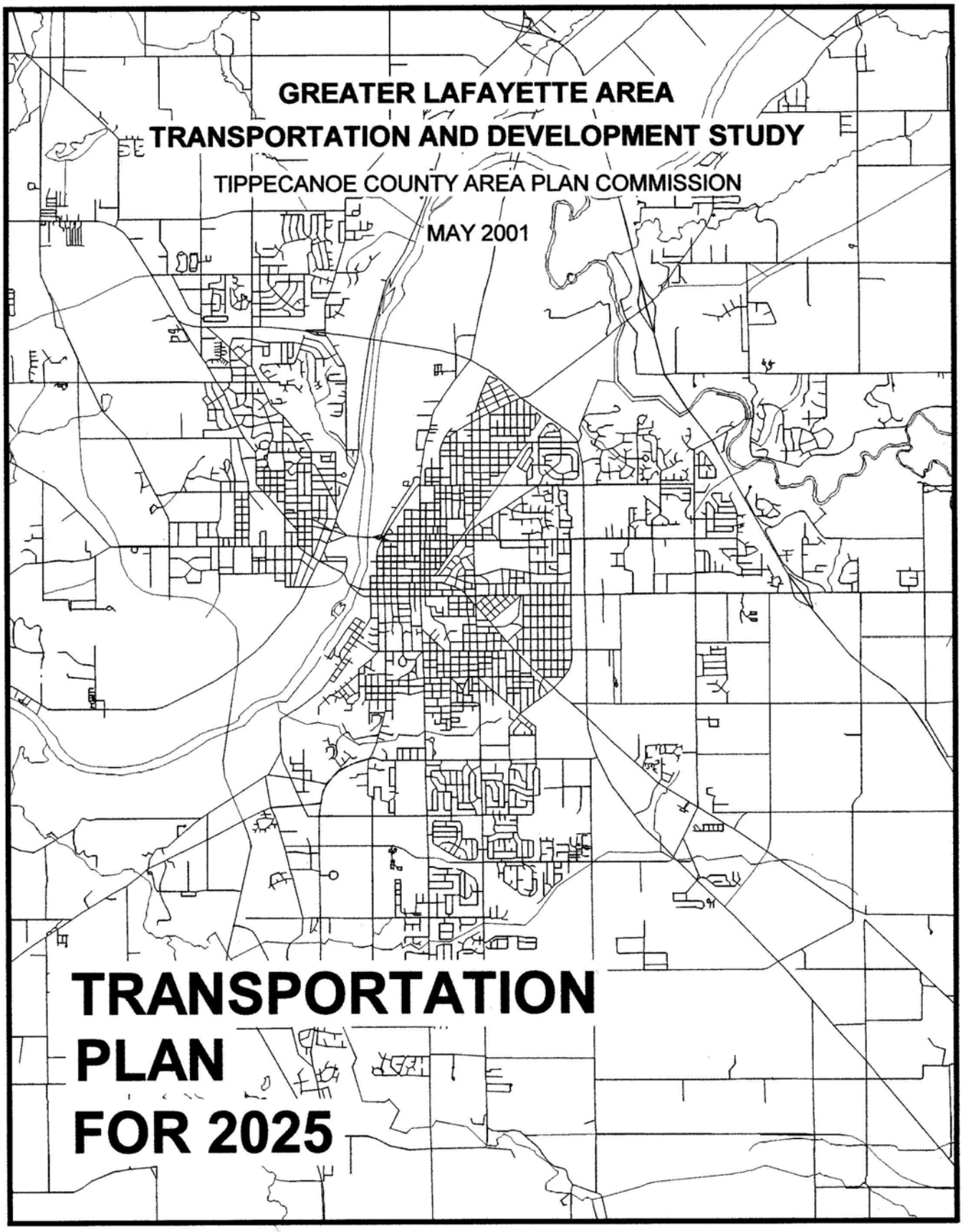

GREATER LAFAYETTE AREA TRANSPORTATION AND DEVELOPMENT STUDY

TIPPECANOE COUNTY AREA PLAN COMMISSION

MAY 2001

TRANSPORTATION PLAN FOR 2025

TRANSPORTATION PLAN FOR 2025

GREATER LAFAYETTE AREA
TRANSPORTATION AND DEVELOPMENT STUDY

prepared by the
Area Plan Commission of Tippecanoe County Staff

in Cooperation with:
Indiana Department of Transportation
Federal Highway Administration
City of Lafayette
City of West Lafayette
Tippecanoe County
CityBus
Purdue University Airport

Overall Work Program Element 545
A Part of the Comprehensive Plan

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May 2001
TRANSPORTATION PLAN FOR 2025
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Chapter 1
INTRODUCTION

In September 1978, the consulting firm of Vogt Sage & Pflum completed its Final Report on the **Greater Lafayette Area Transportation and Development Study**. That report -- prepared for the Tippecanoe County Area Plan Commission – included a Transportation Plan adopted by the Commission the previous December, with additional sections on plan phasing, financing and implementation. Three years later, the Report was included as an element of the **Comprehensive Plan for Tippecanoe County**. **The Comprehensive Plan** was adopted by the Commission and then by its five member governments: The Cities of Lafayette and West Lafayette, the Towns of Dayton and Battle Ground, and unincorporated Tippecanoe County.

This work represents a third update of that original Transportation Plan, and as such, an amendment to the adopted **Comprehensive Plan**. It becomes a part of the continuous process of planning and implementation which brings our growing community the transportation improvements it so clearly needs.

This Plan, like its predecessors, is the product of a cooperative effort, involving public officials, agency staffs and citizens of the community. The process which has generated alternative solutions to our major issues, and ultimately the plan itself, has been discussed, tested and evaluated in open forum, through the efforts of the Area Plan Commission of Tippecanoe County and its staff.

REASONS FOR TRANSPORTATION PLANNING

Transportation planning is important to the community for a number of reasons:

- It helps us work effectively within the always difficult funding situations facing proposed transportation projects. Rising construction costs and falling revenues require public officials to spend funds in the most effective way possible. Project expenditures can best be made through sound planning and fiscal programming, within a system-wide context.

- It helps us find our way through the maze of local, state and federal agencies charged with project implementation responsibilities. The transportation plan and its implementation program call for the coordinated spending of more than a dozen sources of transportation funds. It is crucial that all agencies controlling these funds actively participate so that funds are made available as they are needed.

- It notifies the public, the development community and other government agencies of an established and approved transportation framework. Without a plan, development and redevelopment projects cannot be designed to be consistent with community needs.

- It provides a basis for enforcement of local regulations. The plan standardizes zoning, subdivision and other ordinances regarding right-of-way reservation, setback controls, design standards and access controls.

- It fulfills the federal mandate for a *continuing, comprehensive and cooperative* transportation planning process. This Federal Aid Highway

Act requirement must be met if local communities are to receive available funds to assist with transit, highway, railroad and airport facilities and operations. Each year the area is "certified" as being eligible for federal aid if the process is functioning effectively. Decertification means USDOT funds cannot be obtained in the urbanized area for transportation projects. Full certification of our transportation planning process was first achieved on June 30, 1978; we have been recertified annually ever since.

In short, the transportation planning process gives us an effective way to coordinate the full variety of available financial resources on a continuing and comprehensive basis.

LOCAL ORGANIZATION AND PROCESS

The Area Plan Commission of Tippecanoe County is designated by the Governor to be the official "Metropolitan Planning Organization". Thus, in addition to local and state mandated functions related to planning and zoning, we are the responsible local agency for transportation planning and for review of all federally assisted projects and programs within the County. Our Executive Director and supporting staff carry out technical tasks that lead to adoption of a transportation plan, such as the one documented here.

The Area Plan Commission also encompasses three standing committees -- Administrative, Technical Transportation and Citizens Participation -- to oversee the planning process and to advise on important decisions and resolutions. Each was involved in this planning process.

- The Administrative Committee receives the counsel of elected and appointed officials involved with policy, administrative and fiscal

decisions. Members of this committee ultimately have important responsibilities in implementing the plan recommendations.

- The Technical Transportation Committee gains the advice and knowledge of various agency engineers, planners, traffic police, and transit operators. Members have important responsibilities for designing, operating, and maintaining the transportation system.

- The Citizens Participation Committee receives ideas and comments from a representative group of persons from throughout the private sector of the community. These citizens provide important observations in evaluating plan alternatives.

The assembled goals and objectives that give direction to comprehensive planning in Tippecanoe County were generated through the efforts of the Citizens Participation Committee. The 1976 Plan reached hundreds of citizens within APC's jurisdiction. That work is summarized in Chapter II of the ***Greater Lafayette Area Transportation and Development Study*** Final Report, which contains the original 1978 plan. A full presentation can be found in the 1976 APC publication, ***Goals and Objectives Formulation Process***. In this report, we address the specific goals and objectives relating to transportation in **Chapter 6**.

Review of the plan proposals in this document has been accomplished between the Fall of 2000 and Winter of this year through presentations to the Administrative Committee, Citizens Participation Committee and the Technical Transportation Committee. Suggestions and comments were incorporated into the 2010 and 2025 network plans shown in this document.

TEA 21's PLANNING FACTORS

Under TEA 21, Congress intended Metropolitan Planning Organizations to consider and include seven factors in developing Transportation Plans and Programs. In developing this Plan, we considered all of them. Here is a synopsis:

Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.

Economic growth was identified as one of six areas of concern in the adopted 1978 Plan. This Plan continues those specific goals and objectives.

To support and improve the economic vitality of the Greater Lafayette Area, this Plan strives to strengthen the connections between different modes of transportation. It also seeks to reduce travel delay to maintain on time delivery service and reduce lost productivity. To reduce delay and improve travel time, this Plan strengthens and improves upon the circular and radial road system.

One objective this Plan attempts to incorporate is the vital connection and ease of movement of persons and goods in and through the area. It provides connections by continuing to develop multiple ring road systems around the community, and strengthening the cross routes. Improvements to the major corridors that bring commuter traffic from surrounding Counties are specifically targeted.

Increase the safety and security of the transportation system for motorized and nonmotorized users.

This Plan increases safety and security for both motorized and non-motorized user by different means.

a) When comparing the build to no build scenarios; the combination of projects in the 2010 and 2025 horizons reduces congestion in various corridors. With reduced congestion, conflicts are reduced thus increasing safety.

b) For all road improvements, whether increasing the number of lanes or new construction, design standards will follow national guidelines. Those design standards outlined in the Thoroughfare Plan will also be adhered to.

c) In addition to road design standards, all improvement projects will incorporate safety measures for bicyclists and pedestrians.

d) The Plan pursues construction of railway/roadway grade separations, or relocation of rail lines to reduce motor vehicle/train conflicts.

e) The Plan includes implementation of projects identified in the Transit Development Plan and the Bicycle Plan.

f) The Plan encourages development of a highway system that diverts through traffic from residential neighborhoods while still providing accessibility.

Increase the accessibility and mobility options available to people and for freight.

This Plan strengthens and creates accessibility on two distinct levels. One focuses on improving the connections throughout the road network. The other provides additional connections and improvements between modes of travel. Not only do citizens benefit, but travelers and businesses do as well.

Travel time is of utmost concern for people who continue to use their automobiles and businesses whose goods are truck delivered. This Plan reduces travel and shipment time by increasing accessibility through a circular or ring road system with major radial connections. Improvements also target the corridors that carry travelers, workers, and freight from other Counties and States.

Increasing bicycle and pedestrian mobility is an important goal within this Plan update. All proposed road improvements will include provisions for these two non-vehicular modes.

Protect and enhance the environment, promote energy conservation, and improve quality of life.

This Plan Update incorporates these three goals. It does so at various stages and steps throughout the Plan: forecasting future data, designing roads, and improving multi-modal transportation. Some improvements benefit all three, others only one or two. All three are integrated within this Plan Update and they do play a significant role.

The foundation for this work is **The Comprehensive Plan for Tippecanoe County**. It strongly guides future development, both residential and business, into a compact pattern, thus reducing urban sprawl. Benefits include less travel time to points of interest, less fuel use and fewer emissions.

This Update builds upon the multi-modal base found in the last Plan. Transit continues to play a major role. So do facilities for bicyclists and pedestrians. Not only do new road improvements incorporate these modes of travel; this Plan contains improvements specifically for these modes. Multi-modal travel not only promotes energy conservation it also improves the quality of life.

Each road widening or new construction project will follow INDOT, FHWA and EPA guidelines regarding environmental protection.

The process used when developing this Plan is consistent with applicable federal, state, and MPO adopted energy conservation programs.

Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.

Citizens established in the original 1978 Transportation Plan, an objective to develop an area-wide circulation network to accommodate present and anticipated future traffic demands. This Plan update builds upon that foundation. Projects proposed within connect to each other via ring or circular and radial routing.

Constructed under previous plans, Tippecanoe County created connectivity between the eastern and southern sections of

Lafayette via CR 500E and CR 350S. To the west, INDOT has completed or working on pre-engineering, engineering and construction of a western connection, US 231. This ring road, or circular system, connects all National Highway System Roads as well as major principal corridor arterials in both Cities.

This Plan Update further strengthens this connectivity by extending US 231 northward connecting it to I-65 and SR 43. With construction of the Hoosier Heartland to SR 25, and by using I-65 to this new corridor, people and freight can travel around both Cities with little delay.

Although of lesser impact, this Plan Update proposes additional projects that strengthen connectivity throughout the communities.

Promote efficient system management and operation

This goal encompasses a wide spectrum of tasks and projects. It begins with continued maintenance of the existing road system, identification of deficiencies within the system, and then targeting specific projects.

It is the intent of the member jurisdictions to preserve existing transportation facilities through maintenance and repair programs and to utilize existing transportation facilities more efficiently, where practicable. This Plan Update recommends the creation of additional lanes by removing parking during peak hours along certain urban corridors.

This Plan Update promotes efficient operation through management systems developed both by INDOT and our member communities to be used to identify transportation needs. Those needs translate into projects that will show up as maintenance and capital improvements in future budgets and Transportation Improvement Programs.

Specific projects that meet this goal are more micro in scale than new road construction projects. These include traffic signals at suggested locations, improved signal timing and synchronization, and reduction or elimination of rail/street crossings.

Emphasize the preservation of the existing transportation system.

It is the intent of member jurisdictions to preserve existing transportation facilities through maintenance and repair programs and to utilize existing transportation facilities more efficiently, where practicable. This Plan Update recommends the creation of additional lanes by the removal of parking during peak hours along certain urban corridors.

Several road improvements would use existing corridors: US 231 would use portions of McCormick Road. The Hoosier Heartland corridor would be aligned with the current Norfolk Southern Tracks, thus placing two modes in one corridor, and reducing both the number of road crossings and rail crossings.

ENVIRONMENTAL JUSTICE

A new area or emphasis this Plan focuses on is Environmental Justice. Environmental Justice further amplifies and strengthens Title VI. It assures that minorities and persons of low income are considered in developing this Plan. Further, improvements that are proposed in this Plan must not disproportionately impact them. We define minorities as African American, Hispanic, Asian, and American Indian.

Environmental Justice encompasses three principles:

- to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority and low-income populations;
- to ensure the full and fair participation by all potentially affected communities in the transportation decision-making process; and
- to prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

Specific steps were developed for this Plan. Each step addresses a specific goal. Proposed improvements were assessed relative to Census tracts that have a higher than average number of minorities or persons of low income. Additional outreach to minority groups has been accomplished. After assessment, indicating minimal or no impact, then proposed projects are scheduled based on need and funding.

Environmental Justice Assessment

Principal One: avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.

To identify if a project disproportionately impacts minority and low income persons, we divide this analysis into two levels: a macro and micro review. On a macro level, proposed improvements that may have an impact are identified. Improvements so identified are taken forward to a micro review for further analysis.

Under the macro review, maps depicting 1990 Census tracts and proposed improvements were created for areas of concentrated minority group and/or low-income population. These maps highlight those tracts demonstrating higher than average target populations. Projects located in tracts with less than average target populations, or that have been completed, are under construction, will start construction shortly, or that will be funded using only local funding, were not forwarded to the micro review.

The micro review then looks at those projects that may have an environmental justice concern. Using 2000 aerial photos, projects were

examined individually. Staff evaluated each project according to the nine concerns: displacement of residents; increase in noise and air pollution; creation of barriers in neighborhoods; destruction of natural habitat; reduction in access to transit; displacement of persons, businesses, farms, nonprofit organizations; increase in traffic congestion; and isolation.

Results of the micro review range from as many as four concerns per project to none. Two projects, the widening of South Street from Main to US 52 and the widening of SR 43 from Robinson to Happy Hollow, indicate four concerns. South Street may possibly dislocate some residents and businesses, create barriers between neighborhoods, and reduce access to walkways. Three of these concerns apply to the SR 43 project, which would not create a neighborhood barrier but would destroy some natural habitat. Only three projects indicate three concerns: the widening of US 231 from the SR 25 south intersection to Teal Road, the widening of SR 25 from CR 375W to CR 100W, and the widening of US 231 from CR 500S south to the county line. The majority of remaining projects yielded one concern. Proper engineering will be able to mitigate nearly all of them. Reducing the right-of-way needed through design will reduce the dislocation of residents and businesses. Many of the projects involve widening corridors that already exist. Improving pedestrian and bicycle crosswalks will improve reduced access to walkways.

Principal Two: ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.

This Plan update focuses on increased community awareness through additional media coverage and citizens meetings. Staff contacted the JOURNAL AND COURIER newspaper which resulted in a story and listing of the meetings in the local meeting section. Television was utilized too.

Before the December meeting, an interview was broadcast during the noon, evening and late night news. Before the January meeting, Staff gave a live interview. The press attended and reported all three meetings.

Three citizens meetings were utilized to present the on-going testing and work. Comments were received and are listed in **Appendix 4**. Staff also held a special Area Plan Commission Work Session to present the data, steps taken, model, and proposed improvements. Comments and questions were answered. The meeting was held in open forum and it was reported by both broadcasting and print media.

Principal Three: prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

Projects proposed in this Plan Update were identified from deficiencies shown in the traffic model or through public input and comment. The phasing of projects was based on need and financing.

MAJOR LOCAL ISSUES

This work addresses a number of major on-going local transportation issues. We can solve some of these within the next twenty-five years. Others will need the continuing attention of local officials and citizens for some time to come. Some may never be resolved to everyone's satisfaction. However, we have examined issues in the context of a total transportation system. Alternatives have been weighed and recommendations made which seem to offer reasonable solutions.

Our urban area is bisected by the Wabash River. As such, we are always concerned with moving vehicles over bridges as efficiently as possible. Traffic continues to increase on our bridges, and projections indicate even

more vehicular trips in the years to come. The 1978 plan called for an additional river crossing south of the urban area to take pressure off our three urban bridges, and to reduce traffic on streets leading to and passing through downtown. Now referred to as US 231 Relocation, the Indiana Department of Transportation has completed constructing portions of this project. It is estimated that the new bridge and its related construction should be completed by 2001. Additional planning must be done to help move bridge-related traffic through and around West Lafayette in the years after 2000.

The Lafayette Railroad Relocation Project -- with its final phase nearly complete -- is a big, expensive, and sometimes inconvenient job. But it will certainly lower our fuel consumption levels, enhance our quality of life and make our transportation infrastructure safer and more efficient for both the railroads and those driving local streets. Relocating the railroads from 5th Street and the diagonal Norfolk Southern corridor to the riverfront has already increased the vitality of Lafayette's downtown by making it more accessible and more attractive.

INTERMODALISM

As required by ISTEA, the Transportation Plan for 2015 expanded its planning vision to other transportation modes. A bicycle and pedestrian plan was adopted alongside the current Transportation Plan. This Plan update continues to build upon the foundation laid under the last plan.

The adopted Bicycle and Pedestrian Plan continues to play a major role in both Cities and County, and all jurisdictions have applied for special enhancement funding. Several have been successful. Both Cities, as well as

the County, are placing greater emphasis on bicycle and pedestrian travel. The City of West Lafayette is building a loop system around the City. On the east side of the Wabash, Lafayette has applied for enhancement funds to begin its first Linear Park trail.

This Plan recognizes that improvements go beyond individual trails and paths to include the design of road improvements and new construction. Any future improvement needs to include sidewalks, bicycle lanes or a combination of the two, where appropriate.

The Purdue Airport supports a commuter air service to Detroit, along with air cargo shipping and delivery. As an intermodal terminal it interfaces with surface transportation in the form of local bus and taxi service that meet for air passenger needs. Repair and maintenance improvements are complete per a long-term Master Airport Plan which ultimately would relocate the terminal building to a location near the US 231 connection to SR 26 just east of the runways. The Master Airport Plan was recently updated in 2000. In 2000, the passenger enplanements on scheduled airlines totaled 16,339. Small freight handling was mostly pharmaceuticals.

Since the restored historic Depot was relocated to the foot of Main Street, CityBus's downtown ticket operations have been housed in its lower level. Local bus service circulates through Riehle Plaza, where all buses meet after every trip. CityBus operates under five year incremental programs. Short-range goals are addressed in this Transit Development Plan. They will be updated in 2002.

The Depot serves as a multi-modal terminal facility. AMTRAK service stops here, as well as inter-city buses, CityBus and taxi service. Bicycle and

pedestrian trails radiate from this hub on the banks of the Wabash River. CityBus has also expanded the impact of this hub by building a childcare center nearby.

CityBus continues as the main source of public transportation in our urban area. Mass transit -- even at CityBus's scale -- adds flexibility to our urban area transportation system, represents an energy efficient way to travel, and increases mobility of the young, the poor, the elderly and the handicapped. Increased ridership is vital to our community's well-being.

As a means of reducing the need for additional parking facilities on the Purdue Campus, the University and CityBus developed an agreement to allow for unlimited bus use both on and off campus. Students ride anywhere in Greater Lafayette by simply showing an ID card. A year later, this service was expanded to faculty and staff. Ridership in 2000 neared reached three million passengers.

Routes have been modified and created as well. Based at Tippecanoe Mall, a new shuttle service ferries passengers from nearby shopping complexes, apartments and manufacturing companies. The Market Square route has been modified and now runs through the north, then east sides of Lafayette to the Tippecanoe Mall. To the south, a new route travels through the Wabash Avenue Neighborhood, across the south side of town to Tippecanoe Mall. The Mall has now become a second hub for transferring from one route to another.

In late 1999 and early 2000, CityBus daily ridership was approximately 9,900 persons per weekday when Purdue was in session. From the model base year, all daily trips totaled 711,000 in the study area. Transit trips

were only 1.4% of the base year total trips. This is too insignificant to attempt modal-split modeling: Its threshold is 5% of trips.

On December 19, 2000, the CityBus Board of Directors approved a Strategic Plan. Unlike the five year Transportation Development Plan, this one is designed to guide the Corporation over the next five to ten years. The plan sets out four goals:

- Increase the number of transit riders by promoting more transit-friendly development and transportation policies.
- Plan for growth: fleet and maintenance infrastructure.
- Improve the ease and use of public transportation by using available technology.
- Maximize funding sources to meet daily service levels and provide necessary capital improvements.

Each goal is discussed in great detail with proposed courses of actions listed.

The State of Indiana has an active group dedicated to bringing high-speed rail to the State. Several routes have been delineated with one passing through Lafayette connecting Chicago to Indianapolis and further east to Cincinnati. If high-speed rail becomes reality, Lafayette may become a commuter hub for Chicago. This in turn may create additional demand for housing, and spur retail growth.

More than ever, we must deal with a series of "network-oriented" -- as opposed to "project-oriented" -- issues. We are witnessing industrial expansion to the east and southeast, significant commercial development along our arterials, record-breaking enrollments at Purdue University, and

residential expansion in all directions. Our roads are noticeably more congested, delays are longer, and safety at key intersections can be questioned. Alternative networks have been evaluated in terms of these issues and others relating to social and economic factors.

THE 1978 PLAN: A REVIEW

The Transportation Plan, adopted in 1978, served as the foundation for later efforts in the Greater Lafayette Area. Like this updated version, it too was intended as a guide for the development and construction of roadway projects. However not all recommendations, proposals and objectives have been met.

The steps used to develop all previous plans were, in effect, the same ones we follow in this version: development of necessary parameters, testing of alternative solutions, and determination of which projects would be of most benefit. What differs this time is that we no longer need to rely on consultants to generate traffic forecasts. We can now do these in house, with our own computers, at considerable savings in cost and time.

Those involved in the 1978 process explored a number of alternatives, from which a single plan was chosen. Choices were based on system costs, service quality, economic, social and environmental impacts. After determining a single alternative, five-year incremental plans were developed. Each project was "staged" within a specific five-year period according to its expected benefit.

The 1978 Plan included a list of 23 "major component" roadway projects, ranging from Railroad Relocation to specific intersection improvements. We

have seen significant progress and even completion on most projects; others have been delayed for a lack of funding. Some are still waiting to be "staged".

Between 1978 and 1985 the Environmental Impact Statement and Final Design of the Railroad Relocation Project were completed. Construction of the first phase -- the Wabash Avenue Underpass -- was completed in 1987. The State Road 26 Replacement Bridge -- Phase 2 --was completed in 1992. The Ninth Street Underpass -- Phase 3 -- was completed in 1993. CSX Relocation -- Phase 4 -- was completed in late 1995 with landscape planting completion of this phase in spring of 1996. At this point 18 of 42 rail crossings have been eliminated. Work on part of the 5th and final phase -- Norfolk Southern Relocation -- began in 1997. Then on January 23, 2001, the first Norfolk Southern train passed through downtown in the river corridor. On April 6th, 2001, the last train traversed the City in the old diagonal corridor.

We continue to see progress on the US 231 Road Relocation project. Without any fanfare, INDOT opened the first segment of relocated US 231 in 1997. Motorists are now diverted onto the new road just south of CR 500S with the journey ending at SR 25. To the north, construction is complete to River Road. Reconstructing River Road continues with portions already done. It is anticipated that motorist will be able to traverse the entire route sometime in 2001. Both local and INDOT officials are pressing forward moving the relocation further northward. INDOT is now working on the engineering plans for the second phase, extending US 231 to SR 26 west of Airport Road. Further north, a consultant has been selected to identify corridor location and environmental impacts between SR 26 and US 52.

By 1990, Lafayette's Earl Avenue project -- a four lane improvement between South and Main Streets was completed. In West Lafayette, improvements at the Brown Street/State Street/River Road intersection were also completed. Kalberer Road (CR 350N) is complete from Morehouse to CR 50W. In the southern part of the county, CR 350S is now complete and in use from US 231 to SR 38. Several major intersection improvements have been made along "component" corridors since 1978:

- Main Street at Kossuth and at Earl;
- South Street at Sagamore Parkway;
- Teal Road at 9th, 18th, and Sagamore;
- Yeager at Northwestern;
- SR 43 at Howard, at Prophets Rock, at Burnetts Road and at CR 600 N;
- US 231 at Northwestern and Fowler Streets, at Grant and Cherry Lane.

In early 1990 the Lafayette City Council established tax increment financing districts along Creasy Lane to finance the extension of Creasy Lane from State Road 38 to Brady Lane and the reconstruction of Creasy between State Roads 26 and 38. In October 1995, the City officially opened the newly widened Creasy Lane between Greenbush to McCarty Lane. Several months later, in December, the section between US 52 to SR 38 was completed. The section between McCarty Lane to SR 38 was finally completed in October 1997.

The Area Plan Commission amended the Thoroughfare Plan element of the **Comprehensive Plan** in 1988, shifting the "Beck-Brady" corridor further south and west. Twyckenham Boulevard, built in the early 1980s, thus became part of the corridor between 9th Street and CR 50E. The City of Lafayette will soon begin construction on the next phase, connecting Twyckenham Boulevard from CR 50E to Old US 231. To the east, both the

City and County are designing the new road and bridge over the Norfolk Southern railroad between 9th and 18th Streets.

Another component of the 1978 Plan was completed in 1996. Union Street was widened to four lanes between Creasy Lane and US 52. The City opened later that year the extension of Shenandoah Drive. Just west of US 52, the City completed widening Union Street from Creasy Lane to US 52. Federal funding was utilized west of US 52 while local funds were used east of 52.

The reader will find a full progress report on the 1978 Plan's 23 "major component" projects in **Appendix 1**.

Chapter 2

THE UPDATED PLAN

BACKGROUND

This amendment to the Transportation Element of the adopted ***Comprehensive Plan for Tippecanoe County*** identifies transportation needs based on historic trends, current circumstance and projected population and employment growth, set within the context of the Land Use Element of the ***Comprehensive Plan*****.** The modeling process we used recognizes that traffic pattern forecasts are a function of:

- the type and nature of existing and projected roads;
- the interrelationships between land uses, including their distribution and intensities; and
- the socioeconomic characteristics of the population being served.

Previous origin-destination studies show that 67% of our automobile trips have home as an origin or destination. Further, 15% of our home-based trips get us to or from work while the rest are made for shopping, socializing, recreating, getting medical attention, conducting personal business, or getting to and from school.

The traffic forecast modeling process is based on this hypothesis: When relationships between **current** travel patterns and land use can be mathematically defined through reasonably accurate data, then that mathematical model can be used to generate **future** travel patterns based on projections of future land use. The model then becomes a tool first for anticipating network problems that will result from future land use patterns,

and second for testing solutions to those problems. Later on, the model will allow us to keep evaluating the roadway network as new or unforeseen developments occur, and to measure the traffic impact of specific proposed projects.

The model relates population and employment by assigning vehicle trips -- between places where we live and places where we work, go to school, shop, etc. -- to the available system of roads. We created a computerized network, replicating the community's system of major roads. We divided land within the study area into traffic zones -- in this study, 199 of them -- each with a "centroid" and one or more "connectors" to major nearby roads in the network. Each traffic zone was assigned a number of dwelling units, population, number of autos, and a number of retail and non-retail jobs.

We used standardized "levels of service" to gauge traffic congestion. They reflect a given stretch of road's ability to handle a given traffic volume. They range from A to F: A represents a virtually empty road; C, adequate traffic flow; and F, gridlock. Physical factors, such as number and width of lanes, determine how much traffic a road can handle. Using color-coded lines, levels of service for road segments can be easily mapped, based on current and projected traffic volumes. The resulting graphics clearly demonstrate which road segments are handling traffic loads, and which ones are not, which roads can be projected to be congested, and which solutions will work.

In order to "calibrate" a traffic forecast model -- that is, make it resemble real life -- one first assigns each traffic zone actual dwelling unit, vehicle registration, population, and job counts for a recent year. The model is then run, generating a series of traffic volumes for each segment of every major road. The model-generated volumes are then compared to actual traffic

counts made during the same time period. Minor adjustments are made to "connectors" and "centroids" until model-generated traffic volumes actually match traffic counts.

With accurate dwelling unit and employment numbers, we then calibrated the base year network. We created a network of roads using the computer to precisely simulate conditions as they physically existed in 1999. In the computer modeling process, roads are called “links” because they are linked or joined together. To join the links, a series of connectors called "nodes" are used. As stated earlier, the model is divided into traffic zones. It is within each traffic zone where the "activities" are assigned. "Activities" are the independent variables such as the number of dwelling units, employment, and autos that were allocated to each traffic zone. Each of these "activities" is assigned to the middle of the traffic zone to what is called a centroid. It is from these centroids where the number of trips both internal and external are generated. The number of trips created by each traffic zone is then converted into traffic volumes on the network.

We fine tuned the ***1999 Calibrated Network*** to within 2% of actual traffic volumes. Using the calibrated model, we then generated scenarios representing traffic patterns in 2010, and 2025. In each case, projected volumes for road segments were translated into Level of Service (LOS) maps. Staff prepared three scenarios for 2010: a ***2010 No-Build System,*** a ***2010 Existing plus Committed System,*** and the ***2010 E plus C Alternative***. The no-build shows a network of roads as in 1999 but with no additions or alterations. Road projects that either have been built, are under construction, have already been planned and funded, and/or have been planned but not funded by the year 2010 are included in the second scenario. Finally, the third alternative melds the existing plus committed

improvements together with suggestions generated through the Citizens Participation Committee meetings. This is the adopted plan for 2010.

For 2025, we generated four types of transportation networks for analysis: a no-build network, two alternative tests, and the adopted 2025 Plan network. ***The 2025 No-Build System*** shows a network of roads as per 2025, with no addition or alteration to the 2010 network. Improvements from previous plans plus suggestions gathered through the Technical Transportation, Administrative, and Citizens Participation meetings were variously combined. They are shown in the two ***Alternative Networks.*** Selected improvements from the ***Alternative Networks*** were brought together forming the ***2025 Transportation Plan.***

Many alternative road projects were tested. By testing various improvements, staff, with assistance from the Technical Transportation Committee, the Administrative Committee, and Citizens Participation Committee meetings, was able to select feasible, alternative projects.

