south routes to provide access to US 36/SR 37. It also lacks direct east west routes between US 23 and other north south arterials such as Lackey Old State Road. Development of east west routes in this region will be difficult due to the location of the Olentangy River, the area terrain, and the presence of two north south railroad lines. Alternative 3. The extension of Glenn Road, is a north south route proposed in this quadrant to provide a link between Cheshire Road and US 36/SR 37, connecting to Alternative 5 north of US 36/SR 37 and adding a much needed continuous route to the road system on the east side of town.

It has been emphasized that each of the road network additions, or alternatives, are shown as a line on the Thoroughfare Plan maps but actually represent a corridor, or area of study for a future road alignment. The corridor for Alternative 1, which represents an east west connection in the southern region of the City of Delaware, received extra review during the modeling analysis phase of this project due to the physical constraints associated with its corridor. There have been various groups in the County attending public meetings for the Delaware Thoroughfare Plan expressing concerns with the study area for this corridor. Issues such as terrain, the location of the Olentangy River, the presence of two north south railroad lines, ecological concerns, historic structures, the location of existing roadways and intersections all make planning a new road in this region difficult. Modeling efforts to assess the need for a connection in this area included locating a potential connector north of and south of the US 23 & SR 315/Stratford Road. Other options examined were an extension east from the US 42 & US 23 intersection, and an extension east from Olentangy Avenue. The result of all these analyses show a need for a connection west from US 42 and South Section Line Road, continuing east across US 23 to provide a route which also allows a link with a north south route connecting to US 36/SR 37 east of the City, such as is proposed by Alternative 3, the Glenn Road extension. The additional model analyses show that a connection south of the intersection of US 23 & SR 315 provides transportation results similar to a connection north of the US 23 & SR 315 intersection.

The 2020 combined model results show the extension of US 42 east (Alternative 16) to the Glenn Road extension (Alternative 3) attracts a significant share of trips, but it does not replace the need for a transportation corridor just south of the existing City limits, as represented by Alternative 1. As Alternative 16 the connection of US 42

east from US 23 to the extension of Glenn Road, was shown to have merit in providing an additional east west route south of, but closer to, the City of Delaware limits, it is included in the Delaware Thoroughfare Plan to insure its future evaluation as a possible network addition. The 2020 combined model results further show that, to aid in improving rather than negatively impacting the key intersection of US 23 & SR 315/Stratford Road, the Alternative 1 connector should extend east from US 23, providing a connection to Alternative 3, the north south route connecting to Glenn Road. The Alternative 1 connection, if extended east past US 23 as recommended, would work in combination with the north south connection to US 36/SR 37 provided by Alternative 3 to route traffic around the Point, allowing options to travel on US 23 and US 36 through the City of Delaware. It would also provide an east west route south of the City of Delaware, supporting the planned expansion of the industrial park, reducing vehicles in general utilizing existing Bunty Station Road and lowering future traffic volumes on Ford Road, Bean-Oller Road, Clark-Shaw Road and Hyatts Road.

It should be noted that the need for a corridor south of the City of Delaware as represented by Alternative 1 is not a new idea. A similar corridor was included in the Southern Delaware Thoroughfare Plan adopted in 1988. It was seen back then that the development of continuous east west routes is important to the regional transportation network. This is because, over time, the road system that has developed in Delaware County has been oriented to travel to and from the City of Delaware and to and from Franklin County. Road systems that do not serve these destinations are comparatively underdeveloped. With a few exceptions, this is especially true of roads crossing the Olentangy and other rivers, streams, and railroads. As development patterns change in the county, so are travel patterns. Many travelers are seeking work, shopping and other opportunities that are either east or west of them. As the current development patterns continue, the desire for east-west travel will increase. Even travelers whose primary direction of travel is north or south often need to make a portion of their journey east or west to reach the best north-south route to complete their trip. The Delaware Thoroughfare Plan includes as many east-west routes as possible to facilitate this increasingly important component of Delaware County travel. In particular, Alternatives 1, J, and Y facilitate this type of travel.

Throughout the public involvement process for the Delaware Thoroughfare Plan, there has been discussion and some controversy regarding the possibility of the east west corridors included in the Plan crossing the Olentangy, a state scenic river. The ODNR has indicated its position is not to support new river crossings over the Olentangy scenic corridor. The ODNR position is understood and respected, but roadways that are valuable to the efficiency of the County transportation system should not be discarded without sufficient study that would investigate ways to minimize and mitigate any adverse affects created by potential alignments the alternatives might take. For instance in Alternative Y, it may be possible to make use

of the Main Street bridge or to combine it in some way with Alternative 5. In the case of Alternative 1, the study area includes areas within the City of Delaware, where river crossings are not subject to ODNR approval. These are issues which will be studied in detail during step two, the corridor study phase of roadway planning. It is felt that the ODNR position does not entirely close the door on the possibility for future river crossings if it shows a strong transportation need. The ODNR position may change in the future and mitigative measures may be possible as development increases and more detailed information provided by corridor studies regarding options for alignments become available. In addition, the Delaware Thoroughfare Plan, as the Southern Delaware Thoroughfare Plan from 1987 is now being re-evaluated, will undergo adjustment every 5 or 10 years as conditions change, allowing a continual reassessment of each alternative and its importance to the County road network.

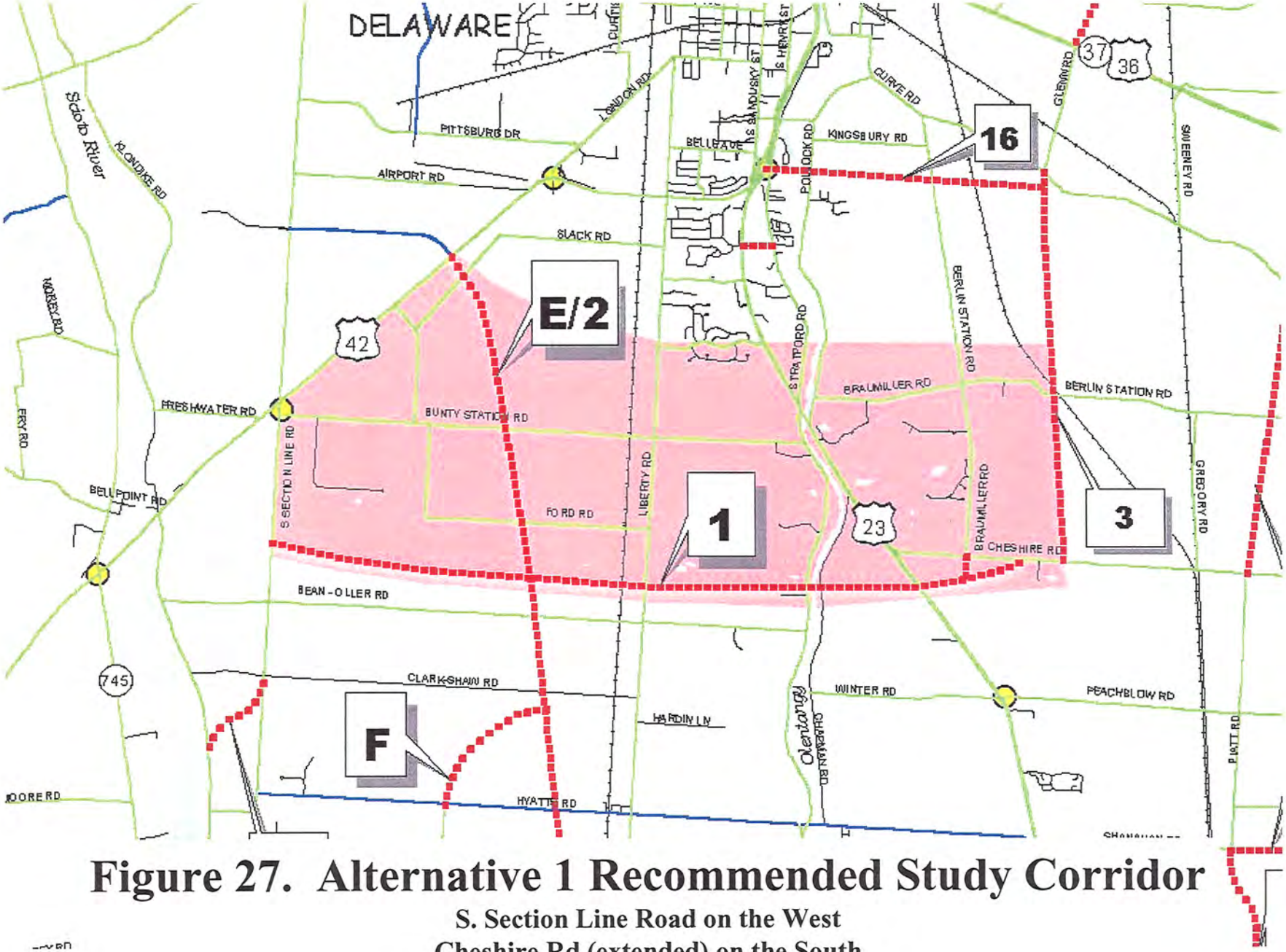
At the September 27, 2001 meeting of the Delaware County Regional Planning Commission, the Delaware Thoroughfare Plan was adopted with a modification to Alternative 1 which removed the portion from the Plan that lies between South Section Line Road and US 42. An additional modification included in the text of the motion for adoption recommends sequencing the initiation of Alternative 16, the extension of US 42 to the extension of Glenn Road, prior to the completion of Alternative 1, the Cheshire Road extension to South Section Line Road. Both of these modifications were made to address concerns about Alternative 1 being a route for "cut-through" traffic from US 42. At their November 12, 2001 meeting, the Delaware City Council adopted the Delaware Thoroughfare Plan map with the portion of Alternative 1 that lies between South Section Line Road and US 42 removed, as adopted by the Delaware County Regional Planning Commission and the Delaware County Commissioners. However, the Delaware City Council did not specify or approve sequencing of alternatives as part of their adoption of the Delaware Thoroughfare Plan map. The Delaware Thoroughfare Plan document will be adopted at a separate meeting.

The removal of the section of Alternative 1 between US 42 and South Section Line Road does not diminish the need for an east west connector in the region of Delaware County south of the City of Delaware, based on the 2020 combined model results without the inclusion of this section of Alternative 1. Trips continue to be attracted to Alternative 1 and the volumes projected for this Alternative between South Section Line Road and US 23 do not significantly change from those projected with the segment in the model from US 42 to South Section Line Road. The 2020 combined model results indicate that the majority of trips projected to utilize Alternative 1 are primarily local trips accessing major north south routes in Delaware County not only from Liberty Township but from northwest of the City of Delaware and from southern Delaware County. Without the section of Alternative 1 between US 42 and South Section Line Road, trips do shift to Bean-Oller Road and Clark Shaw Road as

they provide alternate connections between US 42, South Section Line Road and the extension of Sawmill Parkway immediately south of Alternative 1. However, the traffic volumes projected for 2020 on these two roadways will not significantly change from what was projected for the existing plus committed 2020 transportation network, which is well within the capacity of a two-lane roadway. The exception to this is the section of Bean-Oller Road between SR 257 and South Section Line Road, which is projected to increase in volume when compared with the 2020 existing plus committed network, but will also operate well within the capacity for a two lane roadway. Traffic volumes on US 42 just north of SR 257 are projected to decrease slightly without the Alternative 1 connection between US 42 and South Section Line Road in the model network. The remainder of the roadways in the transportation network are projected to experience no significant change in volume with the removal of the Alternative 1 connection between US 42 and South Section Line Road. In summation, the removal of the section of the Alternative 1 connector between US 42 and South Section Line Road is not projected to significantly affect the County transportation network and does not diminish the need for an east west connector south of the City of Delaware.

The recommended study area for Alternative 1 is shown in **Figure 27.** The recommended Delaware Thoroughfare Plan, shown in **Figure 28 and Figure 29,** includes a line representing the study corridor for Alternative 1 which extends from Cheshire Road to US 42. This line was chosen to represent the connection corridor on the Delaware Thoroughfare Plan maps due to its regional merit. An existing bridge over Alum Creek Lake allows Cheshire Road to extend east from US 23 to the Sunbury and Galena area with the potential to connect to SR 37 on the east side of the County if it is further extended as shown by Alternative N.

It should be noted that the alignments studied for the Alternative 1 corridor as part of the Thoroughfare Plan and others will be revisited and studied in detail as part of Step Two in road planning, the Corridor Study. An amendment to the motion to adopt the Delaware Thoroughfare Plan was made and approved at the September 27, 2001 Regional Planning Commission meeting which noted the need for future detailed study of the corridors included in the Delaware Thoroughfare Plan. Public input will continue to be sought, and, in particular, the concerns of the officials and constituents of Liberty Township and the Delaware County RPC regarding the Alternative 1 connector will be taken into account during the Corridor Study phase of road planning as per the amended motion for approval of the Thoroughfare Plan passed by the RPC September 27, 2001. It is recommended that Delaware County and the City of Delaware conduct a corridor study as soon as possible to determine the constraints associated with an alignment for Alternative 1.




# Figure 27. Alternative 1 Recommended Study Corridor

**S. Section Line Road on the West**
**Cheshire Rd (extended) on the South**
**Glenn Rd/Alternative 3 on the East**
**Hawthorn Blvd (extended) on the North**

# Delaware Thoroughfare Plan

LEGEND
- New Road *
- 2020 Base Network
- 1996-2000 Existing and Commited Network Additions and Improvements
- 2020 Existing and Commited Network Additions and Improvements
- Committed Signal/ Intersection Improvement
- 1996-2000 New Signal/ Intersection Improvement
- Proposed Interchange
- Road
- Railroad
- Water
- Municipal boundary

* New roads are conceptual and shown for planning purposes only. Specific alignments will be determined in future studies.

Please see:
City of Delaware Region for detailed Alternative 1 study area map

0 1 2 3 Miles

August 2001

## 2020 County Road Network Alternatives

B. Extension of Glick Road east from SR 257 to connect with Powell Road west of Wellington Boulevard.

C. Relocate Liberty Road north of Home Road southeast to align with Liberty Road south of Home Road.

E. Extension of Sawmill Parkway from Home Road north past Bunty Station Road, continuing northwest to intersect with US 42 between Owen-Fraley Road and Slack Road.

F. Extension of Steitz Road north from Hyatts Road to connect with the extension of Sawmill Parkway (Alternative E/2) between Hyatts Road and Clark-Shaw Road.

G. Extension of South Section Line Road north from SR 37 to align with North Section Line Road at Buttermilk Hill Road and a connection between South Section Line Road and SR 257 south of Bean-Oller Road.

J. Extension of Home Road east from US 23, crossing the railroad tracks and connecting to Lewis Center Road east of Lewis Center and west of South Old State Road.

K. Extension of Piatt Road north from Cheshire Road to align with Roloson Road at Curve Road and extension of Piatt Road south from Shanahan Road, intersecting Lewis Center Road east of the the railroad.

M. New interchange with IR 71 at Big Walnut Road.

N. Extension of Cheshire Road east from Domigan Road, intersecting SR 3 between Sunbury and Galena, and continuing east to connect with SR37 between Walnut Road and and Longshore Road.

Q. Realignment of SR 605 northwest from Centerburg Road connecting with Porter Central Road south of Olive Green Road.

R. Extension of Cleveland Avenue north from Maxtown Road to connect with Worthington Road.

S. Extension of Rome Corners Road south to connect with Worthington Road.

T. Extension of Sunbury Road from Red Banks Road, east of Hoover Reservoir, northeast to connect with Harlem Road.

V. Extension of Fancher Road from Harlem Road southwest to Smothers Road.

X. New Interchange at IR 71 and SR 521.

Y. Extension of Mink Street from River Road east to County Home Road at its intersection with US 42 and a new interchange at IR 71 and SR 521.

Z. Extension of Shanahan Road from Piatt Road to South Old State Road.

## 2020 City Road Network Alternatives

1 East/west connector road beginning at South Section Line Road, connecting with Cheshire Road at its intersection with US 23.

2 Extension of Sawmill Parkway from Home Road north to US 42.

3 Connector road extending from the intersection of Glenn Road and Curve Road south to Cheshire Road.

4 Extension of Pennsylvania Avenue east from US 23 to the intersection of US 42 and Horseshoe Road.

5 North/south route extending from the intersection of Alternative Y between Horseshoe Road and US 42 south to intersect with US 36/SR37 at Glenn Road and the extension of Panhandle Road east to connect with the north/south route between Horseshoe Road and US 42.

6 East/west connector road from the existing intersection of SR 37/SR 203 and South Section Line Road east to the committed Houk Road extension.

7 Extension of the committed connector road between Houk Road & Troy Road east to align with the existing intersection of US 23 & Panhandle Road.

8 Extension of River Oaks Drive west from Stratford Road, aligning with the intersection of US 23 & Cottswold Drive.

9 Extension of Lexington Boulevard south to US 36.

13 Modification of the US 23 & Pennsylvania Avenue interchange to provide for all the movements.

16 Extension of US 42 east from US 23 to Alternative 3, the extension of Glenn Road.

Figure 28

# Delaware Thoroughfare Plan
# City of Delaware Region

**2020 City Road Network Alternatives**

1 East/west connector road beginning at South Section Line Road, connecting with Cheshire Road at its intersection with US 23.

2 Extension of Sawmill Parkway from Home Road north to US 42.

3 Connector road extending from the intersection of Glenn Road and Curve Road south to Cheshire Road.

4 Extension of Pennsylvania Avenue east from US 23 to the intersection of US 42 & Horseshoe Road.

5 North/south route extending from the intersection of Alternative Y between Horseshoe Road and US 42 south to intersect with US 36/SR37 at Glenn Road and the extension of Panhandle Road east to connect with the north/south route between Horseshoe Road and US 42.

6 East/west connector road from the existing intersection of SR 37/SR 203 & South Section Line Road east to the committed Houk Road extension.

7 Extension of the committed connector road between Houk Road & Troy Road east to align with the existing intersection of US 23 & Panhandle Road.