Finally, we attempted to prepare a realistic, staged implementation program, based on cost estimates and anticipated financial resources. With the federal budget picture as clouded as it is, we can only guess at the nature and amounts of federal and local funding that will be made available over the twenty-five years covered by this plan. But our plan is an optimal one, filled with solutions to most of our congestion problems. We will be prepared to improve our highway network as funds become available.

IMPROVEMENTS, 1999 – 2010:

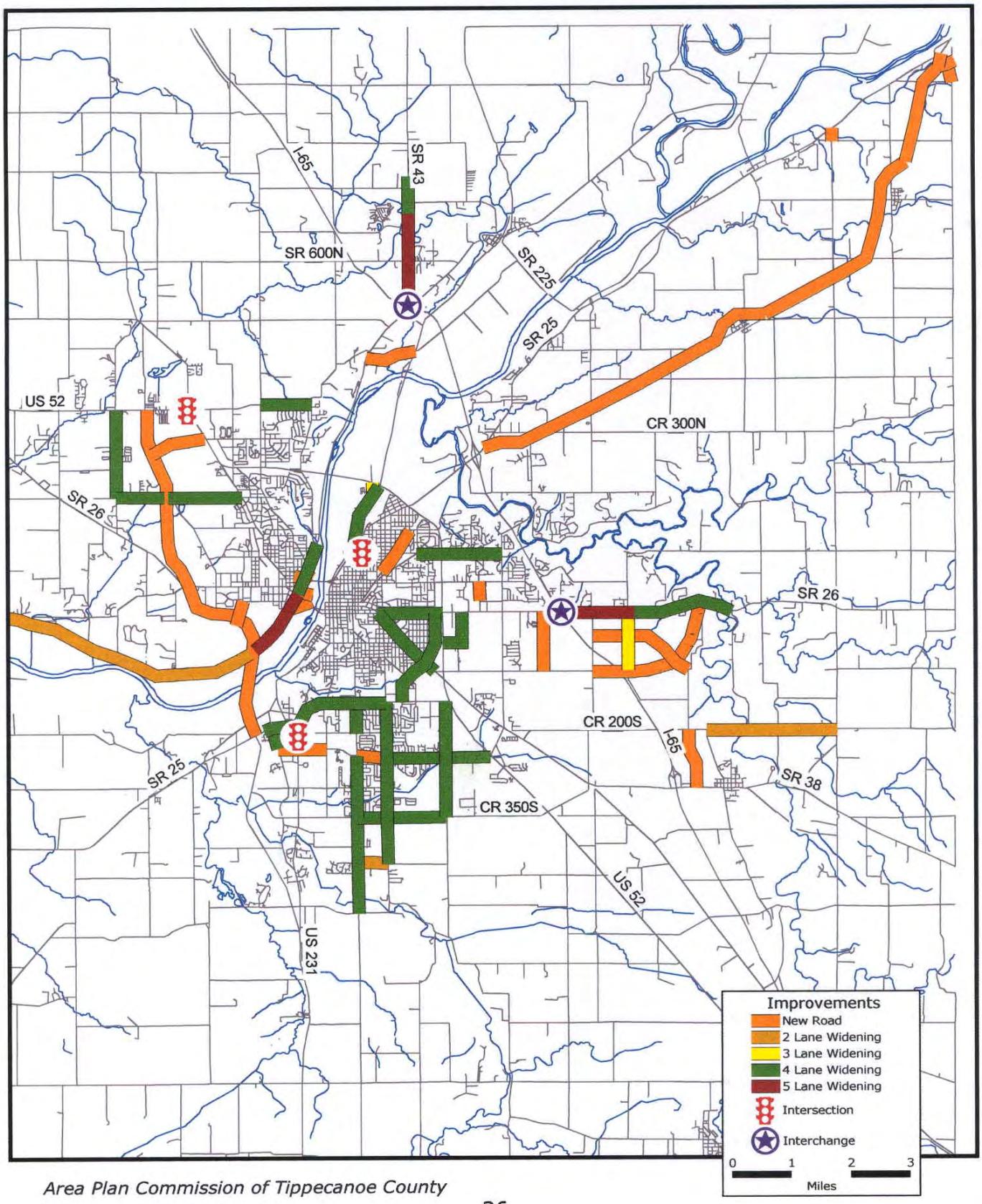
Figure 1 shows planned changes into the first decade. We have included all network improvements that are completed, currently being developed, that have been programmed in our Transportation Improvement Program (TIP), are part of the state's TIP, and in the ***Transportation Plan for 2015***. All of these projects have either started construction or are scheduled for construction this decade. We call this the ***2010 E plus C Alternative***.

The final chapter of Railroad Relocation closes. In segment five, the Norfolk Southern railroad corridor is moved. In the spring of 2001, trains no longer traverse the old diagonal rail corridor. Shortly thereafter road reconstruction begins at each of the old crossings. Erie Street will extend northward connecting to Greenbush and Underwood Avenues. Motorists will never again be delayed in downtown Lafayette because of a train passing through.

A significant roadway improvement will be the US 231 Relocation Project. With the southern segment, new bridge, and northern segment up to the Harrison Bridge completed in 2001, the remaining work will involve taking US 231 from South River Road to the north, and around Purdue's campus to the west. Its northern terminus will be at US 52. The facility will remain a four lane, median-divided limited access by-pass. The new alignment will go north from its intersection at South River Road, around the Purdue Airport to the east, and then head west where it will cross SR 26 just east of the SR 26/Newman Road intersection. From there, the road will go north where it

Figure 1

Planned Improvements Between 1999 to 2010



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ties in with McCormick Road north of the McCormick Road/Lindberg Road intersection. McCormick Road will be improved to four lanes up to its terminus at US 52. Intramural Drive will be extended south through campus, to meet realigned US 231. It will also serve as the point of access to the new airport terminal. Cumberland Avenue will be extended across from US 52 to the new US 231 alignment.

In conjunction with the US 231 project, the City of West Lafayette will be constructing two new roads in and near Wabash Landing. One is the extension of Tapawingo Drive from SR 26 to Williams Street. Designed as a four-lane facility, this will provide access to Purdue's south campus and help to eliminate much of the traffic that would pass through the State/River Road intersection and Chauncey Village. The City also plans to extend Tapawingo north and then west between Wabash Landing and Levee Plaza to Howard Avenue. This new road will also reduce traffic that would pass through the State Street/River Road Intersection and that normally would use Brown Street.

While the majority of road projects planned in this network are on a local scale, one project in the ***2010 E plus C Alternative*** has more of an impact regionally than locally: the ***Hoosier Heartland Industrial Corridor***. The corridor is a proposed four-lane median-divided facility with limited access that would create a safer and faster route from Lafayette to Fort Wayne, while providing greater access to Lafayette's industrial base. Locally, it would take traffic from SR 25 N, which is currently over capacity and very hazardous. Parts of the project have already been planned or completed between Logansport and Fort Wayne. The Lafayette to Logansport section is all that remains.

Currently INDOT is working toward selecting the new route location. A consultant is preparing the Environmental Impact Statement. When completed, a corridor will be recommended. The Area Plan Commission has studied all four proposed corridors and selected a modified O-WA alignment. The modified alignment would be adjacent to the Norfolk Southern railroad tracks. This would combine two substantial, major transportation corridors (railroad right-of-way) into one multimodal corridor producing substantial benefits. The one safer multimodal corridor would allow at-grade rail crossings to be closed or bridged from the I-65 interchange to CR 900E and beyond. It would also minimize agriculture land severance and minimize disruption of the steep and wooded slopes and areas more suited to rural residential development, and environmentally sensitive flood plains.

The APC recommended route would begin just north of the Interstate 65 interchange. It would almost immediately curve eastward paralleling the Aretz Airport southern property line. Just before it reaches the Norfolk Southern railroad tracks it would once again curve and follow the tracks northeastward. It would continue this path until it reaches the town of Buck Creek and at CR 600N. The route would by-pass the town of Buck Creek on its western and northern sides. North of CR 600N, the new route would traverse more northerly than easterly passing by the western side of Colburn. Access to this four lane limited access route would be at CR 500E, CR 750E, CR 900E, CR 600N and the East County Line road.

Outlined in all three previous Plans, this Plan Update continues an “inner-loop” for southern Lafayette via Old Romney Road, Twyckenham Boulevard and Brady Lane. Constructed as a four-lane facility, the loop would begin at SR 25 with the widening of Old Romney Road south approximately four tenths of a mile. A new portion of Twyckenham Boulevard would be built from that point eastward to its existing location. Between 9th and 18th

Street, it would pass over the Norfolk Southern railroad tracks via a new bridge. Brady Lane would then be widened its entire length completing the "inner-loop."

The plan calls for a number of radial street improvements before the end of the decade. Radial streets bring traffic into the central cities. The streets will be widened to create more capacity. The projects include:

1. North 9th Street to four lanes from Greenbush to Duncan Road;
2. Duncan Road from North 9th to US 52;
3. Greenbush Avenue widened to four lanes from Elmwood Street to Creasy Lane;
4. SR 26, or South Street, from Main Street to US 52;
5. Main Street with parking removed and restriped to four lanes from South Street to McCarty Lane;
6. South 9th Street to four lanes from Teal Road to Beck Lane, and from Twyckenham Boulevard to CR 510S;
7. South 18th Street to four lanes from Teal Road to CR 430S;
8. Concord Road to four lanes from Teal Road to CR 350S;
9. Lindberg Road from Northwestern Avenue to McCormick Road, McCormick to relocated US 231;
10. North River Road from Robinson Street to Happy Hollow; and
11. Kalberer Road from Salisbury to Soldier's Home Road.

Radial improvements beyond the urbanized areas include:

1. SR 43 to five lanes from I-65 to north of CR 625 N, then four lanes to north of CR 725N;
2. SR 26 to five lanes east of I-65 to just east of CR 550E;
3. SR 26 to four lanes to the Wildcat Creek;
4. McCarty Lane to four lanes from CR 500 E to SR 26.

Originally identified in the 1978 Transportation Plan, the SR 25 corridor (between relocated and existing US 231 and Teal Road), and the US 231 corridor (between south and north SR 25 intersections) south of Lafayette are again identified as congested corridors. This Plan Update calls for INDOT to address these congested corridors early in the decade, widening them to four lanes.

With increases in traffic volume on SR 43 and SR 26 at the Interstate, both interchanges will no longer be able to function adequately in the future. Improvements to the ramps, signals, and number of lanes are needed.

Several projects in Lafayette have been identified for widening that will result in relieving congestion on US 52. Earl Avenue from South Street to Teal Road is currently a very wide two-lane road. This Plan update calls for the removal of parking and restriping to four lanes. East of US 52, the City will widen Kossuth Street and Farabee Drive from US 52 to SR 26 to four lanes.

Currently INDOT is improving the Harrison Bridge and North River Road interchange as part of the US 231 relocation improvements. On the north side of the bridge two ramps were constructed. Traffic traveling westbound on the Harrison Bridge can exit and turn either north or south onto River Road. The other new ramp allows northbound traffic on River Road to access the bridge and enter Purdue and West Lafayette. With this configuration, southbound traffic on River Road must continue to filter through existing local streets to enter campus and West Lafayette. This Plan update identifies, as a project, the need to correct this missing connection by redesigning the north to westbound on ramp.

Local road improvements are not limited to the urban area. Currently the County is widening CR 200S from Dayton Road to CR 900E. This completes the entire corridor from SR 38 to CR 900E. With the construction of a new elementary school on CR 430S, the County will widened and improved CR 430S from South 9th to South 18th Streets. To the west, traffic volume continues to increase on Klondike Road. The section between US 52 to CR 200N needs to be improved to a four-lane facility.

County Road 350S has become a successful south-side corridor. Usage continues to increase each year as is evident by the increasing traffic volume. The model projects that within the next ten years, traffic will increase beyond the capacity of a super two-lane road. This Plan update identifies the need for widening it to four lanes from South 9th Street to Concord Road. This Plan indicates needed improvements to CR 350S remain with local government and not becoming a state highway. Residential growth on both sides of the corridor continues exponentially. Two and one half miles of the road are already within City limits. If proposed or relocated as SR 25, INDOT would not be relocating the state route outside of the City, just not on Teal Road.

Two projects are to be built by developers. Park East Boulevard will connect SR 26 to McCarty Lane. A portion has already been built with the construction of a Super Wal-Mart. Just to the east of I-65, Stable Drive will be constructed east of CR 500E to CR 650E. Both roads will be constructed as Collectors.

Other improvements in the ***2010 E plus C Alternative*** include:

1. Creating a Prophetstown State Park connector from SR 43 to North 9th Street;
2. Constructing a new road, Yost Drive, between CR 200S and SR 38 just west of the Town of Dayton;
3. Extending Shenandoah south of Union Street to SR 26;
4. South River Road widen to a super two lane from CR 700W to relocated US 231;
5. CR 550E widen to a three lane facility from McCarty Lane to SR 26;
6. Installing a new traffic signal plus road improvements at US 231 and Beck Lane;
7. Installing new traffic signals at Greenbush at 14th and 15th Street; and
8. Installing a new traffic signal at Morehouse and Kalberer.

IMPROVEMENTS, 2011 – 2025:

Figure 2 provides the final piece to our transportation network puzzle. It shows the results of our tests of several alternatives that would best relieve 2025 transportation system problems, within realistic goals and objectives. We call this plan the ***2025 Transportation Plan***.

During the previous ten years, construction will have pushed the relocation of US 231 north to US 52. In this Plan's second phase, construction continues northward to a new interchange at I-65. This would then complete a circular by-pass around Lafayette and West Lafayette by using I-65, CR 500E/CR 475E via SR 26, CR 350S, and US 231. The new road would be constructed as a limited access divided four-lane facility.

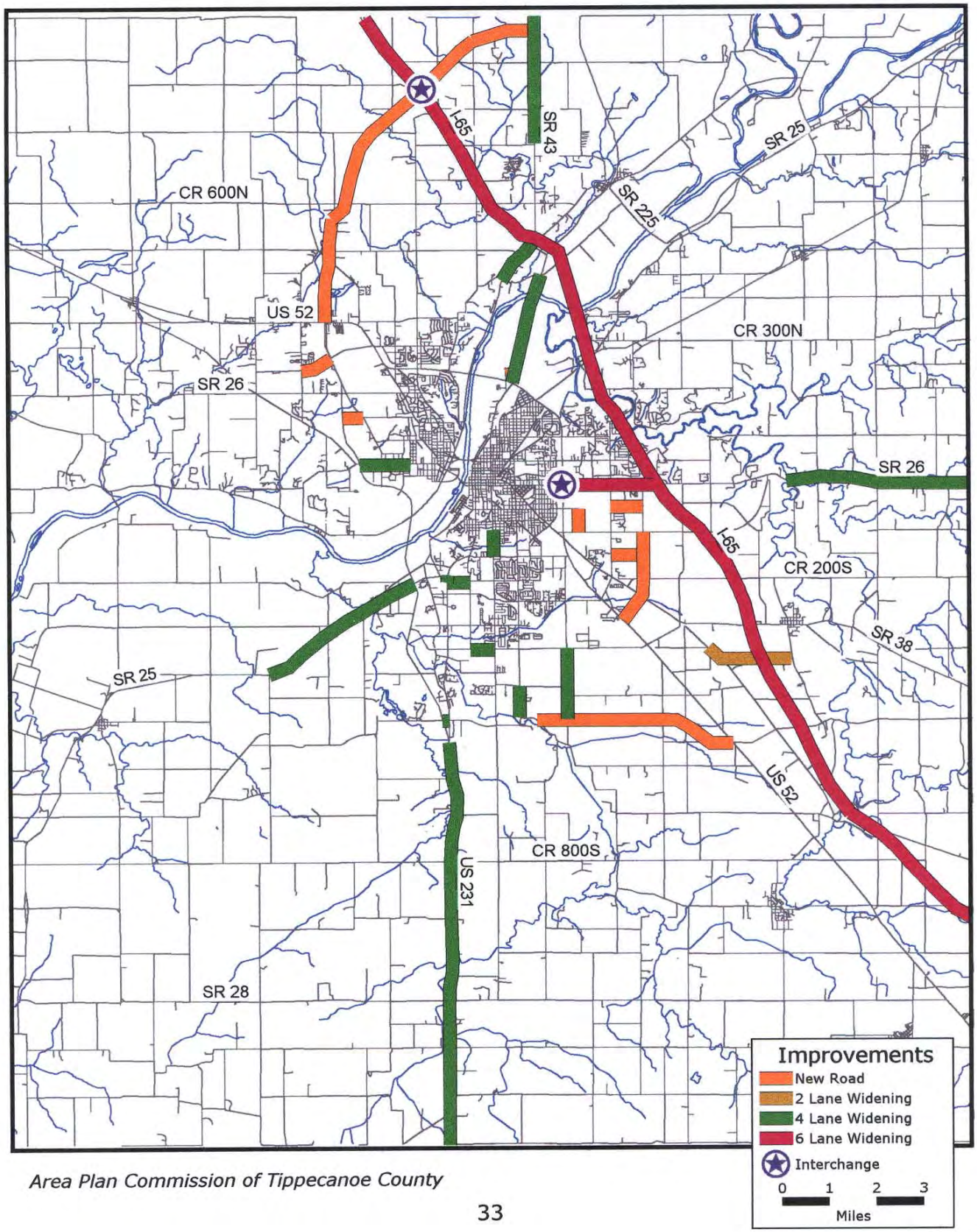
Construction would not stop at the interchange at I-65. Pushing eastward, a new road, similar in design to US 231, would connect the Interstate to SR 43. The new intersection at SR 43 would be located just south of the Tippecanoe County line. Through alternative testing, it was found that if this project were not built, the growth in traffic volume by 2025 would over burden the five and four lane improvements slated north of I-65 in 2001 and 2002.

Already identified in INDOT's long-range Plan, this Plan update confirms the need to widen I-65 to six travel lanes. Combining the continued growth of through traffic, along with local traffic using the Interstate as a by-pass, estimated volumes warrant the widening throughout the entire County.

State Road 26 between the Interstate and US 52 continues to be the "bulls eye" for retail development. This trend is predicted to continue throughout the Plan's last decade and a half. Four lanes simply can not handle the

Figure 2

Planned Improvements Between 2011 - 2025



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estimated 50,000-plus vehicles a day. To relieve congestion, this portion of SR 26 needs to be widened to six lanes.

Because of heavy traffic on both SR 26 and US 52, the intersection of these state roads continues to be congested. A solution that would increase capacity while limiting right-of-way needed would be a modified interchange: through and right-turning vehicles would continue to use the existing intersection, but all left-turning vehicles would be directed to a secondary elevated intersection (center – turning overpass).

With continued growth in employment and retail development, Lafayette has become a major regional attractor. This is easily confirmed by observing increased traffic volumes on all state roads crossing County boundaries. We foresee this trend continuing through the life of this Plan. By 2025, traffic volumes on SR 43 north of CR 725E, SR 26 east of the Wildcat Creek, US 231 south of the new construction, and SR 25 from new US 231 to CR 375W will all pass the point where two-lane roads can no longer handle the volume safely. All four roads need to be widened to four lanes.

Connectivity between major roads continues to be important. Similar in scope to CR 500E and CR 350S improvements, a new road, a combination of new construction and improvement, and the reconstruction of another road are all scheduled for construction during this phase of the Plan update. Just west of West Lafayette, Cumberland Avenue will be extended westward to intersect Klondike Road at CR 250N. South of Lafayette, CR 500S between CR 250E and CR 450E will be reconstructed. New construction both west and east will connect Wea School road to US 52 at Wyndotte Road. Near the Town of Dayton, the portion of New Castle Road and CR 375S will be improved.

Continuing the theme of improving radial streets, additional portions of the network will be widened to four lanes. The projects include:

1. North 9th Street from US 52 to Swisher Road;
2. Concord Road from CR 350S to CR 500S;
3. 9th Street from Central Avenue to Teal Road;
4. South 18th Street from CR 430S to CR 500S;
5. SR 26 from relocated US 231 to Russell Street;
6. Old US 231 from SR 25 (south intersection) to Beck Lane; and
7. Cherry Lane extended to relocated US 231.

Part of the collector system, Park East Boulevard between Creasy Lane and CR500E, will be extended. A new road will extend southward connecting to Haggerty Lane, SR 38 and eventually US 52. Two additional collectors will connect Creasy Lane to Park East Boulevard, one between SR 26 and McCarty Lane, and the other between McCarty Lane and Haggerty Lane.

Once again, a number of roads will be widened to handle increased traffic volumes and improve travel times. The projects include:

1. CR 350S from CR 50E to South 9th Street;
2. Beck Lane from Old US 231 to CR 50E;
3. CR 500S between relocated US 231 and old US 231; and
4. SR 43, to four lanes, from Prophetstown State Park's new road to the I-65 interchange.

Other projects in the ***2025 Transportation Plan*** will include:

1. Extending Farabee Drive south to McCarty Lane; and
2. Completing the construction of Duncan Road north of US 52.

This Plan serves as an overview, a system-wide description of major capital improvements. There are and will be other localized concerns about traffic circulation and operations that we do not address. This broad overview does help member governments examine their own objectives within the context of areawide needs.

This further update of the 1978 plan continues to meet community-wide social and economic goals and objectives established earlier. Unimagined changes will happen, which will require us to modify objectives and solutions to problems. We remain alert to the realities of urban development which may require us to modify previously developed strategies. As such, a plan is not an end in itself but rather a means of satisfying and attaining our current goals and objectives. Additionally, this plan meets requirements mandated by the Transportation Efficiency Act for the 21st Century (TEA 21), the landmark federal legislation which directs transportation funding over this six-year period.

PROJECTED COSTS

Clearly, it will cost a significant amount of money to complete all components of the ***2025 Transportation Plan Update***. Staff projects the total over 25 years at just over $638 million, in constant 2000 dollars. Proposed State Highway projects make up 66.4% of the total. Improvements to our network of local streets and highways account for 29.8%. The remaining 3.8% would result from private development. Almost half (43.2%) of all expenses involve just three projects: the US 231 relocation to I-65, the Hoosier Heartland Corridor, and widening I-65. Anticipated costs are summarized in **Table 1**.

In the remaining chapters of this updated **Transportation Plan**, this amendment to the ***Comprehensive Plan for Tippecanoe County***, we will provide an in-depth look at how the plan was created (the numbers we used as input, the modeling process, the resulting output -- the details of its proposals), and how it is to be implemented (project staging and financial resources).

We encourage those readers interested in the history of transportation in our community to read Chapter I in ***the Final Report of the Greater Lafayette Area Transportation and Development Study (1978).*** The Introduction to the ***Comprehensive Plan for Tippecanoe County*** contains a history of planning in the community and extensive information on the land and its people.

Table 1

2025 Transportation Plan Update:
Summary of Projected Cost by Jurisdiction
(in thousands)

Network	**2010**	**2025**	**Total**
Lafayette	73,276	9,900	83,176
West Lafayette	19,665	2,100	21,765
Tippecanoe Co.	34,303	46,463	80,766
INDOT	170,561	253,130	423,691
Private Development	11,760	12,600	24,360
Town of Dayton	4,620	0	4,620
Network Total	**314,185**	**324,193**	**638,378**

Chapter 3

CREATING INPUT FOR THE TRAFFIC FORECAST MODEL

TranPlan, the traffic forecasting model we use to generate future traffic volumes, requires four kinds of socioeconomic data to do its work: numbers of persons, numbers of households, numbers of vehicles available, and numbers of jobs. These numbers, estimated and projected, must be supplied for each traffic zone within the County, and for each key year in the planning process. For us, that meant 1999 -- the base year for calibrating the model -- 2010, and 2025.

TranPlan generates traffic volumes by mathematically interrelating all four kinds of input data. The theory behind the interrelationship is simple: given a network of roads to travel on, if TranPlan knows where people live, where they need to get to, and how many vehicles they have to get there, then TranPlan can tell us what roads they will take, and in what numbers.

We could not distribute the input to each of the 199 traffic zones within the County as a whole, without an accepted guide to community growth. The Land Use Element of the adopted ***Comprehensive Plan*** fulfills that function.

This chapter then describes how we arrived at the numbers we used as inputs for the traffic-forecasting model and how we distributed them within the 199 traffic zones. Socioeconomic data for Tippecanoe County, 1999 to 2025 projected, is summarized in **Table 2**. The reader can find the full set of input data for the 1999 base year, 2010, and 2025 by traffic analysis zone in **Appendix 2** at the end of this report.

Table 2

Socioeconomic data, Tippecanoe County: 1970 – 2025 Projected

Component	1970	1980	1990	1999	2010	2025
Population	109,378	121,702	130,598	149,654	168,193	195,715
Households	32,320	40,681	45,618	54,812	63,285	74,690
Vehicles	49,053	68,460	83,690	99,624	114,306	134,070
Total Employment	52,015	64,915	80,290	95,976	110,811	130,781
Retail	8,577	10,831	14,335	17,136	23,854	28,153
Non-Retail	43,438	54,084	65,955	78,840	86,957	102,628

Source: U.S. Department of Commerce: Bureau of the Census, Census of Population and Housing, 1970,1980. And 1990, and Bureau of Economic Analysis, Regional Economic Information Systems, 1970 – 1990; Division of Housing and Food Services, Purdue University, 1990; APC Land Use Survey,1999; and APC Staff Analysis, February 2000

EMPLOYMENT

After researching various data sources available, Staff decided to use Bureau of Economic Analysis (BEA) employment data as the starting point. The US Department of Commerce develops this data. We chose BEA data because it is very comprehensive. Not only does it include full time workers, it also includes part time workers as well as sole proprietors.

The most recent BEA data released for Tippecanoe County was for 1997. Therefore we needed to work up to our base year 1999. By using a simple trend analysis over a 28 year period, 1969 to 1997, we estimated that there were 95,976 jobs in Tippecanoe County in 1999.

We also assumed that a change in employment between the projected time horizons was a function of that same trend analysis. As indicated in **Table 2**, employment estimates for 2010 and 2025 are 110,811 and 130,791 respectively.

TranPlan requires that employment figures be divided into "retail" and "non-retail" components before being inputted into the model. The 1997 BEA figures show that retail workers represented 17.9% of all workers. We started with that percentage. Our projections show an increasing percentage of retail jobs, with the retail component representing about 22% of all jobs by 2025. This is based, in part, on developments tracked by the Plan Commission through the zoning and nonresidential land division processes. We also drew upon the expertise of our local economic development organizations to assist us in projecting job growth.

DWELLING UNITS

As of 1999, we knew almost exactly how many dwelling units there were in the County, because we had just counted them. As part of our ongoing program of data collection, we conduct a "windshield survey" of the entire county about every 10 years. We drove all highways, streets, private drives and alleys, and noted every home and apartment we found. There were 57,819 dwelling units ("DUs") in the county when we began the input phase of this study in Spring, 1999. That served as our base year data.

We corroborated the windshield count by using U. S. Bureau of the Census and building permit data. As a starting point, the 1990 Census counted 48,134 housing units in Tippecanoe County on April 1, 1990. By taking into account housing units added and lost (through demolition or conversion) after the official Census Bureau count, we determined that the windshield survey fell within a two-percent level of accuracy.

We know from the 1990 Census of Housing that 94.8% of all housing units in Tippecanoe County were occupied. If we assume a similar occupancy rate for 1999, then a total of 54,812 housing units were occupied.

POPULATION

Since we were a year shy of the 2000 Census, we needed another source for our base year population. After searching, we decided to estimate the 1999 population based on data in hand that could be easily corroborated. We chose two factors: average household size and number of housing units.

We first estimated the average number of persons per household for 1999. This average has changed over the past decades. It has continually dropped from 3.00 in 1970 to 2.50 in 1990. We assumed that household size continued to decrease but at a slowing rate. We settled at about 2.43 persons per household for our 1999 base year.

With 54,812 households, each occupied on average by 2.43 persons, household population in 1999 would have been over 133,142, up over 19,000 people from the 1990 Census count. We also assumed a relatively constant group quarter population of about 16,512 in 1999. Thus we estimated the total population of Tippecanoe County in 1999 to be about 149,654.

Our next step was projecting base year dwelling units and population to 2010 and 2025. The trend of employment growth in the county, among other factors, was the key element in our projections. We assumed that total number of households for the forecast periods is a function of change in employment. We also made other assumptions including:

- average household size levels off at 2.40 for the forecast periods;
- the percent of occupied housing units remain constant at the 1990 level;
- group quarter population remains constant at the 1990 level; and
- vehicles per household and vehicles per person in group quarters remains constant at the 1990 level.

We anticipate this housing to be built within the "Residential Expansion Sectors" identified in the ***Adopted Lane Use Plan*** and ***Housing Element*** of ***The Comprehensive Plan*** (as amended). The Plan promotes a compact development pattern. Sufficient land is programmed into the Plan to house half again as many persons as now live in Tippecanoe County. Yet, areas of

prime farmland have been identified and earmarked for continued agricultural usage. Residential expansion areas include:

- from the southern urban boundary down to Wea Creek in Wea Township (with some overlap into Fairfield Township);
- from the eastern urban boundary to Wildcat Creek, beyond the intersection of I-65 and SR 26 East in Fairfield Township and western Perry Township;
- from the northern and western urban boundary into Wabash Township;
- around the small towns of Battle Ground, Clarks Hill, and Dayton; and
- within the Cities of Lafayette and West Lafayette and the small towns through infilling and intensification.

We are planning for over 66,700 housing units in 2010, and, at 95 percent occupancy, over 63,200 households. By 2025 we would expect 78,700 housing units occupied by over 74,600 households. We assume that the average household size will decrease to 2.40 in 2010 and remain there in 2025. And, we maintain our assumption that group quarter population will remain unchanged. Our projection of population for 2010 is over 168,100 persons and over 195,700 by 2025.

VEHICLES AVAILABLE

TranPlan requires us to input information on non-business vehicles in the form of vehicles available. We used 1990 Census data as our base. From this data, we had a count of the number of vehicles available for use by household members. Since the data only reflect vehicles used by households, and not persons living in group quarters, staff obtained counts of vehicles registered to students living in Purdue University residence halls by residence hall.

The Bureau of the Census counted over 79,000 vehicles for use by households in 1990. The average household in the county had 1.74 vehicles. This ratio was increased only slightly in projecting vehicles used by household occupants for each of our key years. We hypothesized that a continuing increase in vehicles per household would be offset by a continuing decrease in the number of persons per household. We multiplied the ratio for each traffic zone based on 1990 data by the number of projected households per traffic zone for each key year. We added to that factor, the number of vehicles registered to University students. This number was held constant throughout the planning period based on our assumption that group quarter population, including persons living in college dormitories, would remain constant.

DISTRIBUTION BY TRAFFIC ZONES

Our first task was to assign base year data on housing units to traffic zones. This was done by superimposing traffic zone boundaries on aerial photos we used in collecting land use data during our 1999 windshield survey. We simply counted the number of dwelling units in each zone.

We distributed employment data using the Dunn and Bradstreet Employment database provided to us by INDOT. Since it was based on 1997 data, we updated it by using the Land Use Survey information, Greater Lafayette Area Chamber of Commerce employment surveys, Polk Directory, and by telephone surveys.

Before distributing future dwelling units, we compiled a list of proposed subdivisions and planned developments. It included developments nearing completion to those still in the conceptual stage. We discovered that the total number of proposed dwelling units far exceeded our 2010 target.

Therefore we staged the list over the full twenty-five years and not the first eleven. Those subdivisions nearing full build out, close to or nearing ground breaking were phased first.

With base year data mapped, and projections in hand for retail and nonretail jobs for 2010, we invited representatives of our local jurisdictions to join us in distributing them by traffic zones. Distributing jobs for 2025 was handled differently. We identified specific zones where future employment would locate. Each zones size was calculated and future employment was then distributed by size of zone.

The **Land Use Element** of the adopted **Comprehensive Plan** continued to serve as our guide. It projects locations for residential, commercial and industrial expansion, while identifying those portions best suited to open space and agricultural uses. It was developed within the context of the previously noted goals and objectives that form the basis for our comprehensive planning efforts.

The full set of input data – covering population, DUs, retail and nonretail employment and autos/DU for the base year, 2010 and 2025 – can be found in **Appendix 2** at the end of this report.

Chapter 4

THE MODEL AND THE MODELING PROCESS

Transportation system modeling is a complex process that provides planners with a very powerful tool for forecasting future travel patterns. It helps planners, engineers, and elected officials make sound decisions on road improvements needed to meet future travel demands. It is the *sine qua non* of transportation planning; we simply cannot plan without it.

A transportation model such as the one we used -- TranPlan, described below -- is composed of a series of mathematical formulas, designed to perform a specific set of calculations in a specific sequence, and a sort of computerized geography within which the formulas operate.