8 Extension of River Oaks Drive west from Stratford Road, aligning with the intersection of US 23 and Cottswold Drive.

9 Extension of Lexington Boulevard south to US 36.

13 Modification of the US 23 & Pennsylvania Avenue interchange to provide for all the movements.

16 Extension of US 42 east from US 23 to Alternative 3, the extension of Glenn Road.

LEGEND

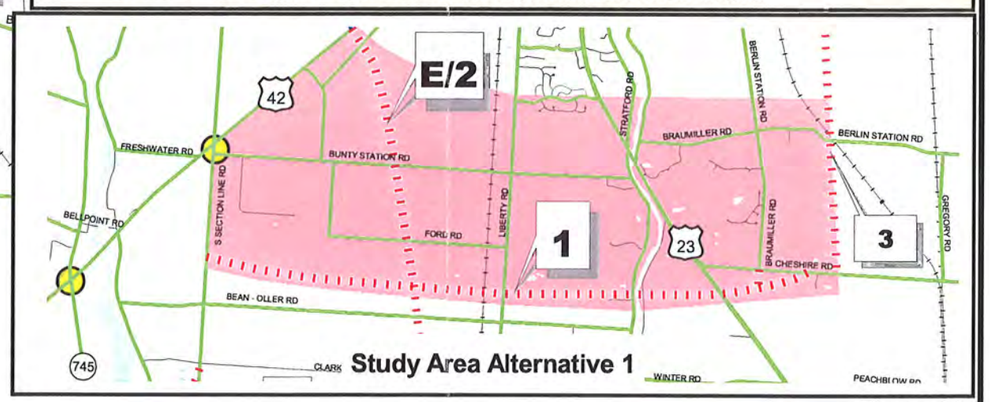
- New Road *
- 2020 Base Network
- 2020 Existing and Committed Network Additions and Improvements

* *New roads are conceptual and shown for planning purposes only. Specific alignments will be determined in future studies.*

- Committed Signal/ Intersection Improvement
- Proposed Interchange
- Road
- Railroad
- Water
- Municipal boundary

0 0.5 1 1.5 Miles

N W E S




**Study Area Alternative 1**

Figure 29

# *Section IX*

## *Functional Classification*

## IX. Functional Classification

The classification of roadways based on their function and purpose is the most fundamental and essential element of a thoroughfare plan. Functional classifications were assigned to the County's roadway system, both existing and proposed, as part of the Delaware Thoroughfare Plan update. This classification system is the foundation for any right of way, design or policy guidelines that are included in the Thoroughfare Plan. Establishing the classification of the roadways may also elicit future discussion between public agencies in regards to routes included in the county or township system. For instance, some roadways, which are now considered township routes, may, due to their existing connectivity or a future road project, better serve as a county route.

Generally, roads are grouped into three major categories depending on the function they serve: local, collector and arterial.

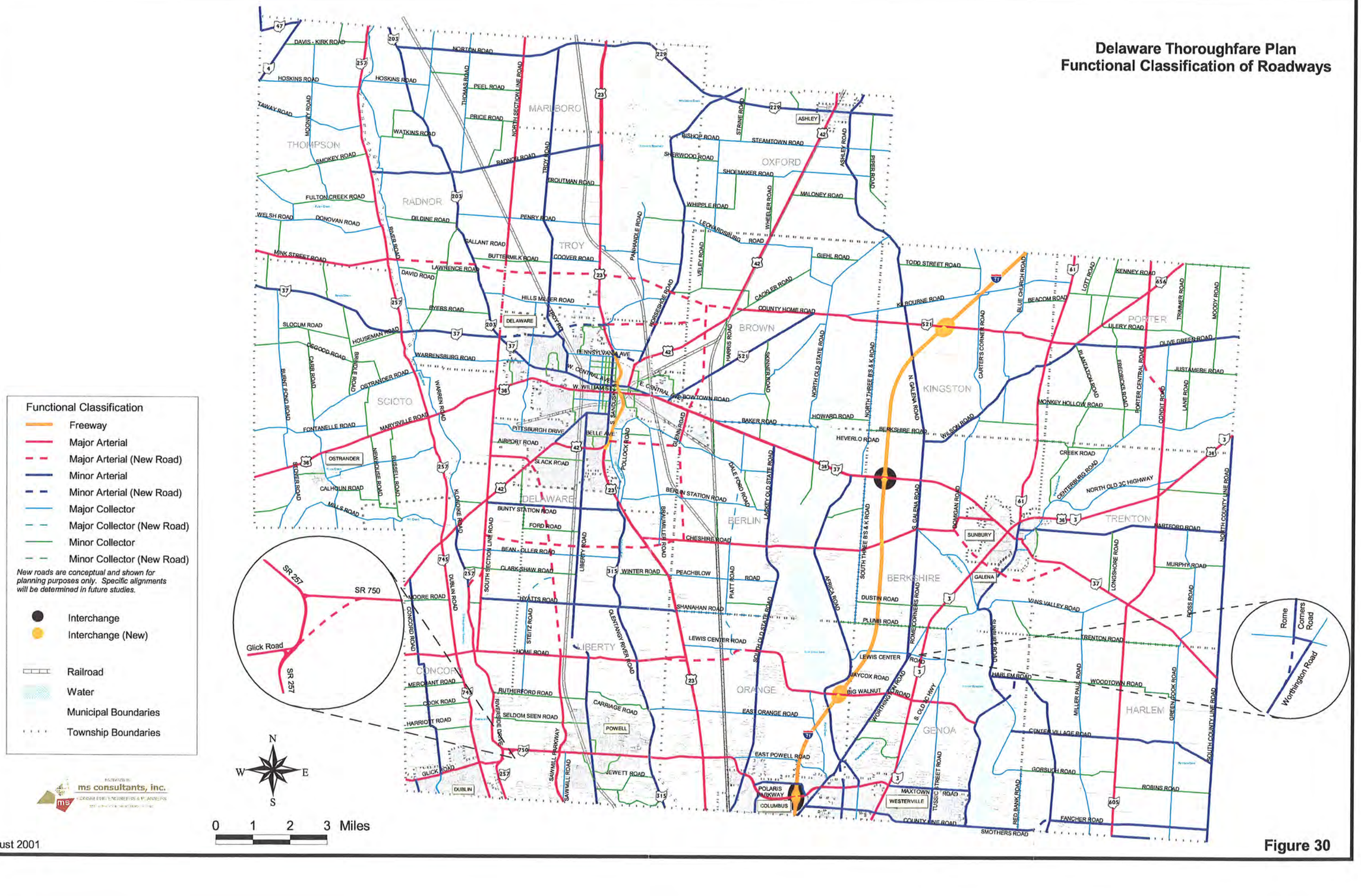
***Local streets*** are low traffic volumes roadways serving local access needs with little or no through traffic. They generally serve lower traffic density residential, industrial and commercial areas but are most commonly associated with residential neighborhoods.

***Collector roads*** link local streets with the arterial street system. Collector roadways are intermediate volume roadways which carry through traffic in addition to providing for local access needs. The through traffic movement on collector roads is for moderate to short distances. Collector roads serve as a conduit between local streets and the arterials. Collector roadways are subdivided into major collectors and minor collectors.

***Arterial roads*** carry the heaviest traffic volumes for the longest distances at the highest speeds. Their primary function is to provide for through movement of vehicles, not to provide access to adjacent properties. The arterial classification is further subdivided into freeways, major arterials, and minor arterials which identifies the level of control of access to the roadway.

Functional classifications were assigned to Delaware County and City of Delaware roadways based upon their regional significance and not necessarily upon existing or projected traffic volumes. For example, Home Road and Lewis Center Road, with their planned realignment at US 23, connection to Big Walnut Road and, potentially, Center Village Road, links Delaware County with Union County to the west and Licking County to the East. Such a cross county roadway is assigned with a major arterial roadway functional classification. **Figure 30** shows the proposed functional classifications for the roadways in Delaware County. **Figure 31** shows a closer view of the proposed functional classifications for roadways in the City of Delaware. **Appendix 6** contains a summary of the Delaware County and City of Delaware roadways listed by functional classification in alphabetical order. This list also includes an inventory of the 1995 and 2020 E+C traffic

# Delaware Thoroughfare Plan
# Functional Classification of Roadways




Prepared by: ms consultants, inc.

August 2001

**Figure 30**

# Delaware Thoroughfare Plan
## Functional Classification of Roadways
## City of Delaware Region

BUTTERMILK ROAD
COOVER ROAD
LAWRENCE ROAD
DAVID ROAD
HILLS MILLER ROAD
BYERS ROAD
TROY RD
HORSESHOE ROAD
VELEY R
CACKLER ROAD
COUNTY HOME ROAD
HARRIS ROAD
BROWN
SKINNER ROAD
NORTH OLD STATE ROAD
NORTH THREE B'S & K ROAD
N. GALENA ROAD
DELAWARE
PENNSYLVANIA AVE
WARRENSBURG ROAD
W. CENTRAL AVE
W. WILLIAM ST
E. CENTRAL AVE
BOWTOWN ROAD
SANDUSKY ST
Scioto River
WARREN R
HOWARD ROAD
BAKER ROAD
BERKSHIRE ROAD
HEVERLO ROAD
PITTSBURGH DRIVE
BELLE AVE
AIRPORT ROAD
SLACK ROAD
POLLOCK ROAD
GLENN ROAD
Olentangy River
DALE FORD ROAD
LACKEY OLD STATE ROAD
BERLIN STATION ROAD
BERLIN
BUNTY STATION ROAD
FORD ROAD
SECTION LINE ROAD
LIBERTY ROAD
BRAUMILLER ROAD
CHESHIRE ROAD
BEAN - OLLER ROAD
CLARK-SHAW ROAD
WINTER ROAD
SOUTH THREE B'S & K ROAD
S. GALENA ROAD

Functional Classification
- Freeway
- Major Arterial
- Major Arterial (New Road)
- Minor Arterial
- Minor Arterial (New Road)
- Major Collector
- Major Collector (New Road)
- Minor Collector
- Minor Collector (New Road)

*New roads are conceptual and shown for planning purposes only. Specific alignments will be determined in future studies.*

- Interchange
- Interchange (New)
- Railroad
- Water
- Municipal Boundaries
- Township Boundaries

prepared by
ms consultants, inc.
CONSULTING ENGINEERS & PLANNERS

N
W E
S

0 0.5 1 1.5 Miles

August 2001

Figure 31

volumes, proposed right-of-way and number of lanes for each of the County and City roadways.

# *Section X*

## *Right-of-Way & Cross Section Standards*

## X. ROW & Cross Section Standards

For the purpose of design, right of way and pavement width design values are specified for various capacities for each functional type of roadway. The basic design elements for arterial, collector and local streets are shown in **Table 11, Table 12** and **Table 13,** respectively. Wherever possible, the recommended pavement width should be adhered to. Minimum pavement widths can be utilized under special or restrictive conditions. The listed right of way (ROW) widths should be attained whenever possible. However, it is understood that the right of way in already established City or County areas may continue to be less due to constraints such as existing structures. **Figure 32** and **Figure 33** show the typical cross section for minor arterial roadways and major arterial roadways, respectively, with curb, sidewalk and no parking. **Figure 34** and **Figure 35** show the typical cross section for local and collector roadways with and without curb and sidewalk, respectively. It should be noted that local and collector roadways without curb and sidewalk are allowed in industrial areas only and require approval by the City of Delaware Planning Commission and the Delaware City Council.

**Table 11. Basic Design Elements for Arterial Street Functional Classification**

| | No. of Lanes | Pavement Width** (ft.) | Shoulder Width (ft.) w/curb & gutter | ROW (ft.) |
|---|---|---|---|---|
| Arterial Highways | 5 | 60 | 2 | 120 |
| | 4* | 48 | 2 | 100 |
| | 3 | 36 | 2 | 80 |
| | 2 | 28 | 2 | 80 |

* Minimum 4-foot median for divided roadways, 12-foot median preferred.

** Lane widths can be 11 feet under restrictive or special conditions; 3-foot shoulder adjacent to median

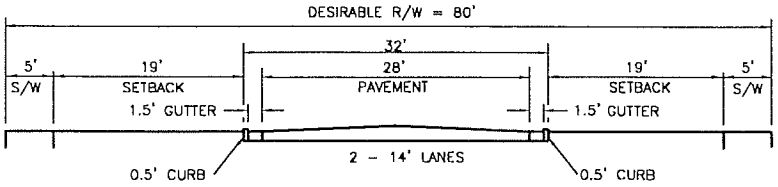
**Table 12. Basic Design Elements for Collector Street Functional Classification**

| | No. of Lanes | Pavement Width (ft.) ° | | Shoulder Width (ft.) | | ROW (ft.) | |
|---|---|---|---|---|---|---|---|
| | | Industrial | Residential | w/Curb & Gutter | w/o Curb & Gutter** | w/parking | w/o parking |
| Collector Roads | 3 | 38 | 36* | 2 | 2 minimum 8 desirable | 70 | 104 |
| | 2 | 28 | 24* | 2 | 2 minimum 8 desirable | 70 | 92 |

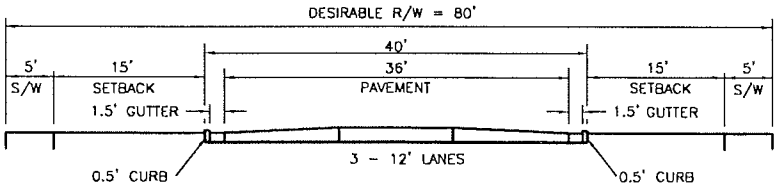
* 12-foot lane widths preferred, 10- to 11-foot acceptable on lower volume roadways or in restrictive areas.

**ONLY allowed in industrial areas and with the approval of the City of Delaware Planning Commission and the City Council; 4-foot paved shoulder with 4-foot graded shoulder desirable.

° Provide 6 to 12 feet of additional pavement width if allowing on street parking; 10 feet required in industrial areas.




TWO LANE MINOR ARTERIAL




THREE LANE MINOR UNDIVIDED ARTERIAL

# MINOR ARTERIAL ROAD TYPICAL CROSS SECTION WITH CURB & SIDEWALK & NO PARKING

Figure 32

# DELAWARE THOROUGHFARE PLAN
## CITY OF DELAWARE

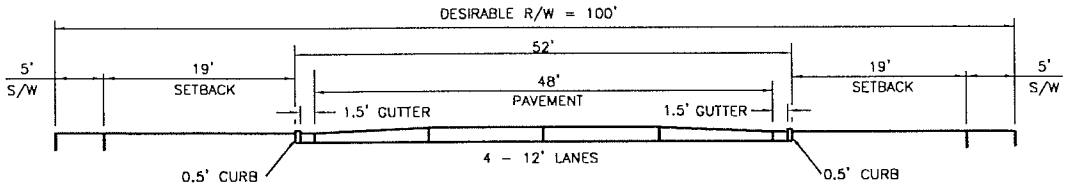
Prepared by

ms consultants, inc.

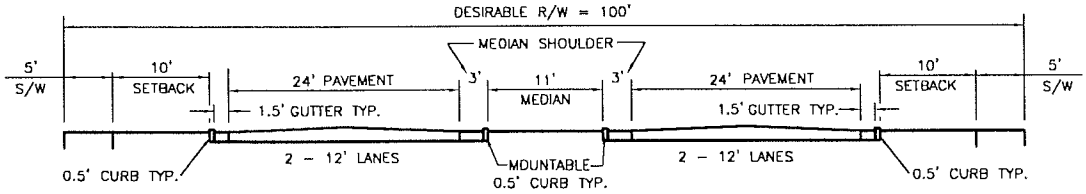
Columbus, Ohio

JANUARY, 2002

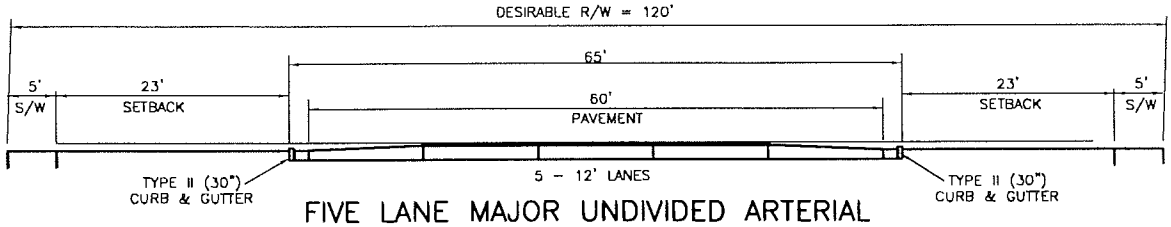
SIPES_MR T:\DRAWING\10\10291\210\VAL-SCITY.DWG JANUARY-16-2002-17:20




FOUR LANE MAJOR UNDIVIDED ARTERIAL




FOUR LANE MAJOR DIVIDED ARTERIAL




FIVE LANE MAJOR UNDIVIDED ARTERIAL

# MAJOR ARTERIAL ROAD TYPICAL CROSS SECTION WITH CURB & SIDEWALK & NO PARKING

Figure 33

# DELAWARE THOROUGHFARE PLAN

## CITY OF DELAWARE

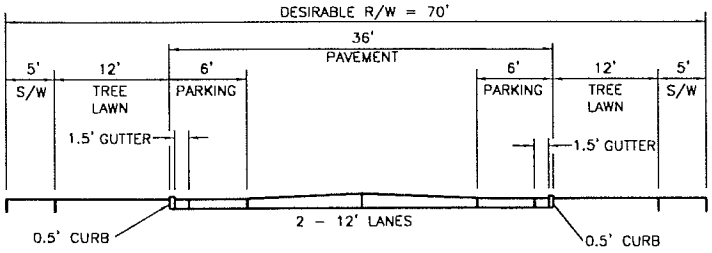
Prepared by

ms consultants, inc.