THE ROAD NETWORK COMPONENT

The geography consists of links, nodes, zones, centroids and connectors. Any highway system can be described as a network, made up of streets and intersections. In a transportation model the streets are called "links", and the intersections "nodes". As we have noted before, "zones" are the geographical areas into which all land in a study area is divided. Zones do not overlap, and there are no gaps between them. The highway network and the zones have to be integrated, or attached to each other. This is done by assigning each zone a special kind of node called a "centroid", which is then linked to the highway network with a centroid "connector". The centroids hold each zone's data.

The geography has to be customized to the community. That is, we needed to build a computerized version of our own network of roads and highways,

by assigning and entering attributes to every link. Each link, or road segment, was attributed with its related physical characteristics. That included an exact length, travel speed, vehicle capacity, base traffic volume, location by land use, parking, and number of travel lanes. Intersection characteristics are also assigned by links. That description included data on the existence of signage or signalization, and the presence of a left turn lane.

In the real world, every dwelling unit and every place of employment serves as an origin and a destination for vehicle trips. In the computerized model that simulates the real world, each traffic zone is supplied with a single centroid that serves as the computerized focal point for all origins and/or destinations within a given zone. As such, we needed to place each centroid properly within its zone to approximate actual land use and driving patterns, and then connect them accurately to their surrounding links.

The zonal information incorporated in each centroid is this:

- the total number of persons in each zone,
- the total number of occupied dwelling units,
- the total number of autos,
- the total number of retail employees, and
- the total number of employees.

THE CALCULATIONS

To understand the modeling process, we need to understand the sequence of calculations performed by the mathematical formulas. There are three stages: trip generation, trip distribution and traffic assignment. "Trip generation" determines how many personal-trips are going to begin or end

in each zone. Personal trips are then converted to vehicle trips. "Trip distribution" determines how many of those trips are going to go from any given zone to any other given zone. "Traffic assignment" assigns vehicle trips to specific links in the highway network.

Trip Generation. During the trip generation stage, mathematical formulas convert input data on employment and dwelling units into the number of person-trips that either have an origin or a destination in each zone. A zone's "trip production" is the number of trips beginning in that zone; its "trip attraction" is the number that end there. At this point, the model also converts person-trips to vehicle-trips.

For modeling purposes, not all trips are alike. Three kinds must be distinguished. Those trips between home and work, or work and home, are called "home-based work" trips. Those made to or from home to or from places other than work are called "home-based nonwork" trips. Finally, those with neither origin nor destination related to the home, such as trips from work to a retail store, are called "nonhome-based" trips.

This information on kinds of trips can be gathered in one of three ways. Origin and destination (O-D) studies poll motorists at survey points on the highway network. Groups of individuals can also be asked to complete travel surveys. Both are time consuming, very costly and inconvenient to the public. Also, there are standard tables that provide general information. But these are not specific to a given community.

The Greater Lafayette Area had already participated in an extensive O-D study in the 1970s. That work indicated that our own local trip productions and attractions follow this pattern: home-based work, 15%; home-based

nonwork, 52%; and nonhome-based, 33%. Since that time, recent studies have shown a shift towards more home-based work and nonhome-based trips at the expense of home based nonwork trips. Trips percentages used for this update follow those of the 1992 Kokomo Survey: 21.44% are home-base work, 39.29% are home-based nonwork, and 39.27% are nonhome-based.

Traffic zones that define the Purdue campus have trip attraction and production rates quite unlike rates in most other zones. That has to do with the relative locations of dormitories and other student housing, classroom and administration buildings, parking and recreational facilities, and the ways in which people travel within and to those zones. In this update we continue to use production and attraction rates for these university zones first developed for the 1978 Transportation Plan.

Not only do trips have to be classified by purpose, but they also have to be grouped by where they come from and go to. Thus there are "internal" trips and a few kinds of "external" trips. Internal trips have both an origin and a destination within the study area. External trips have either an origin or a destination within the study area but not both ("internal-external" or "external-internal"), or simply pass through the study area but neither begin nor end there ("external-external").

In the geography of transportation modeling, an "external station" is placed on the outer edge of the study area where each major road crosses it. Information is then attributed, or stored, in each external station in much the same way that it is stored in a centroid. In this case, the stored information is based on the number of trips crossing the study area boundary, whether internal-external, external-internal or external-external.

We determined numbers of internal-external and external-internal trips by examining rush hour traffic counts at external station points. Because the number of trips leaving and entering the study area were about equal, we could postulate that at the external stations, trip productions and attractions were equal. Based on the IRMS External Travel Estimation Model, external to internal and external to external trips were estimated. External-external trips were calculated between I-65, US 231, US 52, SR 25, SR 26, and SR 28.

Trip Distribution. Trip distribution is the second stage of the mathematical process, when the model calculates trips made between each zone and every other one within the study area. The distribution formulas mathematically link zonal productions and attractions to simulate travel patterns. Once current travel patterns are accurately simulated, the same mathematical relationships can be used to determine future travel patterns by using future productions and attractions estimated for each zone.

Historically, the most successful and best documented technique for distributing trips within an urban area is the "gravity model". This mathematical concept relates trip interchange between zones in two ways. First, the number of trips is directly proportional to the relative attraction of each zone; second, the number is inversely proportional to a function of time separation between zones. Simply put, zones with a lot of homes and/or jobs in them produce and attract a lot of trips to and from other zones. But the longer the travel time between zones, the fewer trips there will be.

Trip Assignment. Traffic assignment is the third, and last stage in the mathematical process. Here a trip is assigned to the shortest time path available between its origin and its destination.

The process at first assigns all interzonal trips to the same shortest time path link in the network; that is called "all-or-nothing assignment". But logically, if all trips were made on the same link, that link would quickly become congested, and thus stop being the shortest time path. To bring traffic volumes and travel times back into sync, traffic assignment formulas are run over and over again to achieve "equilibrium traffic assignment". That is, enough of the interzonal trips get shifted to other available routes to keep the primary link as the shortest time path.

TRANPLAN

Historically, calculations involved in the transportation modeling process were done by hand, later by mainframe computers. But the advent of desktop computing, with enough memory to store sophisticated software, has revolutionized the field. We no longer have to incur tremendous costs in either time or consultant fees to model future transportation needs.

Local planners now do the work at their desks. We can collect and generate the needed data base and enter it rather quickly. The computer runs the full process, and in a comparatively short time gives us back volumes and travel times for the whole network, complete with zonal production and attraction figures, link volumes, interzonal trip totals, *etc*.

In 1992 the Indiana Department of Transportation looked at a number of software packages for a statewide model. After careful consideration, they chose TranPlan. Then, in an effort to coordinate modeling throughout the State, INDOT offered licenses to all Metropolitan Planning Organizations. Recognizing the importance of coordination, TranPlan continued to be the modeling software for this area's ***2025 Transportation Plan Update***.

According to the TranPlan manual, the program was originally developed by DeLeuw, Cather & Company with the support of Raif Kulunk. In 1990 the Urbansys Analysis Group acquired TranPlan. Since then, James Fennessy has made significant enhancements to the software. He has also adapted the program so microcomputers, minicomputers, and work stations can use it.

Supplementing TranPlan's trip generation program, INDOT also offered a package specifically designed for Indiana's Metropolitan Planning Organizations such as ours. The program still uses the same methodology, but all trip factors (NCHRP 187 Report) have been replaced with ones specific to Indiana. These factors are based on travel demand surveys conducted in four regions within the past five years. TRIPGEN used all socioeconomic inputs described in **Chapter 3**, and developed the zonal trip productions and attractions.

TranPlan then performed the remaining trip distribution and traffic assignment calculations. Part of its output is in the form of traffic volumes projected for each link in the network.

CALIBRATING THE COMPUTER MODEL

As we have noted, the model becomes a reliable predictor of future travel demands and patterns only if it accurately simulates current conditions. Thus before the model can be used it must be "calibrated", or adjusted, to do just that.

Traditionally, a transportation model is calibrated at several different stages. This helps to reduce errors and improve its accuracy. Initially, the

calibration begins while developing the road network. Next, results from each of the three step processes are reviewed. It is only after the program generates traffic volumes, that statistical comparison are made.

Paths of shortest travel time between points were used to locate errors in the road network. We had the computer show us its generated paths of shortest travel times between different locations. If these paths differed from known experiences, a coding error in the network was possible. However, TranPlan successfully replicated nearly all shortest travel time paths. Those that differed were examined and corrected.

Trip generation results were examined next. If the model over- or underestimates the total number of trips produced, it would also do the same to the projected traffic volumes. Following FHWA recommendations, the total number of trips were compared to the total number of households. For our size of area, the Federal Highway Administration suggests there should be 14.5 trips per dwelling unit. Our model calculated to 14.3. The results show that the model has accurately calculated the total number of trips.

The next step in calibrating is to compare generated traffic volumes to actual traffic counts. Comparisons are not done at just a few locations. They are done along screen lines and cut lines. Screen lines are imaginary lines bisecting the community at key locations. We use the Wabash River and South Street as our screen lines because they divide the study in half both east to west and north to south. Cut lines divide the community at lesser points. One cut line bisects the south side of Lafayette just north of Teal Road. An imaginary north-south line just to the west of West Lafayette marks the location of the second cut line.

A transportation model is considered to be accurate enough for use as a predictor of future traffic volumes if it can be calibrated to within 15% of actual traffic counts. **Table 3** shows how our calibrated model did in comparison to actual (seasonally adjusted) traffic counts taken in 1999, the base year.

We were able to better the 15% standard along all four screen and cut lines. The difference between our model-generated counts and actual, seasonally adjusted counts was 7.2% along Screen Line 1 and 1.2% along Screen Line 2. Comparisons at the cut lines also indicated the same accuracy. The percent differences were less than 3.5% at both cut lines. In total, our model-generated counts were just 1.7% higher than seasonally adjusted traffic counts.

For this Plan update, Staff used the IRMS program CAL_REP to assist in calibration. This program generates very useful statistical information including: percent root mean square, mean loading and percent errors, mean absolute value error, and VMT percentage error. These statistics were generated for and examined by screen lines, cut lines, area, functional class, and routes. Results indicated that the model replicated the system accurately.

With the model successfully calibrated, we could proceed with the job at hand: to see the impacts of projected population and employment growth on our transportation network, and to test alternative solutions to lessen those impacts.

Table 3

COMPARISON OF MODEL-GENERATED AND ACTUAL TRAFFIC COUNTS, FOR BASE YEAR

				% Difference
Grant Road	2,589	2,329	-260	-10.04
SR 225	1,884	1,883	-1	0.00
I-65	38,845	40,189	1,344	3.46
North 9th St.	8,254	8,129	-125	-1.51
US 52	33,292	36,949	3,657	10.98
Harrison Br..	30,521	32,790	2,269	7.43
SR 26 Bdgs.	30,021	33,334	3,313	11.04
Grandville	1,981	2,347	366	18.48
Total	**147,387**	**157,950**	**10,563**	**7.17**
Wabash Ave.	12,275	12,426	151	1.23
4th St.	11,916	15,736	3,820	32.06
9th St.	12,538	15,768	3,230	25.76
18th St.	12,743	13,424	3,911	5.34
Main St.	14,087	14,320	233	1.65
26th St.	3,679	2,775	-904	-24.57
Earl Ave.	9,766	10,086	320	3.28
US 52	41,538	38,389	-3,149	-7.58
Farabee Dr.	8,668	8,243	-425	-4.90
Creasy Lane	26,460	26,029	-431	-1.63
I-65	37,078	37,695	617	1.66
CR 500E	7,521	6,239	-1,282	-17.05
CR 900E	1,959	1,493	-466	-23.79
				1.20

Table 3, continued
COMPARISON OF MODEL-GENERATED AND ACTUAL TRAFFIC COUNTS, FOR BASE YEAR

				% Difference
Wabash Ave.	10,114	9,706	-408	-4.03
4th St.	13,549	13,962	414	3.05
9th St.	13,358	12,233	-1,125	-8.42
18th St.	14,405	11,521	-2,884	-20.02
22nd St.	7,515	9,541	2,026	26.96
26th St.	11,587	7,209	-4,378	-37.78
US 52	24,519	31,220	6,701	27.33
SR 38	23,717	21,213	-2,504	-10.56
Creasy Lane	17,890	15,644	-2,246	-12.55
Haggerty Lane	6,231	5,692	-539	-8.65
CR 475E	4,648	5,055	407	8.76
				-3.08
So. River Rd.	2,882	2,206	-676	-23.46
SR 26	8,080	8,654	574	7.10
McCormick Rd.	6,532	5,260	-1,272	-19.47
Lindberg Rd.	5,447	4,822	-625	-11.47
US 52	17,068	17,842	774	4.53
Morehouse Rd.	905	1,280	375	41.44
CR 500N	809	1,366	557	68.85
CR 600N	825	1,796	971	117.70
				1.59
				1.69

Chapter 5

TESTING AND EVALUATING OUTPUT: ALTERNATIVE NETWORKS

As we have noted before, when relationships between ***current*** travel patterns and land use can be mathematically defined or modeled, then that mathematical model can be used to generate ***future*** travel patterns based on projections of future land use.

We had assembled our demographic data, projected it to 2010 and 2025 and assigned it to specific traffic zones as future land use. We had computerized our existing road network, and calibrated the traffic forecasting model to within 2% of actual base year traffic counts. Our next step was to create a series of alternative road networks, use the calibrated model to test and evaluate their efficiency, and then choose among them.

The first road network we needed to evaluate, of course, was the current one, the ***1999 Calibrated Network***. That would then show us the extent of our current problems, and serve as a benchmark against which we could measure possible solutions.

- To see what would happen to traffic patterns if we continued to grow but made no improvements at all to our roads, we created two worst-case, "No-Build" scenarios, one each for 2010 and 2025.

- To test the net effect of new projects already in the pipeline, we created an "Existing Plus Committed" (E plus C) Network for 2010.

- To see how we could alleviate traffic problems that would still need to be solved after 2010 E plus C, we then created a series of "Alternative Networks", which then evolved into this updated **2025 Transportation Plan**.

EVALUATION CRITERIA

We needed to find appropriate measures or criteria to compare proposed transportation networks to each other. When the model is applied to data in any existing or proposed network, the resulting output comes in the form of traffic volumes along each link. But volume alone -- sheer numbers of vehicles -- is not a useful measure of efficiency: The effect of 20,000 vehicles/day on four-laned, 65 mph I-65 is simply not comparable to the effect of 20,000 vehicles/day on Main Street with its two lanes, parking maneuvers and frequent traffic signals.

As motorists or passengers, and as planners, we are really not concerned with how ***many*** cars are on the road. What worries us is how ***congested*** the road is. Congestion delays us, causes accidents, slows down delivery and increases the cost of goods and services, wastes fuel and adds to pollution. The prime purpose of transportation planning is to minimize congestion. And thus the best measure of efficiency for any alternative transportation network is how well it reduces congestion.

The planners' measure of congestion is called "Level of Service" (LOS), which can also be determined mathematically. The LOS for any link in the network is a function of traffic volume and specific characteristics along that link: number of lanes, travel speed, turning movements, parking lanes,

traffic signals, etc. There are six Levels of Service, measured at peak hour, ranging from "A" to "F":

- At **LOS A**, traffic flows freely, there are no restrictions on vehicle maneuverability, and drivers feel physically and psychologically comfortable. **LOS B** is virtually as free.
- **LOS C** describes a stable rather than free flow of traffic. Cars move in discernible groups, called platoons. Drivers have less freedom to choose speed, must be more vigilant when changing lanes. This results in mildly increased driver tension.
- At **LOS D**, traffic flow is unstable. Drivers notice decreased physical and psychological comfort levels, brought on by slowed but tolerable driving speed, decreased maneuverability and an increasing accident potential.
- At **LOS E**, the road is operating at or near capacity. Drivers feel uncomfortable, with little or no control over speed or lane choice. Traffic alternately speeds up and slows down, and accident potential becomes high.
- **LOS F** represents a breakdown in the flow of vehicles, a forced flow. Stop-and-go traffic produces high levels of physical and psychological discomfort in drivers. Tempers are frequently lost.

As drivers, we would like all our roads to operate at free flowing LOS A or B. As taxpayers and planners we realize this to be impractical. We cannot afford to build largely empty roads. Instead, officials strive to plan, design and build roads that will operate at LOS C standards during peak hour usage.

And that is how we evaluate and compare transportation network alternatives. The object is to eliminate or at least minimize the difficult miles of LOS D, E, and F in the network, in favor of LOS C. Alternatives that

transform segments of LOS D, E, and F solely into LOS A or B would likely be very effective but prohibitively expensive; those that fail to achieve LOS C are less expensive but insufficiently effective. A balance must be struck.

Clearly there are other measures that must be applied when comparing alternate solutions to transportation network problems. Cost, even independent of LOS, is one. For instance, it may not be fiscally feasible to buy the right-of-way needed to widen a narrow road already lined with homes. We must consider social factors as well: An effective solution may well be useless if for instance a new road must be built that would split a neighborhood in half, or that would force many families to relocate. And sometimes heavy traffic and pedestrian flows make an unsafe mix. Thus the best physical solutions often must be tempered with fiscal restraint and social responsibility.

The remainder of this chapter is devoted to evaluating the alternate transportation systems that have been created for the ***2025 Transportation Plan Update***. Each network will be evaluated by Level of Service (LOS) in miles. Because LOS C is where traffic actually begins to become unstable, only LOS C through F will be calculated and shown by network and functional classification in miles.

THE CURRENT NETWORK AND THE NO-BUILD ALTERNATIVES

Many of us have commented on how congested our streets are. **Figure 3** shows us in graphic form what we experience behind the wheel: stretches of South Street, State Street, SR 26, SR 25, and SR43 are already operating at LOS F. Other parts of South Street, State Street, SR 25, SR 43, along with

Figure 3

1999 Existing Road Network - Urban

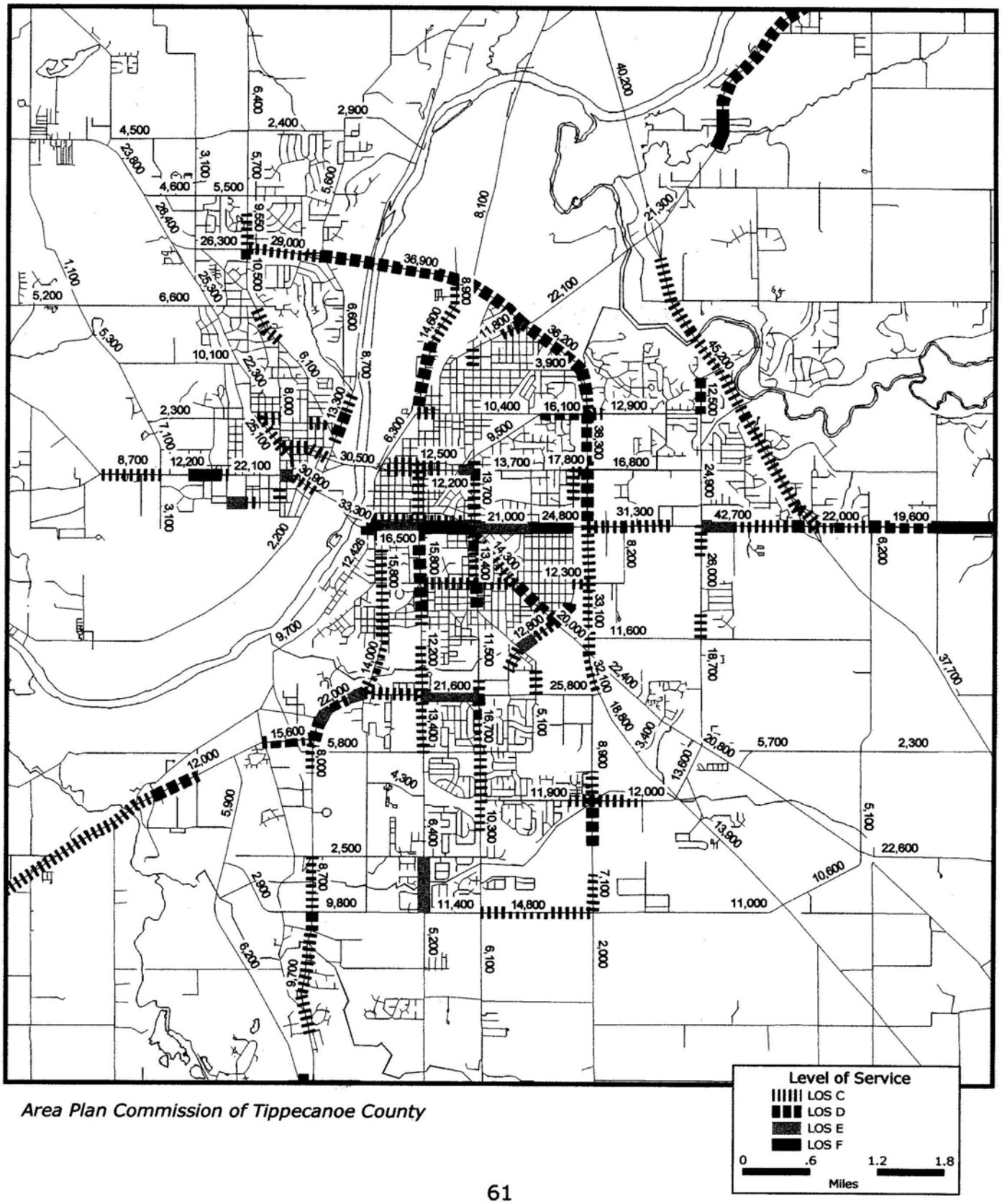

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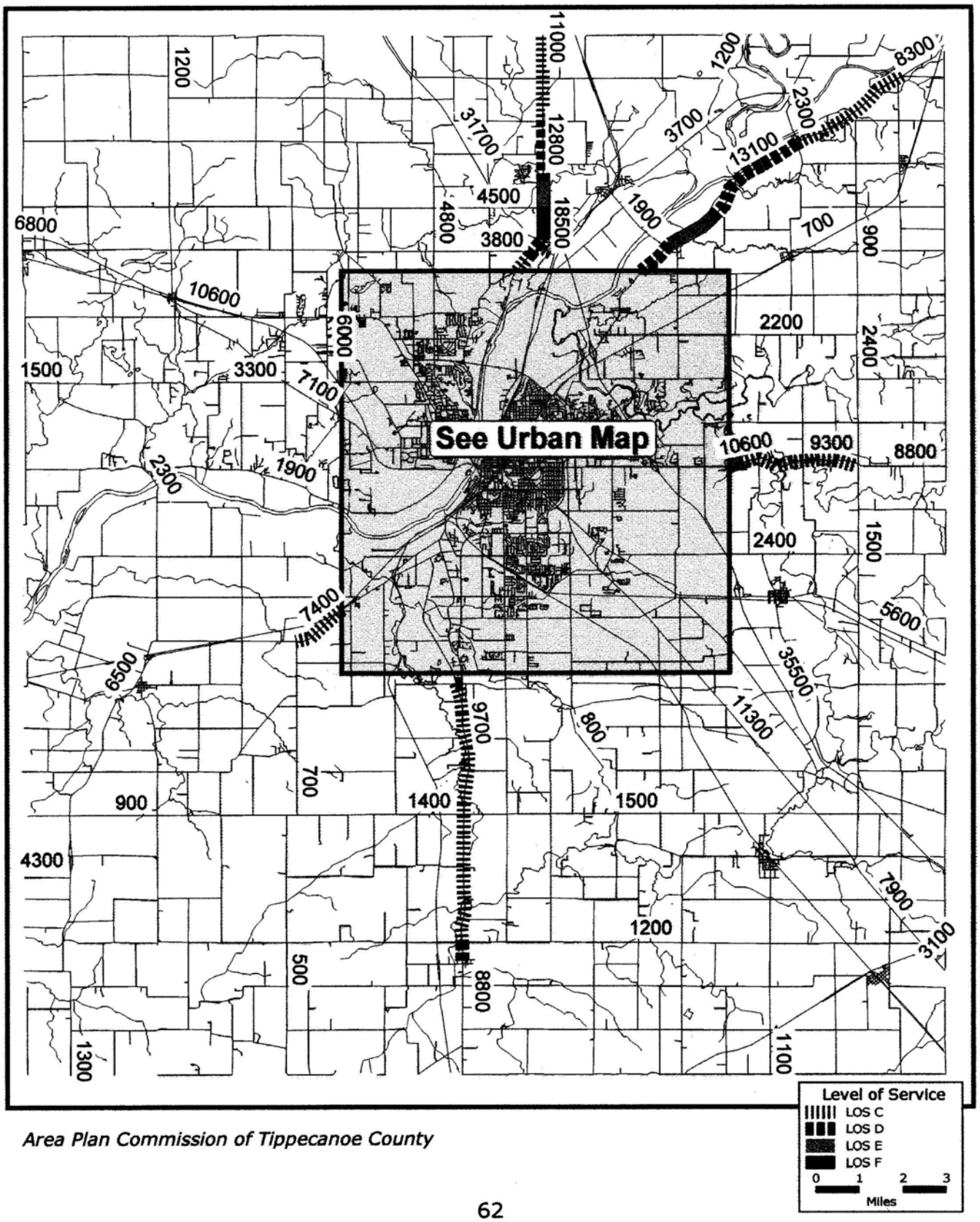
Figure 3

1999 Existing Road Network - Rural



Area Plan Commission of Tippecanoe County

US 231, Teal Road, South 9th, Earl Avenue, and Union show up as LOS E. LOS D is even more common, and there are lots of segments already operating at LOS C. (For readability, we have left LOS A and B off in all graphics.)

Table 4 serves as a guide to our current and anticipated traffic problems, and as a way to compare proposed solutions. Here we show the number of miles of roads operating at LOS D through F currently, and as projected for various 2010 and 2025 alternatives by the model. Our current situation shows up in the column headed "1999 Base Year". The bottom row shows network-wide totals of LOS D-F mileage. We will refer to **Table 4** frequently throughout the rest of this chapter.

As of 1999, we already had 22.2 miles of roads operating beyond the acceptable design standard we call LOS C: 16.8 miles of LOS D; 4.1 miles of E; and 1.3 miles of F. Our problems are occurring on our biggest and busiest streets, our primary arterials. The numbers certainly corroborate our real-world experience.

But notice the next two column totals, the ones for our two No-Build scenarios. If we were to grow in population and jobs as expected, but build no new roads, and widen no existing roads, our total of LOS D-F miles would nearly triple in 10 years. Even if we build all of the projects currently planned but none after 2010, the miles of LOS D-F continue to increase. No-Build scenarios for 2010 and 2025 project 62.7 and 79.9 miles of LOS D-F respectively, with 15.2 and 30.6 of those miles at LOS F alone.

The locations of all this projected congestion can be seen in **Figures 4 and 5**. In 2010, the network breaks down along stretches of I-65, Sagamore

Table 4
Miles of Level of Service
1999 – 2025

Level of Service	1999 Base Year	2010 No Build	2025 No Build	2010 E+C Alt.	2025 1st Alt.	2025 2nd Alt.	2025 Plan
F	1.3	15.2	30.6	8.1	5.1	5.6	2.1
E	4.1	24.5	26.7	12.0	21.7	9.5	9.2
D	16.8	23.0	22.6	16.1	25.6	26.0	22.6
Total	22.2	62.7	79.9	36.2	52.4	41.1	33.9

Figure 4

2010 No Build Network - Urban

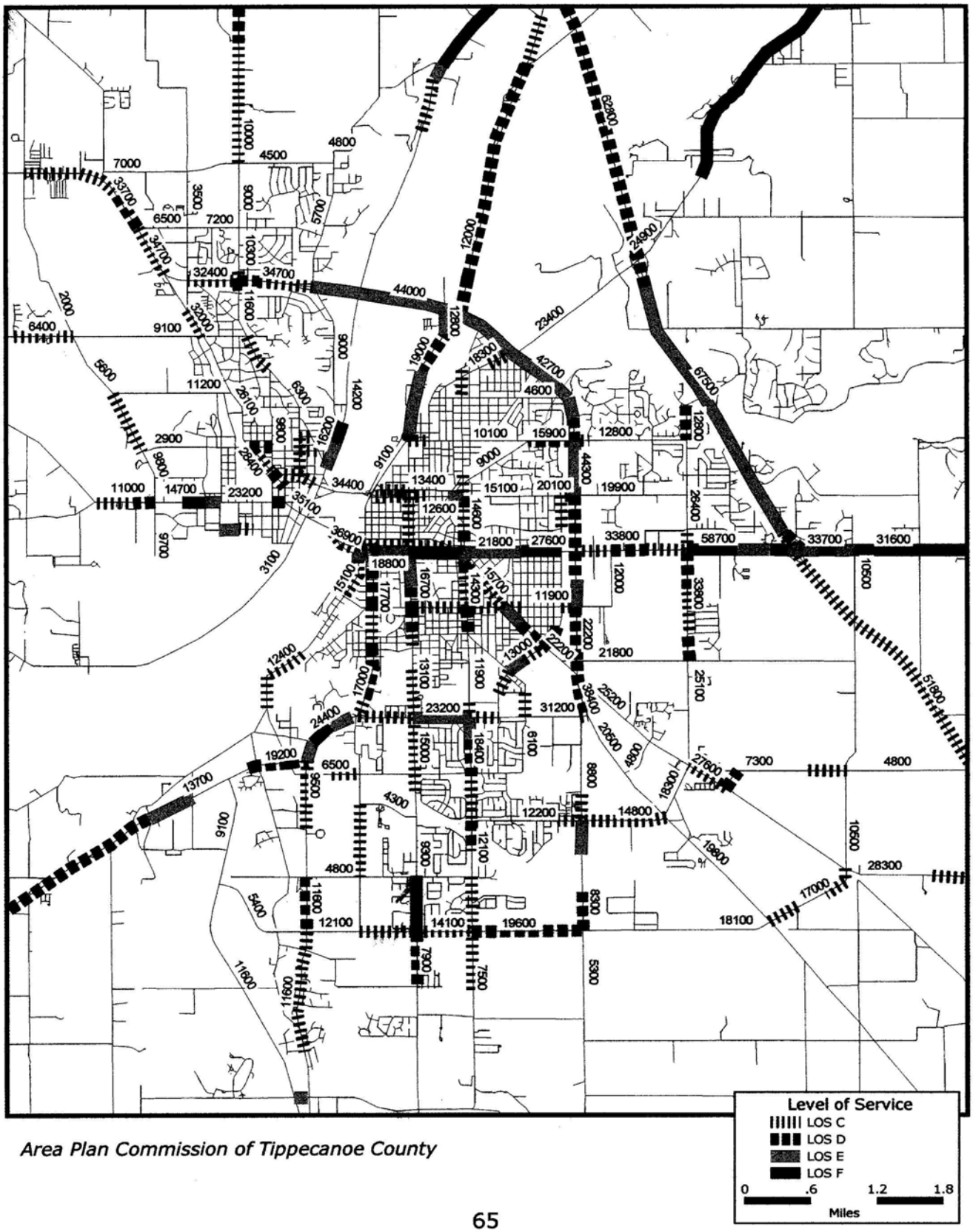


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Figure 4

2010 No Build Network - Rural

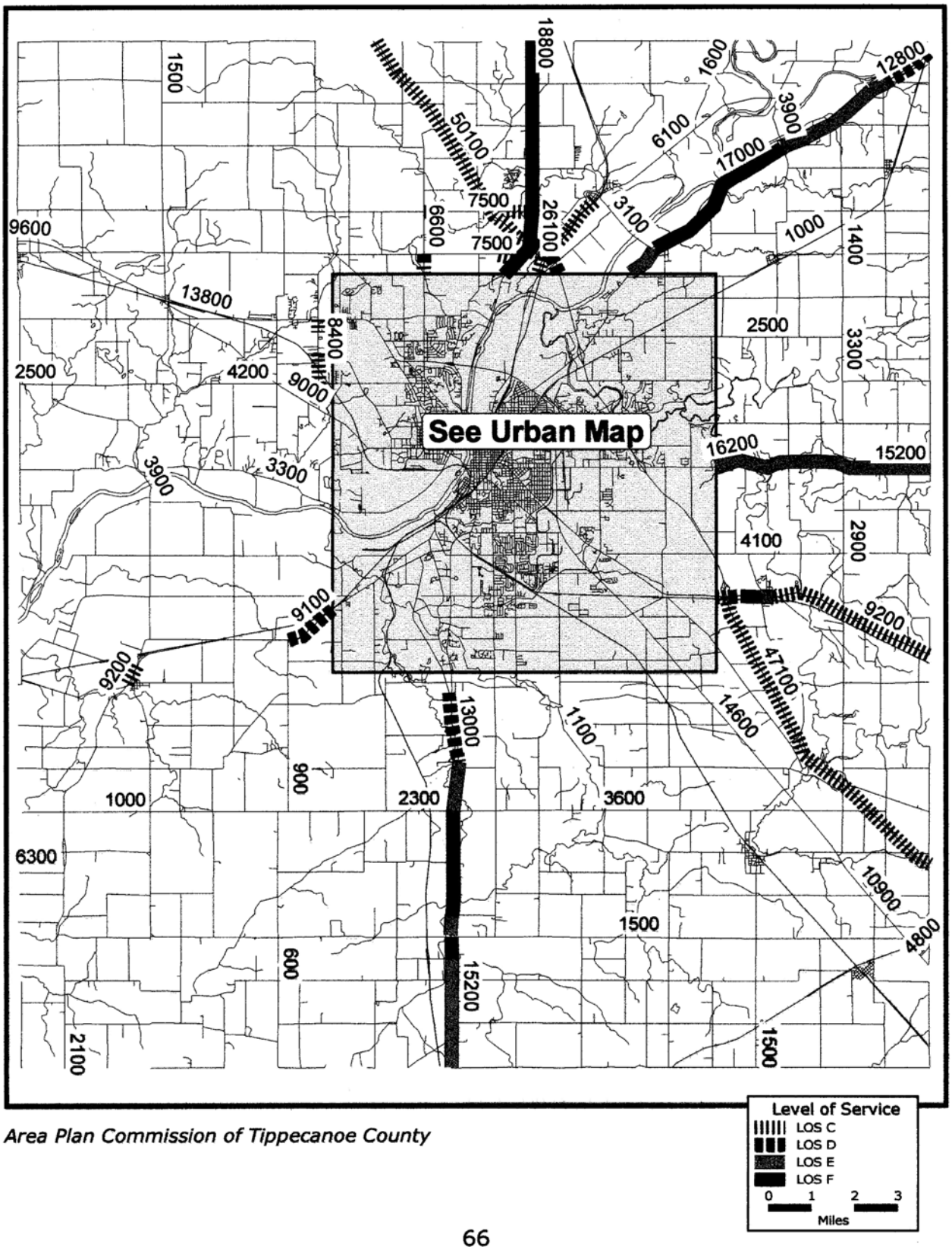

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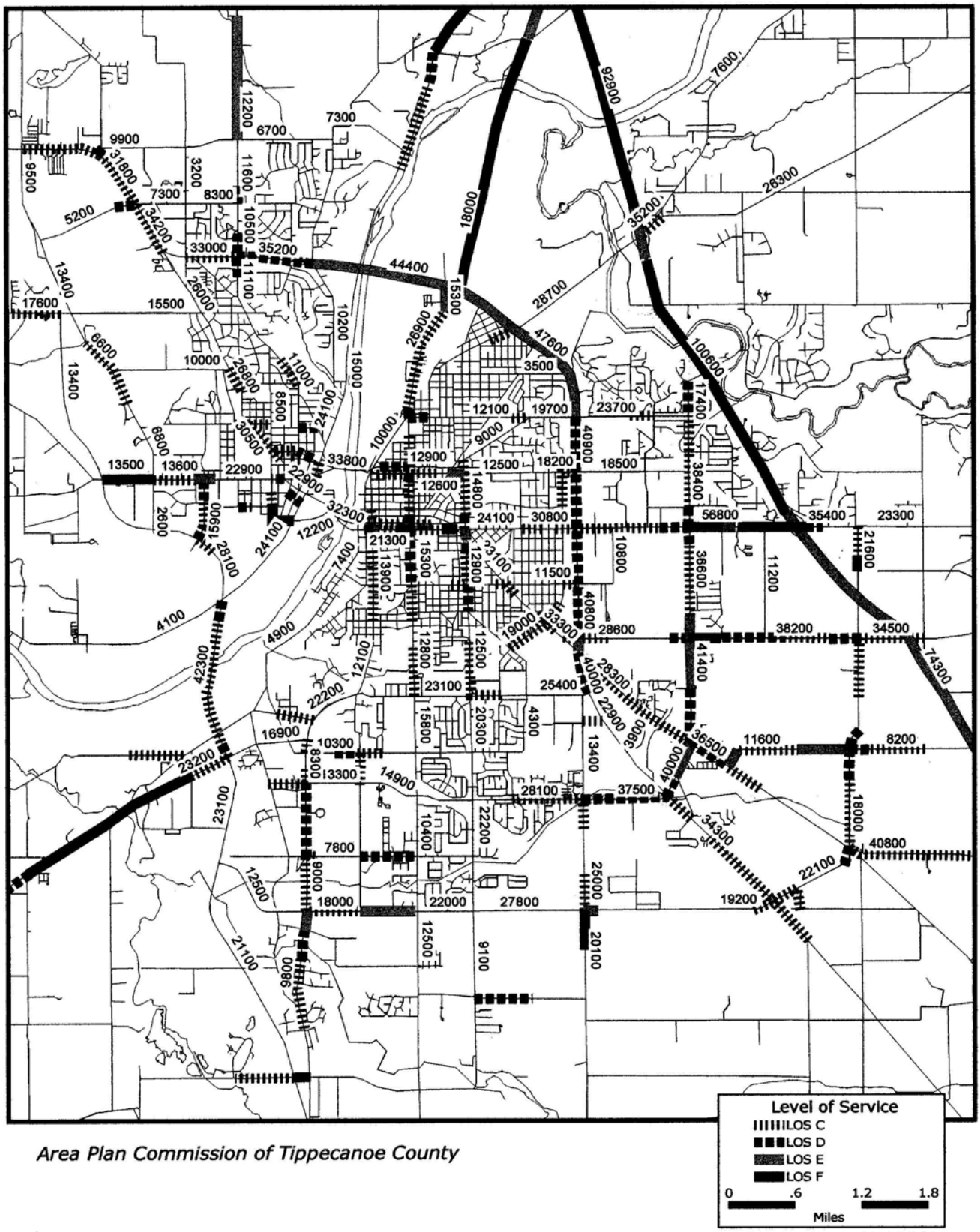
Figure 5

2025 No Build Network - Urban

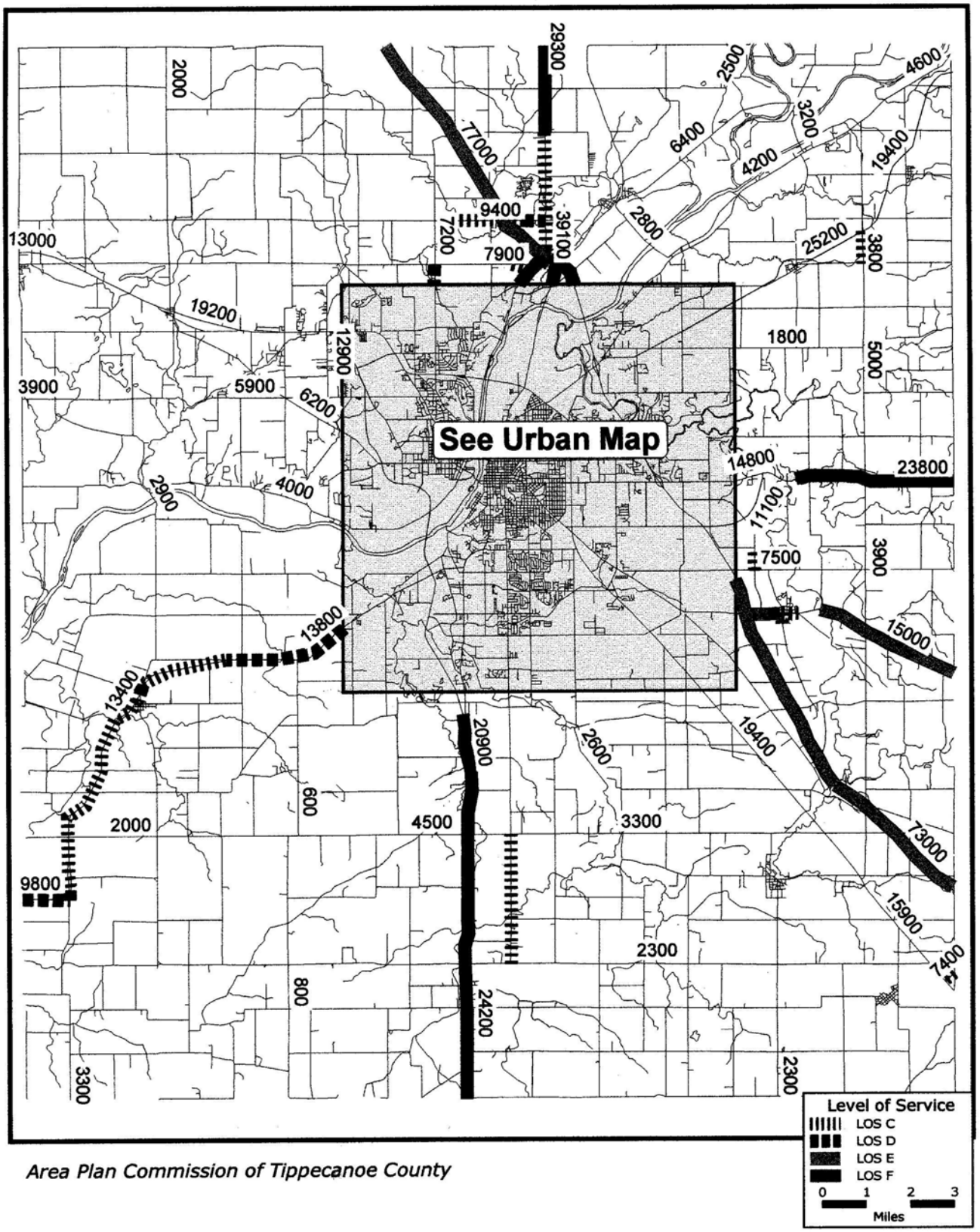


Area Plan Commission of Tippecanoe County

November 10, 2000

Figure 5

2025 No Build Network - Rural



Area Plan Commission of Tippecanoe County

November 10, 2000

Parkway, South Street, out SR 43 and 26, across Teal Road and up and down 4th, 9th, 18th Streets, on North 9th Street and North River Road. By 2025, the Interstate, along with portions of North 9th Street, South and State Street reaches gridlock. Commuters using SR 43, SR 26 to the east and US 231 to the south will experience heavy congestion. These then are worst-case scenarios, our do-nothing alternatives.

ACCOUNTING FOR COMMITTED PROJECTS

Barring major economic misfortune – a possible but unlikely circumstance – our worst-case traffic nightmares will not come true. Progress, at least through 2010, is already planned although not guaranteed. Some improvements are already under construction; others have had rights-of-way acquired or have at least undergone preliminary engineering studies. We anticipate still others that have been programmed in our Transportation Improvement Plan and the adopted Thoroughfare Plan, or are part of the State's Long-Range Plan. These are all facets of 1978 Transportation Plan implementation.

We call all these projects, added to our present system, the Existing Plus Committed (E+C) Network. For our planning purposes, we consider E+C to be our base for 2010, a springboard for additional improvements in the following decade and a half. Please refer to the section titled **"AN OVERVIEW"** in **Chapter 2** of this report and its **Figure 1**, for a full description of 2010 E+C.

But how well off will we be, from a traffic congestion point of view, if all these anticipated improvements are made by 2010? The answer comes as no surprise, we will be better if we build these improvements. Subjecting

the 2010 E+C network to the model shows us that we can expect fewer miles of LOS D-F if these projects are built. **Table 4** shows us a network total of 36.2 miles of LOS D-F for the E+C network, compared to 62.7 for the No Build. That difference is rather significant, especially when comparing the miles of LOS F and E. Both are almost reduced by half.

Figure 6 shows projected LOS and traffic volumes for our 2010 E+C Alternative. The worst problems seemed to be confined to SR 26 between Creasy Lane and the Interstate, SR 26 between relocated US 231 and Airport Road, portions of South and Columbia in downtown Lafayette, and the commuter routes to the north, east, and south. Notice with the improvements, congestion along Sagamore Parkway, SR 26, North 9th Street, Teal Road, and County Road CR 350S are completely eliminated.

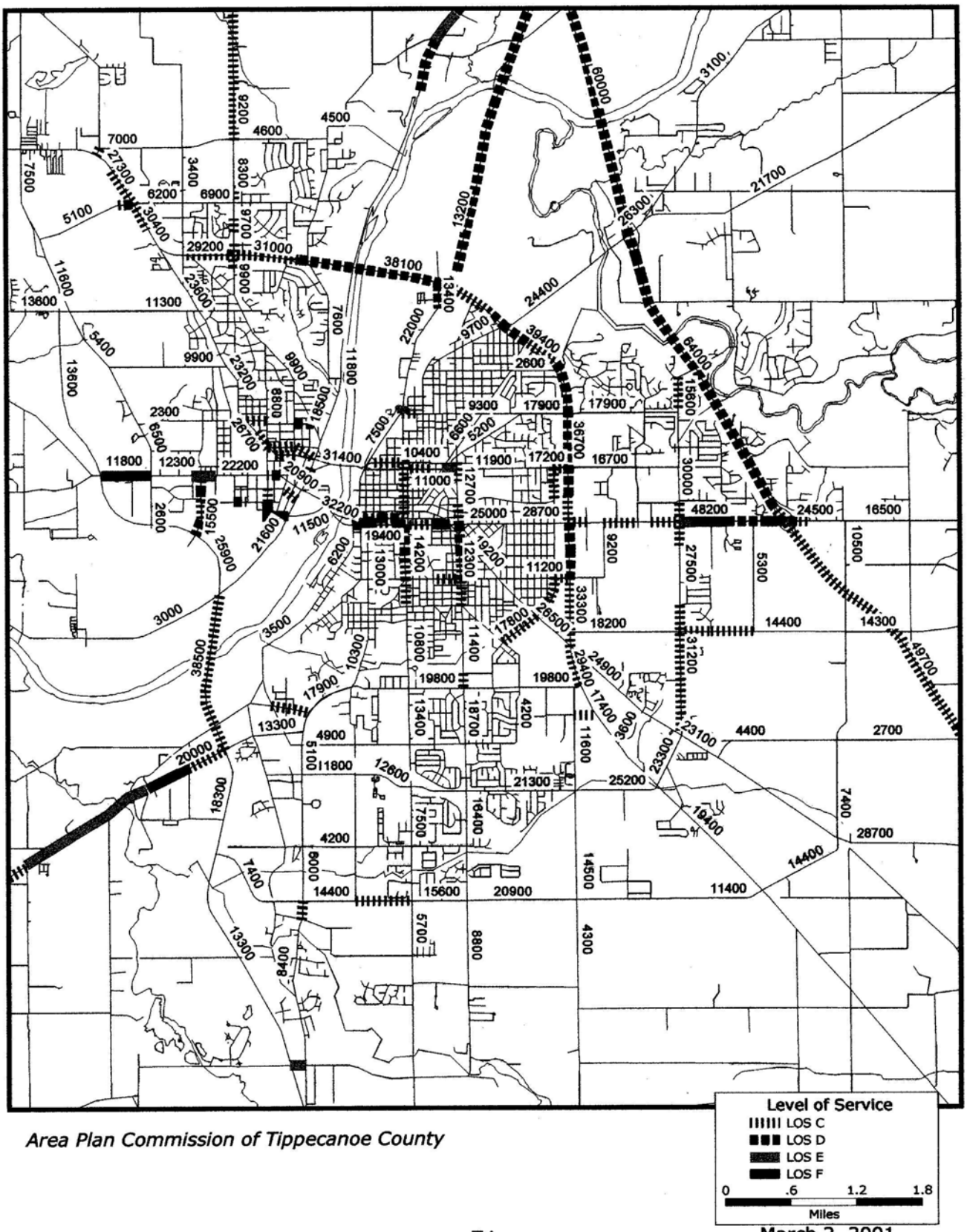
Despite these expected improvements in the network, the implication remains clear. As we continue to grow, we must keep pace with network improvements to solve some of our traffic congestion problems. Compare 2010 E+C and 1999 (**Figure 3**) regarding I-65, SR 43 north of SR 225, SR 26 east of the Wildcat Creek, US 231 south of CR 500S, and SR 26 between Creasy Lane and the Interstate.

SOLVING PROBLEMS BEYOND 2010

The projected 2025 No Build network found us losing ground on traffic congestion, rather than gaining. By testing the 2025 No Build network, what we did gain was knowledge. We became aware of problems still likely to continue to grow past 2010. Armed with this information, we began to test a series of alternative networks, each with a set of proposed projects

Figure 6

2010 E Plus C Alternative Network - Urban

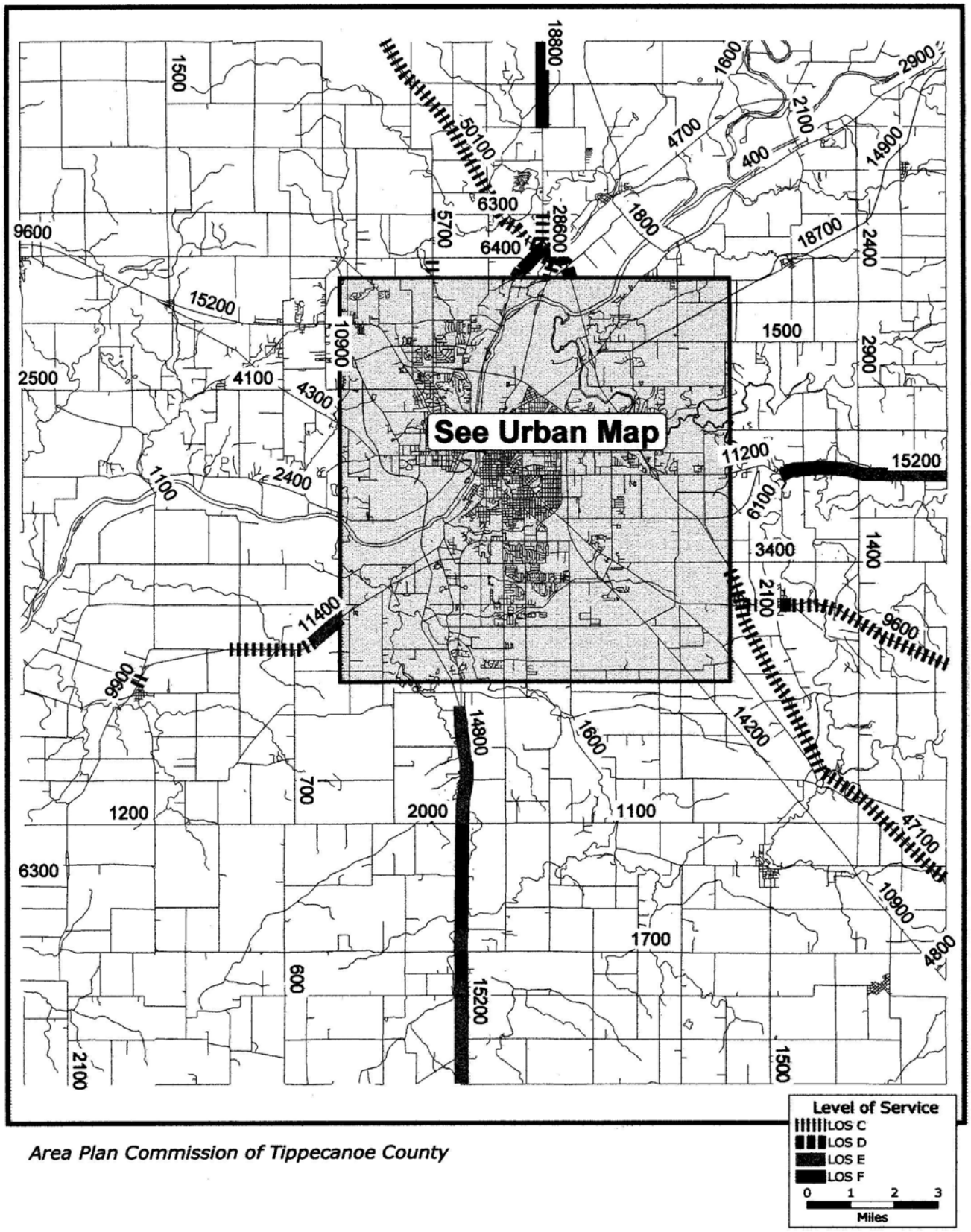


Area Plan Commission of Tippecanoe County

March 2, 2001

Figure 6

2010 E Plus C Alternative Network - Rural



Area Plan Commission of Tippecanoe County

March 2, 2001

intended to solve the traffic problems of 2025. These alternative solutions can be compared to the 2025 No Build Network.

Table 5 shows the features of all three 2025 alternative networks we subjected to the traffic forecast modeling process. They all assume 2010 E+C as a base. Alternatives 1 and 2 were developed from suggestions provided by the Technical Transportation, Administrative, and Citizens Participation Committees, the general public, plus some of our own. The third alternative, which we called the **2025 Transportation Plan**, combines the most effective features of the other two networks plus additional comments generated through the public participation process.

Alternative 1 (**Figure 7**) continues the relocation of US 231 northward past US 52 to the Interstate. Where the two meet, a new interchange would be built. This completes a circular loop or by-pass around Lafayette and West Lafayette via US 231, CR 350S, CR 475E/CR500E and I-65. Similar in design to the portions already built, it would be a four lane, divided, limited access road. Construction would not stop at the new interchange. Extending eastward, a new road would connect the Interstate to SR 43.

Currently INDOT is searching for an alternate route for SR 25 on Teal Road. Alternative 1 looks at possibly using CR 800S. Beginning at a new I-65 interchange, CR 800S would be widened as a super two lane road westward to US 231. State Road 25 would then be routed up US 231 to its existing location just south of the Wabash River.

Addressing the continual increase in traffic, Alternative 1 includes widening the Interstate from SR 43 to SR 38 from four to six lanes. This section,

Table 5 Comparison of Features in 2025 Alternative Network Tested			
Feature	ALT. 1	ALT. 2	PLAN
Super Two Lane Widening			
CR 800S: US 231 to I-65 (with interchange)	*		
CR 800S: US 231 to US 52		*	
CR 800S: SR 25 to US 231		*	
Widen Two to Four Lanes			
SR 25: CR 375W to New US 231	*		*
SR 26: New US 231 to Airport Road	*	*	*
SR 26: Airport Road to Intramural		*	*
SR 26: Wildcat Creek to County Line	*	*	*
SR 43: CR 725N to County Line	*	*	*
SR 43: Park Road to I-65	*	*	*
US 231: via Jackson Hwy & SR 26		*	
US 231: CR 500S to County Line	*	*	*
US 231: SR 25 (S. Int.) to Beck Lane	*	*	*
North 9th: Swisher Road to US 52	*	*	*
9th: Central Street to Teal Road		*	*
18th: CR 430S to Wea School Road		*	*
Beck Lane: Old US 231 to CR 50E	*	*	*
Concord Road: CR 350S to CR 500S		*	*
CR 350S: CR 50E to South 9th Street	*	*	*
CR 500S: New US 231 to Old US 231	*	*	*
Klondike Road: Lindberg Road to SR 26		*	
Widen Four to Six Lanes			
SR 26: US 52 to I-65	*	*	*
I-65: SR 43 to SR 38	*	*	*
I-65: County Line to SR 43		*	*
I-65: SR 38 to County Line		*	*
New Roads and Segments			
US 231: US 52 to I-65 (with interchange)	*		*
SR 43B: I-65 to SR 43	*		*
Cherry Lane: New US 231 to McCormick	*		*
Cumberland: Klondike Road to New US 231	*	*	*
CR 375S: Dayton Road to SR 38	*		
CR 500S: Wea School Road to US 52	*	*	*
Collector North: Creasy Lane to Park East	*	*	*
Collector South: Creasy Lane to Park East	*	*	*

Table 5 Continued Comparison of Features in 2025 Alternative Network Tested			
Feature	ALT. 1	ALT. 2	PLAN
New Roads and Segments Continued			
Duncan Road: US 52 to North 9th	*	*	*
Farabee Drive: Kossuth St. to McCarty Lane	*	*	*
New Castle & CR375S: CR 350S to Dayton Road	*	*	*
Park East Boulevard: McCarty to US 52	*	*	*
Other Improvements			
Modified Interchange at SR 26 & US 52		*	*

especially between SR 43 and SR 26, has become an alternative for local traffic. The model clearly shows this continuing in the future. Another widening to six lanes is proposed for SR 26 between US 52 and the Interstate.

Several new connecting roads would be constructed around the County. To the south, CR 500S would either be improved or new sections constructed between Wea School Road and US 52. This would provided another east-west connection, south of CR 350S and north of CR 800S. New Castle Road and CR 375S would be upgraded between CR 350S and Dayton Road and a new road built over to SR 38. Closer to town, developers would construct Park East Boulevard southward to SR 38 and US 52. Other connections would include Cherry Lane, Cumberland Avenue, and Farabee Drive.

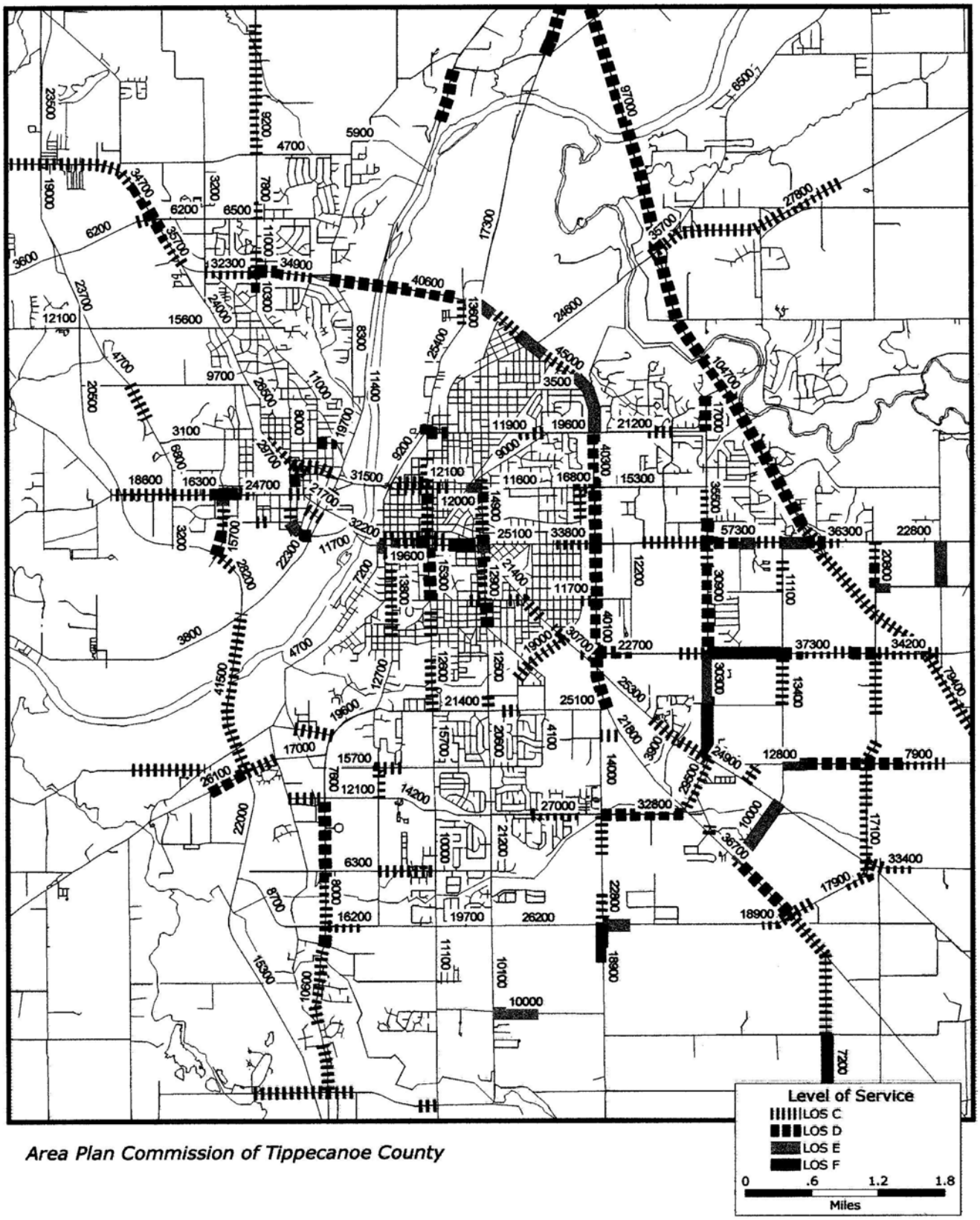
Major arterials that would also be widened include portions of SR 25, CR 350S, Old US 231 and Beck Lane. Alternative 1 also includes two projects located near the new State Park: widening SR 43 north to the Interstate and North 9th Street south to US 52. In rural Tippecanoe County, SR 43 northward, SR 26 eastward, and US 231 southward would be widened to meet the demand in commuter traffic.

How well does all this work? **Table 4** show us that Alternative 1 would be a significant improvement over 2025 No Build. A network total of LOS D-F for 2025 Alt 1 of 52.4 miles would be much better than 2025 No Build's 79.9 miles. The most dramatic difference is the miles of LOS F. It drops from 30.6 miles to 5.1. Unfortunately, even with all of these improvements, it does not get us back to the 2010 E+C level.

Projected LOS levels and traffic volumes for 2025 Alternative 1 are shown in **Figure 7**. Compare these to 2010 No Build (**Figure 4**). Notice how effective the construction of US 231 to I-65 and to SR 43 would be in alleviating congestion on SR 43, CR 600N, and County Farm Road. It also reduces traffic volume on Soldiers Home Road and North River Road. Widening SR 43 north and North 9th south of the new Prophetstown State Park road both reduce congestion from LOS F to a more acceptable level. While congestion is reduced on the Interstate between SR 43 and SR 38, it continues to be a problem both north and south of these State Roads. The extension of CR 375S east of Dayton Road to SR 38 fails to draw any traffic away on SR 38 through the Town of Dayton. Further south, the new SR 25 interchange attracts very little traffic off of the Interstate. It does create another alternate route to US 231 into Lafayette via CR 800S to CR 450E. Congestion on CR 450E reaches LOS F in one location. West of the Purdue Campus, widening SR 26 between Airport Road and relocated US 231 reduces LOS to C. However improvements are needed to the east along the south of Campus edge with congestion still occurring near Intramural Drive.

Figure 7

2025 Build Network, 1st Alternative - Urban



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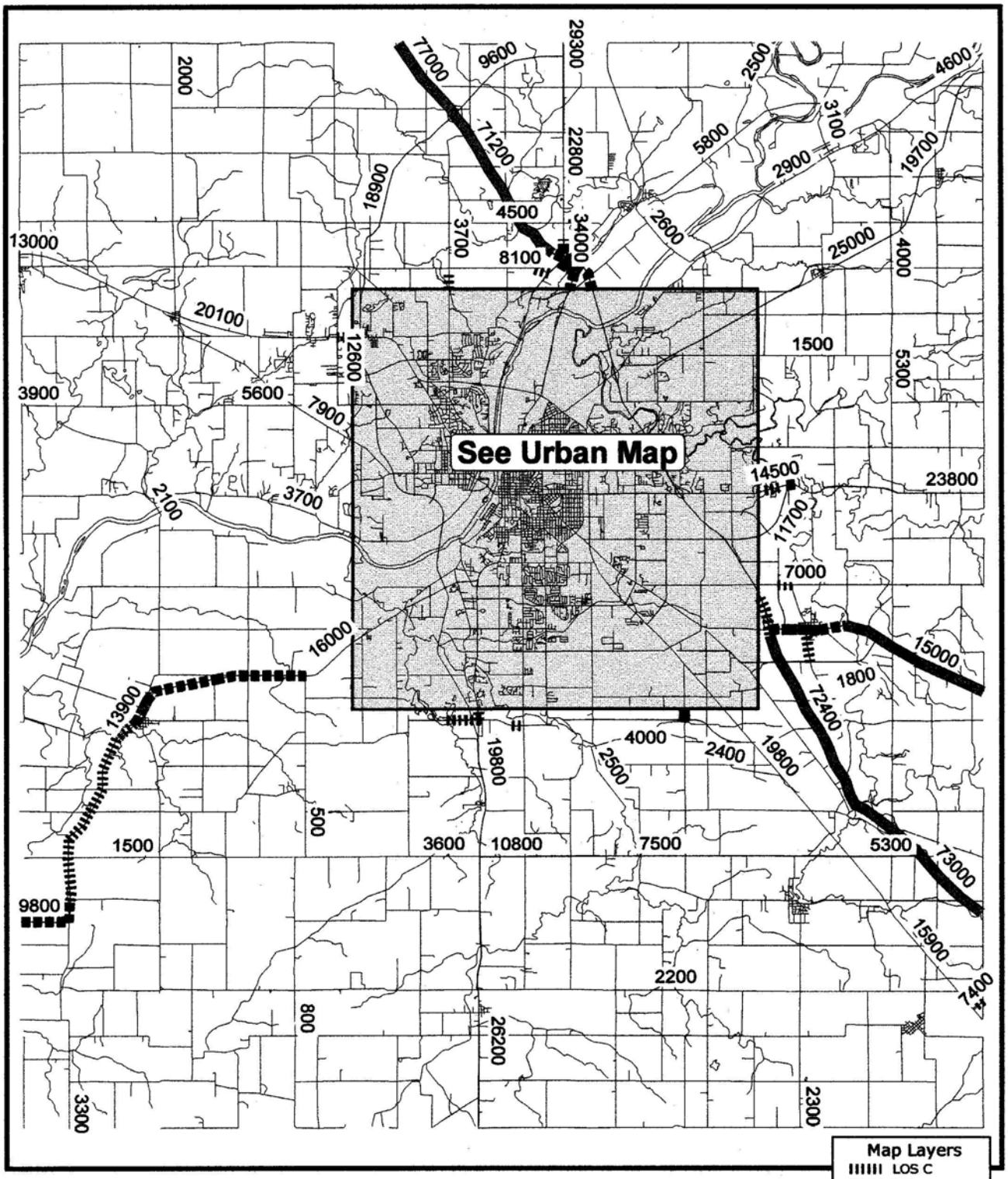
November 9, 2000

Figure 7

2025 Build Network, 1st Alternative - Rural



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As **Table 5** shows, Alternative 2 for 2025 shares many of Alternatives 1's features while adding some new ones. One of the major differences is the routing of US 231 north of SR 26. Instead of taking a northerly direction and connecting to the Interstate, relocated US 231 would take a more westerly route. The route would follow SR 26 to Jackson Highway. At that point it would then use Jackson Highway until it reached the town of Montmorenci. A by-pass would be built around the town northward, eventually connecting back to existing US 231. Similar in design to the other proposed route, it would be constructed as a four lane, median divided, limited access road. In conjunction with this route, Klondike Road south of CR 200N to SR 26 would be widened to four lanes.