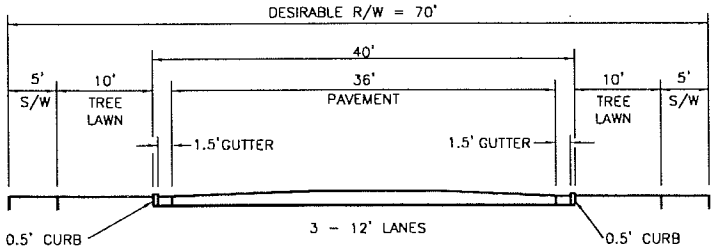
Columbus, Ohio

JANUARY, 2002

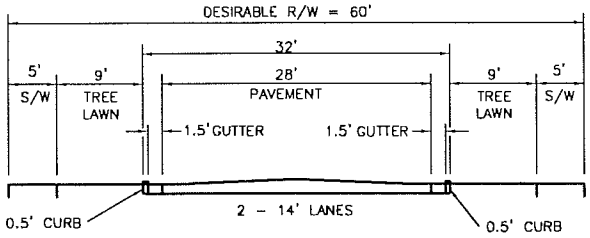
VANMETER_KS T:\DRAWINGS\10\1025\1\210\VAL-10CITY.DWG JANUARY-18-2002-15:35




2 LANE COLLECTOR CURBED WITH SIDEWALK & PARKING




3 LANE COLLECTOR CURBED WITH SIDEWALK & NO PARKING




2 LANE LOCAL CURBED WITH SIDEWALK & PARKING

# LOCAL & COLLECTOR ROAD TYPICAL CROSS SECTION WITH CURB & SIDEWALK

Figure 34

## DELAWARE THOROUGHFARE PLAN
## CITY OF DELAWARE

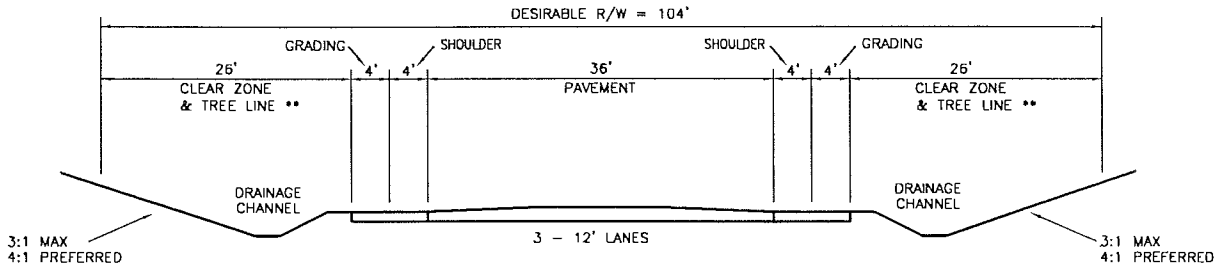
Prepared by

ms consultants, inc.

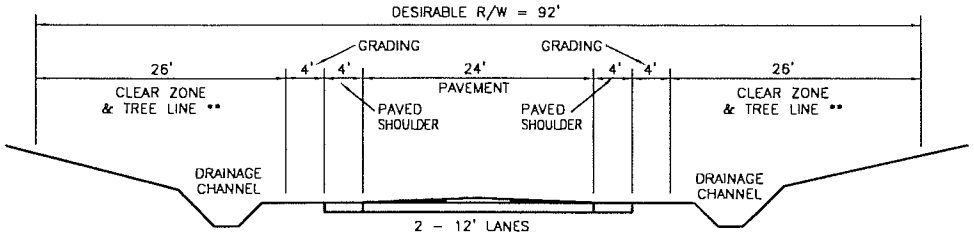
Columbus, Ohio

JANUARY, 2002

VANMETER_KS T:\DRAWING\10\10291\210\VAL-5CITY.DWG JANUARY-16-2002-14:35




THREE-LANE LOCAL & COLLECTOR WITHOUT CURB, GUTTER OR SIDEWALKS




TWO-LANE LOCAL & COLLECTOR WITHOUT CURB, GUTTER OR SIDEWALKS

* LOCAL & COLLECTOR ROADS WITHOUT CURB & GUTTER ALLOWED IN INDUSTRIAL AREAS ONLY AND WITH EXPRESS APPROVAL OF THE CITY OF DELAWARE PLANNING COMMISSION AND CITY COUNCIL.

** MAY BE REDUCED WHEN USED WITH STORM SEWER OR WITH DRAINAGE EASEMENT.

# LOCAL & COLLECTOR ROAD TYPICAL CROSS SECTION WITHOUT CURB, GUTTER & SIDEWALK*

Figure 35

## DELAWARE THOROUGHFARE PLAN
### CITY OF DELAWARE

Prepared by
ms consultants, inc.
Columbus, Ohio

JANUARY, 2002

VANMETER_KS T:\DRAWING\10\1028\210\VAL-2CITY.DWG JANUARY-16-2002-14:20

**Table 13. Basic Design Elements for Local Street Functional Classification**

| | No. of Lanes | Pavement Width (ft.) ° | | Shoulder Width (ft.) | | ROW (ft.) |
|---|---|---|---|---|---|---|
| | | Industrial | Residential | w/Curb & Gutter | w/o Curb & Gutter** | |
| Local Roads | 2 | 28 | 24* | 2 | 1-2 minimum 4-8 desirable | 50-54 |

* 12-foot lane widths preferred, 10- to 11-foot acceptable on lower volume roadways or in restrictive areas.

** ONLY allowed in industrial areas and with the approval of the City of Delaware Planning Commission and the City Council; 4-foot paved shoulder with 4-foot graded shoulder desirable.

° Provide 4 to 9 feet of additional pavement width if allowing on street parking; 9 feet required in industrial areas.

NOTE: Functional Classification criteria obtained from *A Policy on Geometric Design of Highways and Streets*, AASHTO, 1990, and compared with criteria used in the City of Columbus Thoroughfare Plan, the Hilliard Comprehensive Plan, Dublin Comprehensive Plan, and the Southern Delaware County Thoroughfare Plan and City of Delaware Subdivision Specifications and Comprehensive Plan.

Right-of-way at intersections should increase from the basic design standards to provide for the possible addition of turn lanes or additional sight distance. **Table 14** provides guidelines to preserve right of way at intersections which may be required for future turn lanes due to an increase in traffic volumes.

**Table 14. Desirable ROW Requirements at Intersections**

| Road Functional Classification | No. of Lanes | Pavement Width (ft) | ROW (ft) | Length (ft) |
|---|---|---|---|---|
| Major Arterial | 9<br>6 – 12' lanes on approach* | 108* | 140 | 600 |
| Minor Arterial | 7<br>5 – 12' lanes on approach* | 84* | 120 | 600 |
| Major Collector | 5<br>3- 12' lanes on approach** | 60** | 100 | 600 |
| Minor Collector | 3<br>2 – 12' lanes on approach** | 36** | 70 | 600 |

* 12-foot turn lane widths preferred, 11 feet acceptable on lower volume roadways or in restrictive areas.

** 12-foot turn lane widths preferred, 10 to 11 feet acceptable on lower volume roadways or in restrictive areas

# *Section XI*

## *Existing Condition Upgrades/Improvements*

## XI. Existing Condition Upgrades/Improvements

The roadways in Delaware County and the City of Delaware were reviewed to determine which areas might require upgrades to improve future traffic flow. Maximum use of existing facilities by improvement or access management rather than constructing new highway network links is recommended. Roadways or sections of roadways which may require improvement due to a future increase in traffic volumes were identified by a comparison of projected 2020 Average Daily Traffic (ADT) volumes with the threshold at which the conditions of a roadway will typically deteriorate from an acceptable to a poor level of service. Suggestions on additions of pavement width and right of way were made based on the criteria contained in the previous section of this report. The roads which are projected to require lane additions and road width upgrades are shown in **Table 15. Table 16** lists the locations within the City of Delaware limits which may benefit from lane additions.

There are some County roadways which are projected to experience congestion by the year 2020 but, due to terrain or other constraints, lane additions or widening is not feasible. Bale Kenyon Road is one example a roadway with constraints involved in improvements. SR 315, although a state and not a County route, is a major corridor with numerous intersections with County roadways and, due to its proximity to the Olentangy River, is another example of such a constrained roadway. Lane additions at significant intersections may be possible, but reduction of traffic volumes on this roadway will be dependent upon the addition of alternative routes noted on the Thoroughfare Plan. SR 257 north of Powell Road is another roadway which would benefit from the realignment and the redirection of through traffic onto South Section Line Road as shown on the Thoroughfare Plan to allow it to assume a collector road atmosphere and lower traffic volumes. Other locations in the County would benefit from realignment or improvement of intersections for safety or continuity purposes. **Table 17** lists locations in the County which would benefit from such improvement. As opportunities arise at these locations due to the availability of funds, area development or other road work projects in their vicinity, the improvements could be implemented.

The projected 2020 ADT volumes per the MORPC model for County roads and for the streets in the City of Delaware were compared with the daily traffic volumes typically experienced by intersections which meet Warrant 1 or Warrant 2 of the traffic signal guidelines contained in the *Ohio Manual of Uniform Traffic Control Devices for Streets and Highways.* Intersections in the County which may warrant future signal control are shown in **Table 18**. City of Delaware intersections which may warrant future signal control are shown in **Table 19**. Locations are noted which may experience a change in travel patterns due to the implementation of an alternative which could cause traffic volumes to increase or decrease from the 2020 model projections, affecting the potential need for signal control. As the projected traffic volumes are for planning purposes only, a traffic study including traffic counts should be performed in the future to determine if approach volumes at any intersection have increased to meet Traffic Signal Warrants.

# Table 15. Recommended Delaware County Roadway Lane Additions and Width Upgrades

## County and Township Route Recommended Roadway Lane Additions

| ROAD NAME | ROUTE NO. | ROAD SECTION | EXISTING LANES | PROPOSED LANES | PROPOSED FUNCTIONAL CLASS |
|---|---|---|---|---|---|
| Africa Road | CR 21 | Lewis Center Rd to Cheshire Rd | 2 | 3 | Minor Arterial |
| Cheshire Road | CR 72 | US 23 to Piatt Rd | 2 | 3 | Major Arterial |
| | CR 72 | Piatt Rd to Africa Rd | 2 | 4 | Major Arterial |
| Concord Road | CR 129 | Glick to Home Rd | 2 | 4 | Minor Arterial |
| Glick Road | TR 126 | Concord Rd to SR 745 | 2 | 3 | Major Arterial |
| | TR 126 | SR 745 to SR 257 | 2 | 4 | Major Arterial |
| Home Road | CR 124 | Union County Line to US 23 | 2 | 4 | Major Arterial |
| Lewis Center Road | CR 106 | US 23 to I-71 | 2 | 5 | Major Arterial |
| Big Walnut Road | TR 109 | I-71 to Sunbury Rd | 2 | 5 | Major Arterial |
| Liberty Road | CR 9 | Franklin County Line to Village of Powell Limits | 2 | 3 | Minor Arterial |
| | CR 9 | Seldom Seen Rd to Home Rd | 2 | 3 | Minor Arterial |
| North Galena Road | CR 34 | US 36/SR 37 to Berkshire Rd | 2 | 3 | Minor Arterial |
| South Old State Road | CR 10 | Franklin County Line to Lewis Center Road | 2 | 5 | Minor Arterial |
| | CR 10 | Lewis Center Road to US 36/SR 37 | 2 | 3 | Minor Arterial |
| South Section Line Road | CR 5 | Home Rd to SR 37 | 2 | 3 | Major Arterial |
| Worthington Road | CR 13 | Franklin County Line to Africa Rd | 2 | 5 | Minor Arterial |
| | CR 13 | Africa Rd to Big Walnut Rd | 2 | 3 | Minor Arterial |

## County and Township Route Recommended Roadway Width Upgrades

| ROAD NAME | ROUTE NO. | ROAD SECTION | PROPOSED WIDTH | PROPOSED FUNCTIONAL CLASS |
|---|---|---|---|---|
| Bale Kenyon Road | TR 107 | East Powell Rd to Lewis Center Rd | upgrade to 22 foot width | Major Collector |
| Fancher Road | CR 20 | South County Line Rd to Harlem Rd | upgrade to 24 foot width | Minor Arterial |
| Liberty Road | CR 9 | Home Rd to London Rd | upgrade to 24 foot width | Minor Arterial |
| North Galena Road | CR 34 | Berkshire Rd to North Old State Rd | upgrade to 24 foot width | Minor Arterial |
| North Section Line Road | TR 5 | Buttermilk Hill Rd to Marion County Line | upgrade to 22 foot width | Major Arterial |
| Orange Road | TR 114 | SR 315 to Bale Kenyon Rd | upgrade to 24 foot width | Major Collector |
| Piatt Road | TR 99 | Shanahan Rd to Cheshire Rd | upgrade to 24 foot width | Major Collector |
| Sunbury Road | CR 30 | Smothers Rd to Galena Village Limits | upgrade to 22 foot width | Minor Arterial |
| Troy Road | CR 7 | Delaware City Limits to Coover Rd | upgrade to 24 foot width | Minor Arterial |
| Worthington Road | CR 13 | Big Walnut Rd to Plumb Rd | upgrade to 24 foot width | Minor Arterial |

## Table 16. City of Delaware 2020 Potentially Required Lane Additions to Existing Roads if New Alternatives or Improvements Are Not Added

| Road Name | Road Section | Existing Lanes | Potentially Required Lanes | Proposed Functional Class |
|---|---|---|---|---|
| Lake St.* | William St. to Horseshoe Rd | 2 | 3 | Major Arterial |
| Houk Rd. | William St. to Central Ave. | 2 | 3 | Major Collector |
| Hills-Miller Rd.* | Troy Rd. to US 23 | 2 | 3 | Major Collector |
| Panhandle Rd. | US 23 to Hudson Rd. | 2 | 3 | Major Collector |
| Armstrong Rd/Olentangy Ave. | Sandusky St. to Pollock Rd. | 2 | 3 | Major Collector |
| Central Ave. | Houk Rd to Elizabeth St. | 2 | 3 | Minor Arterial |
| | Elizabeth St to Sandusky St | 2 | 3 | Minor Arterial |
| | Milo St. to the Point* | 2 | 4 | Minor Arterial |
| William St. | Houk Rd to Liberty St | 2 | 3 | Major Arterial |
| | Liberty St to Franklin St | 3 | 4 | Major Arterial |
| | US 23 to River St* | 4 | 5 | Major Arterial |
| | Lake St. to the Point* | 2 | 4 | Major Arterial |

* Denotes locations which may experience a change in travel patterns due to the implementation of an alternative which could cause traffic volumes to increase or decrease from the 2020 model projections, affecting the potential need for a lane addition.

## Table 17. Delaware County Geometric Deficiencies

| TOWNSHIP | INTERSECTION | COMMENT |
|---|---|---|
| Brown | Kilbourne Rd, Beard Rd & SR 521 | RealignY intersection |
| Brown | County Home Rd @ SR 521 | Realign skewed intersection |
| Brown | Giehl Rd & Cackler Rd @ Leonardsburg Rd | Realign skewed intersection |
| Brown | Pittman Rd & US 42 | Realign Y intersection |
| Brown | County Home Rd, Walton Rd, Harris Rd & US 42 | Realign and improve intersections. NOTE: Location of intersection and proximity of railroad to US 42 is of concern now, but will become more important with the addition of the SR 521 Cross County Highway (Alternative Y) |
| Brown/Oxford | Veley Rd & Steamtown Rd @ Leonardsburg Rd | Align offset intersection |
| Brown/Oxford | Wheeler & US 42 | Realign Y intersection |
| Berkshire | Cheshire Rd, S. Galena Rd, & Rome Corners Rd | Improve "5 Corners" intersection geometry. NOTE: Any future study of this intersection should include an assessment of this location's value as a landmark. |
| Berkshire | Wilson Rd @ North Galena Rd | Realign through future development |
| Berkshire/Brown | Berkshire Rd & Howard Rd @North 3 B's & K Rd | Align offset intersection |
| Berkshire/Brown | Howard Rd & Baker Rd @ North Old State Rd | Align offset intersection |
| Concord | S. Section Line Rd @ Home Road | Align S. Section Line Rd with SR 257 south of Bean Oller Rd to provide continuity and allow SR 257 to assume a collector status along the riverfront. |
| Concord | US 42 & Freshwater Rd | Realign skewed intersection |
| Concord | US 42 & Concord Rd | Realign skewed intersection |
| Concord | Bellpoint Rd & Klondike Rd @ US 42 | Improve geometry – intersections in close proximity with skew intersection with US 42 |
| Concord | Butts Rd & Hyatts Rd @ South Section Line Rd | Align offset intersection |
| Concord | Concord Rd & Harriott Rd | Align offset intersection |
| Delaware | US 23 & SR 315/Stratford Rd | Improve geometry and signal operation |
| Delaware | Kingsbury Rd and Olentangy Ave. @ Armstrong Rd | Realign offset intersection |
| Delaware | Curve Rd @ Berlin Station Rd | Realign Y intersection & review potential for connecting Kingsbury Rd with Armstong Rd/Olentangy Ave. and with Curve Rd @ Berlin Station Rd |
| Delaware | Horseshoe Rd, Shortcut Rd, Hudson Rd @ US 42 | Improve geometry |
| Delaware | Berlin Station Rd & Braumiller Rd | Improve geometry |
| Genoa | Worthington Rd & Plumb Rd | Improve geometry/proximity to Worthington Rd & SR 3 intersection NOTE: Could be part of the Rome Corners extension to Worthington Rd improvement (Alternative S) |
| Genoa/Berkshire | Rome Corners Rd & Plumb Rd | Align offset intersection |
| Harlem | Duncan Run Rd @ Center Village Rd | Realign skewed intersection |
| Harlem | Duncan Run Rd & Gorsuch Rd @ SR 605 | Align offset intersection |
| Harlem | Robins Rd @ SR 605 | Align offset intersection |
| Harlem | Harlem Rd @ Gorsuch Rd | Realign offset intersection |

## Table 17. Delaware County Geometric Deficiencies (continued)

| TOWNSHIP | INTERSECTION | COMMENT |
|---|---|---|
| Kingston | N Galena @ Kilbourne Rd | Align offset intersection |
| Kingston | Blue Church Rd & Wilson Rd | Align offset intersection |
| Kingston | Carters Corner @ SR 656 | Align offset intersection |
| Liberty | Winter Rd/Peachblow Rd & US 23 | Improve geometry NOTE: ODOT is already pursuing this improvement |
| Liberty | Carriage Rd & Orange Rd @ SR 315 | Align offset intersection |
| Marlboro | Benedict Rd @ AR 229 | Realign skewed intersection |
| Oxford | Claypool Rd & Peters Rd | Realign skewed intersection |
| Oxford | Horseshoe Rd & SR 229 | Realign Skewed intersection |
| Porter | Plantation Rd @ SR 656 | Intersections in close proximity – relocate further south of the SR 656 & SR 521 intersection |
| Porter | Porter Central Rd & SR 656 | Realign skewed intersection |
| Porter | Lott Rd & Chambers Rd | Align offset intersection |
| Porter | Chambers Rd & SR 656 | Realign skewed intersection |
| Radnor | Thomas Rd @ Norton Rd | Align offset intersection |
| Radnor | Norton Rd @ SR 203 | Realign skewed intersection |
| Radnor | David Rd @ Lawrence Rd | Align offset intersection |
| Radnor | Lawrence Rd, Hodges Rd & River Rd @ SR 37 | Improve alignment – three roads intersecting SR 37 in close proximity |
| Radnor | Dildine Rd and Penry Rd @ SR 203 | Align offset intersection |
| Radnor | SR 203 & Meridith Rd | Realign skewed intersection |
| Radnor/Delaware | SR 203/SR 37 & S Section Line Rd | Improve intersection geometry |
| Scioto | Brown Rd & Burnt Pond Rd @ SR 37 | Align offset intersection |
| Scioto | Burnt Pond Rd & Stover Rd @ US 36 | Align offset intersection |
| Scioto | Shipley Rd & Carr Rd @ Degood Rd | Align offset intersection |
| Scioto | Carr Rd @ Ostrander Rd | Realign Y intersection |
| Scioto | Houseman Rd @ SR 37 | Realign Y intersection |
| Scioto | Warren Rd & Klondike Rd @ SR 36 | Align offset intersection |
| Scioto | Slocum Rd & Houseman Rd @ Brindle Rd | Align offset intersection |
| Scioto | Smart Rd & Newhouse Rd @ SR 36 | Align offset intersection |
| Thompson | Hoskins Rd @ SR 257 | Align to allow connectivity and make use of bridge over river |
| Trenton | Centerburg Rd @ North Old 3 C Highway | Align skewed intersection |
| Trenton | Ross Rd @ Murphy Rd | Align offset intersection |
| Trenton | Creek Rd & Partrick Rd @ Stockwell Rd | Align offset intersection |
| Trenton | N. County Road 605 and Condit Rd @ US 36/SR 3 | Align skewed intersection |
| Trenton | Longshore Rd and Vans Valley Rd @ SR 37 | Align offset and skewed intersection |
| Trenton | Ross Rd & Boston Rd | Realign Y intersection |
| Trenton | Trenton Rd and Ross Rd @ SR 37 | Align offset intersection |
| Troy | Main Rd & Hanover Rd @ Panhandle Rd | Align offset intersection |

## Table 18. Delaware County Possible Future Traffic Signal Locations

The projected 2020 ADT volumes per the MORPC model for the roads in Delaware County were compared with the daily traffic volumes typically The following intersections, in no order of priority, have been noted as possibly warranting a traffic signal by the year 2020:

SR 203 & Hills-Miller Rd*
Hills-Miller Rd & Houk Rd*
Hills-Miller Rd & Troy Rd
US 23 & Panhandle Rd
US 36 & SR 257
S. Section Line Rd & Pittsburg Dr.
Houk Rd & Pittsburg Dr.
Armstrong RD & Pollock Rd
Curve Rd & Berlin Station Rd*
Berlin Station Rd & Kingsbury Rd*
Curve Rd & Glenn Rd
Berlin Station Rd & Braumiller Rd
US 42 & Concord Rd
US 42 & SR 257/Klondike Rd
N. Liberty Rd & Hyatts Rd
N. Liberty Rd & Home Rd
N. Liberty Rd & Bunty Station Rd*
S. Section Line Rd & Hyatts Rd*
Home Rd & Concord Rd
Home Rd & Sawmill Pkwy
Home Rd & SR 315
Sawmill Pkwy & Seldom Seen Rd
Sawmill Pkwy & Rutherford Rd
Seldom Seen Rd & SR 257
Harriott Rd & SR 745*
SR 315 & Orange Rd
Piatt Rd & Hollenback Rd*
Piatt Rd & Cheshire Rd*
S. Old State Rd & E. Powell Rd
S. Old State Rd & Orange Rd
S. Old State Rd & Lewis Center Rd
S. Old State Rd & Hollenback Rd
Lackey Old State Rd & Berlin Station Rd*
Lackey Old State Rd & US 36/SR 37
US 36/SR7 & Plunkett Rd
US 36/SR 37 & Africa Rd
US 36/SR 37 & N. 3B's & K Rd *
SR 37 & Vans Valley Rd
SR 37 & County Line Rd*
Africa Rd & Cheshire Rd
Lewis Center Rd & Bale Kenyon Rd
SR 3/Lewis Center Rd & Plumb Rd
SR 3 & S. Galena Rd/Walnut St
Walnut St & Columbus St. (Village of Galena)
S. Old 3C Hwy & Plumb Rd*
Tussic Street Rd & Big Walnut Rd
Columbus St. & Vans Valley Rd (Village of Galena)
Sunbury Rd & Red Banks Rd
Sunbury Rd & Smothers Rd

* Denotes locations which may experience a change in travel patterns due to the implementation of an alternative which could cause traffic volumes to increase or decrease from the 2020 model projections, affecting the potential need for signal control. As the projected traffic volumes are for planning purposes only, a traffic study including traffic counts should be performed in the future to determine if approach volumes at any intersection have increased to meet Traffic Signal Warrants

## Table 19. City of Delaware Possible Future Traffic Signal Locations

The following intersections, in alphabetical order, have been noted as possibly warranting a traffic signal by the year 2020:

Armstrong Rd & North St.*
Armstrong Rd & Pollock Rd.
Houk Rd & Pittsburgh Dr.*
Houk Rd & Hills-Miller Rd.*
Lake St & Joy Ave.*
Pennsylvania Ave. & Executive Blvd.*
Pennsylvania Ave & Euclid Ave.*
Sunbury Rd (US 36/SR 37) & SR 521
Sunbury Rd (US 36/SR 37) & Glenn Rd.
SR 521 & Fieldcrest Dr.*
Troy Rd & Hills-Miller Rd.*
US 23 & Panhandle Rd
US 23 & Hawthorne Blvd.*
William St (US 36) & Houk Rd
William St (US 36) & Curtis Ave.
William St (US 36) & River St.
William St (US 36) & Cheshire St.*
US 42 & Slack Rd.*
US 23 & Olentangy Ave.

* Denotes locations which may experience a change in travel patterns due to the implementation of an alternative which could cause traffic volumes to increase or decrease from the 2020 model projections, affecting the potential need for signal control. As the projected traffic volumes are for planning purposes only, a traffic study including traffic counts should be performed in the future to determine if approach volumes at any intersection have increased to meet Traffic Signal Warrants

Traffic signals in many regions are installed based on a priority system that takes into account information such as volumes and accident occurrence, and if a private funding source is available. It may be beneficial in the future for Delaware County and the City of Delaware to establish a priority system for future installations or upgrades.

Spacing of traffic signals along a roadway is an important consideration to ensure good traffic flow especially if coordination systems are being considered. For example, the Draft Access Management Plan for US 23 prepared by ODOT District 6 recommends investigation of the removal of the existing traffic signal at the intersection of US 23 and the McDonald's restaurant located just south of Hills-Miller Road within the City of Delaware limits. This signal is located in close proximity to the signalized intersection of US 23 & Hills-Miller Road and serves a limited number of commercial establishments. In addition, the 2020 traffic projections along with the possible future connection west to SR 37/SR 203 as shown by Alternative 6 and 7, make the intersection of US 23 & Panhandle Road a likely candidate for future installation of a traffic signal. With the McDonald's signal removed, the spacing of approximately 0.5 miles between Panhandle Road and Hills-Miller Road is more conducive to providing a future coordinated signal system along US 23. Proper signal spacing according to roadway type is further addressed in the access management guidelines.

# *Section XII*

## *Cost Estimates and Potential Funding Sources*

## XII. Cost Estimates & Potential Funding Sources

Cost estimates for the road network additions in Delaware County and the City of Delaware are shown in **Table 20** and **Table 21** respectively. The costs are listed by either the number or letter corresponding to each alternative recommended to be included in the Delaware Thoroughfare Plan. The cost estimates were prepared using year 2000 dollars with property information contained in DALIS-Data 3.2 (January, 2000) and DALIS Digital Orthophotos, 1996-97 aerial photos providing right-of-way data. These estimates provide a general idea of project costs. Detailed design and alignment studies provide more current and detailed costs estimates for roadway projects. An inventory summary of items priced for each alternative and a list of the typical prices used to prepare the cost estimates are contained in **Appendix 7.**

As can be seen in the cost estimate summaries, the scale and complexity of some of the road projects proposed as part of the Delaware Thoroughfare Plan can exceed a local government's financial resources. Major transportation infrastructure projects face enormous financing challenges. Although additional aid is available through government programs for road projects and improvements, competition is great for use of these funds. Good planning will assist in early identification of potential funding sources for needed road projects. It will also assist in identifying supplemental or secondary sources of capital.

Transportation projects are funded by federal, state, local or private sources with combinations of sources used where applicable. These funds can be used for construction of new roads or improvement of existing roads. The major sources of funding available to agencies such as Delaware County and the City of Delaware in the State of Ohio are:

- Federal Funds - US Department of Transportation (USDOT)
  *TEA-21*- Transportation Equity Act
  Mid Ohio Regional Planning Commission (MORPC) Attributable Federal Funds
- Other Federal Programs
  *CDBG* – Community Development Block Grants
  *USDA CF Loan Guarantees* – United States Department of Agriculture Rural Community Facilities Loan Guarantees
  *EDA* – Economic Development Administration Funds
- Ohio Department of Transportation (ODOT)
- Other State of Ohio Programs
  *Ohio Public Works Commission Funds*:
  *SCIP* – State Capital Improvement Program
  *LTIP* – Local Transportation Improvement Program

## Table 20 Delaware Thoroughfare Plan
## County 2020 Roadway Network Alternatives
## Cost Estimates*

| ALT # | Roadway | Structures | Design | Inspection | ROW | Grand Total |
|---|---|---|---|---|---|---|
| B | 1,700,000 | 0 | 350,000 | 120,000 | 140,000 | **2,310,000** |
| C | 1,320,000 | 0 | 260,000 | 90,000 | 310,000 | **1,980,000** |
| E | 16,060,000 | 0 | 3,100,000 | 1,090,000 | 700,000 | **20,950,000** |
| F | 1,495,000 | 0 | 285,000 | 100,000 | 100,000 | **1,980,000** |
| G | 5,700,000 | 0 | 1,140,000 | 400,000 | 320,000 | **7,560,000** |
| J | 5,130,000 | 1,900,000 | 1,410,000 | 500,000 | 850,000 | **9,790,000** |
| K north | 2,950,000 | 0 | 590,000 | 210,000 | 250,000 | **4,000,000** |
| K south | 5,900,000 | 0 | 1,120,000 | 410,000 | 570,000 | **8,000,000** |
| M | 4,180,000 | 2,100,000 | 1,260,000 | 450,000 | 675,000 | **8,665,000** |
| N | 9,330,000 | 2,405,000 | 2,350,000 | 820,000 | 950,000 | **15,855,000** |
| Q | 1,370,000 | 0 | 280,000 | 100,000 | 30,000 | **1,780,000** |
| R | 2,310,000 | 0 | 460,000 | 160,000 | 160,000 | **3,090,000** |
| S | 260,000 | 0 | 50,000 | 20,000 | 180,000 | **510,000** |
| T | 1,070,000 | 0 | 215,000 | 75,000 | 650,000 | **2,010,000** |
| V | 800,000 | 0 | 160,000 | 60,000 | 740,000 | **1,760,000** |
| X | 4,180,000 | 2,100,000 | 1,260,000 | 450,000 | 720,000 | **8,710,000** |
| Y | 17,230,000 | 11,000,000 | 3,220,000 | 1,130,000 | 1,380,000 | **33,960,000** |
| Z | 1,700,000 | 0 | 350,000 | 120,000 | 110,000 | **2,280,000** |

* Year 2000 costs.

## Delaware Thoroughfare Plan
## Table 21 City 2020 Roadway Network Alternatives
## Cost Estimates*

| ALT # | Roadway | Structures | Design | Inspection | ROW | Grand Total |
|---|---|---|---|---|---|---|
| 1 | 11,850,000 | 6,255,000 | 3,600,000 | 1,270,000 | 900,000 | **23,875,000** |
| 2 | 16,060,000 | 0 | 3,100,000 | 1,090,000 | 700,000 | **20,950,000** |
| 3 | 7,300,000 | 1,900,000 | 1,800,000 | 640,000 | 400,000 | **12,040,000** |
| 4 | 1,300,000 | 3,200,000 | 770,000 | 270,000 | 290,000 | **5,830,000** |
| 13 | 990,000 | 1,360,000 | 400,000 | 140,000 | 330,000 | **3,220,000** |
| 4&13 | 2,300,000 | 3,200,000 | 930,000 | 330,000 | 620,000 | **7,380,000** |
| 5 | 13,230,000 | 7,130,000 | 3,470,000 | 1,210,000 | 200,000 | **25,240,000** |
| 6 | 3,430,000 | 0 | 850,000 | 300,000 | 320,000 | **4,900,000** |
| 7 | 3,600,000 | 3,560,000 | 1,430,000 | 500,000 | 230,000 | **9,320,000** |
| 6&7 | 7,030,000 | 3,560,000 | 2,280,000 | 800,000 | 550,000 | **14,220,000** |
| 8 | 620,000 | 0 | 110,000 | 40,000 | 660,000 | **1,430,000** |
| 9A | 1,340,000 | 0 | 230,000 | 80,000 | 310,000 | **1,960,000** |
| 16 | 4,500,000 | 2,080,000 | 1,300,000 | 470,000 | 700,000 | **9,050,000** |

* Year 2000 costs.

- Local Programs
  Motor Vehicle License Plate Tax
  *TIF* -Tax Increment Financing
  County Surface Transportation Program

The following is a brief description of the major funding sources:

**A. Federal Funds - US Department of Transportation (USDOT)**

The Transportation Equity Act for the 21st Century (TEA-21), signed into law by the Federal Government on June 9, 1998, provides policy to manage and operate the nation's transportation system. Federal transportation programs available through TEA-21 include such areas as Safety, Highway, Rail, and Transit Programs. These programs not only support infrastructure additions, but transportation systems management, access management, transit, bicycle and pedestrian programs. A more complete list of available programs is contained in **Appendix 7** or can be accessed at the FHWA website at www.fhwa.dot.gov.

MORPC Attributable Federal Funds are suballocated to MORPC by the State of Ohio to finance local projects such as traffic signals, major reconstruction of roadways, improvement to existing roads, bikeways or purchase of buses. These funds must be used on roads included in the federal aid system. The funds are available to communities within the urban boundary established by the U. S. Census. The MORPC urban boundary extends into Southern Delaware County to approximately Powell Road, covering the communities of Dublin, Powell, and Westerville and also separately includes the City of Delaware. The boundary is currently undergoing adjustment and the new official boundary is expected to become available in one to two years. Given the isolation of the City of Delaware from the Columbus Urban area MORPC sets aside $250,000 to $300,000 per year for City of Delaware transportation projects. The remainder and largest portion of MORPC-attributable federal funds are allocated in a competitive process and, outside of the city of Delaware, only the most densely populated areas along the southern boundary of the county are eligible to use them. The eligible areas are those included within the US census defined Columbus urbanized area or the Delaware urban area.

**B. Other Federal Programs**

Other Federal programs available to fund transportation projects include Community Development Block Grants (CDBG), United States Department of Agriculture (USDA) Community Facility (CF) loan guarantees, and Economic Development Administration (EDA) funds.

CDBG can be used if a road improvement project will directly benefit low or moderate-income persons. Greater than fifty-one percent of the population benefiting from the improvement must be in the targeted income group. Delaware County is

what is considered a 'formula' County and receives a set amount of these funds from the State each year to use for various types of projects. It may be possible for a road improvement project to compete for use of a portion of these funds. This type of funding would be applicable to any road projects that are part of a revitalization effort in downtown or impoverished areas. Information regarding CDBG is contained in **Appendix 7.**

Although Delaware County has passed the population level of 85,000 to be eligible for the Small Counties Capital Improvements Program, some of the townships or villages in the County may be eligible for funding of road projects through the USDA Rural Development Community Facility (CF) Loan Guarantees. Eligible areas are those rural countryside and rural communities of up to 20,000 population. An information sheet regarding this funding is contained in **Appendix 7**.

Economic Development Administration funds are not applicable to most projects. EDA funds can only be used for a transportation improvement project if it is part of an industrial park. For instance, a road or bridge project in an industrial development could compete for use of these funds. These funds should be kept in mind for projects involving the expansion of the City of Delaware's industrial park and for any locations in the County which involve the construction or expansion of an industrial site. Information on the EDA Application process is contained in **Appendix 7**.

**C. Ohio Department of Transportation (ODOT)**

ODOT relies on the state gas tax and borrowing by the legislature to provide funding for transportation projects. State funds for road projects that will cost ODOT more than $5 million are allocated by the Transportation Review Advisory Council (TRAC) through ODOT's Major Expansion/New Project Program. These road projects must do one or more of the following to be considered for funding: reduce congestion, increase mobility, provide connectivity, or increase a region's accessibility for economic development. Priority for these funds is placed on state, interstate, and U.S. routes. Projects on local roads or those with a total project cost under $5 million must seek funds elsewhere. Information regarding the TRAC application guidelines for major new projects is contained in **Appendix 7.**

**D. Other State of Ohio Programs**

The Ohio Public Works Commission (OPWC) was created to assist in financing local public infrastructure improvements under the SCIP and the LTIP. Similar to ODOT, it relies on the state gas tax and borrowing by the legislature to provide funding for transportation projects. It provides grants, loans and financing for local debt support and credit enhancement for local transportation projects such as roads, bridges and culverts as well as other types of infrastructure. These funds are distributed through OPWC District Integrating Committees.

The SCIP was created in 1987 following voter passage of State Issue 2 which allows the State to use its general revenues as debt support to issue up to $120 million in bonds each year. This program is targeted mainly on repairing and replacing infrastructure and has strict limits on how much of the funding may be used to build new or expanded infrastructure. The SCIP also has a small government fund sub program to provide grants, loans, local debt support and credit enhancements for villages and townships of under 5,000 in population whose projects were not funded through the district's allocation. Delaware County is within OPWC's District 17.