Based on suggestions, Alternative 2 revisits the proposed routing of SR 25 via CR 800S. In this set-up, the interchange is no longer included. SR 25 would be routed south along US 52 rather than I-65. Once again CR 800S would be improved to US 231. But instead of diverting the route on US 231, the improvements would continue westward on CR 800S to existing SR 25. Since this would become the new route, we looked to see if old SR 25 would not need to be widened west of relocated US 231.

Other major improvements were looked at. One was a modified interchange at Sagamore Parkway and South Street. While through and right-turning vehicles would continue using the existing intersection, all left turning vehicles would be directed to a secondary elevated intersection. Additional widening was tested. The Interstate would be widened to six lanes throughout the County. Concord Road, 18th Street, 9th Street, and State Street west of Airport Road would all be widened to four lanes. Finally, since the extension of CR 375S did not relieve congestion through Dayton, we removed the improvements between Dayton Road and SR 38.

Alternative 2 proved to work somewhat better when tested with the traffic forecasting model. **Table 4** shows just 41.1 miles of LOS D-F. Compared to Alternative 1, that's more than ten fewer miles of congestion. However on a closer look, the miles of LOS F and D slightly increased. Simply put, some of the improvements worked and some did not. Alternative 2 projected LOS and traffic volumes are shown in **Figure 8**.

Finally, we created the Plan Network for 2025. It was assembled from the best features of Alternatives 1 and 2. The features are, again, summarized in **Table 5**. The routing of US 231 via SR 26 and Jackson Highway was dropped in favor of the northerly route. The SR 26 route split traffic between the new route and US 52. Thus both roads would be underutilized. However the most apparent impacts were on the north-south roads north of West Lafayette. SR 43 north of the Interstate surpasses 40,000 vehicles a day. Once again the road is over capacity even with the improvements done earlier in the Plan. Traffic volume increases on North River Road, CR 600N, County Farm Road, Kalberer Road, Cumberland Avenue, and Soldiers Home Road. As a direct result, congestion increases too.

The 2025 Plan abandons rerouting SR 25 along CR 800S. The cost of building two interchanges at CR 800S and US 231 in Tippecanoe County would be enormous especially considering the limited impact the southern interchange would have. Another reason is mileage between the SR 25 and I-65 Interchange to the SR 25 and CR 800S intersection. It is shorter to travel up I-65 to the new interchange and use relocated US 231 rather than traveling south on I-65 to a new southerly interchange and use CR 800S. By using relocated US 231, INDOT would save precious federal and state funds by not widening CR 800S and building a new interchange.

Figure 8

2025 Build Network, 2nd Alternative - Urban

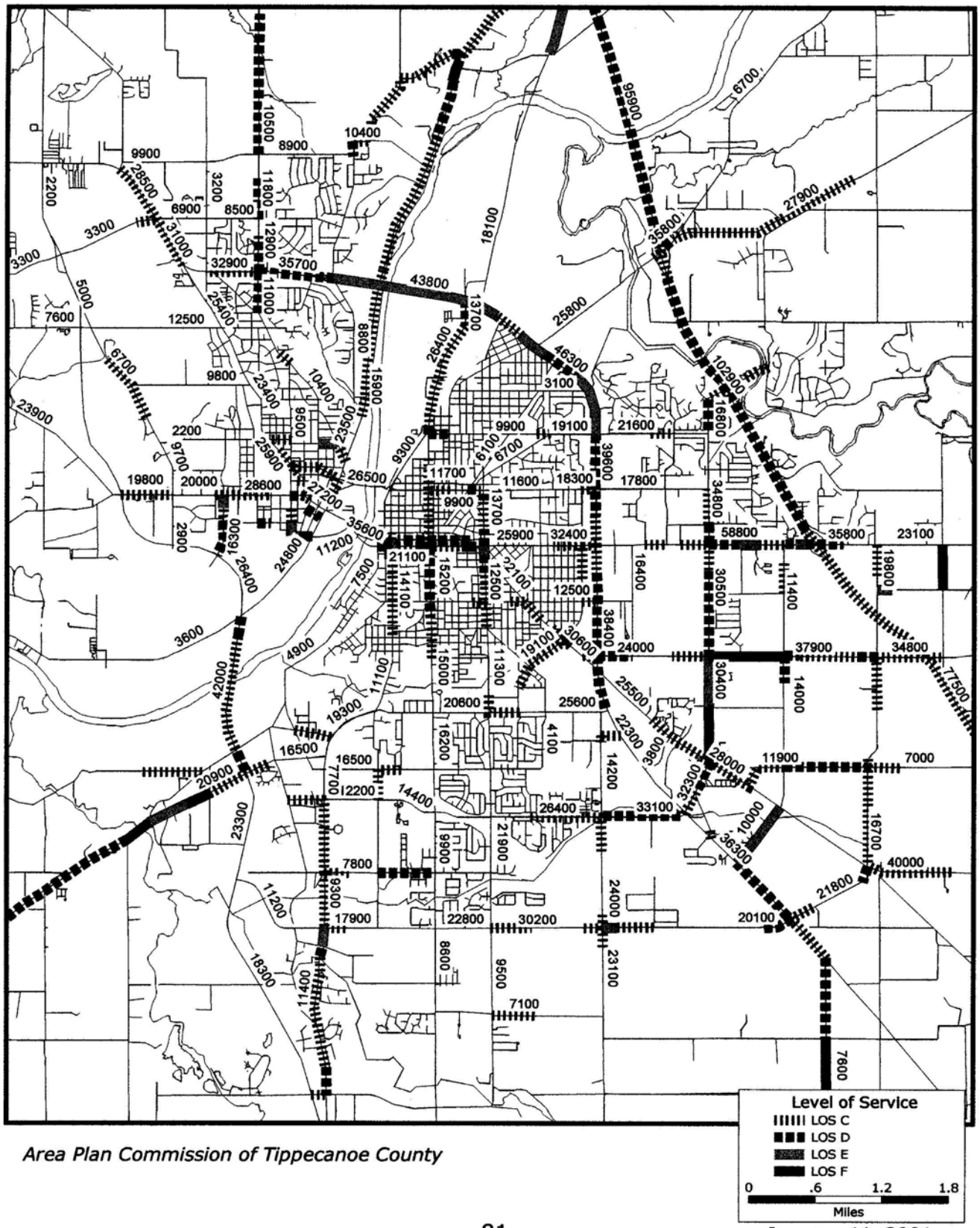

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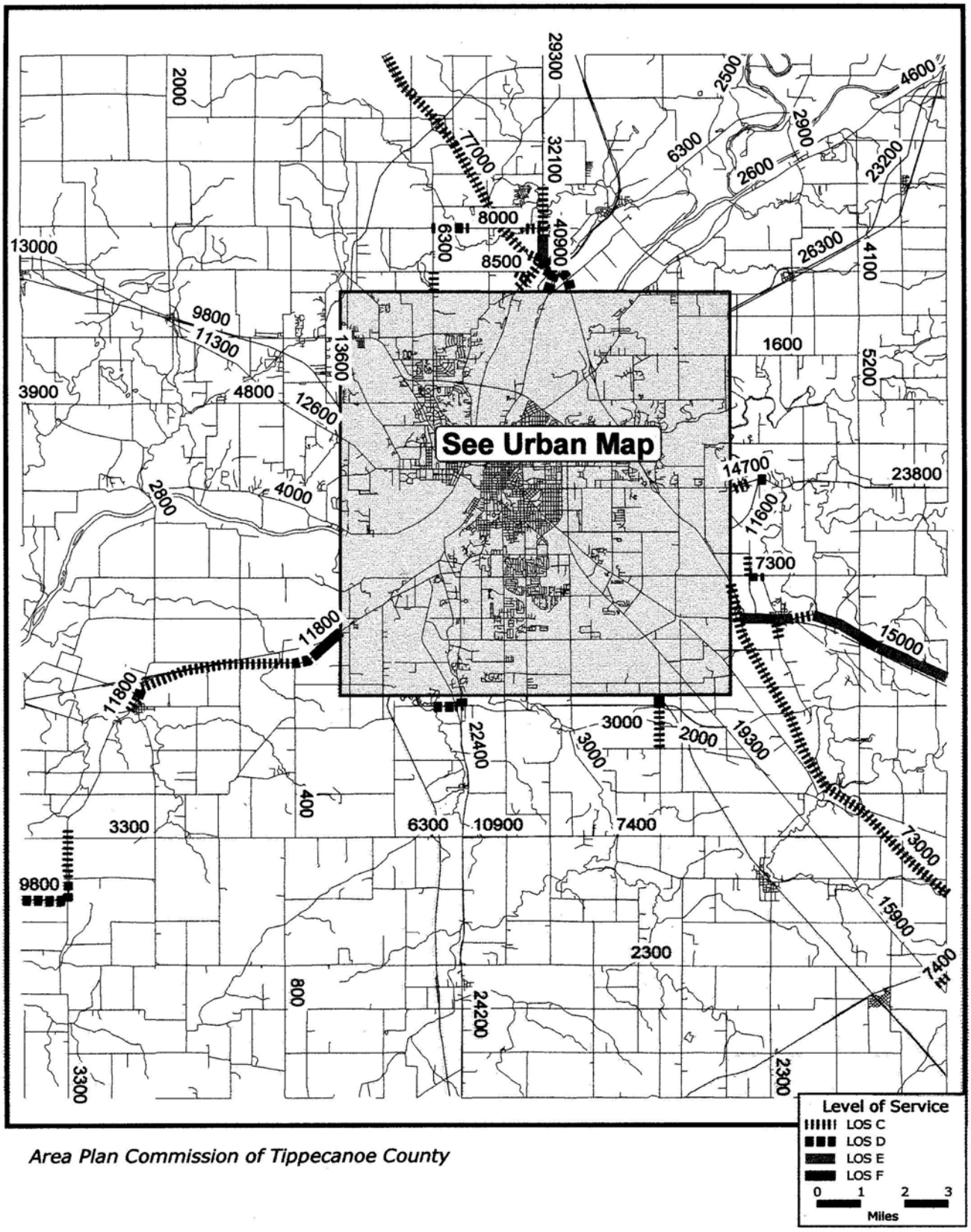
Figure 8

2025 Build Network, 2nd Alternative - Rural



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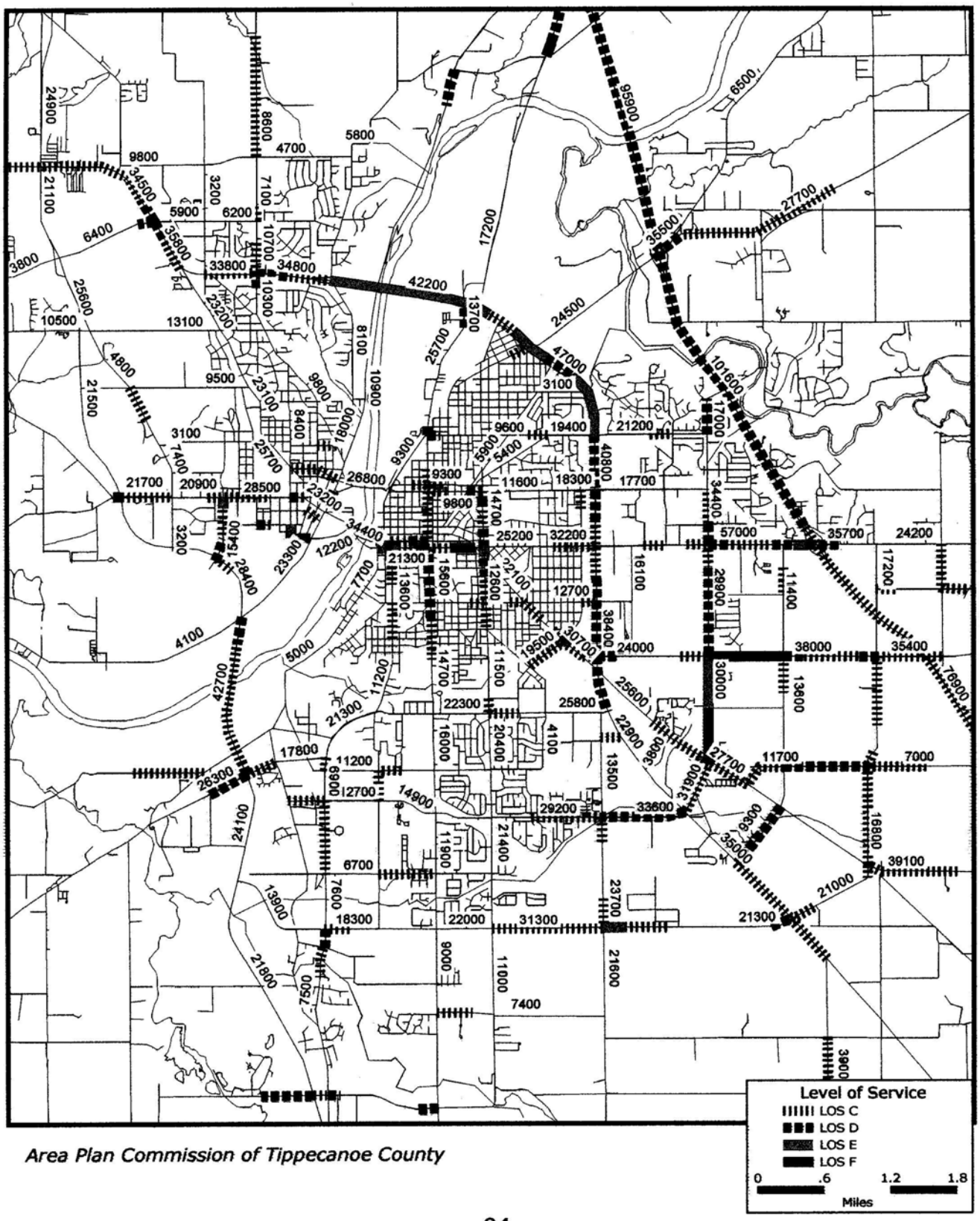
January 11, 2001

Figure 9 shows traffic volumes and LOS for this final version. Notice there remains just a handful of congested urban and rural road segments. Access via Harrison Street to the southeastern portions of campus remains problematic. Several congested areas continue to plague the downtown Lafayette corridors. In rural Tippecanoe County, SR 38 as well as portions of SR 25 are reaching capacity.

In summary, the **2025 Transportation Plan** presents us with many fewer miles of traffic congestion, is a clear indication of its effectiveness. We expect to grow by 46,000 people, add 19,000 dwelling units and 34,000 jobs, and still reduce our traffic congestion problems. The 2025 Plan betters the 2025 No Build by more than 57%. It even shows 6% fewer miles of congestion when compared to the 2010 E+C.

Figure 9

2025 Transportation Plan - Urban



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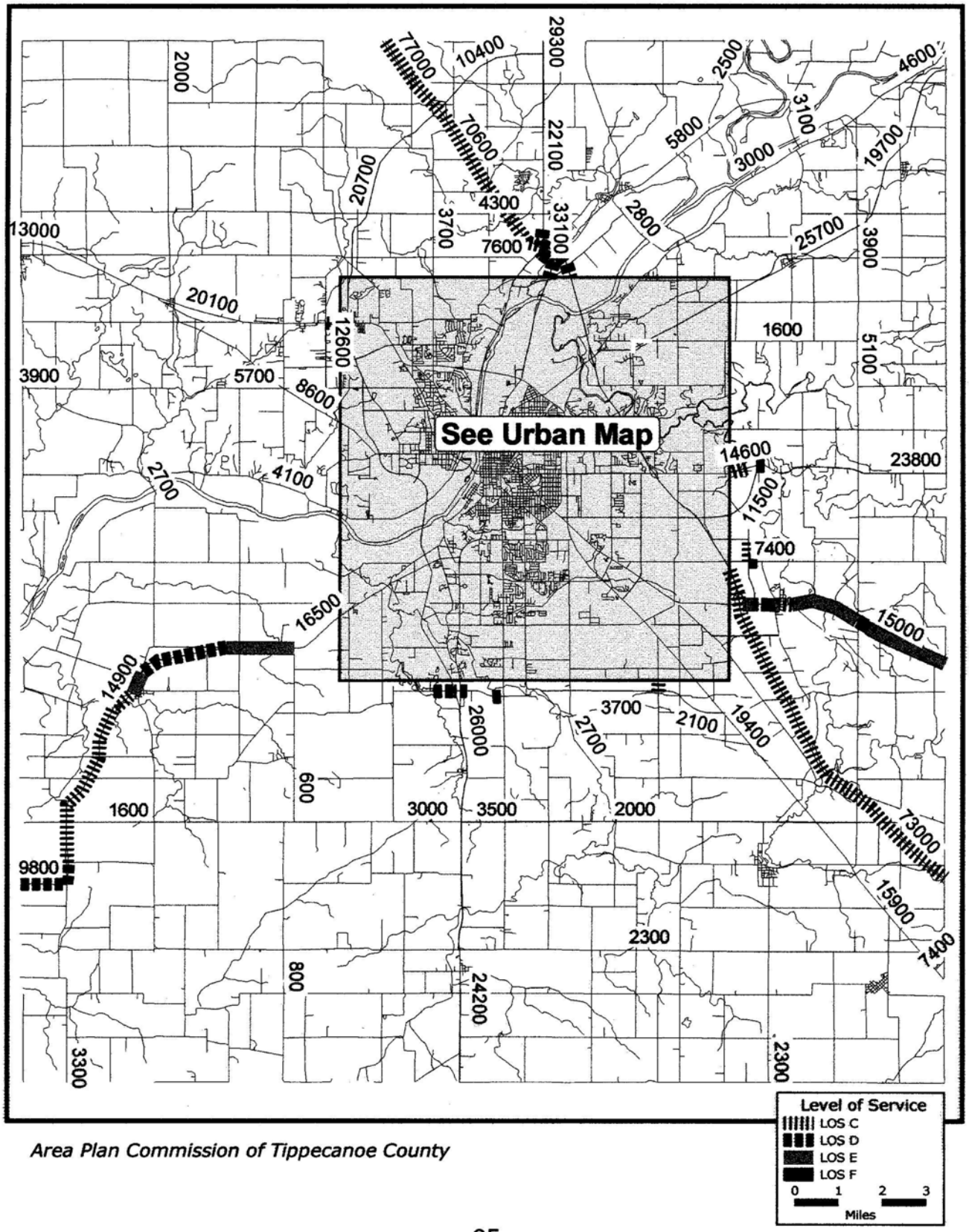
March 1, 2001

Figure 9

2025 Transportation Plan - Rural



Area Plan Commission of Tippecanoe County

March 1, 2001

Chapter 6

THE PLAN AND ITS IMPLEMENTATION

This Transportation Plan, in its final form, is the product of computerized modeling and human deliberation. We have based it on today's street system, built it on projects we expect to be funded by 2010 and augmented it with reasonable solutions to problems likely to arise after 2010. Our plan describes a two-stage process. Each stage covers a specific period of time: 1999 through 2010, and 2011 through 2025. The first period includes improvements we can expect and the second covers improvements we will still need.

We stress again that this plan serves as a way to achieve community-wide goals. It is not an end in itself. We know that conditions and needs will change over time; we can project the future but we cannot see it. Through this plan, we can only provide an overview, a framework, a context for addressing change over time. It is not the intention of this plan, its authors, or its adopting jurisdictions to only seek these solutions. Responsible agencies will be alert to the realities of urban development, and will modify these strategies as needed.

As we noted in **Chapter 2**, the tab for completing all these projects comes to just over **$638 million** in constant 2000 dollars. Because of the cost and chronically scarce funding, the plan's proposed network improvements must be staggered over time. We cannot build them all at once. And before construction can begin, each improvement must first be engineered on the drawing board. Then, unless enough right-of-way is already controlled, there must be negotiations with adjoining property owners to acquire it. Money must be allocated to complete these jobs before construction can

start. And construction can take weeks, months or years depending on a project's complexity.

Table 6 and **Figure 10** show how our road network will look if we were to complete all proposed improvements by 2025. In this version, all improvements are integrated into the network, and all roads are designated by functional classification: interstate, arterials and connectors. **Figures 1 and 2** in **Chapter 2** highlight just the road improvements projected for each period. These should be referred to when reading this portion of the text.

We have worked out the timing of these improvements resulting in a "staged implementation program". The reader will find these programs in **Tables 7, and 8**, further on in this chapter; there is one for each time period. For clarity, each proposed improvement has been assigned a letter and number which will be used in the text and in the tables. The letter is keyed to the jurisdiction responsible for building the improvement:

L = City of Lafayette;
W = City of West Lafayette;
C = Tippecanoe County;
I = Indiana Department of Transportation;
P = Private developers.
D = Town of Dayton

The proposed timing takes into account a number of factors:

- financial resources expected to be available;
- project implementation lead time;
- system flexibility requirements;
- coordination with other community development projects; and
- responsible fiscal management.

Table 6
Planned Improvements: 1999 – 2025
Note: "*" Project Needed but Shown for Illustrative Purposes

Improvement	Functional Class	Improvement	Functional Class
NEW ROAD CONSTRUCTION			
SR 25, I-1	Primary Arterial	Park East, P-1	Collector
US 231, I-11	Primary Arterial	Stable Drive, P-2	Collector
US 231, I-12	Primary Arterial	Park East, P-3	Collector
US 231, I-13	Primary Arterial	Collector N., P-4	Collector
Park Road, I-14	Collector	Collector S., P-5	Collector
US 231*, I-22	Primary Arterial	CR 900E, C-4	Collector
SR 43B*, I-24	Primary Arterial	McCarty Lane, C-6	Minor Arterial
Shenandoah, L-13	Collector	McCarty Lane, C-7	Minor Arterial
Twyckenham, L-22	Minor Arterial	CR 500S, C-12	Collector
Twyckenham, L-23	Minor Arterial	Cumberland, C-13	Collector
Twyckenham, L-24	Minor Arterial	Cumberland, W-1	Collector
Erie Street, L-5	Collector	Harrison Bdg., W-2	New Ramp
Duncan Road, L-27	Collector	Tapawingo N., W-8	Collector
Farabee Drive, L-28	Collector	Tapawingo S., W-9	Primary Arterial
Yost Drive, D-1	Collector	Cherry Lane, W-10	Collector
2 LANE IMPROVEMENTS			
CR 430S, C-3	Local	South River Rd, C-8	Collector
CR 200S, C-1	Collector	New Castle, C-14	Collector
3 LANE IMPROVEMENTS			
Duncan Road, L-11	Primary Arterial	CR 550E, C-9	Local
4 LANE IMPROVEMENTS			
SR 25, I-2	Primary Arterial	Earl Avenue, L-4	Minor Arterial
SR 25, I-3	Primary Arterial	Farabee, L-6	Collector
SR 25, I-4	Primary Arterial	Greenbush Av., L-8	Minor Arterial
SR 26, I-6	Primary Arterial	Greenbush Av., L-9	Minor Arterial
SR 26, L-14	Primary Arterial	Main Street, L-10	Primary Arterial
SR 43, I-8	Primary Arterial	North 9th St., L-11	Primary Arterial
SR 25*, I-15	Primary Arterial	Old Romney, L-12	Minor Arterial
SR 26, C-17	Primary Arterial	South 9th St., L-15	Minor Arterial
SR 26, C-18	Primary Arterial	South 9th St., L-16	Minor Arterial
SR 26, I-18	Primary Arterial	South 9th St., L-17	Minor Arterial
SR 43*, I-19	Minor Arterial	South 9th St., L-18	Minor Arterial
SR 43, I-20	Primary Arterial	South 18th St., L-19	Minor Arterial
US 231, I-25	Primary Arterial	South 18th St., L-20	Minor Arterial
Brady Lane, L-1	Minor Arterial	South 18th St., L-21	Minor Arterial
Concord Rd., L-2	Minor Arterial	CR 350S, L-25	Minor Arterial
CR 350S, L-3	Minor Arterial	Beck Lane, L-26	Collector

Table 6 Continued Planned Improvements: 1999 – 2025 Note: "*" Project Needed but Shown for Illustrative Purposes			
Improvement	**Functional Class**	**Improvement**	**Functional Class**
4 LANE IMPROVEMENTS			
Old US 231, L-29	Primary Arterial	CR 200N, C-2	Minor Arterial
9th Street, L-30	Minor Arterial	Klondike Rd., C-5	Collector
Kalberer Road, W-3	Collector	Concord Rd., C-10	Minor Arterial
Lindberg Road, W-5	Minor Arterial	CR 500S, C-11	Collector
Lindberg Road, W-6	Minor Arterial	North 9th, C-15	Collector
N. River Road, W-7	Primary Arterial	South 18th St., C-16	Minor Arterial
5 LANE IMPROVEMENTS			
SR 26, I-5	Primary Arterial	SR 43, I-7	Primary Arterial
6 LANE IMPROVEMENTS			
SR 26, I-17	Primary Arterial	I-65, I-21	Interstate
TRAFFIC SIGNALS			
US 231, I-10 Greenbush Av., L-7		Kalberer Road, W-4	
INTERCHANGES: NEW or MODIFIED			
I-65, I-9 SR 26*, I-16		US 231*, I-23	

Note: Projects Needed but Shown for Illustrative Purposes Only

This project list is so noted in response to INDOT's letter dated April 26, 2001. For more information see **Appendix 4**.

Projects not in agreement with INDOT Plan but are under study and should be shown in illustrative list:

SR 26 - Modified Interchange at US 52 (I-16)
US 231 - US 52 to I-65 (I-22)
US 231 - Interchange at I-65 (I-23)

Projects not in agreement with INDOT Plan and not under study and may be shown in the illustrative list as unfunded needs:

Planning Period 1999 to 2010

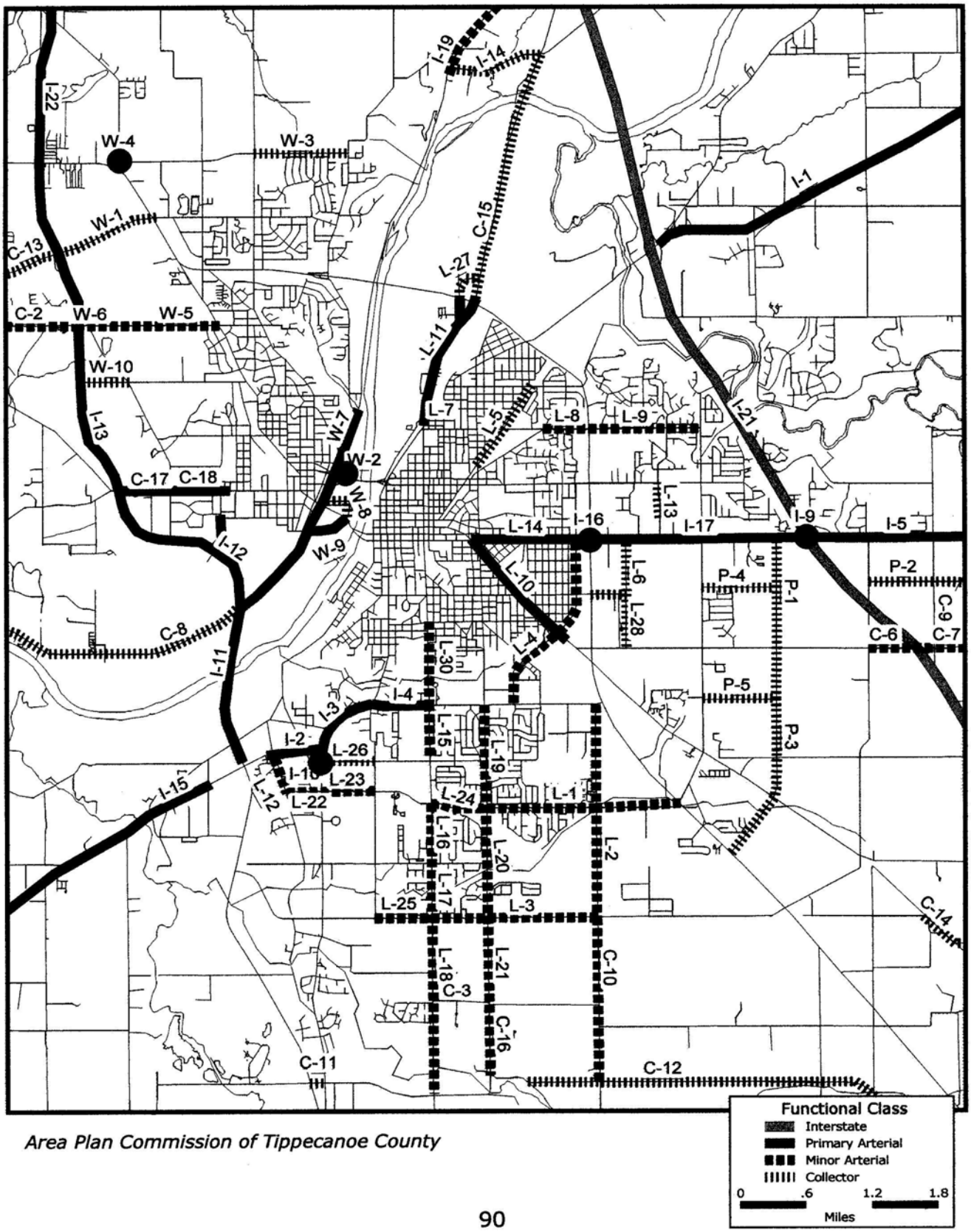
SR 25 - Old Romney to US 231 (I-2)
SR 25 – SR 25/US 231 to Teal Road (I-3)
SR 25 – 4th to 18th (I-4)

Planning Period 2011 to 2025

SR 25 – CR 375 to new US 231 (I-15)
US 231B – I-65 to SR 43 (I-24)
SR 43 – State Park Road to I-65 (I-19)

Figure 10

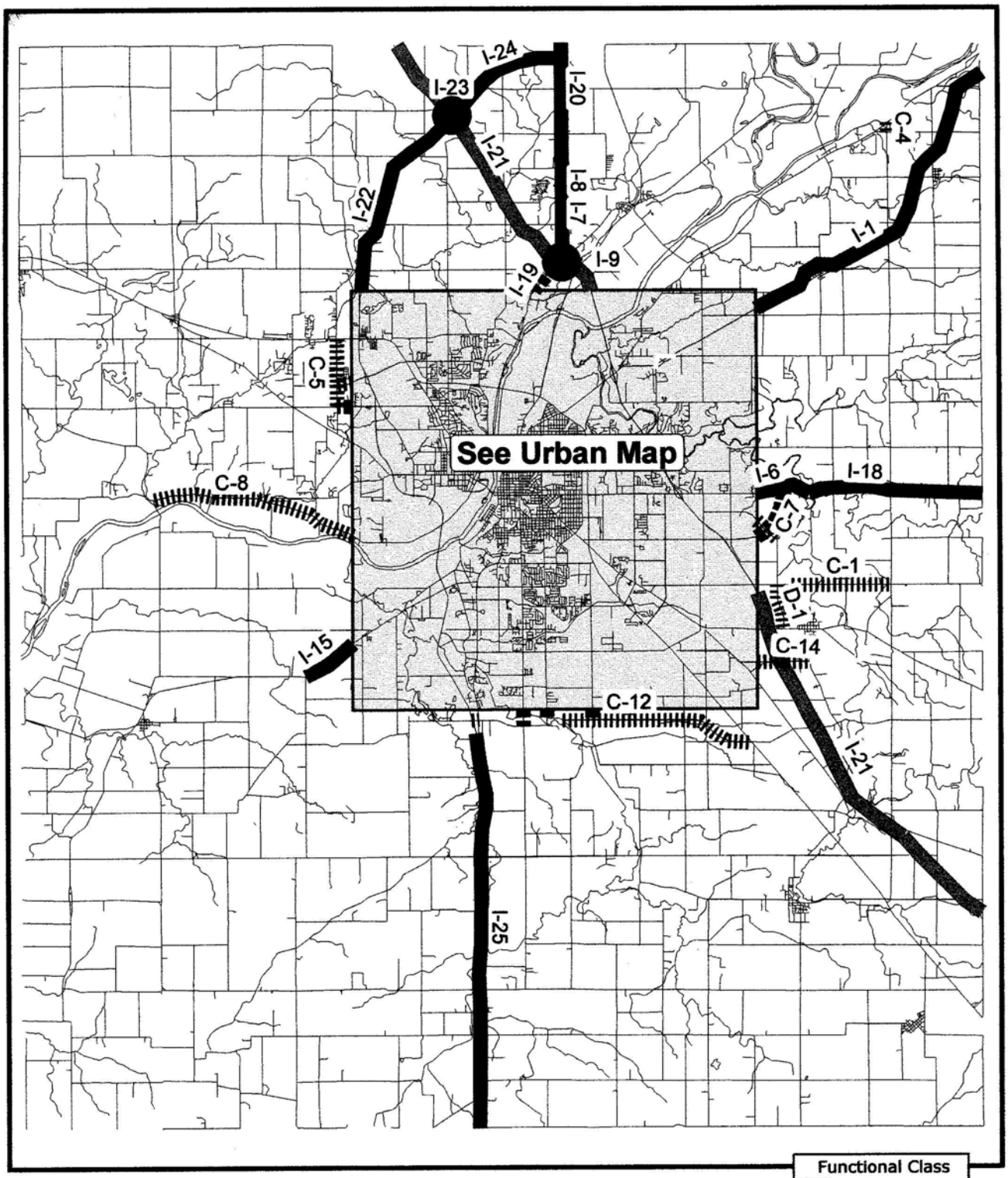
Planned Improvements - Urban



Area Plan Commission of Tippecanoe County

Figure 10

Planned Improvements - Rural



Area Plan Commission of Tippecanoe County

THE FIRST ELEVEN YEARS: 1999-2010

The portion of the plan dealing with the first decade matches up committed projects with anticipated growth patterns. We continue to promote a ring-road, or circumferential, approach to solving traffic congestion problems, as we had in 1978, 1991, and 1997. Improving our outer loops will be supplemented by better radial streets carrying traffic from the periphery to the center. For a graphic summary of committed projects, see **Figure 1** in **Chapter 2**. **Table 7** shows the corresponding Staged Implementation Program, by jurisdictions.