The LTIP was created in 1988 and provides approximately $60 million in gasoline tax receipts each year for roads and bridges. LTIP has no restrictions on building new or expanded roads. A copy of the Application for Financial Assistance for the SCIP and LTIP funds is contained in **Appendix 7.**

**E. Local Programs**

Local road and bridge transportation projects can be funded through use of the motor vehicle license tax distributed by the state to counties and municipalities. Another method of funding local programs is through Tax Increment Financing (TIF). TIF is a tool used by cities or other development authorities to finance roads or utilities needed to support a new development. Tax Increment Financing "captures" the additional property tax generated by a development that would have gone to other taxing jurisdictions and uses it to finance the development costs. Typically, tax increment financing is used for either new road projects or system upgrades that directly serve the property generating the revenue. There is also a restricted "remote" TIF which can allow infrastructure investment at a location distant from the tax generating properties. This allows for a transfer of revenues from growing areas of the community to older, urbanized areas.

Another funding source for local highway and bridge projects is available through the County Surface Transportation Program allocated by the County Engineers Association of Ohio (CEAO). Projects making use of these funds are administered by ODOT and must be on a route designated with a collector functional classification or above on the system of Federal-aid highways. Most of the new links proposed in the Delaware Thoroughfare Plan are not included in the system of Federal-aid highways. However, that system may be altered by application to MORPC or ODOT and approval by MORPC, ODOT, and FHWA. Information regarding the County Surface Transportation Program is contained in **Appendix 7**.

Funding for transportation projects depends upon the scale, type and location of the project. All possible funding sources should be evaluated when a decision is made to actively pursue a transportation project as it is possible to use sources in combination or use different funds for various phases of a project. Smaller road connections or roads planned through areas experiencing a surge of development typically are constructed using local and/or private funds. It is sometimes possible, depending on the scale of the

development, for private entities to construct arterial roads of a regional nature. Sawmill Parkway in southern Delaware County is an example of such a project. Roadway or bridge projects of regional significance may be eligible for funds through the Federal Highway Administration (FHWA) or the State of Ohio Department of Transportation (ODOT) and could be further supported by local and private funds or possibly road improvement funds, if applicable. Although there is not a wealth of programs available to solicit funds for transportation improvements, early planning and use of innovative methods of combining land development and road improvement projects using both private and public funds can make better use of the available resources.

Projects included in the Delaware Thoroughfare Plan which may be eligible for state or federal funds include the following alternatives:

***Alternative B*** – the extension of Glick Rd east from SR 257 to connect with Powell Rd west of Wellington Blvd.

***Alternative E/2*** –the extension of Sawmill Parkway from Home Rd north to US 42.

***Alternative G*** – Extension of South Section Line Rd north from SR 37 to align with North Section Line Rd at Buttermilk Hill Rd.

***Alternative J*** – Extension of Home Rd east from US 23, crossing the railroad tracks connecting to Lewis Center Rd east of Lewis Center and west of South Old State Rd.

***Alternative K*** – Extension of Piatt Rd north from Cheshire Rd to align with Roloson Rd at Curve Rd and the extension of Piatt Rd south from Shanahan Rd, intersecting Lewis Center Rd approximately midway between the railroad and South Old State Rd.

***Alternative M*** – New interchange with IR 71 at Big Walnut Rd.

***Alternative N*** – Extension of Cheshire Rd east from Domigan Rd, intersecting SR 3 between Sunbury and Galena, and continuing east to connect with SR 37 between Walnut Road and Longshore Rd.

***Alternative X*** - New interchange at IR 71 and SR 521.

***Alternative Y*** - Extension of Mink Street Rd from River Rd east to County Home Road at its intersection with US 42.

***Alternative 1*** – East/west connection between US 42 and US 23 at Cheshire Rd

***Alternative 3*** - Extension of Glenn Rd south from Curve Rd to Cheshire Rd.

***Alternative 4*** – Pennsylvania Ave extension east from US 23 to the intersection of US 42 & Horseshoe Rd

***Alternative 5*** – North/south route connecting from the intersection of Alternative Y & Horseshoe Rd/Kelly McMaster Rd south to intersect with US 36/SR 37 between Glenn Rd and Sweeney Rd and the extension of Panhandle Rd east to connect with this north/south route between Horsehoe Rd and US 42.

***Alternative 13*** – Modification of the US 23 & Pennsylvania Ave interchange to provide for all movements.

***Alternative 16*** –Extension of US 42 east from US 23 to connect with Alternative 3, the extension of Glenn Rd south to Cheshire Rd.

The Delaware Thoroughfare Plan road network additions generally suited for local or private funding are:

***Alternative C*** – Realignment of North and South Liberty Rd at Home Rd.

***Alternative F*** – Extension of Steitz Rd north from Hyatts Rd to the extension of Sawmill Parkway.

***Alternative Q*** – Realignment of SR 605 northwest from Centerburg Road connecting with Porter Central Road south of Olive Green Road.

***Alternative R*** – Extension of Cleveland Avenue north from Maxtown Road to connect with Worthington Road.

***Alternative S*** – Extension of Rome Corners Rd south to connect with Worthington Rd

***Alternative T*** – Extension of Sunbury Rd from Red Bank Rd, east of the Hoover Reservoir, northeast to connect with Harlem Rd.

***Alternative V*** – Extension of Fancher Rd from Harlem Rd southwest to Smothers Rd

***Alternative Z*** – Extension of Shanahan Rd east from Piatt Rd to South Old State Rd.

***Alternative 6*** - East/west connector road from the existing intersection of SR 37/203 & South Section Line Rd east to the committed Houk Rd extension.

***Alternative 7*** - Extension of the committed connector road between Houk Rd and Troy Rd east to align with the existing intersection of US 23 & Panhandle Rd.

***Alternative 8*** - Extension of River Oaks Dr from its intersection with Stratford Rd west to US 23. The existing River Oaks Dr is a short, residential street located north of Hull Dr and south of SR 42.

***Alternative 9*** - Extension of Lexington Blvd south to SR 36.

# *Section XIII*

## *Five-Year Increment Model Results*

## XIII. Five-Year Increment Model Results

To assist in assessing where and when over the next twenty years improvements or road network additions would be beneficial to facilitate traffic flow and safety, the transportation model for the City of Delaware road network was reviewed at five year intervals between 2000 and 2020. A model depicting what full build out of the City land uses would implicate to the road network was also developed and evaluated. Committed or proposed road projects were added to the model network which were considered by City staff to reasonably be constructed and in place in during each five year incremental timeframe. The following are the assumptions made regarding road network additions in the City of Delaware region for each five-year interval:

### 2005

- Pinecrest Dr./Executive Blvd with signal at US 23 & Pinecrest Rd
- Fieldcrest Dr./Vernon Ave
- Grand Circuit Blvd
- Houk Rd extension north from Central Ave
- Houk Rd extension south from William St.
- US 23/US 42 Interchange Modification

### 2010

- E+C road between Houk Rd and Troy Rd in the northwest quadrant of the City of Delaware
- E+C road south of Airport Rd
- Pennsylvania Ave extension and the modification of its interchange with US 23 to allow for all movements (Alternative 4+13)
- Extension of River Oaks Dr west from Stratford Rd aligning with US 23 & Cottswold Dr (Alternative 8)
- Extension of Lexington Blvd south to connect with William St (US 36) (Alternative 9)
- Houk Rd, existing between US 36 (William St) and SR 37 (Central Ave), widened to 3 lanes

### 2015

- Sawmill Parkway extension (Alternative 2)
- New road between SR 37/SR 203 and Houk Road in the NE quadrant of the City (Alternative 6)

### 2020

- Extension of Cheshire Road west from US 23 to connect with US 42 (Alternative 1)
- Connector road from the intersection of Glenn Road & Curve Road south to Cheshire Road (Alternative 3)

### 2020 Full Build

- New road between Troy Rd and US 23 in the NE quadrant of the City with improvement of Panhandle Rd bridge (Alternative 7)
- North/south route extending from the intersection of Alternative Y between Horseshoe Rd and US 42 south to intersect with US 36/SR 37 at Glenn Rd and the extension of Panhandle Rd east to connect with the north south route between Horseshoe Rd and US 42 (Alternative 5 – Northeast City Quadrant Grid)
- US 42 extension to the extension of Glenn Road (Alternative 16).

Assessments of the City of Delaware transportation system were made for both intersections warranting future traffic control and for roadways which may require a lane addition.

**A. Possible Future Traffic Signal Locations**

The locations noted in Section XI as warranting a traffic signal by the year 2020 in the City of Delaware were again evaluated using the increment model results to determine when they may be warranted and what affect road network additions may have upon the intersection. The following is a summary chart showing City of Delaware intersections with the year the location warrants a signal.

**City of Delaware Possible Future Traffic Signal Locations 2000 – 2020 Full Build**

| Intersection | 2000 | 2005 | 2010 | 2015 | 2020 | 2020 Base | 2020 Full Build |
|---|---|---|---|---|---|---|---|
| Armstrong Rd & North St. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | O |
| Armstrong Rd & Pollock Rd. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Houk Rd & Pittsburgh Dr. | --- | O | O | O | O | ✓ | O |
| Houk Rd & Hills-Miller Rd. | --- | O | O | O | O | ✓ | O |
| Lake St & Joy Ave. | ✓ | ✓ | O | O | O | ✓ | O |
| Pennsylvania Ave. & Executive Blvd. | --- | O | O | O | O | ✓ | O |
| Pennsylvania Ave & Euclid Ave. | O | O | O | O | O | ✓ | O |
| Sunbury Rd (US 36/SR 37) & SR 521 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Sunbury Rd (US 36/SR 37) & Glenn Rd | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| SR 521 & Fieldcrest Dr. | --- | ✓ | ✓ | ✓ | ✓ | ✓ | O |
| Troy Rd & Hills-Miller Rd. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| US 23 & Panhandle Rd | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| US 23 & Hawthorne Blvd. | O | O | O | O | O | ✓ | O |
| William St (US 36) & Houk Rd | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| William St (US 36) & Curtis Ave. | O | O | ✓ | O | ✓ | ✓ | ✓ |
| William St (US 36) & River St. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| William St (US 36) & Cheshire St. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| US 42 & Slack Rd. | O | ✓ | ✓ | O | O | ✓ | O |

--- indicates intersection not constructed
O indicates signal is not warranted
✓ indicates signal is warranted

As shown in this chart, all locations warrant a traffic signal in the year 2020 without roadway additions. The shaded intersections in the chart above warrant a signal in the year 2000 and throughout the 20 year period. The intersection of Lake Street and Joy Avenue warrants a signal in the year 2000 and 2005, but the addition of the Pennsylvania Avenue extension and interchange modification reduces volumes on Lake Street such that the signal is not warranted between 2010 and 2020.

The intersections of Pennsylvania Avenue & Executive Boulevard and Pennsylvania Avenue & Euclid Avenue only warrant signal control in the year 2020 without any network additions. Traffic volumes on Pennsylvania Avenue are reduced sufficiently with network additions through the 20 year period to allow these locations to operate with stop control.

The intersection of SR 521 and Fieldcrest Drive warrants a signal from 2005, the year that Fieldcrest Drive is in place, until the 2020 full build condition when Alternative 5, the northeast connection between US 36/SR 37 and US 23 is in place. Alternative 5 reduces volumes at this intersection sufficiently to allow it to operate with stop control.

Hawthorne Boulevard and US 23 warrant signal control under 2020 base conditions without additions to the road network. This intersection does not warrant a signal from 2000 to the 2020 full build condition due the reduction in traffic volume on Hawthorne Boulevard with the inclusion of road network additions.

The intersection of William Street & Curtis Avenue does not warrant a signal until the year 2010, according the increment model results. Volumes are again reduced to a level where stop control is appropriate in the year 2015 as alternatives such as the new road connecting Section Line Road to Troy Road, Alternative 6, are in place. Volumes again increase at this intersection in 2020 and in the 2020 full build condition to warrant traffic signal control.

US 42 & Slack Road warrants signal control in the year 2005, according to traffic projections. However, the presence of the Sawmill Parkway extension (Alternative 2) in the year 2015 reduces traffic volumes on Slack Road to a level where stop control would be appropriate at its intersection with US 42.

## B. Roadway Lane Additions

The information obtained from the incremental transportation model runs expands upon and supplies further information regarding the improvements noted for the City of Delaware in Section XI. The following is a summary of the five year increment transportation model results for City of Delaware streets separated into three areas: north City region, south City region, and the central City region.

### *NORTH CITY OF DELAWARE REGION*

#### *Lake Street (US 42)*

Lake Street north of Central Avenue (SR 37) was shown to require 3 travel lanes to accommodate the traffic projected in the 2000 year transportation model and will continue to require 3 lanes through to year 2020 if there are no additions made to the transportation network. Two lanes will be adequate for this roadway, however, in 2010 with the addition of the extension of Pennsylvania Avenue

(Alternative 4) and the modification of its interchange with US 23 to provide for all movements (Alternative 13).

***Houk Road – William Street to Central Avenue***
This section of Houk Road is shown by the traffic volumes projected in the incremental model to require 3 travel lanes now through to 2020. Network additions or improvements did not assist in reducing the demand for the additional travel lane.

***Hills-Miller Road – west of US 23***
Hills-Miller Road requires three travel lanes west of US 23 to accommodate projected traffic volumes from year 2000 to 2020. However, traffic volumes are reduced on this section of roadway to a point where two lanes would be adequate if Alternative 7, the new road between Troy Road and US 23, north of Pinecrest Road and south of Hills-Miller Road is in place.

***Panhandle Road Bridge – US 23 to Hudson Road***
The Panhandle Road bridge over the Olentangy River north of the City of Delaware is not shown by projected traffic volumes to require widening until Alternative 7, the new road between Troy Road and US 23, north of Pinecrest Road and south of Hills-Miller Road is in place. Alternative 7 was added to the increment model network for the full build out condition in 2020.

***Executive Boulevard and Pinecrest Drive***
Two lanes will be adequate to accommodate the traffic volumes projected for Pinecrest Drive and Executive Boulevard from 2000 through 2020 full build conditions. Alternative 7, the new road between Troy and US 23, and Alternative 5, the north south and east west grid in the northeast quadrant of the City, which were added to the model for the 2020 full build condition, were shown to reduce volumes on these two roadways.

***SOUTH CITY OF DELAWARE REGION***

***Olentangy Avenue/Armstrong Road Bridge***
Three travel lanes are required to accommodate the traffic volumes projected for the Olentangy Avenue/Armstrong Road bridge over the Olentangy River south of the City of Delaware from 2000 through 2020. However, the extension of US 42 east from US 23 to Glenn Road extended (Alternative 16), when added to the transportation network in the 2020 full build scenario, reduces volumes on this bridge, which would allow it to remain a 2 lane section.

***Bunty Station Road***
Bunty Station Road, as a two lane section, will be adequate to accommodate projected traffic volumes until Alternative 2, the extension of Sawmill Parkway is added to the network in 2015, at which point a three lane section will be required between the Sawmill Parkway extension and SR 315. With the addition of Alternative 1, the extension of Cheshire Road west from US 23 to US 42, traffic volumes are projected to drop significantly to well within the capacity of a two lane roadway.

***US 23 & SR 315***
Although US 23 & SR 315 is an ODOT controlled intersection, it bears mention as inclusion or exclusion of some road network alternatives in the Delaware Thoroughfare Plan affect the operation of this key intersection. Located south of the City of Delaware, US 23 & SR 315 experiences congestion today with congestion projected to increase through year 2020. It has been noted in the ODOT Draft US 23 Access Management Plan that this intersection requires improvement to allow it to operate efficiently in the future. It should also be noted that Alternative 2, the extension of Sawmill Parkway, has the potential to add traffic to this intersection unless there is a more direct east west connection provided from Sawmill Parkway east across US 23.

***CENTRAL CITY OF DELAWARE REGION***

***Troy Road, Euclid Avenue, Liberty Street***
According to the increment model results, traffic volumes on these three central City streets are projected to remain well within the capacity for a two-lane roadway and will not be adversely affected by road network additions.

***Sandusky Street***
The existing lane configuration of Sandusky Street will be adequate to accommodate projected traffic volumes through year 2020, although the section between US 42 and Olentangy Avenue will reach the limits of a three lane section by 2020 without any additions to the road network. Alternatives such as the Pennsylvania Avenue extension (Alternative 4) and modification of its interchange with US 23 to provide for all movements (Alternative 13) assist in maintaining the projected traffic volumes on this section of Sandusky Street within the capacity of a three lane roadway through 2020.

The section of Sandusky Street from Park Avenue to William Street experienced a high incidence of accidents during the three-year period from 1996 to 1998 (31 total). These accidents were primarily angle and

rear-end type. As there are many commercial drives along this section of Sandusky Street, this area should be further studied for consolidation of driveways and implementation of access management techniques to improve traffic safety and flow.

***Pennsylvania Avenue***

Two lanes will be adequate on Pennsylvania Avenue to accommodate the traffic volumes projected through the year 2020. However, without any network additions in place, the traffic volumes projected for the section of Pennsylvania Avenue from Troy Road to Euclid Road will approach the threshold of requiring a three-lane section. The extension of Pennsylvania Avenue (Alternative 4) and the modification of its interchange with US 23 (Alternative 13) when added to the model network in year 2010 does add some traffic to Pennsylvania Avenue. However, the total daily traffic volumes projected for this street with the extension of Pennsylvania Avenue in place will remain within the capacity of a two-lane facility. Alternatives 5 and 7 when added to the incremental model network in the year 2020 full build condition, are projected to decrease volumes on Pennsylvania Avenue to approximately their year 2000 level. This is due to their provision of additional options for travel between US 23 and US 36/SR 37 other than the Pennsylvania Avenue extension and interchange modification (Alternative 4+13) on the north side of town.

***Central Avenue and William Street***

Central Avenue (US 36) and William Street (SR 37) were evaluated from Houk Road to the Point to determine their roadway requirements given the information provided by the 2000 to 2020 incremental model results. These two roadways serve as the primary east-west arterial highways in the City of Delaware, provide access to US 23 and are designated state and interstate roadways. The future roadway requirements on Central Avenue and William Street have been subdivided into three main areas:

Western section from Houk Road to Elizabeth Street
Downtown section from Elizabeth Street to US 23
Eastern section from US 23 to the Point.

***Central Avenue and William Street, Western Section: Houk Road to Elizabeth Street***

Central Avenue and William Street between Houk Road and Elizabeth Street, according to the traffic volumes projected in the increment model runs, require 3 lanes in the year 2000 and continue to require a 3-lane section through the year 2020 regardless of any network additions. Central Avenue in this area

heads toward exceeding a 3 lane capacity by 2005 until the Pennsylvania Avenue extension and interchange modification (Alternatives 4 and 13) are added to the network in 2010. Alternative 7 connects to Alternative 6 and provides a new east west connection between Section Line Road and US 23 on the northwest side of town. Alternative 5 extends this route east from US 23 to the extension of Glenn Road south to US 42 and US 36/SR 37. When these Alternatives (5, 6, and 7) are added to the road network in the 2020 full build condition, they also provide some reduction in volume along the section of Central Avenue and William Street from Houk Road to Elizabeth Street.

With the surge in development occurring in the north west area of town, the section of Central Avenue and William Street from Houk Road to Elizabeth Street would benefit from application of access management techniques and guidelines now to maintain traffic flow and safety before opportunities are lost as this region develops.

***Central Avenue and William Street, Downtown Section: Elizabeth Street to US 23***

Traffic volumes on Central Avenue and William Street through the downtown City of Delaware area between Elizabeth Street and US 23 do not show wide variations of change throughout the 20 year period according to the results of the increment model runs. As alternatives are added to each five-year model networks, the volumes in the downtown area on these two roadways show only slight increases or decreases. The projected traffic volumes on both these roadways through the downtown area fluctuate just around the threshold for requiring a lane addition throughout the 20-year period. For example, the traffic volumes on William Street are near to requiring a lane addition throughout the 20-year period and, by 2020, the projected volumes indicate a 4-lane section will be required to accommodate the projected trips. Projected traffic volumes on Central Avenue in this same downtown area are just above the capacity of a 2-lane facility, indicating a need for 3 travel lanes in 2000 and throughout the 20-year period. The transportation model provides planning level traffic volumes. As these projected planning level volumes for Central Avenue and William Street in the downtown area oscillate around the threshold for requiring a lane addition, and in consideration of the associated costs and the desire noted by

citizens to maintain the existing atmosphere of their City, other options should be explored to provide increased road capacity. This would include adjusting traffic signal coordination, on-street parking assessment, intersection lane additions, along with access management and traffic system management techniques, where applicable, to gain the most capacity out of the existing road system while keeping impacts to structures at a minimum.

***Central Avenue and William Street, Downtown Section: US 23 to the Point***

Central Avenue and William Street between US 23 and the Point each require improvement to a 4-lane section in 2020 if there are no network additions made. William Street along the short stretch of road between US 23 and Lake Street is already 4 lanes, which will remain adequate until 2020 when a 5-lane roadway may be necessary. These two roadways are shown to require 3 lanes between US 23 and the Point beginning at year 2000 through 2020, with volumes on William Street projected for a 4-lane facility by 2020 between Lake Street and the Point based on the results of the increment model runs. The increment model runs up to year 2020 do not include the addition of Alternatives 5 and 7, which provide a route north of the City of Delaware between US 36/SR 37 and US 23. The addition of these two alternatives to the full build 2020 model network result in a decrease in volumes on Central Avenue and William Street between US 23 and the Point which could allow them to operate at the upper limits of capacity for a 2 lane roadway. Although other alternatives provide slight assistance in decreasing volumes in this key area, it is this provision of a connection north of the City between US 23 and US 36/SR 37 which allows the most reduction in traffic between US 23 and the Point, in particular on Central Avenue. William Street between US 23 and the Point gains a slight added reduction in volume from the inclusion of the US 42 extension in the 2020 full build model network.

***US 36/SR 37 – East of the Point***

US 36/SR 37 east of the point is a 4-lane roadway, narrowing to 2 lanes prior to the railroad underpass (the Point). At the present time, the City limits extend east along this route to just west of Sweeney Road. This segment of US 36/SR 37 from the City limits to the Point includes a number of drives and intersections. This section of roadway would benefit from the application of access management techniques to consolidate driveways and identify major access points before additional development takes place. The intersection of Bowtown Road and US

36/SR 37 should receive particular attention and consideration of closure or change to a right in /right out access in conjunction with the installation of a traffic signal at US 36/SR 37 & SR 521.

## C. Summary

A summary of the roadways in the City of Delaware which may require future widening, the year the widening will be required and comments regarding the affect of network additions based on the result of the 2000 through 2020 five-year increment model results is shown below:

**City of Delaware –Possible Future Lane Additions – 2000 - 2020**

| | | No. Lanes | Year Required | Comments: |
|---|---|---|---|---|
| Lake Street | North of Central Ave | 3 | 2000 | 2 lanes sufficient if Alternative 4+13 is in place |
| Houk Road | William St to Central Ave | 3 | 2000 | Needed 2000 to 2020 |
| Hills-Miller Road | West of US 23 | 3 | 2000 | 2 lanes sufficient if Alternative 7 is in place |
| Panhandle Road | US 23 to Hudson Rd | 3 | 2020 | Needed when Alternative 7 is added to the network |
| Olentangy Avenue | Sandusky St to Armstrong Rd | 3 | 2000 | 2 lanes sufficient if Alternative 16 is in place |
| Bunty Station Road | Sawmill Pkwy to SR 315 | 3 | 2015 | 2 lanes sufficient if Alternative 1 is in place |
| Central Avenue | Houk Rd to Elizabeth St. | 3 | 2000 | Needed 2000 to 2020 |
| William Street | | 3 | 2000 | |
| Central Avenue | Elizabeth St to US 23 | 3 | 2000 | Road network additions do not significantly change volumes in this area |
| William Street | | 4 | 2020 | |
| Central Avenue | US 23 to the Point | 3 | 2000 | 2 lane may be sufficient if Alternative 5 is in place |
| William Street | | 3 | 2000 | |

Traffic signal warrants should be evaluated for the following intersections which were shown as possibly warranting a traffic signal in the 2000 transportation model:

Armstrong Rd & Pollock Rd
Sunbury Rd (US 36/SR 37) & SR 521
Sunbury Rd (US 36/SR 37) & Glenn Rd
Troy Rd & Hills-Miller Rd
US 23 & Panhandle Rd
William St (US 36) & Houk Rd
William St (US 36) & River St
William St (US 36) & Cheshire St

Decisions on future road improvement projects should incorporate the community's future vision for the City of Delaware, balancing traffic flow with the desired land use. In particular the role of the downtown area, should be carefully considered and decided upon in coordination with meeting future transportation needs. For instance, if the community's desire is to maintain a historical downtown atmosphere, roadway projects impacting existing City structures may be kept to a minimum. If improved traffic flow is an important community goal, consideration could be given to upgrading the existing arterial system to fully provide for the future transportation needs. Changes to the road network could impact existing structures, affect pedestrian traffic, bike traffic and on-street parking, creating a downtown atmosphere not in line with the goals of the community.

# *Section XIV*

## *Prioritization of Improvements*

## XIV. Prioritization of Improvements

Projects were evaluated based on their ability to maintain the existing system, the necessity to reduce areas of congestion, as well as financial practicality and technical feasibility. The recommended additions to the roadway network were ranked as either high, medium or low priority to provide direction regarding their importance to the transportation network as a whole. This does not preclude roadways ranked in the low category to be studied or constructed prior to roadways ranking high in priority if funding is readily available. **Table 22** and **Table 23** indicate the priority ranking of roadway additions for Delaware County Alternatives (noted by letters) and City of Delaware Alternatives (noted by numbers), respectively. The alternatives are listed alphabetically or numerically in each priority group, not according to any additional ranking of importance.

## Table 22. 2020 Delaware Thoroughfare Plan Project Priority Assessment – County Alternatives*

| | Alternative No. | Description |
|---|---|---|
| **HIGH PRIORITY** | B | Extension of Glick Rd east from SR 257 to connect with Powell Rd west of Wellington Blvd. |
| | C | Relocate Liberty Rd north of Home Rd southeast to align with Liberty Rd south of Home Rd |
| | E | Extension of Sawmill Parkway from Home Rd north past Bunty Station Rd, continuing northwest to intersect with US 42 between Owen-Fraley Rd and Slack Rd. |
| | J | Extension of Home Rd east from US 23, crossing the railroad tracks connecting to Lewis Center Rd east of Lewis Center and west of South Old State Rd |
| | M | New interchange with IR 71 at Big Walnut Rd |
| **MEDIUM PRIORITY** | K | Extension of Piatt Rd north from Cheshire Rd to align with Roloson Rd at Curve Rd and extension of Piatt Rd south from Shanahan Rd, intersecting Lewis Center Rd approximately midway between the railroad and South Old State Rd. |
| | N | Connector road extending east from Domigan Road, intersecting SR 3 between Sunbury and Galena, continuing east to connect with SR 37 between Walnut Rd and Longshore Rd. |
| | R | Extension of Cleveland Ave north from Maxtown Rd to connect with Worthington Rd. |
| | S | Extension of Rome Corners Rd south to connect with Worthington Rd. |
| | V | Extension of Fancher Rd from Harlem Rd southwest to Smothers Rd. |
| | G | Extension of South Section Line Rd north from SR 37 to align with North Section Line Rd at Buttermilk Hill Rd and a connection between South Section Line Rd and SR 257 south of Bean-Oller Rd |
| **LOW PRIORITY** | F | Extension of Steitz Rd north from Hyatts Rd to connect with the extension of Sawmill Parkway (Alternative E/2) between Hyatts Road and Clark-Shaw Road. |
| | Q | Realignment of SR 605 northwest from Centerburg Rd connecting with Porter Central Rd south of Olive Green Rd. |
| | T | Extension of Sunbury Road north from Red Bank Road east of the Hoover Reservoir northeast to connect with Harlem Road. |
| | X | New interchange at IR 71 and SR 521. |
| | Y | Extension of Mink Street from River Rd east to County Home Rd at its intersection with US 42 and a new interchange at IR 71 and SR 521. |
| | Z | Extension of Shanahan Road east from Piatt Road to South Old State Road. |

* The recommended additions to the roadway network are ranked as either high, medium or low priority to provide direction regarding their importance to the transportation network as a whole. The alternatives are listed alphabetically or numerically in each priority group, not according to any additional ranking of importance.

## Table 23. 2020 Delaware Thoroughfare Plan Project Priority Assessment – City Alternatives*

| | Alternative No. | Description |
|---|---|---|
| **HIGH PRIORITY** | 2 | Extension of Sawmill Parkway north past Bunty Station Rd to connect with US 42 |
| | 3 | Connector Road extending from the intersection of Glenn Rd & Curve Rd south to Cheshire Rd |
| | 4 | Pennsylvania Avenue extension east from US 23 to the intersection of US 42 & Horseshoe Rd |
| | 7 | Extension of the committed connector road between Houk Rd and Troy Rd east to align with the existing intersection of US 23 & Panhandle Rd. |
| | 13 | Modification of the Pennsylvania Avenue interchange with US 23 to provide for all movements. |
| | 16 | Extension of US 42 east from US 23 to Alternative 3, the extension of Glenn Road. |
| **MEDIUM PRIORITY** | 5 | North/south route connecting from the intersection of Alternative Y & Horseshoe Road/Kelly McMaster Rd south to intersect with US 36/SR 37 between Glenn Rd and Sweeney Rd ***AND*** the extension of Panhandle Rd east to connect with this north/south route between Horsehoe Rd and US 42. |
| | 6 | East/west connector road from the existing intersection of SR 37/203 & South Section Line Rd east to the committed Houk Rd extension. |
| | 9 | Extension of Lexington Blvd south to SR 36. |
| | G | Extension of South Section Line Rd north from SR 37 to align with North Section Line Rd at Buttermilk Hill Rd and a connection between South Section Line Rd and SR 257 south of Bean-Oller Rd |
| **LOW PRIORITY** | 1 | East/West connector beginning at S. Section Line Road, connecting with Cheshire Road at its intersection with US 23. |
| | 8 | Extension of River Oaks Dr west from Stratford Rd, aligning with the intersection of US 23 & Cottswold Dr. |
| | Y | Extension of Mink Street from River Rd east to County Home Rd at its intersection with US 42 and a new interchange at |

* The recommended additions to the roadway network were ranked as either high, medium or low priority to provide direction regarding their importance to the transportation network as a whole. The alternatives are listed alphabetically or numerically in each priority group, not according to any additional ranking of importance.

# *Section XV*

## *Geographic Information System (GIS)*

## XV. Geographic Information System (GIS)

Both Delaware County and the City of Delaware have invested in robust Geographic Information Systems (GIS) which include detailed roadway centerline layers. **ms consultants,** inc. used GIS extensively to organize, store, and graphically display data used throughout the development of the Thoroughfare Plan. The GIS data files containing the Thoroughfare Plan information will ultimately be incorporated into the Delaware County and the City of Delaware Geographic Information Systems and can be used to address such issues as future land use and transportation planning, economic development and road maintenance.

**ms consultants, inc.** used ArcView GIS 3.2 from Environmental Systems Research Institute, Inc. (ESRI) for this project. Both Delaware County and the City of Delaware use ArcView software extensively for other applications.

### A. MORPC Data

In the early stages of the Thoroughfare Plan development process, the Mid-Ohio Regional Planning Commission (MORPC) collected background data and used ArcView GIS to store this information and prepare graphics. Several hardcopy exhibits were prepared by MORPC of their initial data. In late 1999 and early 2000, MORPC provided **ms consultants, inc**. with their ArcView files via CD-ROM and email. **ms consultants, inc.** have made no modifications to MORPC's background demographic, employment, or traffic zone data.

### B. MORPC Exhibits

MORPC prepared numerous hardcopy exhibits during the early stages of the Thoroughfare Plan development process. In order to provide continuity at both public meetings and task force meetings, **ms consultants, inc.** continued to use the original MORPC graphics to illustrate the alternative new roadways under consideration. **ms consultants, inc.** did not convert the MORPC graphics into ArcView data. However, the MORPC graphics were modified to reflect revisions to various alternative roadways under consideration. Graphic displays were prepared as color prints and electronic files for inclusion in PowerPoint presentations and for distribution via the Internet.

### C. ms consultants, inc. Data

**ms consultants, inc.** developed a seamless database of county and city roadway information using ArcView GIS. All data was organized as centerline segment attributes, not graphic elements as in the MORPC data. These attributes included roadway functional classifications, speed limits, county and township road numbers, and traffic volumes. Data for both the existing year and future year (2020) was incorporated where appropriate.

The road center line data layer contained in the Delaware Appraisal Land Information System (DALIS) was used as the base map for the thoroughfare plans. The DALIS

Project Office supplied **ms consultants, inc**. with DALIS-DATA Version 3.2 (January 2000). Attribute information was added to the existing roadway segments to the extent possible. Some DALIS segments were divided into new sub-segments where the attribute data varied within the existing DALIS segment. These new segments were numbered according to the "baby segment" numbering methodology suggest by the Delaware County GIS director. A GIS coordination meeting was help on November 9, 2000 to review issues such as segment numbering and the format for GIS deliverables. Representatives from **ms consultants, inc.,** MORPC, Delaware County, and the City of Delaware were in attendance.

**D. GIS Deliverables**

Delaware County and the City of Delaware each receive CD-ROMs containing the data developed by MORPC and **ms consultants, inc.** as the final GIS product. **ms consultants, inc.** has not reviewed the accuracy of the original MORPC GIS data, except that required to revise the graphics mentioned above. The data developed by **ms consultants, inc.** included ArcView Shapefiles (.shp, .dbf & etc.) and Project files (.apr) along with Arc/Info export files (.E00). These files are in the DALIS coordinate system and are intended for use with other DALIS data.

In addition to the GIS data files, **ms consultants, inc**. provided digital files (.pdf) of display graphics used at public meetings and task force meetings. These files are intended to serve a record copy of display graphics and should allow the county and city to replicate various displays using their GIS.

# *Section XVI*

## *Public Involvement Program*

## XVI. Public Involvement Program

Public involvement is essential to incorporate individual community needs into a regional Thoroughfare plan and aids with future support for transportation projects. The Delaware County and the City of Delaware agencies believe that public participation is essential to improve both the quality of planning and the degree of acceptance and implementation of the Thoroughfare recommendations by affected communities. Therefore, consensus and public input was intensively sought for the Delaware Thoroughfare Plan update.

The public involvement program organized for the Delaware Thoroughfare Plan consists of both direct and indirect methods of public contact. Direct public contact was provided by a schedule of public open house sessions, workshop sessions with public officials, public hearings, and monthly meetings by the City of Delaware Transportation Task Force. Indirect contact with the general public was accomplished through more universal methods such as advertisements or notices in newspapers, news articles and providing information regarding the plan at the Delaware County Engineer's Office (DCEO) and on their website at www.co.delaware.oh.us. The public involvement strategy also recognized participants that were interested in the Delaware Thoroughfare Plan revision by compiling a mailing list that was used and updated throughout the public involvement process, enhancing the strategy of direct contact. The public involvement program meeting schedule is shown below in **Table 24.**

**Table 24. Public Involvement Meeting Schedule**

| Meeting | Date |
|---|---|
| City of Delaware Transportation Task Force – nominally monthly meetings | June, 1999 to present |
| Delaware County Regional Planning Commission (RPC) | April 27, 2000 |
| 12 Public Open House Sessions throughout Delaware County hosted by the DCEO | May to June, 2000 |
| 2 ODNR, ODOT, City of Columbus, Zoo, Metro Parks Open House Sessions | June 2000 |
| 4 Regional Workshops with Public Officials hosted by the DCEO | October, 2000 |
| City of Delaware Transportation Task Force Public Hearing | November 16, 2000 |
| Delaware County RPC | November 30, 2000 |
| Delaware County RPC | March 29, 2001 |
| Delaware Thoroughfare Plan Public Meeting | May 16, 2001 |
| City of Delaware Planning Commission | June 27, 2001<br>July 25, 2001* |
| Delaware County RPC | June 28, 2001<br>July 26, 2001<br>August 30, 2001* |
| Delaware County Commissioners | To be determined* |
| Delaware City Council | August 27, 2001* |

* Presentation and adoption of the Thoroughfare Plan

A synopsis of the meetings held to date as part of the public involvement program is provided below:

**A. City Transportation Task Force**

The Delaware City Council, by resolution, assigned a Transportation Task Force to serve as an advisory board to the City Planning Commission and City Council. As noted in the organizational outline contained in **Appendix 8,** the purpose of the Transportation Task Force is to "assist and advise the Planning Commission and City Council by providing for community representation and citizen input and information in the decisions regarding the development of new streets, intersections, and the categorizing and planning for improvements to existing streets throughout the city and adjacent county".