One ring-road has been created with the connection of Creasy Lane to Brady Lane. Eventually it will connect to the old US 231 and SR 25 by way of Twyckenham Boulevard. A second ring connects CR 500 E/475 E and State Road 38 (near the SIA plant) to a widened CR 350S, extended west to US 231. The western leg of the outer ring will be the new US 231 alignment, with its new south river bridge to a widened South River Road.

The southern stretch of the inner ring will be improved by extending Brady Lane from its current terminus at 18th Street to intersect with old US 231 (L-23, & L-24): four new lanes with a bridge over the Norfolk Southern Railroad tracks will be built from 18th to 9th, where Brady will become Twyckenham Boulevard; four lanes will also be built from the west end of Twyckenham (at CR 50E), terminating at Old US 231.

Another key connection is the continuation of Brady Lane or Twyckenham Boulevard to Old Romney Road (L-22) and improving Old Romney Road to SR 25 (L-12). This allows traffic to by-pass the US 231/SR 25 intersection.

Table 7
Staged Implementation for Network Improvements by Jurisdiction
(P = preliminary engineering, R = right-of-way acquisition, C = construction)
Dollars Shown in $1,000

Project	1999	2000	2001	2002	2003	2004
Lafayette						
Brady, L-1			C:5,000			
Concord, L-2						P:630
CR 350S, L-3						
Earl, L-4						
Erie Street, L-5	Under Construction					
Farabee, L-6			R:150		C:2,500	
Greenbush, L-7					P:20	R:25
Greenbush, L-8					P:150	
Greenbush, L-9				P:400	R:100	C:4,000
Main, L-10				P:280	R:140	
N. 9th & Duncan, L-11	Under Construction					
Old Romney, L-12						
Shenandoah, L-13	Project Complete					
South Street, L-14					P:330	
South 9th, L-15						
South 9th, L-16				R:80	C:1,626	
South 9th, L-17				P:300		R:80
South 9th, L-18						
South 18th, L-19						P:330
South 18th, L-20				P:300	R:80	C:2,000
South 18th, L-21						
Twyckenham, L-22						
Twyckenham, L-23			C:1,430			
Twyckenham, L-24			R:75	C:6,370		
Total			6,655	7,730	4,946	7,065
West Lafayette						
Cumberland, W-1						P:160
Harrison Bdg, W-2			P:15	C:220		
Kalberer, W-3				C:800		
Kalberer, W-4					P:25	R:5
Lindberg, W-5			C:4,620			
Lindberg, W-6						
North River Rd, W-7					P:100	
Tapawingo, W-8						P:150
Tapawingo, W-9					R:2,000	
Total			4,635	1,020	2,125	315

Table 7 Continued
Staged Implementation for Network Improvements by Jurisdiction
(P = preliminary engineering, R = right-of-way acquisition, C = construction)
Dollars Shown in $1,000

Project	2005	2006	2007	2008	2009	2010
Lafayette						
Brady, L-1						
Concord, L-2		R:2,520		C:10,080		
CR 350S, L-3				P:160	C:1,200	
Earl, L-4		P:360		R:180		C:2,880
Erie Street, L-5	Under Construction					
Farabee, L-6						
Greenbush, L-7	C:350					
Greenbush, L-8	R:600		C:2,400			
Greenbush, L-9						
Main, L-10	C:2,240					
N. 9th & Duncan,L-11	Under Construction					
Old Romney, L-12	P:120		R:80		C:1,280	
Shenandoah, L-13	Project Complete					
South Street, L-14		R:1,320			C:5,280	
South 9th, L-15		P:120		R:60		C:960
South 9th, L-16						
South 9th, L-17		C:1,700				
South 9th, L-18	P:510		R:340		C:5,440	
South 18th, L-19		R:220		C:3,520		
South 18th, L-20						
South 18th, L-21		P:240		R:160		C:2,560
Twyckenham, L-22						
Twyckenham, L-23						
Twyckenham, L-24						
Total	3,820	6,480	2,820	14,160	13,200	6,400
West Lafayette						
Cumberland, W-1		R:640		C:2,560		
Harrison Bdg, W-2						
Kalberer, W-3						
Kalberer, W-4	C:250					
Lindberg, W-5						
Lindberg, W-6	P:20		R:80		C:320	
North River Rd, W-7	R:400		C:1,600			
Tapawingo, W-8		R:2,600		C:1,600		
Tapawingo, W-9	C:1,500					
Total	2,170	3,240	1,680	4,160	320	

Table 7 Continued
Staged Implementation for Network Improvements by Jurisdiction
(P = preliminary engineering, R = right-of-way acquisition, C = construction)
Dollars Shown in $1,000

Project	1999	2000	2001	2002	2003	2004
Tippecanoe County						
CR 200S, C-1						
CR 200N, C-2						R:270
CR 430S, C-3			C:1,000			
CR 900E, C-4						
Klondike, C-5						
McCarty Lane, C-6			R:120	C:4,977		
McCarty Lane, C-7			P:350	R:476	C:4,780	
South River Road, C-8				P:360		R:1,080
CR 550E, C-9					P:110	R:440
Total			1,470	5,813	4,890	1,790
Indiana Department of Transportation						
SR 25, I-1					P:5,700	
SR 25, I-2		P:180		R:720		C:2,880
SR 25, I-3		P:210		R:840		C:3,360
SR 25, I-4		P:330		R:1,320		C:5,280
SR 26, I-5				C:7,741		
SR 26, I-6			P:480			R:320
SR 43, I-7			C:6,300			
SR 43, I-8				C:2,000		
I-65, I-9						P:20
US 231, I-10	Under Construction					
US 231, I-11	Under Construction					
US 231, I-12		P:600		R:500	C:20,000	
US 231, I-13				C:1,650		
Prophetstown State Park Road, I-14			P:180		R:720	
Total		1,320	6,960	14,771	26,420	11,860
Private Developers & Town of Dayton						
Park East Drive, P-1			P:180		R:720	
Stable Dr, P-2				P:380		R:1,520
Yost Dr, D-1						P:220
Total			180	380	720	1,740
Totals, All Jurisdictions		**1,320**	**19,900**	**29,714**	**39,101**	**22,770**

Table 7 Continued
Staged Implementation for Network Improvements by Jurisdiction
(p = preliminary engineering, r = right-of-way acquisition, c = construction)
Dollars Shown in $1,000

Project	2005	2006	2007	2008	2009	2010
Tippecanoe County						
CR 200S, C-1						
CR 200N, C-2		R:180		C:2,880		
CR 430S, C-3						
CR 900E, C-4		P:40		R:160		C:460
Klondike, C-5	P:480		R:320		C:5,120	
McCarty Lane, C-6						
McCarty Lane, C-7						
South River Road, C-8		C:8,280				
CR 550E, C-9	C:2,420					
Total	2,900	8,500	320	3,040	5,120	460
Indiana Department of Transportation						
SR 25, I-1		R:4,560			C:80,000	
SR 25, I-2						
SR 25, I-3						
SR 25, I-4						
SR 26, I-5						
SR 26, I-6			C:7,620			
SR 43, I-7						
SR 43, I-8						
I-65, I-9			R:300			C:3,000
US 231, I-10	Under Construction					
US 231, I-11	Under Construction					
US 231, I-12						
US 231, I-13	R:1,320			C:11,550		
Prophetstown State Park Road, I-14	C:880					
Total	2,200	4,560	7,920	11,550	80,000	3,000
Private Developers & Town of Dayton						
Park East Drive, P-1	C:2,880					
Stable Dr, P-2		C:6,080				
Yost Dr, D-1		R:880		C:3,520		
Total	2,880	6,960		3,520		
Totals, All Jurisdictions	**13,970**	**29,740**	**12,740**	**36,430**	**98,640**	**9,860**

It also allows those who live in this area's newly constructed homes better access to the Brady-Creasy ring-road system. This inner loop will be strengthened east of 18th Street. Brady Lane, more heavily traveled for having been extended east and west, will be further improved to four lanes between 18th Street and US 52 (L-1).

Even further in, a series of projects will improve travel along State Road 25S from Old Romney Road to US 231 (I-2), up and down US 231 from the southern SR 25 and US 231 intersection to Teal Road (I-3), and out Teal from South 4th to South 18th (I-4). These all involve widening to four lanes. (We have advocated widening Teal Road since the 1978 plan; and now it is essential.) The east side of that inner loop, Earl Avenue, will be widened to four lanes from South Street to Teal Road (L-4), further relieving pressure on Sagamore Parkway in Lafayette.

The western leg of the outer ring will be the much-needed, long-heralded, realigned US 231 with its new Wabash River bridge (I-11). Beginning about a mile south of McCutcheon High, a new US 231 now veers off slightly west of its current alignment (which becomes 4th Street in Lafayette), and will cross the river (between the Lafayette sewage treatment plant and Eli Lilly), to South River Road. Nearly all of it will be four lanes. South and North River Roads will be beefed up to five lanes from the new bridge on the south to the Harrison Bridge on the north. Ramps are being built connecting North River Road to the Harrison Bridge. South of the River, new US 231 will be a limited access facility. Except for intersections with CRs 500S, 400S, extended 350S, 275S and State Road 25, vehicles will not be permitted to enter the road. That means no tangle of driveways, and a much better traffic flow. Already the portion between CR 500S and SR 25 is open with the remainder to be open this year.

For the first time, motorists from the east and south sides of Lafayette, from Dayton and beyond, and from northbound US 231 and I-65, will not have to drive through downtown Lafayette to get to Purdue University and the Westside (West Lafayette). Traffic congestion downtown, on the downtown bridges and on South 4th Street, will be significantly reduced. On the down side -- until a western bypass around West Lafayette can be added later in this decade -- university-bound traffic will be still funneled through West Lafayette's Levee and Village.

Another of this decade's most ambitious projects will continue the western leg of the new circumferential road system. Newly aligned US 231 will be extended from its intersection with South River Road all the way to Sagamore Parkway (US 52), west of West Lafayette (I-12 & 13). In phase one (I-12), four new lanes will be built from the South River Road intersection, around the east and north sides of Purdue Airport, across Airport Road, then on up to meet State Road 26 east of the Newman Road intersection. To link this with the south side of campus, Intramural Street will be extended southwesterly to the US 231 extension.

In a second phase (I-13), US 231 will be extended from its State Road 26 intersection in a new four-lane limited access corridor to join McCormick Road just north of its intersection with Lindberg. McCormick Road will then be four-laned to carry US 231 from that point north to US 52.

Several projects are designed to relieve congestion north and east of the downtown. To improve access from the north, Duncan Road from US 52 to North 9th Street, and North 9th Street from Duncan Road to Canal Road, will be widened to three lanes and four lanes respectively (L-11). Congestion will also be reduced through improvements to Greenbush Street at 14th and

15th Streets (L-7). Instead of having to stop at one intersection and then another in such a short distance, coordinated traffic signals will allow traffic to flow smoother.

There are also several projects planned on the east side of Lafayette. One involves widening Farabee Drive and a portion of Kossuth Street (L-6). This improvement will offer a better by-pass around the congested intersection of Sagamore Parkway and South Street. Purchasing the additional land is scheduled for this period with construction to follow in 2003. The City has already completed the connection of Shenandoah between Union Street and Rome Drive (L-13). This collector provides access between SR 26 and Union Street without having to use either Sagamore Parkway or Creasy Lane. Improvements to SR 26 east of the Interstate (I-5 & I-6) will also be taking place. Although construction won't occur until 2002 for the first phase, the State will be purchasing necessary land for this five-lane improvement soon. Pushing the four lane improvements past CR 550E won't take place till later this decade.

Improvements to the radial arms of the network will all involve adding traffic lanes. To better handle residential traffic going to and from the developing northeast, Greenbush Streets will be four-laned from Elmwood east to US 52 (L-8) and then on to Creasy Lane (L-9). Both improvements will ease congestion on Sagamore Parkway and State Road 26.

South of Lafayette, housing continues to grow. The preferred way to ease congestion here is to widen the north/south corridors from two to four lanes. Targeted for these improvements are 9th Street, 18th Street and Concord Road. With the staging over four projects, 9th Street will be widened from Teal Road south to CR 510S (L-15, 16, 17, & 18). In a similar fashion, 18th

Street will be widened from Teal Road to CR 430S (L-19, 20, & 21). Finally later this decade, Concord Road will be widened from Teal Road to CR 350S (L-2).

Because it runs from the heart of the city to the retailing centers to the southeast, and interconnects with major arterials along the way and beyond, Main Street has always been a very attractive path to travel. Its attractiveness will only increase with time. Congestion on Main Street will finally be relieved by widening it to four lanes between South Street to just south of Earl Avenue (L-10).

Like Main Street, South Street is another major east/west arterial thus attracting a large volume of traffic. Unlike the one-way pair's downtown or the four lanes east of Sagamore Parkway, between Main Street and Sagamore Parkway, travelers are funneled through only two travel lanes. Congestion is quite evident when a vehicle is making a left hand turn. This Plan Update calls for this section to be reconfigured as four lanes (L-14) thus increasing its capacity.

All aspects of Railroad Relocation will either have been completed or at least begun by 2001. A new riverfront corridor in Lafayette is now carrying both the CSX and NS lines that ran up 5th Street and across town diagonally. Phases 1 through 4 have been completed with Phase 5 nearly complete. The last project connected with this massive project is the extension of Erie Street northward past Greenbush Avenue to Underwood Avenue (L-5).

West of the River, another project will help ease congestion problems. Lindberg Road from Northwestern Avenue out to McCormick Road will be reconstructed as a widened four-lane road (W-5). In addition to widening,

the project includes a bicycle and pedestrian path. This will complement the bicycle and pedestrian trail that was built between the Celery Bog Park and Purdue University. Another companion project includes widening Lindberg Road or CR 200N from Klondike Road to McCormick Road (C-2 & W-6). Similar to the improvements just to the east, it will be improved and widened to four lanes.

To relieve congestion and provide better access on West Lafayette's north-south arterials, Cumberland Avenue will be extended from its current terminus at US 52 southwesterly to intersect McCormick Road (W-1). This two-lane road will connect West Lafayette's north side residential neighborhoods to the west side of campus, the airport, and the rest of the ring-road to Lafayette's south and east sides. Kalberer Road between Salisbury Street and Soldiers Home Road (W-3) will be improved and widened too.

There are also several projects planned to help alleviate congestion caused by the relocation of US 231. When US 231 is completed, large volumes of traffic will be funneled through the State Street and River Road intersection, and then be forced to merge into two lanes north of the Harrison Bridge. For the five point intersection, the City intends to build a by-pass to the southeast (W-9). Vehicles will have the ability to access the southern portions of Campus on an extended Tapawingo Drive without having to travel through the State Street and River Road intersection. Congestion will be reduced at the two lane portion of North River Road by widening it to four lanes (W-7) as far as Happy Hollow Road. Construction is targeted for 2007.

The City of West Lafayette has targeted two additional improvements. In the Levee, as part of the improvements the City has planned, a new road

will be built to carry through traffic. Tapawingo Drive (W-8) would be extended northward and then curve westward when it reaches the outer fringes of the Levee parking lot. Eventually it will intersect with Howard Avenue. Just to the north, the City will fix the Harrison Bridge (W-2) and River Road Interchange. No provisions in the US 231 reconstruction project were included to allow southbound vehicles on River Road to access the bridge. This project would add that ramp.

Just a mile south of SR 26, the county will continue McCarty Lane over the Interstate (C-6). In addition to a new bridge over I-65, new road construction will continue eastward and eventually tie into SR 26 around CR 675E (C-7). Between the State Road and McCarty Lane, Stable Drive (P-2) will be built. This collector will provide a critical connection between the explosive subdivision growth and the surrounding arterial system. The County will also reconstruct CR 550E (C-9) from McCarty Lane to SR 26. It will be constructed as a three-lane improvement with a center shared left turning lane.

In the 90's the County improved Haggerty Lane or CR 200S from SR 38 to Dayton Road. In 2000, the next phase was let for construction. The improvements stretch eastward to CR 900E. Likewise, the County will improve CR 430S from 9th Street to 18th Street (C-3) for the new elementary school. Already started, the County will super two-lane South River Road from CR 700W to relocated US 231 (C-8). Just to the north, Klondike Road (C-5) will be widened to four lanes later this decade. Finally, on the northeastern side of the County, CR 900E (C-4) will be extended northward making a direct connection to SR 25.

The area just north of the Interstate, at SR 43, is experiencing explosive growth in both businesses and housing. In addition, commuter traffic continues to increase. To accommodate this increasing vehicular demand, SR 43 will be widened to five lanes between the Interstate and CR 625N (I-7). It then will be widened to four lanes to CR 725N (I-8). Construction is targeted to begin in 2002.

While not as massive as the SR 43 projects, a new two-lane collector connecting SR 43 to North 9th Street at Swisher Road will be built. This improvement is tied to the new Prophetstown State Park (I-14). The Park and all its related attractions are projected to be complete later this decade.

The Greater Lafayette area will see another major improvement on a scale matching the Relocation of US 231 and Lafayette's Railroad Relocation projects. Since the mid 80's, INDOT has been improving SR 25 and SR 24, the Hoosier Heartland Corridor, between Lafayette and Fort Wayne. The improvements are targeted to boost and foster economic development along the entire corridor. Close to Lafayette, SR 25 is also used extensively as a route for commuter traffic.

Since this is a large multi-billion dollar project, it has been divided into smaller more manageable pieces. The Lafayette to Logansport portion is one of the last sections to be improved. Currently Presnell Associates of Indiana is in the process of selecting a new route location. The Area Plan Commission has examined the routes and choose a new alignment that parallels the Norfolk Southern railroad tracks (I-1).

The new road design will be comparable to the southern portion of relocated US 231. There will be two travel lanes in each direction separated by a

grassed median. Access will also be limited to only a select few locations. The new road will not act as a wall or barrier between the northern and eastern parts of the County. At certain locations, bridges will be built over the new road and railroad tracks providing a safer means of travel and access.

No matter where you travel, Interchanges act like magnets for highway oriented business and development. Those in Tippecanoe County are no different. While the node at SR 26 is the worst, the one just north at SR 43 is becoming more congested too. INDOT has targeted these two interchanges for improvements (I-9) with construction slated later this decade.

Private development of commercial Park East properties in the southwest quadrant of the I-65/State Road 26 interchange, will add an important north-south connector in that part of town. A two-lane road will be built by developers to connect State Road 26 to McCarty Lane (P-1). A portion has already been constructed in conjunction with the opening of Super Wal-Mart.

A similar improvement has been targeted near the town of Dayton. A collector (D-1) has been programmed to be built between and parallel to the Interstate and Dayton Road. This new collector will serve anticipated growth in this area. It will connect CR 200S and SR 38.

THE LAST FIFTEEN YEARS: 2011-2015

The same themes, build ring-roads and improve the radials that serve them, that dominate the past period continue into this one. Not only are these improvements a major focus, but new parallel roads are also proposed. **Figure 2** in **Chapter 2** highlights these improvements. **Table 8** shows the corresponding Staged Implementation Program, by jurisdictions.

Ultimately, construction of US 231 (I-22) would continue northward to a new Interchange at I-65 (I-23). Unlike the urban four lane design south of US 52, this new construction will be similar to US 231 south of SR 25: a four-lane highway with a grassy median divide. It will be a limited access highway, meaning vehicles can only access it from county roads and no driveways will be allowed to connect to it.

Construction will not stop at the Interchange. A new road, similar in design to US 231, will be built between I-65 and SR 43 (I-24) just south of the county line. Our traffic model shows that this link is very attractive and does relieve congestion on SR 43 north of the Interstate as well as other north/south county roads. We have labeled this SR 43B.

Radial improvements are programmed both east and south of Lafayette and west of West Lafayette. In West Lafayette, a key connection will be made between extended Cumberland Avenue to Klondike Road at CR 250N (C-13). This new road will allow persons to travel from CR 400W to Soldiers Home Road or *vice versa*. Widened two lane standards will be followed when it is constructed. Just south, Cherry Lane will be extended to Relocated US 231 (W-10).

Table 8
Staged Implementation for Network Improvements by Jurisdiction
(P = preliminary engineering, R = right-of-way acquisition, C = construction)
Dollars Shown in $1,000, Note: "*" Project Needed but Shown for Illustrative Purposes

Project	2011	2012	2013	2014	2015	2016
Lafayette						
CR350S, L-25						
Beck Lane, L-26		P:180		R:120		C:1,920
Duncan Road, L-27	P:40		R:120		C:640	
Farabee, L-28						
Old US 231, L-29		P:90		R:60		C:510
South 9th, L-30						
Total	40	270	120	180	640	2,430
West Lafayette						
Cherry Lane, W-10		P:100		R:400		C:1,600
Tippecanoe County						
Concord Road, C-10						
CR 500S, C-11						
CR 500S, C-12	P:60		R:40		C:640	
Cumberland, C-13		P:140		R:560		C:2,240
New Castle, C-14						
North 9th, C-15			P:690		R:460	
South 18th, C-16					P:210	
SR 26, C-17	P:150			R:600		
SR 26, C-18			P:150			R:600
Total	210	140	880	1,160	1,310	2,840
Indiana Department of Transportation						
SR 25*, I-15						
SR 26,* I-16						
SR 26, I-17	P:660		R:660			C:8,800
SR 26, I-18					P:1,140	
SR 43*, I-19	P:360			R:240		
SR 43, I-20						P:780
I-65, I-21		P:9,520			R:9,520	
US 231*, I-22	P:1,710			R:4,560		
US 231*, I-23	P:300			R:1,000		
SR 43B*, I-24			P:780			
US 231, I-25						
Total	3,030	9,520	1,440	5,800	10,660	9,580
Private Developers						
Park East Drive, P-3			P:440		R:1,760	
Collector North, P-4				P:80		R:320
Collector South, P-5				P:80		R:320
Total			440	160	1,760	640
Total All, Jurisdictions	**3,280**	**10,030**	**2,760**	**7,700**	**14,370**	**17,090**

Table 8 Continued
Staged Implementation for Network Improvements by Jurisdiction
(P = preliminary engineering, R = right-of-way acquisition, C = construction)
Dollars Shown in $1,000, Note: "*" Project Needed but Shown for Illustrative Purposes

Project	2017	2018	2019	2020	2021	2022
Lafayette						
CR350S, L-25		P:50				C:400
Beck Lane, L-26						
Duncan Road, L-27						
Farabee, L-28	P:250		R:2,250		C:1,750	
Old US 231, L-29						
South 9th, L-30				P:160		R:80
Total	250	50	2,250	160	1,750	480
West Lafayette						
Cherry Lane, W-10						
Tippecanoe County						
Concord Road, C-10				P:477		R:318
CR 500S, C-11		P:640		R:2,360		C:11,640
CR 500S, C-12						
Cumberland, C-13						
New Castle, C-14					P:180	
North 9th, C-15	C:7,360					
South 18th, C-16	R:140		C:2,240			
SR 26: C-17	C:2,400					
SR 26: C-18			C:2,400			
Total	9,900	640	4,640	2,837	180	11,958
Indiana Department of Transportation						
SR 25*, I-15		P:1,020			R:1,360	
SR 26*, I-16				C:6,000		
SR 26, I-17						
SR 26, I-18		R:1,520			C:12,160	
SR 43*, I-19	C:3,840					
SR 43, I-20			R:1,040			C:8,320
I-65, I-21		C:95,200				
US 231*, I-22	C:19,950					
US 231*, I-23	C:8,000					
SR 43B*, I-24			C:9,100			
US 231, I-25	P:2,670			R:3,560		
Total	34,460	97,740	10,140	9,560	13,520	8,320
Private Developers						
Park East Drive, P-3	C:7,040					
Collector North, P-4		C:1,280				
Collector South, P-5		C:1,280				
Total	7,040	2,560				
Total All, Jurisdictions	**51,650**	**100,990**	**17,030**	**12,557**	**15,450**	**20,758**

Table 8 Continued **Staged Implementation for Network Improvements by Jurisdiction** (P = preliminary engineering, R = right-of-way acquisition, C = construction) Dollars Shown in $1,000, Note: "*" Project Needed but Shown for Illustrative Purposes						
Project	2023	2024	2025			
Lafayette						
CR350S, L-25 Beck Lane, L-26 Duncan Road, L-27 Farabee, L-28 Old US 231, L-29 South 9th, L-30		C:1,280				
Total		1,280				
West Lafayette						
Cherry Lane, W-10						
Tippecanoe County						
Concord Road, C-10 CR 500S, C-11 CR 500S, C-12 Cumberland, C-13 New Castle, C-14 North 9th, C-15 South 18th, C-16 SR 26: C-17 SR 26: C-18	R:540	C:5,088	C:4,140			
Total	540	5,088	4,140			
Indiana Department of Transportation						
SR 25*, I-15 SR 26*, I-16 SR 26, I-17 SR 26, I-18 SR 43*, I-19 SR 43, I-20 I-65, I-21 US 231*, I-22 US 231*, I-23 SR 43B*, I-24 US 231, I-25	C:28,480	C:10,880				
Total	28,450	10,880				
Private Developers						
Park East Drive, P-3 Collector North, P-4 Collector South, P-5						
Total						
Total, All Jurisdictions	**29,020**	**17,248**	**4,140**			

Closer to Purdue, the model shows that State Street or SR 26 continues to act as a major gateway into campus. Traffic volume east of relocated US 231 is congested and quite difficult to travel on if it remains two-lanes. Therefore, SR 26 from the intersection of US 231 eastward to Intramural needs to be widened to four travel lanes (C-17 & 18).

In Lafayette, four roads are targeted for expansion from two to four lanes. Next to each other, Beck Lane from Old US 231 to CR 50E (L-26) and Old US 231 between SR 25 and Beck Lane (L-29) are slated for widening. The CR 350S by-pass continues to attract vehicles to the point were it can no longer handle the volume safely between CR 50E and South 9th Street (L-25). This section is slated for widening around 2020. Finally, citizens suggested 9th Street (L-30) between Central Avenue and Teal Road be widened. Unlike the other three projects, 9th Street is already wide enough to accommodate the two extra lanes. Parking will be removed and the road restriped to four lanes.

The County's radial improvements are also located south of Lafayette. Continuing the four lanes improvements from the previous decade, both South 18th Street (C-16) and Concord Road (C-10) need to be widened further south: South 18th Street to Wea School Road and Concord Road to CR 500S.

Congestion continues to plague the SR 26 corridor west of the Interstate. Both through and site generated traffic push the need for additional capacity. By 2025, the section west of the Interstate reaches over 50,000 vehicles a day. A four-lane road simply won't handle this traffic. In this phase of the Plan, SR 26 is to be widened to six lanes (I-17).

A modified interchange will be built at the intersection of South Street and Sagamore Parkway (I-16). Unlike a diamond or cloverleaf interchange, this design is new. Through and right-turning vehicles would continue to use the existing intersection, but all left-turning vehicles would be directed to a secondary elevated intersection.

In the County, two projects are programmed that will provide better access. In the 90s, CR 350S from CR 450E to New Castle Road was widened and built as a super two-lane road. The first improvement continues upon these improvements eastward. New Castle Road will be widened to a super two lane configuration and CR 375S will be realigned and improved to Dayton Road (C-14). Currently CR 500S ends at South 18th Street. East of South 18th Street, there are no good connections to US 52 until CR 800S. First, the gravel road between Concord Road and CR 450E will be reconstructed as a super two-lane. To the west of Concord Road, a new road will be built over to Wea School Road. To the east of CR 450E, a new road will be built to US 52 at Wyndotte Road. This is project C-12.

In the previous decade, a private collector is built (Park East Drive). In this time frame, Park East Drive will be extended southward (P-3) connecting to SR 38 and eventually to US 52. By doing so, it provides an alternative route for north/south travelers between Creasy Lane and CR 500E. This new collector will be built to a two-lane standard configuration. In conjunction with this project, two collectors will connect Park East Drive to Creasy Lane. One between SR 26 and McCarty Lane (P-4) and the other between McCarty and Haggerty Lane (P-5).

Already programmed in INDOT's Long Range Plan, I-65 will be widened to six lanes from SR 38 and SR 43. Our traffic model confirms the need. Our

model also shows that the remaining sections of the Interstate in Tippecanoe County surpass capacity limits before 2025 if improvements are not done. So this Plan update programs widening its entire length (I-21) during the last decade and a half to match INDOTs estimated construction date.

Between 1990 and 1999, the number of working commuters from the surrounding eight Counties increased 45%. While we do not foresee this level continuing, we do anticipate a continual increase. Our traffic model shows that SR 43 north of CR 725N, SR 26 east of the Wildcat Creek, and US 231 south of CR 500S will be over capacity because of these commuter trips. Volumes projected even surpass the capacity of a super two-lane facility. Therefore this Plan calls for all three State Roads (I-18, 20 & 25) as well as SR 25 from CR 375W to relocated US 231 (I-15) to be widened to four lanes.

During this last phase of the Plan, Prophetstown State Park with all its amenities will be open. Like other State Parks, they are very attractive places to visit. To handle the Park as well as local traffic, SR 43 (I-19) between the new Park road and the Interstate, and North 9th Street (C-15) from Swisher Road south to US 52 needs to be widened to four lanes.