The Task Force has held monthly public meetings since June, 1999 to discuss City transportation issues. **ms consultants, inc.** and MORPC provided information regarding the Delaware Thoroughfare Update project at the following Task Force meetings:

| Meeting Date | Information Provided |
|---|---|
| January 20, 2000 | Introduction to Transportation Modeling |
| February 24, 2000 | 1995 to 2020 Land Use Projections, 5-year increment 1995 & 2020 Modeling Results City of Delaware Thoroughfare Plan Possible 2020 Road Network Alternatives (first set of possible alternatives) |
| May 11, 2000 | Review of City of Delaware Thoroughfare Plan Possible 2020 Road Network Alternative model results |
| July 20, 2000 | Summary of Cost Estimates for the City of Delaware Thoroughfare Plan Possible 2020 Road Network Alternatives |
| September 14, 2000 | Summary of City of Delaware 2020 Possible Road Improvements |
| November 2, 2000 | Review of 2020 Road Network Alternatives Suggested for Further Study in Final Combined Model Runs |
| November 16, 2000 | City Task Force Public Hearing - 2020 Road Network Alternatives Suggested for Further Study in Final Combined Model Runs |
| December 7, 2000 | Review and Decision on 2020 Road Network Alternatives Suggested for Further Study in Final Combined Model Runs |
| March 29, 2001 | Combined Model Run Results |
| April 19, 2001 | Additional Model Run Results |
| May 17, 2001 | Discussion of the Final Draft Delaware Thoroughfare Plan |

The Transportation Task Force publicizes notice of their meetings in the *Delaware Gazette* and also on the Delaware public access television channel. Public attendance at these meetings has been sporadic with a concentration of people representing the Stratford Ecological Center and the Stratford Woods subdivision attending several sessions, voicing their opposition to the alternative which connects the extension of Sawmill Parkway east to US 23 (Alternative 1B).

In an attempt to obtain a broader spectrum of input from City of Delaware residents and stimulate interest for the Thoroughfare Plan, the Task Force hosted a public hearing on November 16, 2000 at the Ohio Wesleyan University. The intent of the public hearing was to present the 2020 road network alternatives suggested for further study to the public and allow time for the Task Force members to hear comments from constituents to aid them in formulating recommendations for the Thoroughfare Plan. Public notice of the hearing was placed in the *Delaware Gazette*. News articles also mentioned the pending public hearing in both the *Delaware Gazette* and *This Week News*. As with all Task Force Meetings, the public hearing was announced on the local Delaware public access television channel.

The format for the public hearing allowed a moderated public comment session following a formal presentation regarding the Delaware Thoroughfare Plan. Open house sessions preceded and followed the hearing to allow constituents additional time to ask questions or gain information directly from Task Force members, City staff, and consultant representatives. One hundred fifty-seven (157) people attended the public hearing. Comment forms were provided for those preferring to provide written comments regarding the Thoroughfare Plan. Twenty-three (23) constituents spoke during the moderated comment period following the presentation.

By a show of hands, the majority of people attended the public hearing to voice their concerns with Alternative 1B which is shown as a connection between the extension of Sawmill Parkway and US 23 on the Delaware Thoroughfare Plan and is in close proximity to the Stratford Ecological Center. A number of representatives spoke in opposition to Alternative 1B. Additional comments received at the hearing related to concern with increased traffic on local streets due to the modification of the US 23 & Pennsylvania Avenue interchange and the extension of Pennsylvania Avenue east from US 23 to connect at US 42 & Horseshoe Road (Alternative 4 and 13). Two citizens commented as preferring no growth and no new roads with one citing concern that an outerbelt would eliminate the downtown Delaware central business district. Three people preferred an outerbelt for the City of Delaware as long as it was farther out from the City than proposed on the Thoroughfare Plan. Four people spoke against Alternative 6 and 7 which connects Section Line Road at SR 203 to US 23 at Panhandle Road either because it will impact their property or because they feel it will increase traffic on their local streets. Three people commented in favor of the US 42/US 23 improvement plans and felt US 42 should serve as the main connection to US 23 on the southwest side of the City of Delaware rather than the alternative in

the vicinity of the Stratford Ecological Center (Alternative 1B). One person pointed out that the connection of South Section Line Road to North Section Line Road and also the Mink Street Road extension to SR 521 would need closer review to determine if it would impact the Preservation Parks area located south of Buttermilk Hill Road. The public hearing agenda and meeting minutes are contained in **Appendix 8.**

The City Transportation Task Force meetings regarding the Delaware Thoroughfare Plan culminated in a May 17, 2001 session the day after a final public meeting was held to review additional transportation model run results. The primary group of citizens attending this meeting was a group opposed to Alternative 1 due to its change in representation on the Thoroughfare Plan maps to an extension of Cheshire Road west to US 42. Noise, trucks, disruption of open space, cost and loss of homes were all cited as concerns with the connection now shown on the map representing Alternative 1. There was support voiced for an extension of US 42 east from US 23 to provide truck access around the City of Delaware to access US 36/SR 37 east of town. After hearing comments from the public, and discussion among members, the City Task Force voted in favor of proceeding with the alternatives placed in the combined model network as part of the Thoroughfare Plan, adding the extension of US 42 west to connect with Alternative 3, the extension of Glenn Road, as shown in Figure 36, and including Alternative 1 represented as the extension of Cheshire Road.

**B. Delaware County Regional Planning Commission (RPC)**

As the RPC will be continually referencing the Delaware Thoroughfare Plan when interfacing with developers, it was essential that they be frequently informed regarding the project throughout its preparation. Three presentations were made to the Delaware RPC prior to the presentation of the Draft Thoroughfare Plan. The first presentation was early in the project on April 27, 2000, familiarizing the members of the RPC with the Delaware Thoroughfare Plan project scope and present status. An additional presentation was made on November 30, 2000, informing the members of the results of the preliminary transportation model runs for the 2020 road network alternatives and again providing the project status. The combined model run results were reviewed at the March 29, 2001, meeting.

Presentations were also made at the June 28, 2001 and July 26, 2001 RPC meeting to provide updates regarding revisions to the combined model network and to allow additional time for public comment. The line representing Alternative 1, located in the much studied region just south of the City of Delaware, had previous to the June RPC meeting, been shown north of Bunty Station Road. After additional modeling efforts and results, a decision was made jointly by the Delaware Thoroughfare Plan team (with representatives from the City, County, County RPC, MORPC and ms consultants, inc.) to relocate the line representing Alternative 1 on the map to a best option location extending west from Cheshire Road to US 42. It was explained that

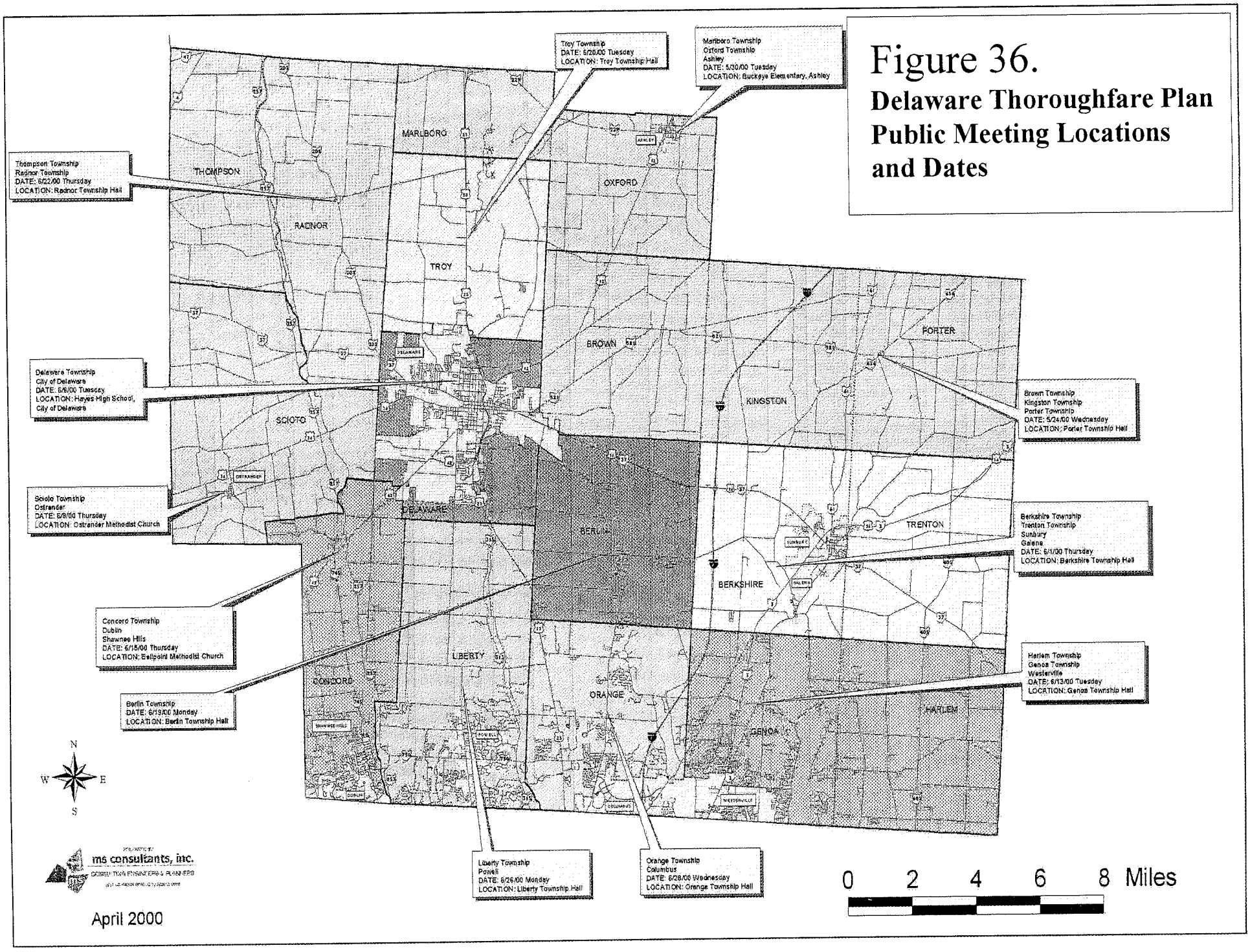
study corridor for Alternative 1 extends between the extension of Hawthorn Boulevard to just south of Cheshire Road, west to US 42 and east to the extension of Glenn Road and would include the previously shown location. The majority of citizens attending the June and July RPC meetings were part of a group called Citizens for Responsible Road Development (CRRD) newly formed in response to the change in location of the line on the Thoroughfare Plan map representing Alternative 1. Concerns of the group were noted regarding impacts on structures, the environment, high costs, and the difficulty in obtaining a river crossing. The group also felt the City of Delaware was visiting their congestion problems on Liberty Township citizens. A trustee from Liberty Township voiced his disapproval of the Cheshire location shown for Alternative 1. Other citizens attended the June meeting to voice disapproval with Alternative U, the bridge over the Hoover Reservoir connecting Big Walnut Road with Central College Road, creating a continuous east west road in southern Delaware County. All comments heard were noted and taken under consideration. The Draft Delaware Thoroughfare Plan is planned to be presented for adoption at the August 30, 2001, RPC meeting.

### C. Public Open House Sessions

One of the purposes of the public involvement program is to inform and educate the public regarding the purpose and development of the revision to the Thoroughfare Plan. A series of twelve public open house sessions were hosted by the Delaware County Engineer's Office during the months of May and June, 2000 to provide information regarding the Delaware Thoroughfare Plan Update and to gain input from the public regarding transportation concerns in their region. These meetings were held at various geographical locations as shown in **Figure 36** to encourage public participation throughout the county. These meetings focused primarily on the County road network, although information regarding the City of Delaware portion of the Thoroughfare Plan was also presented for comment and questions.

Prior to the open house sessions, invitations were sent to township trustees, city and village officials requesting their attendance at the session in their geographical region and inviting them to attend any other session, if desired. Flyers were provided to the officials to post notification of the upcoming meetings at their township halls. Public notices were placed in the *Delaware Gazette*, the largest circulating local newspaper in Delaware County and in local newspapers, such as the Sunbury News, when available, prior to each of the public open houses. Interested constituents were encouraged to visit the County Engineer's office or the County Engineer's website to obtain additional information regarding the Thoroughfare Plan.

In general, attendance at the public open house sessions was light, although the meetings were publicized in the newspaper frequently either as legal ads, events listed in the community calendar or news articles written by reporters, as shown in the listing contained in **Appendix 8.** A total of 153 people chose to attend an open


Figure 36.
Delaware Thoroughfare Plan
Public Meeting Locations
and Dates
Troy Township
DATE: 6/20/00 Tuesday
LOCATION: Troy Township Hall
Marlboro Township
Oxford Township
Ashley
DATE: 5/30/00 Tuesday
LOCATION: Buckeye Elementary, Ashley
Thompson Township
Radnor Township
DATE: 6/22/00 Thursday
LOCATION: Radnor Township Hall
Delaware Township
City of Delaware
DATE: 6/6/00 Tuesday
LOCATION: Hayes High School, City of Delaware
Brown Township
Kingston Township
Porter Township
DATE: 5/24/00 Wednesday
LOCATION: Porter Township Hall
Scioto Township
Ostrander
DATE: 6/8/00 Thursday
LOCATION: Ostrander Methodist Church
Berkshire Township
Trenton Township
Sunbury
Galena
DATE: 6/1/00 Thursday
LOCATION: Berkshire Township Hall
Concord Township
Dublin
Shawnee Hills
DATE: 6/15/00 Thursday
LOCATION: Ballpoint Methodist Church
Harlem Township
Genoa Township
Westerville
DATE: 6/13/00 Tuesday
LOCATION: Genoa Township Hall
Berlin Township
DATE: 6/19/00 Monday
LOCATION: Berlin Township Hall
Liberty Township
Powell
DATE: 6/26/00 Monday
LOCATION: Liberty Township Hall
Orange Township
Columbus
DATE: 6/28/00 Wednesday
LOCATION: Orange Township Hall
MARLBORO
THOMPSON
OXFORD
RADNOR
TROY
BROWN
PORTER
KINGSTON
SCIOTO
DELAWARE
BERLIN
TRENTON
BERKSHIRE
LIBERTY
CONCORD
ORANGE
GENOA
HARLEM
N
W
E
S
ms consultants, inc.
CONSULTING ENGINEERS & PLANNERS
0 2 4 6 8 Miles
April 2000

house session. Attendees of an open house session received general information regarding thoroughfare planning and transportation modeling, along with 1995 traffic volumes, 2020 traffic volume projections, land use, population and employment growth rates in Delaware County. A map showing a preliminary set of 2020 Road Network Alternatives was available for review and comment. Twenty road network alternatives were initially presented by the County for public input. Due to suggestions received at the open house sessions, two additional alternatives were added to the road network: a new interchange at SR 521 & I-71 and an east-west cross county highway connecting Mink Street Road to the west with County Home Road/SR 521 in the east.

Attendees of an open house session were provided with survey forms and encouraged to ask questions and give input regarding transportation issues in their community. Eighty-one completed surveys were returned. Eighty-three percent of those people responding to the survey placed a high importance on establishing a functional regional road network in Delaware County. Problem spots identified via the survey form included locations such as the US 36/SR 37 & I-71 interchange, US 36/SR 37 & Galena Road, US 23, SR 315 & SR 750, travel through the Village of Powell and travel through the City of Delaware. Central Avenue & William Street at the railroad crossing on the east side of town, also known as "the Point", was named as a particularly congested spot in the City of Delaware. Survey respondents listed the extension of Sawmill Parkway from Home Road to US 42 and the alignment of Liberty Road at Home Road as the most strongly favored of the alternatives. Both of these alternatives provide an additional north south route between southwest Delaware County and the City of Delaware with the possibility of reducing traffic volumes on the already congested main routes of SR 315 and US 23.

The survey respondents as a whole were in favor of planning for future roadways to preserve right-of-way before development takes place and eliminates the possibility for good future connections. However, at the same time, there is a concern that building new roads in the rural, agricultural areas of the county would attract unwanted development. Although relieving congestion on southern county roads is desired, achieving this goal by upgrading routes such as Orange Road or Winter Road, considered by area residents as scenic, was not favored. In summation, the tone from the few attendees at the public open house sessions was to achieve a balance between alleviating congestion through road improvement projects while maintaining as much as possible the rural/suburban flavor of their communities.

Sample copies of the legal ads, invitations, flyers, and survey along with a summary of the comments and information received at the public open house sessions is contained in **Appendix 8.**

**D. ODNR, ODOT, City of Columbus, Zoo, Metro Parks Open House Sessions**

Two additional open house sessions which were held specifically for representatives from the Ohio Department of Transportation (ODOT), the City of Columbus, Columbus Metro Parks, the Columbus Zoo, and the Ohio Department of Natural Resources (ODNR) to gain their perspectives and any information which would aid in updating the Delaware Thoroughfare Plan. Minutes and an attendance list for these two meetings are contained in **Appendix 8**.

**E. Regional Workshops for Public Officials**

Four Regional Workshops were held during the month of October, 2000 as the next stage of the public information program for the Delaware Thoroughfare Plan update. These meetings were hosted by the Delaware County Engineer's office, with emphasis on the County road network in the geographic area of each workshop.

The regional workshops provided an overview of the Thoroughfare Plan results to date while gaining input directly from public officials to assist in formulating a future road network which will address the needs of and be supported by the community. Although the workshops did not focus upon public participation, a moderated public comment session was provided during a designated time period. Open house sessions also preceded and followed each workshop to allow time for questions to be answered and comments heard from the general public. Public attendance was highest at Workshops #2 and #3, held in the southern and central areas of Delaware County which have experienced the most impact from the recent influx of development. A summary of the comments heard and written comments received at each workshop along with a sample copy of the meeting invitation and format are contained in **Appendix 8.**

The groupings and dates for the Regional Workshops were as follows:

| | | |
|---|---|---|
| ***Workshop #1*** | ***Northeast County Area*** –Kingston, Porter, Berkshire, & Trenton Townships, Villages of Sunbury & Galena | ***Oct. 3, 2000*** |
| ***Workshop #2*** | ***South County Area*** – Harlem, Genoa, Orange, Liberty & Concord Townships, Villages of Powell & Shawnee Hills | ***Oct. 18, 2000*** |
| ***Workshop #3*** | ***Central County Area*** – Delaware, Troy, Brown, & Berlin Townships, City of Delaware | ***Oct. 24, 2000*** |
| ***Workshop #4*** | ***Northwest County Area*** – Scioto, Thompson, Radnor, Marlboro and Oxford Townships, Villages of Ashley & Ostrander | ***Oct. 12, 2000*** |

Individual invitations with information packets were mailed to township trustees, city and village officials prior to each regional workshop. The information packets contained an overview of the model results for each of the 2020 road network

alternatives with a notation of which alternatives were suggested for further study. A general invitation to the regional workshops was also sent to each person who attended one of the public open house sessions held during May and June, 2000 or returned a survey sheet. In an attempt to offer the general public additional opportunities for direct contact to obtain additional information regarding the Thoroughfare Plan, a legal ad was placed in the *Delaware Gazette* and a public notice placed in the *Olentangy News* prior to the regional workshops. Announcement of the upcoming workshops was also placed in the Delaware Gazette Civic Calendar along with an announcement in *This Week News* and *Sunbury News.*

Public officials representing their geographic area attended each of the regional workshops a good exchange of information took place regarding the Delaware Thoroughfare Plan update. The concept of the City and County agencies working together to establish a recommended Thoroughfare Plan which will be seamless among political jurisdictions was well received and encouragement was given to continue working together to implement the recommendations made in the plan.