Three other improvements are slated during this phase of the Plan. Currently only a small portion of Duncan Road exists north of Sagamore Parkway. Just to the north, the area is prime for commercial development. To make this area more accessible, the City will extend Duncan Road (L-27) and connect it back to North 9th Street. Currently Farabee Drive terminates just south of Kossuth Street. The Plan includes the City extending it southward and connecting it to McCarty Lane (L-28). Finally, because of increasing congestion, CR 500S between old US 231 and relocated US 231 (C-11) needs to be widened and improved to four travel lanes.

MEETING COMMUNITY GOALS

In **Chapter 1** we alluded to the adopted goals and objectives that give direction to the comprehensive planning process in Tippecanoe County. The reader can find these in our 1976 publication, ***Goals and Objectives Formulation Process***. Here we will reprint only the single goal and multiple objectives established for transportation planning, and then evaluate how this Transportation Plan measures up to them.

GOAL I

Develop a coordinated, safe, and interrelated transportation system, integrating thoroughfares, public mass transit, air facilities, rail systems, pedestrian ways and bike ways to adequately serve the entire community, compatible with anticipated land use, economic development, financial resources, and cooperative governmental and citizen action; linking Tippecanoe County and the Greater Lafayette area with the region, state and nation.

OBJECTIVES

- Plan for, design and develop a balanced multi-modal transportation system.
- Develop an area-wide circulation network to accommodate present and anticipated future traffic demands.
- Provide maximum accessibility to the area's major activity centers.
- Upgrade where possible, the circulation capacity of existing thoroughfares.

- Require that improvement projects utilize modern safety and design standards to minimize pedestrian/vehicle conflicts.
- Encourage the development of a highway system that diverts through traffic away from residential neighborhoods while providing accessibility.
- Minimize railroad/vehicle conflicts where possible.
- Reduce negative environmental effects in future transportation systems by recognizing social, environmental, and historical values of the community.

Traffic circulation and highway capacity will be much improved as we continue to build concentric ring-roads with widened radial roads to carry traffic between our residential neighborhoods and those places where we work, shop and go to school. Short connectors and extensions turn discontinuous north-south and east-west streets into valuable ring roads at relatively low cost. Crosstown and through traffic will be kept on our perimeters. Earl Avenue, Creasy Lane and CR 500E will join with Teal Road and State Road 25, Brady Lane and CR 350S to create well placed and useful eastern and southern legs of these rings. The new US 231 alignment from well south of Lafayette to northwest of West Lafayette will form the western leg. To get us from our rings to our centers, Greenbush Avenue, Main Street, South Street/State Road 26, South 9th Street, South 18th Street, Concord Road, North 9th/Duncan Road, Cumberland Avenue, and Lindberg Road will all be widened. It will be easier for us to work downtown, study at the University, shop at the Mall, visit a friend at the hospital.

To protect homes and businesses, new construction -- and its disruptions -- will be kept to a minimum. The network strives to improve mostly by extending, connecting and widening existing roads.

The massive and nearly complete Railroad Relocation project helped integrate rail facilities into the transportation fabric better than ever before. In this case, we are really integrating by separating. By creating a new corridor for trains along the riverfront, we enhance our safety, save our time and keep our air cleaner.

Public transit and air transportation facilities are key parts of the transportation system. Purdue Airport will benefit directly from a newly realigned US 231 and the improved circumferential road network. Drivers heading for the airport will no longer need to filter through downtown Lafayette and the Village. Preliminary plans to redesign the airport with its main terminal along South River Road are fully compatible with the proposed highway network. Clearly, buses and their passengers benefit from eased traffic congestion as much as drivers and passengers in cars and trucks.

Transit related issues are thoroughly addressed in the Transit Development Plan, as required by the US Department of Transportation's Federal Transit Administration. APC assisted CityBus prepare its most recent TDP in 1998. They will soon begin updating it. The TDP addresses CityBus's current capacities, and projects its future needs.

A large thrust of this updated Transportation Plan has been to find ways to help cars, trucks and buses make their way around and through our community. Obviously, there are other ways to get around. Many of us either walk or bike to work or school. Many more of us do these things for fun and for good health. Finding better ways to accommodate these transportation needs is not only a valid transportation planning function, but an essential one. To conserve fuel and keep our air breathable, we must get

people out of their cars, and either on their feet or bicycles, or into van pools or buses. We shouldn't need seven cars to take every eight of us to work each day, but we do. If we could change people's habits, fewer road improvements would be needed, and much money saved. These issues will be addressed as we enter the next phase of the on-going transportation planning process. That is called Management Systems.

MANAGEMENT SYSTEMS, TIP AND THE THOROUGHFARE PLAN

The Management Systems are one of several major tools we can use in the transportation planning process. Another, of course, is this long-range Transportation Plan. The other two are the Transportation Improvement Program (TIP) and the Thoroughfare Plan, both of which also relate to long-range planning.

Whereas a transportation plan takes a long-range, system-wide approach, Management Systems are meant as short-range plans for maximizing system efficiency. Management Systems projects are much smaller than transportation plan projects; they do not include proposals for new or widened roads. The two we use mostly are Highway Safety Management and Traffic Congestion Management.

Management Systems, then, are an adjunct to the Transportation Plan: they complement the long-range effort with smaller, short-range projects to make the system more efficient. Efficiency helps us conserve energy, reduce pollution, and in general, enhance our quality of life.

The next step for us, after adoption of this Transportation Plan, will be to focus more sharply on each of the management systems, specifically designed to complement this long-range plan.

The TIP, or ***Transportation Improvement Program***, is a capital budgeting tool that sets an on-going five-year timetable for funding transportation improvements. These projects come from both the Transportation Plan and Management Systems. The TIP includes all projects which are at least partially funded by the US Department of Transportation.

We prepare a new TIP for adoption each year, corresponding with the upcoming fiscal year. It specifies a timetable (much like our **Tables 7 and 8**), funding sources and the agency responsible for completing each project listed. These projects may be originated by any one of these six implementing agencies: the Cities of Lafayette and West Lafayette, Tippecanoe County, INDOT, CityBus and the Purdue Airport. Each year, after federal and state review of the TIP, we are notified which projects will actually be funded.

As we have noted before, situations change over time. As such, TIP projects are often drawn from those specified in the adopted Transportation Plan, but sometimes in a different time sequence. And in some cases, entirely new projects are included to help with new and unforeseen circumstances that have arisen since the Plan's adoption.

The Thoroughfare Plan is an element of the adopted ***Comprehensive Plan for Tippecanoe County***. It combines the functional classification of roads -- freeways, arterials and collectors -- with specific design standards

for each classification. As such, it derives from both the ***Transportation Plan*** and the ***Unified Subdivision Ordinance of Tippecanoe County***.

Currently roads are classified as either urban or rural. The dividing line is the US Census Bureau's Urbanized Area Boundary. Urban and rural roads are then further classified as being either residential, nonresidential or arterial. There are three subcategories of residential roads (place, local road, collector), two of nonresidential roads (local road, collector), and three of arterials (secondary, primary and divided primary). For each subcategory, standards are established regarding: minimum right-of-way width, minimum pavement, side ditch and shoulder widths, maximum grade, and five more characteristics dealing with the geometry of curves and cul-de-sacs.

The Thoroughfare Plan ensures that local governments and private developers will not only build new roads and widen existing ones to accepted standards, but will also help implement the Transportation Plan in the process.

Our most recent ***Thoroughfare Plan*** was adopted in 1981 and amended seven times since. Adoption of this updated Transportation Plan means further amendment of the ***Thoroughfare Plan*** as well. We will further adjust the Urbanized Area Boundary, and we will designate and redesignate roads to match the functional classifications established for them in the Transportation Plan.

TRADITIONAL FUNDING SOURCES

Road construction costs are huge and can be very difficult for local jurisdictions to bear. And as time goes on, dollars for transportation related improvements become scarcer. We are finding that, each year, the gap widens between what is made available and what is needed to build necessary improvements.

Thus, making transportation related fiscal decisions has become much harder and extremely crucial. Local officials have learned to be realistic in their expectations, and to carefully prioritize their lists of needed improvements. Because we do this, we are prepared to make informed decisions about what to improve when, as funds are found.

Dollars from a variety of local, state and federal sources have traditionally been made available for street and highway related improvements. We list the principal ones here, and more fully describe them in **Appendix 3**

1. Local Cumulative Bridge Fund;
2. Local Cumulative Capital Improvement Fund;
3. Local General Obligation Bonds;
4. Indiana Local Road and Street Account;
5. Motor Vehicle Highway Account:
6. Bridge Replacement Fund;
7. STP Urban;
8. STP Rural;
9. STP Enhancement;
10. STP Hazard Elimination Fund;
11. Interstate Reconstruction;

12. Minimum Guarantee Fund;
13. Railroad Relocation Fund;
14. Rail Highway Protection and Crossing Fund; and
15. National Highway System Funds.

All projects requesting Federal Aid Funds, as well as those strictly funded with local dollars, that are to be built within the Study Area Boundary, have to be programmed through the ***Transportation Improvement Program*** (TIP), prioritized, and then adopted by the Metropolitan Planning Organization. In our case, the Area Plan Commission is the MPO. Also, not all of these sources of funds are available for building segments of the road network; some can only be used to improve street safety at highway crossings.

ALTERNATIVE FUNDING SOURCES

Today, traditional sources may not provide enough funding to carry out all the projects proposed in this Transportation Plan. We list four alternative sources here, and once again, refer the reader to **Appendix 3** for full descriptions:

16. Annual License Excise Surtax;
17. County Wheel Tax;
18. Tax Increment Financing; and
19. Thoroughfare Project Fund.

The Excise Surtax and County Wheel Tax can provide extra funds for road construction and maintenance. These must be enacted at the same time.

We have not done this in Tippecanoe County. Tax Increment Financing (TIF) provides extra dollars for public infrastructure improvements in a specified area. It is based on an anticipated increase in property taxes to be collected from future development within that area. Local government created eight TIF Districts. Three of them cover redevelopment areas at the core of our two cities; five establish economic development areas at the urban fringe. These are the districts and their jurisdictions:

1. Creasy Lane/Brady Lane Economic Development Area (Lafayette);
2. Levee/Village Redevelopment Area (West Lafayette);
3. Kalberer Road/Cumberland Avenue/Blackbird Pond Economic Development Area (West Lafayette);
4. Creasy Lane/Treece Meadows Economic Development Area (Lafayette);
5. Central Lafayette Redevelopment Area (Lafayette);
6. Jefferson Square (Lafayette);
7. Redevelopment McCarty Lane (Lafayette); and
8. North 9th Street (Lafayette).

A FEW WORDS OF CAUTION

The reader will remember that this plan represents an optimal situation: This is as good as we can expect to get if funds become available to build all these projects by 2025. Realistically, this may not happen. Some projects may never get funded, others may not be realized until after 2025. And because community growth is fluid and can only be projected and not foreseen, new needs may arise that require entirely unforeseen projects to be proposed, included in a TIP, funded and built.

We also offer the reader this caution: Federal funding sources listed here and expanded on in **Appendix 3**, are based on the Surface Transportation Act for the 21st Century. Congress will amend that Act during 2003. Thus the type and availability of federal funding sources may change a little or a lot. And of course, changing economic conditions and shifting priorities always make the nature and extent of local and state funding uncertain as well.

Appendix 1

MAJOR COMPONENTS OF THE 1978 TRANSPORTATION PLAN: ACCOMPLISHMENTS THROUGH 2001

Railroad Relocation -- riverfront corridor:

- Wabash Avenue Underpass completed in 1987
- SR 26 Replacement Bridge completed in 1992
- Ninth Street Underpass completed 1993
- CSX Relocation completed in late 1995
    - Harrison Bridge ramps
    - CSX Track Work
    - Depot Plaza
    - New Arterial
- Pedestrian Overcrossing
    - Reconstruction of Fifth St.
- Landscape Planting & Trail Completion in Spring 1996
- Norfolk Southern Relocation -- contract let in Fall 1996
    - Earth embankment - complete
    - US 52 & SR 25 rail bridge - complete
    - Wabash Heritage Trail between SR 26 and Harrison bridges – complete
    - Norfolk Southern rail relocation - complete
    - Last train through corridor: April 6, 2001

Lafayette Business District -- South & Columbia one-way pairs:

- SR 26 Bridge completed
- Fourth & Fifth one-way pairs revised to Third and Fourth

Main Street -- four lane improvement between South and Earl:

- Intersection improvements at Kossuth and at Earl
- Signal timing change at Earl

South Street -- four lane improvement between Main and Sagamore:

- Intersection improvement at Sagamore; traffic signals at 26th and 30th,
- Railroad crossing reconstruction both east and west of US 52
- New synchronization system on SR 26 between Earl Avenue and 36th Street, and retiming of traffic signals
- Left turn arrows for Earl Avenue
- No progress on lane improvements

Erie-Elmwood-Greenbush Corridor -- four lane improvements to Elmwood and Greenbush and Erie extension along abandoned NORFOLK SOUTHERN corridor:

- No progress on Greenbush Avenue
- Constructing Erie Street north of 18th Street beginning in 2001

Union Street -- widening between Sagamore and Creasy:

- Widening of Union between 18th and Sagamore complete
- Widening of Union between Sagamore and Creasy Lane complete
- New traffic signal installed at 36th Street

Earl Avenue -- four lane improvement between South and State:

- Completed in 1988 between South and Main

Farabee Drive -- extension of Farabee south to SR 38:

- ***Thoroughfare Plan*** amendment - Removed section of Farabee from McCarty to SR 38 in 1995
- Commercial development south of Kossuth on Farabee has established 700' of the roadway

Creasy Lane -- extension to US 52 and reconstruction between SR 26 and SR 38:

- TIF District established to finance extension;
- SR 26 to McCarty Lane completed in 1992
- Improvements from Kensington to SR 26 (Phase 2) completed late 1994
- Improvements from Greenbush to Kensington completed Spring 1996
- New signal installed at intersection with Union Street, left turn signals at the intersection of SR 26 and Creasy
- Creasy Extension from SR 38 to US 52 completed in 1995
- Improvements between McCarty and SR 38 completed in 1997

Teal Road -- widening between 4th and 18th and extension to SR 38:

- Intersection improvements at 9th, 18th, and Sagamore
- 1995 amendment to the Thoroughfare Plan removed extension to SR 38
- Widening between 4th and 9th and 9th to 18th - No progress

Brady-Beck Corridor -- Brady Lane extensions at both ends; new roadway connecting Brady and Beck along NORFOLK SOUTHERN rail; widening:

- ***Thoroughfare Plan*** Amendment; Twyckenham Blvd. built
- Brady extended to meet Creasy at US 52, complete late 1995
- Twyckenham Boulevard between Old US 231 and CR 50E to begin construction in 2001
- City and County working on engineering plans for the 9th to 18th Street connection

Road 350S -- extensions at both ends; improvements between Road 50E and Concord:

- New construction between US 231 and CR 50 E completed 1994
- Reconstruction between CR 50 E and US 52 completed 1995
- Construction between US 52 and SR 38 completed 1996
- Construction between old US 231 and relocated US 231 completed 1998
- Construction of phase VI completed in 1997

SR 43 (now US 231 S) -- four lane improvement from Road 500S to downtown:

- Traffic signal with left turning lanes at Beck

Bypass -- from Road 350S around WL and rejoin SR 43 at Road 500N: US 231 Road Relocation and Bridge Project southern terminus extended to .85 miles south of CR 500 S

- Construction from CR 500S to SR 25 complete and open to traffic 1997

- Bridge portion complete but not open to traffic
- River Road portion under construction: South Street widening complete, portions of North River Road complete, ramps on north side of Harrison Bridge complete and open, new rail bridge complete.
- The portion between River Road and SR 26 has advanced to preliminary engineering
- North of SR 26 to US 52, a consultant has been hired to update the EIS and locate an alignment

Chauncey-Vine Corridor -- one-way pairs between Fowler and State; extension of Chauncey to S. River:

- No progress; Chauncey extension discarded alternate in US 231 EIS

South River Road -- widening between the "new bypass" bridge and extension of Chauncey:

- See “Bypass”

State Street -- four lane improvement between University and Gates:

- No progress

Yeager Road -- four lane improvement between Northwestern and Sagamore:

- Intersection improvement at Northwestern

McCormick-Cumberland Connector -- four lane improvement to McCormick and extension of Cumberland:

- A portion of Cumberland has been extended

McCormick Road -- reconstruction between Cherry and US 52:

- See “Bypass”
- A proposal to extend US 231 Bypass northwest of campus and onto McCormick gaining local support.
- A consultant has been hired by INDOT

Road 350N and Soldiers Home Road -- alignment improvements:

- A portion of 350N is complete, the remaining portion ready for construction; no progress on Soldiers Home

Appendix 2

SOCIOECONOMIC DATA FOR BASE YEAR 1999

	Population			Housing		Vehicles	Employment		
Zone	Total	G. Quarter	Household	Units	Household	Available	Retail	Non-retail	Total
001	26	21	5	6	5	9	28	195	223
002	123	12	111	117	111	46	89	904	993
003	4	0	4	4	4	6	155	1,007	1,162
004	206	0	206	80	76	297	272	1,159	1,431
005	124	0	124	66	63	43	14	273	287
006	904	70	834	437	414	414	244	1,930	2,174
007	437	20	417	259	246	284	76	461	537
008	1,455	0	1,455	648	614	868	55	540	595
009	993	0	993	488	463	575	2	36	38
010	121	0	121	128	121	109	44	599	643
011	1,096	28	1,068	545	517	659	23	280	303
012	1,192	0	1,192	559	530	769	75	371	446
013	974	0	974	502	476	701	11	118	129
014	1,020	176	844	458	434	607	45	251	296
015	399	0	399	177	168	262	0	501	501
016	182	56	126	61	58	122	12	2,768	2,780
017	384	0	384	233	221	281	459	907	1,366
018	26	0	26	27	26	50	627	1,147	1,774
019	556	79	477	234	222	212	55	1,968	2,023
020	73	0	73	38	36	72	704	1,193	1,897
021	589	0	589	267	253	500	16	20	36
022	1,054	0	1,054	424	402	791	134	173	307
023	0	0	0	0	0	0	144	91	235
024	2	0	2	1	1	2	0	115	115
025	192	80	112	90	85	43	45	978	1,023
026	789	0	789	360	341	452	11	61	72
027	998	36	962	475	450	706	27	374	401
028	1,162	0	1,162	550	521	679	184	134	318
029	249	0	249	71	67	68	13	295	308
030	673	0	673	322	305	528	36	36	72
031	1,200	30	1,170	588	557	864	54	62	116
032	9	0	9	4	4	6	13	1,008	1,021
033	132	0	132	47	45	87	69	242	311
034	110	0	110	37	35	123	9	499	508
035	342	0	342	141	134	291	18	5	23
036	2,139	0	2,139	833	790	1,549	15	53	68
037	2,048	0	2,048	736	698	1,158	8	139	147
038	1,363	0	1,363	568	538	1,082	4	76	80
039	0	0	0	0	0	0	0	1,718	1,718
040	63	0	63	47	45	51	842	403	1,245
041	1,343	0	1,343	527	500	1,082	20	84	104
042	632	0	632	264	250	493	17	64	81
043	1,905	0	1,905	643	610	1,335	6	98	104
044	1,491	0	1,491	525	498	1,085	8	239	247
045	368	0	368	135	128	349	0	51	51
046	0	0	0	0	0	0	594	232	826
047	1,717	0	1,717	646	612	1,448	2	72	74
048	893	35	858	322	305	758	1	85	86
049	390	0	390	172	163	240	25	538	563

	Population			Housing		Vehicles	Employment		
Zone	Total	G. Quarter	Household	Units	Households	Available	Retail	Non-retail	Total
050	721	0	721	348	330	403	16	73	89
051	589	0	589	258	245	378	16	84	100
052	775	0	775	418	396	544	15	64	79
053	863	11	852	420	398	657	23	90	113
054	627	0	627	318	301	453	9	112	121
055	934	0	934	476	451	619	15	79	94
056	0	0	0	0	0	0	372	298	670
057	589	0	589	241	228	343	0	10	10
058	968	0	968	436	413	846	54	80	134
059	1,057	0	1,057	485	460	893	0	183	183
060	1,351	0	1,351	620	588	1,021	6	68	74
061	1,189	0	1,189	531	503	787	103	120	223
062	0	0	0	0	0	0	64	3,699	3,763
063	139	0	139	126	119	131	170	381	551
064	1,077	135	942	506	480	819	10	378	388
065	467	0	467	177	168	319	22	85	107
066	152	95	57	26	25	47	0	351	351
067	8	0	8	4	4	4	419	85	504
068	2	0	2	1	1	2	15	319	334
069	0	0	0	0	0	0	131	1,743	1,874
070	122	0	122	54	51	87	513	424	937
071	1,791	0	1,791	735	697	1,386	185	99	284
072	1,984	0	1,984	938	889	1,352	25	69	94
073	5	0	5	2	2	3	324	1,020	1,344
074	7	0	7	3	3	5	179	1,976	2,155
075	0	0	0	0	0	0	1,653	115	1,768
076	1,153	0	1,153	484	459	895	7	27	34
077	2,527	0	2,527	947	898	1,598	65	71	136
078	0	0	0	0	0	0	0	318	318
079	1,780	0	1,780	1,116	1,058	1,622	15	15	30
080	2	0	2	1	1	2	0	257	257
081	18	0	18	8	8	13	169	361	530
082	836	0	836	336	319	592	13	131	144
083	1,266	0	1,266	628	595	706	67	26	93
084	1,535	0	1,535	839	795	968	40	122	162
085	235	0	235	75	71	171	0	20	20
086	2	0	2	1	1	2	0	1,534	1,534
087	425	0	425	192	182	337	15	58	73
088	96	0	96	30	28	150	0	261	261
089	1,007	0	1,007	364	345	769	332	272	604
090	2,447	0	2,447	1,010	957	1,348	3	287	290
091	357	0	357	172	163	538	9	23	32
092	288	0	288	109	103	218	0	18	18
093	1,128	15	1,113	412	391	977	0	57	57
094	2,062	0	2,062	1,029	975	1,524	63	95	158
095	1,642	0	1,642	581	551	1,070	0	118	118
096	2,861	0	2,861	933	884	2,103	56	243	299
097	49	24	25	16	15	26	60	1,012	1,072
098	18	0	18	11	10	41	0	718	718
099	774	0	774	352	334	555	58	302	360
100	0	0	0	0	0	0	0	3,635	3,635

	Population			Housing		Vehicles	Employment		
Zone	Total	G. Quarter	Household	Units	Households	Available	Retail	Non-retail	Total
101	0	0	0	0	0	0	0	221	221
102	29	0	29	21	20	35	0	84	84
103	1,102	0	1,102	399	378	686	19	65	84
104	391	0	391	164	155	330	2	29	31
105	1,080	0	1,080	392	372	750	41	181	222
106	2,431	0	2,431	805	763	1,549	3	244	247
107	1,921	0	1,921	625	593	1,161	6	152	158
108	444	0	444	135	128	424	0	22	22
109	149	0	149	50	47	107	24	35	59
110	370	0	370	147	139	339	309	199	508
111	246	0	246	90	85	223	15	110	125
112	1,920	582	1,338	488	463	849	211	93	304
113	2,641	34	2,607	1,213	1,150	2,017	361	10	371
114	2,447	1,508	939	427	405	1,394	58	1,661	1,719
115	0	0	0	0	0	0	0	3,130	3,130
116	3,459	650	2,809	1,169	1,108	1,861	0	204	204
117	1,374	103	1,271	802	760	994	0	10	10
118	2,289	146	2,143	884	838	1,413	241	365	606
119	127	64	63	55	52	37	38	4,342	4,380
120	1,778	1,362	416	168	159	589	40	419	459
121	4,658	4,658	0	0	0	1,372	239	890	1,129
122	0	0	0	0	0	0	0	3,505	3,505
123	4,046	3,808	238	93	88	1,374	0	552	552
124	1,238	0	1,238	470	446	827	8	129	137
125	768	58	710	337	319	555	45	168	213
126	0	0	0	0	0	0	0	448	448
127	2,469	1,607	862	408	387	1,076	0	206	206
128	1,029	0	1,029	491	465	684	10	46	56
129	653	0	653	249	236	436	5	7	12
130	647	0	647	307	291	494	88	113	201
131	774	0	774	372	353	639	20	269	289
132	951	0	951	613	581	736	24	91	115
133	273	0	273	252	239	276	605	225	830
134	755	154	601	305	289	490	0	527	527
135	899	179	720	376	356	468	13	687	700
136	4,340	0	4,340	1,514	1,435	2,517	21	62	83
137	14	0	14	8	8	20	10	142	152
138	22	0	22	15	14	25	19	391	410
139	257	0	257	95	90	166	0	12	12
140	223	0	223	93	88	185	10	8	18
141	78	0	78	27	26	17	7	1	8
142	1,465	0	1,465	523	496	932	20	43	63
143	247	0	247	109	103	184	0	10	10
144	678	0	678	318	301	514	0	14	14
145	308	0	308	136	129	220	1	38	39
146	42	0	42	19	18	38	0	0	0
147	143	0	143	63	60	102	0	0	0
148	467	0	467	296	281	365	638	495	1,133
149	765	0	765	469	445	651	32	1,095	1,127
150	0	0	0	0	0	0	235	2,675	2,910
151	1,785	0	1,785	772	732	1,297	9	208	217

	Population			Housing		Vehicles	Employment		
Zone	Total	G. Quarter	Household	Units	Households	Available	Retail	Non-retail	Total
152	517	0	517	193	183	317	0	12	12
153	2,676	0	2,676	1,017	964	1,828	57	182	239
154	1,415	0	1,415	567	538	1,090	26	178	204
155	242	0	242	111	105	232	1	276	277
156	622	478	144	74	70	124	0	169	169
157	180	0	180	93	88	147	15	219	234
158	139	0	139	57	54	107	0	7	7
159	423	0	423	293	278	129	0	157	157
160	1,262	0	1,262	505	479	750	3	49	52
161	254	0	254	81	77	148	3	17	20
162	1,479	0	1,479	653	619	1,143	15	1,105	1,120
163	773	0	773	370	351	540	13	43	56
164	522	64	458	148	140	287	1	93	94
165	94	0	94	51	48	83	8	101	109
166	2	0	2	1	1	2	29	220	249
167	12	0	12	5	5	14	0	1	1
168	0	0	0	0	0	0	0	1	1
169	0	0	0	0	0	0	244	76	320
170	24	0	24	8	8	26	0	5	5
171	998	0	998	457	433	943	0	37	37
172	140	0	140	44	42	107	0	74	74
173	36	0	36	21	20	37	15	0	15
174	356	0	356	139	132	317	6	30	36
175	0	0	0	0	0	0	115	226	341
176	30	0	30	28	27	31	186	15	201
177	0	0	0	0	0	0	52	55	107
178	846	64	782	343	325	548	238	1,019	1,257
179	273	0	273	204	193	222	674	87	761
180	1,179	0	1,179	694	658	1,036	146	135	281
181	213	0	213	159	151	173	244	438	682
182	0	0	0	0	0	0	468	876	1,344
183	0	0	0	0	0	0	167	0	167
184	0	0	0	0	0	0	242	71	313
185	611	56	555	209	198	400	2	389	391
186	1,486	0	1,486	590	559	1,165	28	131	159
187	263	0	263	99	94	238	0	57	57
188	1,044	0	1,044	412	391	887	4	71	75
189	481	0	481	184	174	365	10	198	208
190	751	0	751	318	301	680	15	131	146
191	2,479	0	2,479	960	910	1,862	48	336	384
192	376	0	376	150	142	288	3	37	40
193	437	0	437	158	150	301	6	93	99
194	378	0	378	144	137	349	0	96	96
195	1,215	14	1,201	415	393	879	18	38	56
196	510	0	510	224	212	358	0	35	35
197	473	0	473	185	175	442	0	46	46
198	71	0	71	26	25	57	0	21	21
199	112	0	112	34	32	74	0	17	17
SUM	**149,653**	**16,512**	**133,141**	**57,819**	**54,812**	**99,624**	**17,136**	**78,842**	**95,978**

SOCIOECONOMIC DATA FOR BASE YEAR 2010

	Population			Housing		Vehicles	Employment		
Zone	Total	G. Quarter	Household	Units	Households	Available	Retail	Non-retail	Total
001	27	21	6	6	6	10	28	495	523
002	123	12	111	117	111	47	89	904	993
003	4	0	4	4	4	6	155	1,007	1,162
004	203	0	203	80	76	293	272	1,659	1,931
005	232	0	232	126	119	80	64	473	537
006	889	70	819	437	414	408	244	1,930	2,174
007	454	20	434	275	261	297	76	461	537
008	1,432	0	1,432	648	614	855	55	540	595
009	975	0	975	488	463	567	2	36	38
010	121	0	121	128	121	108	44	599	643
011	1,077	28	1,049	545	517	650	23	280	303
012	1,172	0	1,172	559	530	758	75	371	446
013	956	0	956	502	476	691	11	118	129
014	1,003	176	827	458	434	598	45	251	296
015	393	0	393	177	168	258	0	501	501
016	179	56	123	61	58	121	12	2,768	2,780
017	376	0	376	233	221	277	459	907	1,366
018	117	0	117	123	117	225	627	1,222	1,849
019	547	79	468	234	222	209	55	1,968	2,023
020	71	0	71	38	36	71	704	1,193	1,897
021	612	0	612	282	267	521	16	20	36
022	1,038	0	1,038	424	402	780	134	198	332
023	0	0	0	0	0	0	144	91	235
024	2	0	2	1	1	2	0	115	115
025	424	80	344	282	267	134	45	978	1,023
026	827	0	827	384	364	475	11	61	72
027	981	36	945	475	450	696	27	374	401
028	1,142	0	1,142	550	521	670	184	134	318
029	246	0	246	71	67	67	13	295	308
030	662	0	662	322	305	521	36	36	72
031	1,179	30	1,149	588	557	852	54	62	116
032	9	0	9	4	4	6	13	608	621
033	131	0	131	47	45	85	219	292	511
034	109	0	109	37	35	121	9	499	508
035	336	0	336	141	134	287	18	5	23
036	2,107	0	2,107	833	790	1,527	15	53	68
037	2,294	0	2,294	836	793	1,297	8	139	147
038	1,342	0	1,342	568	538	1,066	4	76	80
039	0	0	0	0	0	0	0	1,718	1,718
040	208	0	208	159	151	171	842	428	1,270
041	1,353	0	1,353	539	511	1,091	20	84	104
042	646	0	646	274	260	505	17	64	81
043	2,149	0	2,149	735	697	1,505	6	98	104
044	1,569	0	1,569	560	531	1,141	8	239	247
045	370	0	370	138	131	352	0	51	51
046	0	0	0	0	0	0	694	432	1,126
047	2,074	0	2,074	792	751	1,750	2	72	74
048	939	35	904	344	326	798	1	85	86
049	384	0	384	172	163	237	25	538	563

	Population			Housing		Vehicles	Employment		
Zone	Total	G. Quarter	Household	Units	Households	Available	Retail	Non-retail	Total
050	708	0	708	348	330	397	16	73	89
051	579	0	579	258	245	372	16	84	100
052	760	0	760	418	396	536	15	64	79
053	848	11	837	420	398	647	23	90	113
054	616	0	616	318	301	447	9	112	121
055	917	0	917	476	451	611	15	79	94
056	0	0	0	0	0	0	372	298	670
057	580	0	580	241	228	338	0	10	10
058	952	0	952	436	413	834	54	80	134
059	1,039	0	1,039	485	460	881	0	183	183
060	1,328	0	1,328	620	588	1,007	6	68	74
061	1,329	0	1,329	603	572	881	103	120	223
062	0	0	0	0	0	0	64	3,699	3,763
063	134	0	134	126	119	129	170	431	601
064	1,161	135	1,026	562	533	897	10	378	388
065	461	0	461	177	168	314	22	85	107
066	151	95	56	26	25	47	0	351	351
067	7	0	7	4	4	4	419	85	504
068	2	0	2	1	1	2	15	319	334
069	0	0	0	0	0	0	131	1,743	1,874
070	120	0	120	54	51	86	576	424	1,000
071	1,764	0	1,764	735	697	1,366	185	99	284
072	1,950	0	1,950	938	889	1,333	25	69	94
073	4	0	4	2	2	3	324	1,220	1,544
074	7	0	7	3	3	5	179	2,576	2,755
075	0	0	0	0	0	0	1,653	115	1,768
076	1,135	0	1,135	484	459	883	7	27	34
077	2,490	0	2,490	947	898	1,575	65	71	136
078	0	0	0	0	0	0	0	318	318
079	1,742	0	1,742	1,116	1,058	1,600	15	15	30
080	2	0	2	1	1	2	0	557	557
081	18	0	18	8	8	13	169	461	630
082	823	0	823	336	319	583	13	131	144
083	1,244	0	1,244	628	595	696	117	26	143
084	2,098	0	2,098	1,169	1,108	1,330	90	322	412
085	232	0	232	75	71	168	0	20	20
086	2	0	2	1	1	2	0	1,534	1,534
087	418	0	418	192	182	332	15	58	73
088	95	0	95	30	28	148	0	261	261
089	1,239	0	1,239	454	430	945	632	372	1,004
090	2,987	0	2,987	1,252	1,187	1,648	3	437	440
091	1,292	0	1,292	634	601	1,957	9	23	32
092	351	0	351	135	128	266	50	218	268
093	1,674	15	1,659	623	591	1,457	200	357	557
094	2,059	0	2,059	1,046	992	1,527	138	170	308
095	2,427	0	2,427	871	826	1,582	0	118	118
096	4,089	0	4,089	1,351	1,281	3,002	131	268	399
097	49	24	25	16	15	25	60	1,212	1,272
098	17	0	17	11	10	40	0	718	718
099	930	0	930	430	408	668	158	602	760
100	0	0	0	0	0	0	0	3,635	3,635