**F. Final Public Meeting**

Consideration and discussion of transportation model results, general project costs, and other issues along with noting public comments and community transportation concerns throughout the preparation of the Delaware Thoroughfare Plan resulted in some changes to the lines representing connections on the road network addition maps. This was due to mutual decisions by team members which included County and City representatives to show a line representing the best choice for a connection on these maps given the preliminary information known at this time. As some of these changes occurred after public meetings held earlier in the project timeframe, it was decided to hold an additional meeting to gain public input regarding any newly shown connections. The changes on the maps included the relocation of the line representing Alternative 1 from north of the US 23 & SR 315 intersection to a location which extends Cheshire Road west to US 42 and South Section Line Road. Also requested was input regarding the inclusion or exclusion of the I 71 interchange at the Cheshire Road extension east to SR 37 shown as Alternative N. It was reiterated at this meeting that the lines shown on these maps actually represent, in most cases, a broad area through which an alignment could occur and will be studied in the future.

The final public meeting was held on May 16, 2001 at the Delaware JVS South in a format similar to that of the Regional Workshops: an open house session prior to a formal presentation, a moderated public comment session and a subsequent open house at the end of the meeting. The meeting was well attended with 200 people in present. Forty seven percent of those attending the meeting were from Liberty Township, although at least one person was present from 13 out of 18 of the townships in Delaware County. Fourteen speakers were heard with the majority of

the comments against the location of the line representing Alternative 1, which is shown extending Cheshire Road west to connect with US 42 and South Section Line Road. Concerns with this alternative were impacts on green space, homes, noise pollution, trucks, and project costs. Some speakers represented a newly formed group called "Citizens for Responsible Road Development" who reside in Liberty Township in the vicinity of the Alternative 1 connector. This group noted that they were for good planning but did not see that the Alternative 1 connector as extended west from Cheshire Road was in line with the vision for their community in Liberty Township. Additional comments were made in favor of the Big Walnut interchange with I 71, encouraging the County to improve mis-aligned intersections so they are at right angles for safety purposes, in favor of controlling growth and development, and a request to relocate Alternative Y, the Mink Street Road connection to SR 521, so it would provide access to Buckeye High School.

A summary of the comments heard and written comments received at the final public meeting is contained in **Appendix 8.**

**G. City of Delaware Planning Commission**

Presentations were made at the June 27, 2001 and July 25, 2001 City Planning Commission meeting to provide updates regarding revisions to the combined model network and to allow additional time for public comment. Approximately 25 citizens attended the June 27, 2001 meeting primarily to comment on Alternative 1 which was now represented as a line extending Cheshire Road west to US 42 in place of the previous location north of Bunty Station Road. Concerns with impacts to the environment, existing structures, costs, difficulty with crossing the river were noted by concerned citizens. The Delaware Thoroughfare Plan map was adopted by the City of Delaware Planning Commission at their July 25, 2001, meeting.

**H. Delaware County Commissioners**

The Delaware Thoroughfare Plan will be presented to the Delaware County Commissioners for adoption after approval by the Delaware RPC. The date of this meeting is yet to be determined. As the plans adopted by both the County and the City should show the same recommended corridors for new roadways, any changes made by the Delaware City Council during their review process will be appraised by the County Commissioners for approval as an amendment to the Thoroughfare Plan, if necessary.

**I. Delaware City Council**

The Delaware Thoroughfare Plan update will be presented to the Delaware City Council for adoption at their August 27, 2001, meeting.

**J. Summary**

Overall, the public voiced concern with the congestion occurring on County roads as a result of the recent rise in population. Many see the need to upgrade existing roads or plan for new roads, but caution against providing such improvements at the expense of ecological or historic areas. Some were open about seeing a need for new roads as long as they weren't in "my backyard". One person noted that he preferred improvements in his "front yard" and encouraged widening of existing roadways. Avoiding new scenic river crossings such as the Olentangy River and preserving green space as Delaware County develops were cited as important to attendees of public meetings. Alternatives were added or modified based on information received from the series of public meetings. Information obtained at these meetings allows further insight into existing and future transportation needs in the widely diverse regions of Delaware County.

The public involvement program, as intended, provided a means to communicate and interact directly with area residents and public officials to assist in formulating the Delaware Thoroughfare Plan. It was timely that meetings were being held by the Delaware Regional Planning Commission with many area townships to update or prepare their Comprehensive Plans. These meetings supplemented the Thoroughfare Plan Public Involvement program by providing a smaller and more informal arena for citizens to gain information and air their concerns with Thoroughfare Plan issues along with local issues. This local and regional interaction is important to integrate land use and road planning for the overall benefit of the communities. The Delaware Thoroughfare Plan is the first step in roadway planning and the first, but not final, opportunity for public input. Public involvement continues and becomes increasingly important during the remaining steps as corridor studies are conducted and final design and construction plans are prepared. Citizen involvement is encouraged to ensure road improvements are responsive to and meet the needs of the community.

# *Section XVII*

## *Access Management Guidelines*

## XVII. Access Management Guidelines

Access Management Guidelines have been provided as a supplement to the Delaware Thoroughfare Plan to assist in maximizing the capacity and improve the safety of the existing and proposed roadways in Delaware County and the City of Delaware.

The access management guidelines shall apply to all existing, planned or proposed roadways within the jurisdiction of Delaware County and the City of Delaware. New or proposed local roadways within the County or City not identified on the adopted Thoroughfare Plan should be designed to interconnect with the existing roadway network in a uniform and efficient manner. State routes in Delaware County fall under the access management policies and procedures established by the Ohio Department of Transportation (ODOT) and contained in *their State Highway Access Management Manual.*

There are five access management categories based on the functional classification of roadways which define the relative responsibilities for each classification to provide mobility and access to adjacent properties. These categories are similar to those assigned by ODOT to their state highways. **Table 25** describes the types of roads and general provisions allowed for each of the five access management categories. Access Category V applies to local roadways which are not included in the Thoroughfare Plan. Design and access to these roadways typically follow local subdivision and street design regulations and, therefore, access management controls for Category V roadways are not included in these guidelines. The Access Management Guidelines are contained in **Appendix 9**.

## Table 25. Access Category Description and General Guidelines

| Category | Facility Description | General Design Guidelines |
|---|---|---|
| I | High speed, high volume, long distance through traffic for interstate, intrastate, intercity travel; All Interstate and Freeway type facilities are included in this category. | Multi-lane; median; access at interchange; no direct private access allowed |
| II | Relatively high speed, high volume, long distance through traffic for interstate, interregional, intercity, and some intra-city travel. Typically includes state routes, major arterials and facilities in an early stage of design, which could become Category I as funding and priorities allow. | Access at interchange or public street intersection; no direct private access allowed unless there are no other reasonable means to provide access or if such access prevents more impact to traffic operations, such as an additional signal. Access is through connections to public streets which intersect Category II roadways. This is the highest category allowing at-grade intersections. Traffic signals should be avoided and grade separations should be considered for high volumes cross streets or other cases where signals do not meet warrants. Where traffic signals must be installed their effect on the mainline traffic flow should be minimized through signal coordination. |
| III | Moderate to high speed, volumes, and longer distances for interregional, intercity, and intra-city travel; Typically includes arterials, some collectors and some state routes. This category is appropriate for areas that have some historic, minor dependence on the highway to serve land access and where financial and social costs of attaining full control would substantially exceed benefits. | General provision is that one private access point will be provided for each parcel unless it can be shown that additional access points are necessary and that they would not be detrimental to the safety and operation of the roadway. |
| IV | Balances service for access and mobility at moderate to high speeds and volumes for moderate to short distances providing intercity, intra-city, and intra-community travel. Typically includes collectors, and some local roads | One direct access allowed per parcel with additional access allowed if it meets access safety, design, and operational standards. |
| V | Low to moderate volumes, speed and distance serving intra-city, intra-community traffic. Typically includes most local streets and roads providing local land access where there is little value in providing for high speed travel. | Providing form reasonable and safe access to abutting property is an important purpose of this category but should still consider safe mobility. |

Sources: Ohio Department of Transportation, State Highway Access Management Manual, 1998, Ohio State Highway Access Category Table.

Orgeon Department of Transportation Access Management Classification and Spacing Standards, 1996.

# *Section XVIII*

## *Traffic Impact Study (TIS) Standards*

## XVIII. Traffic Impact Study (TIS) Standards

As a supplement to the Thoroughfare Plan, standards were developed for Delaware County and the City of Delaware for preparation of Traffic Impact Studies. Provision of this uniform set of directives streamlines the site plan review and permitting process and avoids confusion for public agencies, land owners and developers. These standards allow all involved parties know up front when a traffic impact study is required and what information the study must provide.

To ensure the TIS standards address concerns from all arenas, a Focus Group was assembled with representatives from public agencies, private contractors, and developers. The purpose of the Focus Group was to review, discuss, and provide comments on the draft TIS Standards document. The Delaware TIS Standards Focus Group met twice, once on December 14, 2000, and once January 11, 2001. The discussions at these meetings were taken into account and comments incorporated to prepare an equitable set of TIS standards for Delaware County and the City of Delaware. The time spent by Focus Group members to assist in preparation of the TIS Standards is greatly appreciated. The list of Focus Group members, a summary of comments and the TIS Standards are contained in **Appendix 10.**

# *Section XIX*

## *Transportation System Management*

## XIX. Transportation System Management

Transportation System Management (TSM) is provided as a supplement to the Delaware Thoroughfare Plan to provide a means for the region to make more efficient use of the existing and proposed transportation system through a reduction in traffic volumes. TSM involves the implementation of plans and policies geared toward community involvement and life style changes which encourage alternate modes of transportation or work schedule adjustments to decrease traffic volumes during peak travel periods. TSM is especially important for communities such as those in southern Delaware County and the City of Delaware which are experiencing growing transportation demands coupled with a lack of 'build' solutions.

The goal of including this TSM element in the Delaware Thoroughfare Plan is to create the foundation for use of TSM projects in future urban planning, traffic engineering, and development review. Therefore, an extensive list of strategies has been developed to provide local area planners and officials with a working "tool box" of up to date TDM techniques which can be accessed in future community planning and engineering studies. This information will also serve as an educational resource for local area planners to find new ways to link land use and transportation planning. The following is an abbreviated list of TDM categories. Details regarding these categories are included in **Appendix 11**.

***Parking Controls***

- Park & Ride
- Parking Management ie: shared parking facilities, price parking, & overflow parking plans

***Transit Incentives***

- Guaranteed Ride Home
- Ride Sharing
- Public Transit Improvement – conventional transit bus
  - Express commuter bus
  - Mini bus
  - Shuttle service
  - Light Rail
  - Heavy Rail
  - Shared Taxi

***Land Use Planning***

- Transit Oriented Development
- Smart Growth
- New Urbanism

***Other***

- School Trip Management
- Street Reclaiming
- Alternative Work Schedules
- Tele-commuting
- Bicycle/Walking Encouragement
- Campus Trip Reduction
- Freight Management
- Vehicle Restrictions

The institutional framework for TSM, which solicits cooperation between public and private agencies, is essential to the successful implementation of TDM strategies. In developing a TSM plan, transportation planners, engineers, and officials must work together to formulate goals, objectives, and action plans. It would be helpful if public officials in local areas would also be involved in discussions to develop a TSM program. TSM programs are usually established and funded by local, regional or state/provincial governments. TSM programs can be a division within a transportation or government agency with the following possible responsibilities:

- Plan and coordinate implementation of TDM projects and activities
- Marketing, Data Collection and Evaluation of TDM projects
- Provide Ride Matching, Shuttle Services, Pedestrian and Cycle Promotions and Special Event Transportation Management services
- Provide parking management, parking pricing and regulatory reform activities
- Supports pedestrian and bicycle improvements, freight transportation management and security improvements that encourage use of alternative modes.
- Supports integrated transportation and land use planning to improve access and reduce vehicle travel such as access management, smart growth traffic calming or location efficient planning.

Smaller associations can also be established to support a regional TSM program. These Transportation Management Associations (TMA) are normally private, non-profit, member-controlled organizations that provide transportation services in a particular area, such as a business district, mall, medical center, or industrial park. Further information regarding the development of TSM programs and TMA's are contained in **Appendix 11**.

The overall goal of all TSM projects is to make existing transportation facilities work better than they do now. This idea must be put across effectively to ensure the success of a program. There should be no illusions that the process of establishing a TSM program will be easy or the results immediate. Initially, the TSM idea may seem an intrusion in the daily activities of some people involved in local transportation planning. However, over time and the successful implementation of the plan, TSM will become routine and part of the community atmosphere.

# *Section XX*

## *Traffic Calming Guidelines*

MS CONSULTANTS, INC.

## XX. Traffic Calming Guidelines

Traffic calming responds to public concerns about speeding and cut-through traffic on neighborhood streets. The intent of traffic calming is to reduce the speed and volume of traffic to levels acceptable for the functional class of the street and the nature of the bordering activity. Traffic calming measures are meant to be self-enforcing as opposed to traffic control devices such as stop signs and speed limit signs which are regulatory and require enforcement.

The following is a list of traffic calming measures which may be considered singly or in combination:

Neighborhood Speed Watch Program
Speed Hump
Speed Table
Traffic Circle
Center Island Narrowing
Raised Intersection
Choker
Chicane
Closure

A description and summary of each of these traffic calming measures is contained in the Traffic Calming Guidelines contained in **Appendix 12.** Information is also contained in the Traffic Calming Guidelines on the criteria for and process of implementing a traffic calming plan.

# *Section XXI*

*Conclusion*

## XXI. Conclusion

Due to the rapid increase in area growth, Delaware County and the City of Delaware saw the need for not only an updated Thoroughfare Plan, but also a plan which would enlist the cooperation of public agencies to be seamless among political jurisdictions. To this end, the process of developing the plan became as important as the plan itself. Over a year and a half of time has been devoted to the development of the update to the Delaware Thoroughfare Plan, combining numerous hours of data collection and analyses with an intensive public involvement program. Much of the information provided in the Delaware Thoroughfare Plan has been computerized to serve as an information base that can be easily accessed, updated, and revised.

The focal point of the Delaware Thoroughfare Plan is the functional classification of roadways and road network additions to support the traffic volumes projected 20 years in the future. Assignment of functional classifications to all Delaware County and City of Delaware major roadways assists agencies with right-of-way, design or policy decisions regarding roadway improvements. Additions to the transportation network included in the Thoroughfare Plan were made based on a collective assessment of technical data, terrain, geographic area and public contributions. The identified road network additions represent corridors and not specific alignments as the Delaware Thoroughfare Plan is a conceptual document, the first step in road planning.

Future decisions on transportation improvements, in particular those involving new scenic river or reservoir crossings, will have to be made based on balancing the need for a road addition or upgrade with project costs and impacts to structures and the environment. A network addition which seems invasive today may, in 20 years with a progression of development, be seen by a majority as a required transportation need. There are other times when the need for a road addition may never materialize due to changes in development. However it is important to include identified transportation need now on the Thoroughfare Plan to allow progression, when and if required, to the second step, a detailed corridor study and evaluation of costs and benefits for a potential road project. The alternative would be to leave future generations to contend with congestion without a plan.

The Delaware Thoroughfare Plan provides a transportation network to support the expected growth and planned development projected in the County and City. It is a reflection of community land use plans and zoning which direct how future growth should occur. It is in the best interest for citizens in Delaware County as a whole to plan regionally for the rapid growth projected to occur to insure a cohesive plan rather than disjointed plan which stops at township, village or city boundaries. The future construction of a new road or interchange shown on the Plan does not necessarily have to be followed by a proliferation of development.

Comprehensive plans, zoning regulations, and cooperation between public agencies can control the land use surrounding transportation projects. Local agencies, in fact, are encouraged not to drastically change their community's zoning due to a future roadway addition or improvement. The transportation improvements identified in this plan are based on City, Village, Township, and County comprehensive plans. A significant alteration of existing or planned zoning could place unexpected travel demands on the planned roadway network, adding to future congestion rather than alleviating it as desired.

To assist in improved interaction between land use and transportation planning, various tools are provided with the Delaware Thoroughfare Plan. The inclusion of Traffic Impact Study Standards, Access Management guidelines, Traffic System Management guidelines, and Traffic Calming guidelines for the City of Delaware, the Delaware Thoroughfare Plan not only identifies new route and road improvement options but enhancement opportunities for the existing roadway system. These enhancement opportunities are important because, given the constraints associated with cost and time, it is unrealistic to expect all the road network additions and improvements identified in the Delaware Thoroughfare Plan to be constructed and in place within 20 years. Some alternatives and improvements or a section of an alternative may not to be built until a time period after 2020 as area growth progresses requiring a planned roadway addition or upgrade. The Plan, as a guideline to decision making, identifies funding opportunities and provides a first assessment of project priorities.

The key to providing for future transportation needs is to identify problem areas, provide a solution and coordinate with all involved parties to act on the adopted plan. The Delaware Thoroughfare Plan Update Project has identified problem areas and ultimately provides a coordinated final plan to address future transportation needs in the region. It also, through the joint implementation of the plan by the County and City and through the extensive public involvement program, lays the base for public agencies and constituents to continue working together to implement the transportation improvements the region would require as growth continues over the next twenty years.

T:\msword\10\10281\report\CITY_DRAFT RPT\CityReport2_final.doc.doc