	Population			Housing		Vehicles	Employment		
Zone	Total	G. Quarter	Household	Units	Households	Available	Retail	Non-retail	Total
101	0	0	0	0	0	0	150	721	871
102	28	0	28	21	20	35	0	84	84
103	1,446	0	1,446	531	503	901	49	105	154
104	427	0	427	182	173	361	2	29	31
105	1,184	0	1,184	436	413	822	41	181	222
106	3,186	0	3,186	1,069	1,013	2,028	203	344	547
107	2,481	0	2,481	818	775	1,498	6	152	158
108	458	0	458	141	134	437	150	322	472
109	159	0	159	54	51	114	24	35	59
110	593	0	593	239	227	543	909	499	1,408
111	875	0	875	325	308	794	365	210	575
112	1,975	582	1,393	516	489	885	311	93	404
113	2,808	34	2,774	1,313	1,245	2,153	561	10	571
114	2,425	1,508	917	427	405	1,374	58	1,661	1,719
115	0	0	0	0	0	0	0	0	0
116	3,414	650	2,764	1,169	1,108	1,835	0	0	0
117	1,347	103	1,244	802	760	980	0	10	10
118	2,255	146	2,109	884	838	1,393	241	365	606
119	125	64	61	55	52	36	88	4,342	4,430
120	1,767	1,362	405	168	159	581	40	419	459
121	4,658	4,658	0	0	0	1,352	239	890	1,129
122	0	0	0	0	0	0	0	3,505	3,505
123	4,057	3,808	249	102	97	1,373	0	552	552
124	1,220	0	1,220	470	446	815	8	129	137
125	756	58	698	337	319	547	45	168	213
126	0	0	0	0	0	0	0	448	448
127	2,448	1,607	841	408	387	1,061	0	206	206
128	1,012	0	1,012	491	465	674	10	46	56
129	644	0	644	249	236	430	5	7	12
130	636	0	636	307	291	487	88	113	201
131	761	0	761	372	353	630	20	269	289
132	930	0	930	613	581	726	24	91	115
133	264	0	264	252	239	272	705	225	930
134	742	154	588	305	289	483	0	527	527
135	885	179	706	376	356	461	13	687	700
136	4,529	0	4,529	1,601	1,518	2,625	21	62	83
137	13	0	13	8	8	20	10	1,030	1,040
138	22	0	22	15	14	25	19	2,837	2,856
139	253	0	253	95	90	163	0	12	12
140	220	0	220	93	88	182	10	8	18
141	77	0	77	27	26	16	7	1	8
142	2,141	0	2,141	775	735	1,362	20	43	63
143	590	0	590	265	251	442	0	210	210
144	667	0	667	318	301	507	0	14	14
145	303	0	303	136	129	217	101	138	239
146	41	0	41	19	18	37	0	0	0
147	943	0	943	423	401	674	0	0	0
148	754	0	754	488	463	594	738	595	1,333
149	778	0	778	487	462	666	82	1,445	1,527
150	0	0	0	0	0	0	235	2,825	3,060
151	3,211	0	3,211	1,411	1,338	2,336	109	208	317

	Population			Housing		Vehicles	Employment		
Zone	Total	G. Quarter	Household	Units	Households	Available	Retail	Non-retail	Total
152	536	0	536	203	192	329	0	12	12
153	3,449	0	3,449	1,330	1,261	2,357	157	432	589
154	1,489	0	1,489	606	574	1,149	26	378	404
155	621	0	621	290	275	598	1	276	277
156	755	478	277	145	137	240	0	169	169
157	177	0	177	93	88	145	40	469	509
158	283	0	283	118	112	219	100	107	207
159	583	0	583	413	392	179	0	157	157
160	1,908	0	1,908	775	735	1,135	3	49	52
161	260	0	260	84	80	152	3	17	20
162	1,744	0	1,744	783	742	1,351	15	1,105	1,120
163	1,311	0	1,311	638	605	918	813	143	956
164	541	64	477	156	148	298	1	93	94
165	92	0	92	51	48	81	158	201	359
166	2	0	2	1	1	2	179	370	549
167	12	0	12	5	5	14	0	1	1
168	0	0	0	0	0	0	0	1	1
169	0	0	0	0	0	0	244	76	320
170	23	0	23	8	8	26	0	305	305
171	2,661	0	2,661	1,239	1,175	2,521	50	137	187
172	138	0	138	44	42	105	0	74	74
173	35	0	35	21	20	36	15	0	15
174	436	0	436	173	164	389	6	30	36
175	0	0	0	0	0	0	215	276	491
176	29	0	29	28	27	30	186	15	201
177	0	0	0	0	0	0	52	105	157
178	833	64	769	343	325	540	838	1,069	1,907
179	266	0	266	204	193	219	874	187	1,061
180	1,230	0	1,230	739	701	1,087	146	135	281
181	208	0	208	159	151	171	844	638	1,482
182	0	0	0	0	0	0	668	876	1,544
183	0	0	0	0	0	0	267	100	367
184	0	0	0	0	0	0	242	71	313
185	624	56	568	217	206	410	2	389	391
186	1,659	0	1,659	669	634	1,303	28	131	159
187	285	0	285	109	103	258	0	57	57
188	1,081	0	1,081	433	410	919	4	71	75
189	495	0	495	192	182	375	10	198	208
190	782	0	782	336	319	709	15	131	146
191	2,570	0	2,570	1,010	957	1,932	48	336	384
192	664	0	664	269	255	509	3	37	40
193	466	0	466	171	162	321	6	93	99
194	453	0	453	175	166	419	0	96	96
195	1,356	14	1,342	470	446	982	18	38	56
196	573	0	573	256	243	403	0	35	35
197	533	0	533	212	201	499	0	46	46
198	84	0	84	31	29	67	0	21	21
199	124	0	124	38	36	81	0	17	17
SUM	**168,197**	**16,512**	**151,685**	**66,688**	**63,220**	**114,197**	**23,854**	**86,957**	**110,811**

SOCIOECONOMIC DATA FOR BASE YEAR 2025

	Population			Housing		Vehicles	Employment		
Zone	Total	G. Quarter	Household	Units	Households	Available	Retail	Non-retail	Total
001	27	21	6	6	6	9	28	495	523
002	123	12	111	117	111	46	89	904	993
003	4	0	4	4	4	6	155	1,007	1,162
004	201	0	201	80	76	285	272	1,659	1,931
005	230	0	230	126	119	78	64	473	537
006	879	70	809	437	414	397	244	1,930	2,174
007	448	20	428	275	261	289	76	461	537
008	1,416	0	1,416	648	614	832	55	540	595
009	964	0	964	488	463	552	2	36	38
010	121	0	121	128	121	105	44	599	643
011	1,065	28	1,037	545	517	632	23	280	303
012	1,158	0	1,158	559	530	738	75	371	446
013	945	0	945	502	476	672	11	118	129
014	992	176	816	458	434	582	45	251	296
015	388	0	388	177	168	251	0	501	501
016	177	56	121	61	58	117	12	2,768	2,780
017	372	0	372	233	221	269	459	907	1,366
018	117	0	117	123	117	219	627	1,222	1,849
019	541	79	462	234	222	203	55	1,968	2,023
020	70	0	70	38	36	69	704	1,193	1,897
021	605	0	605	282	267	506	16	20	36
022	1,027	0	1,027	424	402	759	134	198	332
023	0	0	0	0	0	0	144	91	235
024	2	0	2	1	1	2	0	115	115
025	420	80	340	282	267	130	45	1,080	1,125
026	818	0	818	384	364	462	11	61	72
027	970	36	934	475	450	677	27	374	401
028	1,129	0	1,129	550	521	651	184	134	318
029	243	0	243	71	67	65	13	394	407
030	654	0	654	322	305	506	36	36	72
031	1,166	30	1,136	588	557	829	54	62	116
032	9	0	9	4	4	6	13	779	792
033	129	0	129	47	45	83	219	292	511
034	108	0	108	37	35	118	9	499	508
035	333	0	333	141	134	279	18	5	23
036	2,084	0	2,084	833	790	1,485	15	53	68
037	2,268	0	2,268	836	793	1,261	8	139	147
038	1,327	0	1,327	568	538	1,037	4	76	80
039	0	0	0	0	0	0	0	1,718	1,718
040	205	0	205	159	151	166	842	428	1,270
041	1,874	0	1,874	755	716	1,486	20	84	104
042	666	0	666	286	271	512	17	64	81
043	2,702	0	2,702	935	886	1,861	6	98	104
044	1,676	0	1,676	605	574	1,199	8	239	247
045	377	0	377	142	135	352	0	51	51
046	0	0	0	0	0	0	694	432	1,126
047	2,828	0	2,828	1,092	1,035	2,347	2	72	74
048	1,004	35	969	373	354	842	1	85	86
049	379	0	379	172	163	230	25	538	563

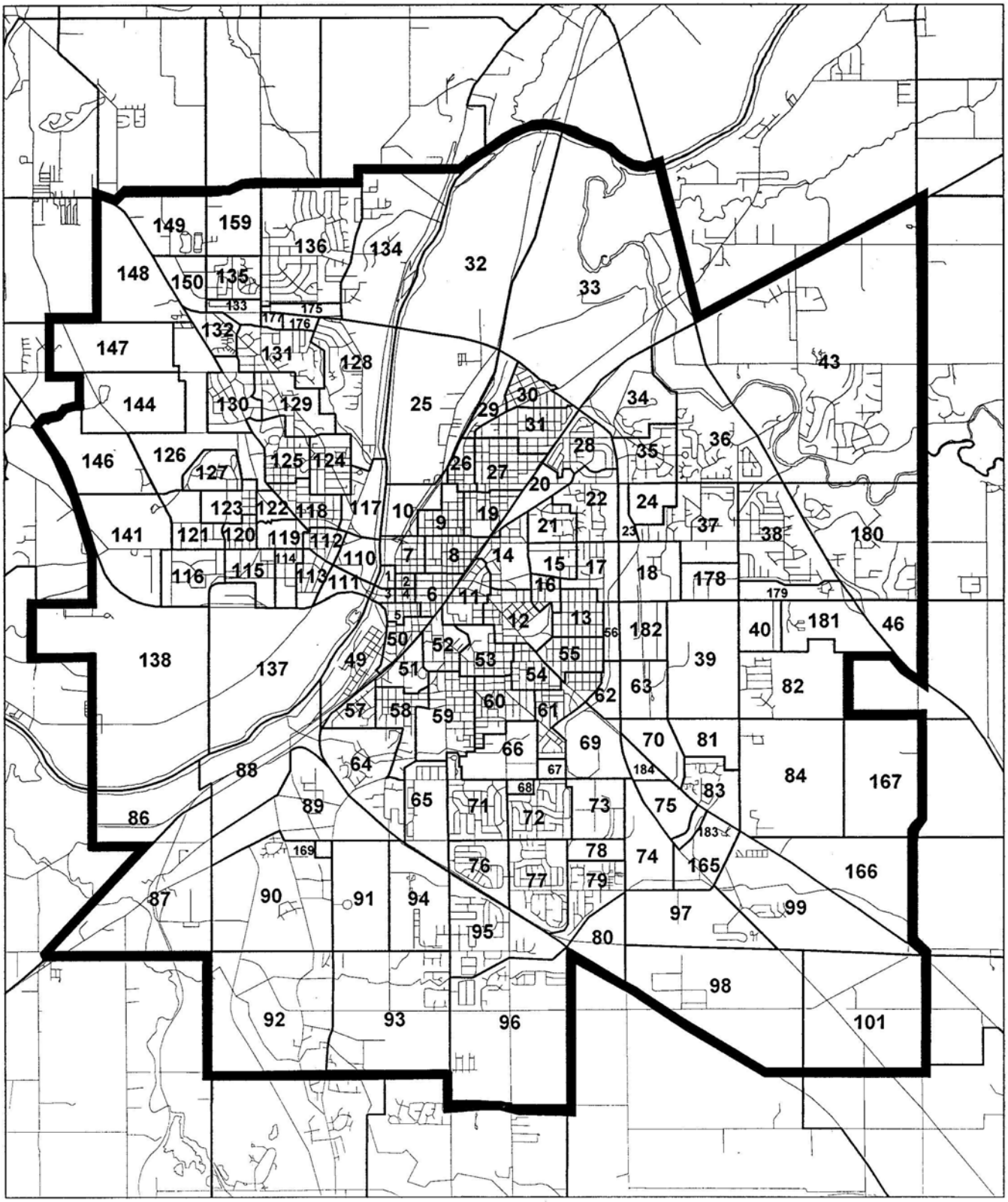
	Population			Housing		Vehicles	Employment		
Zone	Total	G. Quarter	Household	Units	Households	Available	Retail	Non-retail	Total
050	700	0	700	348	330	386	16	73	89
051	573	0	573	258	245	362	16	84	100
052	752	0	752	418	396	521	15	64	79
053	838	11	827	420	398	629	23	90	113
054	609	0	609	318	301	434	9	112	121
055	907	0	907	476	451	594	15	79	94
056	0	0	0	0	0	0	372	298	670
057	574	0	574	241	228	328	0	10	10
058	942	0	942	436	413	811	54	80	134
059	1,027	0	1,027	485	460	856	0	183	183
060	1,313	0	1,313	620	588	979	6	68	74
061	1,314	0	1,314	603	572	857	103	129	232
062	0	0	0	0	0	0	64	3,699	3,763
063	133	0	133	126	119	125	170	431	601
064	1,148	135	1,013	562	533	873	10	378	388
065	455	0	455	177	168	306	22	85	107
066	149	95	54	26	25	45	0	351	351
067	7	0	7	4	4	4	419	85	504
068	2	0	2	1	1	2	15	319	334
069	0	0	0	0	0	0	131	1,743	1,874
070	119	0	119	54	51	84	576	424	1,000
071	1,744	0	1,744	735	697	1,328	185	99	284
072	1,928	0	1,928	938	889	1,297	25	69	94
073	4	0	4	2	2	3	324	1,220	1,544
074	7	0	7	3	3	5	179	2,576	2,755
075	0	0	0	0	0	0	1,653	115	1,768
076	1,122	0	1,122	484	459	858	7	27	34
077	2,462	0	2,462	947	898	1,532	65	71	136
078	0	0	0	0	0	0	0	318	318
079	1,723	0	1,723	1,116	1,058	1,555	15	15	30
080	2	0	2	1	1	2	0	557	557
081	18	0	18	8	8	12	169	461	630
082	814	0	814	336	319	567	1,414	551	1,965
083	1,230	0	1,230	628	595	677	117	26	143
084	2,425	0	2,425	1,367	1,296	1,513	90	955	1,045
085	302	0	302	99	94	216	0	20	20
086	2	0	2	1	1	2	0	1,534	1,534
087	413	0	413	192	182	323	15	58	73
088	94	0	94	30	28	144	0	261	261
089	1,224	0	1,224	454	430	919	632	372	1,004
090	3,383	0	3,383	1,434	1,359	1,835	3	437	440
091	1,278	0	1,278	634	601	1,903	993	74	1,067
092	347	0	347	135	128	258	50	218	268
093	3,509	15	3,494	1,327	1,258	3,018	200	357	557
094	2,036	0	2,036	1,046	992	1,485	138	170	308
095	2,400	0	2,400	871	826	1,539	0	118	118
096	5,090	0	5,090	1,701	1,613	3,675	131	268	399
097	48	24	24	16	15	25	60	1,212	1,272
098	17	0	17	11	10	39	0	1,666	1,666
099	920	0	920	430	408	650	158	602	760
100	0	0	0	0	0	0	0	3,635	3,635

	Population			Housing		Vehicles		Population	
Zone	Total	G. Quarter	Household	Units	Households	Available	Retail	Non-retail	Total
101	0	0	0	0	0	0	150	721	871
102	28	0	28	21	20	34	0	1,410	1,410
103	1,429	0	1,429	531	503	876	49	105	154
104	474	0	474	204	193	394	2	29	31
105	1,856	0	1,856	691	655	1,267	41	181	222
106	4,270	0	4,270	1,449	1,374	2,673	203	344	547
107	4,127	0	4,127	1,376	1,304	2,451	6	152	158
108	1,120	0	1,120	349	331	1,051	1,035	3,028	4,063
109	172	0	172	59	56	121	24	3,515	3,539
110	586	0	586	239	227	528	909	499	1,408
111	1,397	0	1,397	525	498	1,247	365	210	575
112	1,952	582	1,370	516	489	860	311	93	404
113	2,776	34	2,742	1,313	1,245	2,094	561	10	571
114	2,398	1,508	890	427	405	1,336	58	1,661	1,719
115	0	0	0	0	0	0	0	0	0
116	3,375	650	2,725	1,169	1,108	1,784	0	0	0
117	1,331	103	1,228	802	760	953	0	10	10
118	2,230	146	2,084	884	838	1,355	241	365	606
119	123	64	59	55	52	35	88	4,342	4,430
120	1,746	1,362	384	168	159	565	40	419	459
121	4,658	4,658	0	0	0	1,315	239	890	1,129
122	0	0	0	0	0	0	0	3,505	3,505
123	4,011	3,808	203	102	97	1,336	0	552	552
124	1,206	0	1,206	470	446	793	8	129	137
125	747	58	689	337	319	532	45	168	213
126	0	0	0	0	0	0	0	448	448
127	2,420	1,607	813	408	387	1,031	0	206	206
128	1,000	0	1,000	491	465	656	10	46	56
129	637	0	637	249	236	418	5	7	12
130	629	0	629	307	291	474	88	113	201
131	752	0	752	372	353	613	20	269	289
132	920	0	920	613	581	706	24	91	115
133	261	0	261	252	239	265	705	225	930
134	728	154	574	305	289	470	0	527	527
135	875	179	696	376	356	448	13	687	700
136	4,477	0	4,477	1,601	1,518	2,552	21	62	83
137	13	0	13	8	8	19	10	1,030	1,040
138	21	0	21	15	14	24	19	2,837	2,856
139	250	0	250	95	90	159	0	12	12
140	217	0	217	93	88	177	10	8	18
141	76	0	76	27	26	16	7	1	8
142	3,620	0	3,620	1,325	1,256	2,264	20	43	63
143	932	0	932	423	401	686	0	210	210
144	659	0	659	318	301	493	0	14	14
145	300	0	300	136	129	211	101	138	239
146	41	0	41	19	18	36	0	0	0
147	1,263	0	1,263	573	543	888	0	0	0
148	745	0	745	488	463	577	738	595	1,333
149	769	0	769	487	462	648	82	1,445	1,527
150	0	0	0	0	0	0	235	2,825	3,060
151	4,025	0	4,025	1,789	1,696	2,881	109	208	317

	Population			Housing		Vehicles	Population		
Zone	Total	G. Quarter	Household	Units	Households	Available	Retail	Non-retail	Total
152	562	0	562	215	204	338	0	12	12
153	4,051	0	4,051	1,580	1,498	2,723	157	432	589
154	1,509	0	1,509	621	589	1,145	26	378	404
155	1,041	0	1,041	492	466	986	1	276	277
156	1,441	478	963	510	483	819	0	169	169
157	175	0	175	93	88	141	40	469	509
158	1,228	0	1,228	518	491	935	100	107	207
159	716	0	716	513	486	216	0	157	157
160	2,930	0	2,930	1,204	1,141	1,715	3	49	52
161	269	0	269	88	83	155	3	17	20
162	2,694	0	2,694	1,223	1,159	2,053	15	1,105	1,120
163	1,296	0	1,296	638	605	893	813	143	956
164	565	64	501	166	157	308	1	93	94
165	91	0	91	51	48	79	158	201	359
166	2	0	2	1	1	2	425	841	1,266
167	11	0	11	5	5	13	0	1,564	1,564
168	0	0	0	0	0	0	0	1,060	1,060
169	0	0	0	0	0	0	244	76	320
170	23	0	23	8	8	25	0	2,261	2,261
171	10,064	0	10,064	4,739	4,493	9,378	50	137	187
172	1,221	0	1,221	394	374	915	0	74	74
173	34	0	34	21	20	35	801	507	1,308
174	1,200	0	1,200	481	456	1,051	6	207	213
175	0	0	0	0	0	0	215	276	491
176	29	0	29	28	27	29	186	15	201
177	0	0	0	0	0	0	52	105	157
178	824	64	760	343	325	525	838	1,069	1,907
179	263	0	263	204	193	213	874	187	1,061
180	1,216	0	1,216	739	701	1,057	146	135	281
181	205	0	205	159	151	166	844	638	1,482
182	0	0	0	0	0	0	668	876	1,544
183	0	0	0	0	0	0	267	100	367
184	0	0	0	0	0	0	242	71	313
185	643	56	587	227	215	417	2	389	391
186	1,775	0	1,775	724	686	1,371	28	131	159
187	315	0	315	122	116	281	0	57	57
188	1,135	0	1,135	460	436	949	4	71	75
189	515	0	515	202	191	384	10	198	208
190	828	0	828	360	341	738	15	131	146
191	2,704	0	2,704	1,075	1,019	1,999	48	336	384
192	1,193	0	1,193	489	464	899	3	37	40
193	507	0	507	188	178	343	6	93	99
194	547	0	547	214	203	498	0	96	96
195	1,436	14	1,422	504	478	1,024	18	38	56
196	624	0	624	282	267	432	0	35	35
197	612	0	612	246	233	563	0	46	46
198	102	0	102	38	36	80	0	21	21
199	138	0	138	43	41	90	0	17	17
SUM	**195,720**	**16,512**	**179,208**	**78,787**	**74,690**	**134,070**	**28,156**	**102,635**	**130,791**

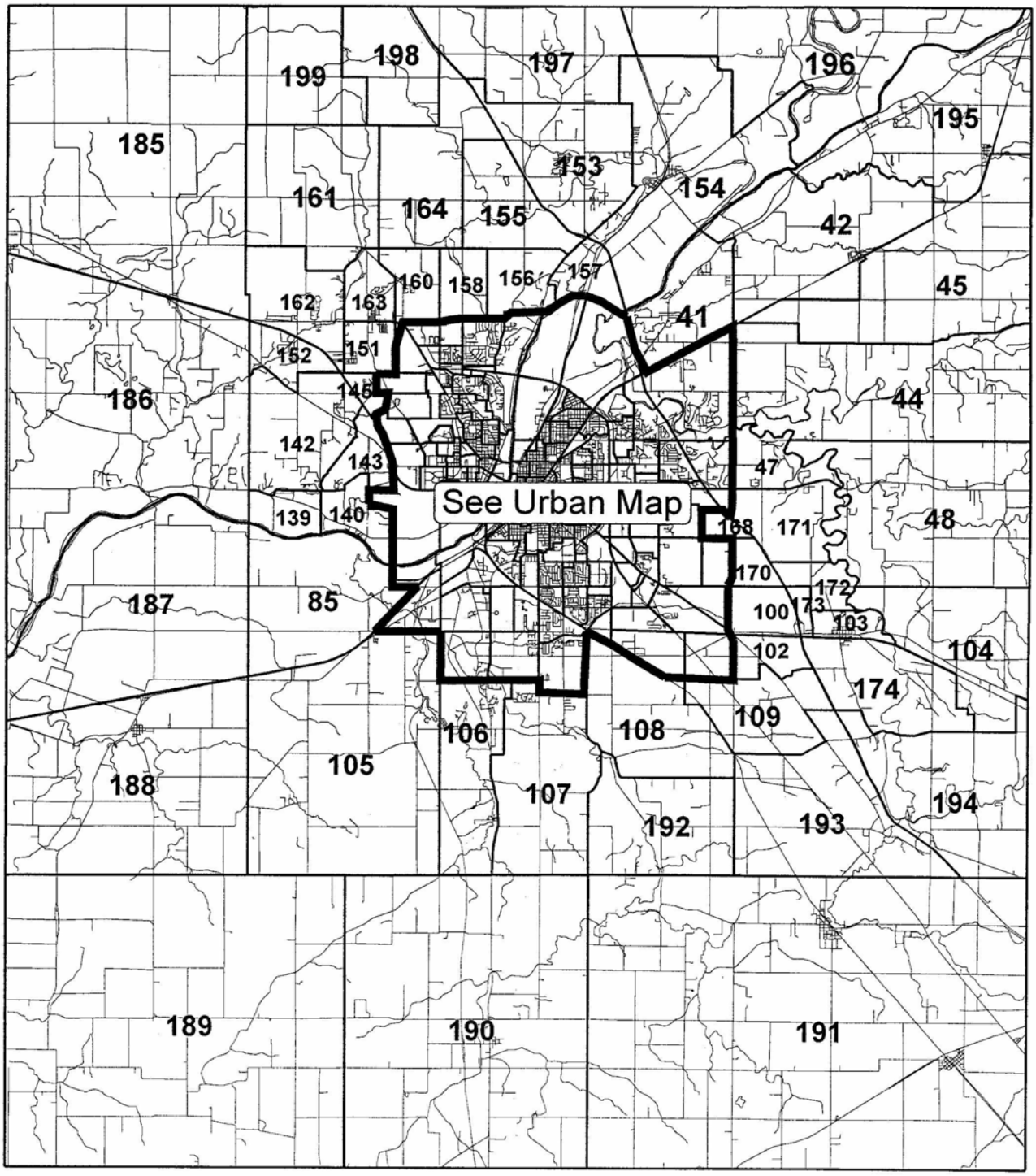
Urban Traffic Zone Map

Greater Lafayette Area Transportation and Development Study



Rural Traffic Zone Map

Greater Lafayette Area Transportation and Development Study



Appendix 3

FUNDING SOURCES FOR TRANSPORTATION RELATED PROJECTS

LOCAL SOURCES:
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1. Local Cumulative Bridge Fund

   This fund is an important supplementary source of revenue for the construction and repair of county highway bridges, bridge approaches, and grade separations. Indiana statutes authorize county commissioners to establish a county-wide tax levy on assessed valuation of all taxable personal and real property to accumulate revenue for the fund.

   It may be levied annually or established for a period of five years and renewed for like periods of time. The tax rate may not exceed 30 cents per $100 of assessed valuation.

2. Local Cumulative Capital Improvement Fund

   Indiana statutes authorize cities and towns to establish a cumulative capital improvement fund to provide monies for several municipal purposes, including land acquisition for right-of-way, construction or improvement of streets and thoroughfares, and retirement of general obligation bonds.

   Monies for this fund are derived from levied taxes, not to exceed $1 per $100 of assessed valuation of all locally taxable real and personal property. The tax may be renewed annually or for any period not to exceed ten years.

3. Local General Obligation Bonds

   The cities of Lafayette and West Lafayette have the power to debt finance nonproprietary functional expenditures, such as roads and schools. This power is exercised by the sale of general obligation bonds. The general obligation bond indebtedness either city can incur in any given year is limited to a fixed percentage of the net assessed property value. The limited percentage is fixed by state law and may be changed by the state general assembly. General obligation bonds are backed by the full faith and credit of the issuing agency and are repaid through taxes levied on real property.

STATE SOURCES:
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4. Indiana Local Road and Street Account

The Local Road and Street (LR&S) fund was established by the 1969 Indiana General Assembly. The funds are derived from gasoline tax, drivers license and vehicle registration fees. Monies of this account are derived from 45% of the Special Highway User Account. The other 55% is deposited into the Primary Highway Special Account to be used by the Department of Transportation. The funds are dedicated for engineering, construction or reconstruction of roads, streets or bridges, as well as for payment of bonds and interest to finance any project of this type.

Total monies collected for this fund are allocated monthly to counties and cities. Monies are allocated in reserve to local agencies based upon formulas accounting for registered passenger cars, population, and roadway mileage. Local units submit their applications for these reserve funds to the Auditor of the state on an individual project basis.

5. Indiana Motor Vehicle Highway Account

These funds collected by the State from vehicle registration fees, licenses, operator licenses, automotive title fees, weight taxes and excise taxes on motor vehicle and trailer, are partially returned to local governments by allocation formula. Before distribution, 50 percent of the State Police Budget and the department of traffic safety budget are deducted from the total amount.

The funds returned must be used for construction, reconstruction, maintenance, maintenance or repair of street and allies in the municipalities and county highway or bridges in the counties.

FEDERAL SOURCES:
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6. Bridge Replacement Fund

Federal funding for Bridge Replacement is available for bridge projects involving the replacement or rehabilitation of bridges on any state highway, county road, or city or town street. To qualify, a bridge must have a sufficiency rating of less than 50% for replacement, and a sufficiency rating of less than 80% for rehabilitation.

Funds from the federal government are apportioned to the state of Indiana on the basis of square footage of deficient bridges and unit price of Indiana bridges compared to the total deficient bridges in the United States. Indiana portions are distributed 50% to the state and 50% to the counties. The federal matching share is 80% of the project costs.

7. Federal Aid STP Urban

Urban funds provide federal aid sources to any city or town with a population over 5,000, for use on all urban system routes including city streets and state highways within an urbanized area. A street or state highway must be classified as an urban arterial or collector to qualify for urban funds. This includes all city streets with the exception of local streets and all state highways not classified as Interstate or Primary. Funds can be used for projects on streets, bridges, railroad crossings, street signs, pavement striping, lighting, channelization and signalization. The federal share is 80%.

These funds are apportioned to a state's cities and towns by one of two methods: attributable and non-attributable. Attributable funds are apportioned to cities and/or urbanized areas of over 200,000 population classed as Group I cities. Non-attributable urban funds are apportioned to cities and towns of 5,000 to 200,000 population. Federal policy states that cities and/or urbanized areas of 50,000 or greater population must also have their own TIP (Transportation Improvement Program). Cities of 50,000 to 200,000 population are classed as Group II cities and cities and towns with 5,000 to 50,000 are classed as Group III cities. The state apportions non-attributable urban funds based on the total population of each city and/or urbanized area to the total population of Groups II and III cities combined.

8. Federal Aid STP Rural

Federal Aid STP rural or Group IV funds are available for use on all rural secondary systems of states and counties. To qualify, a state highway or county road must be classified as a major collector, which is defined as a highway that:

- provides service to counts seats but not as an arterial route;
- provides service to larger towns and other traffic generators;
- links traffic generators with nearby cities; and
- serves important intra-county travel corridors.

9. STP Enhancement Funds

These funds are dedicated to projects that are non-traditional in nature. Congress has identified 12 categories that may receive these funds. They include: facilities for pedestrians bicycles; acquisition of scenic easements and scenic or historic sites; scenic or historic programs; landscaping and other scenic beautification; historic preservation, rehabilitation of historic transportation buildings; preservation of abandoned railway corridors; control and removal of outdoor advertising; archaeological planning and research; environmental mitigation due to highway run off; provision of safety and educational activities for pedestrians and bicycles; and establishment of transportation museums. These projects competed against others statewide and are selected though a group review process.

10. Hazard Elimination Fund

Funds from this program are to be used on the Federal-Aid Highway System and off-system highways (the majority of these highways are under the jurisdiction of Local Public Agencies). These funds are apportioned to the Indiana Department of Transportation and Local Public Agencies on a 80/20 basis. Funds are used for correction and improvement of deficient characteristics at narrow bridges, on sharp curves, or at intersections with poor visibility or turning movements. The federal matching share is 90%.

11. Interstate Reconstruction

Funds from this program are used to reconstruct interstate highway systems as designated by the Federal Highway Administration. The federal matching share is 90%.

12. Minimum Guarantee Fund

The 1997 Federal Highway Act establishes that a state shall not receive less than 93% of the estimated tax payment from that state paid into the Highway Trust Fund. Funds received by the state of Indiana under this provision will be equitably distributed between the Department of Transportation and Local Public Agencies. The distribution for FY 2001 is calculated by subtracting half the value of demonstration projects of the top of the state's total Minimum Guarantee apportionment and then the balance is distributed 75% to the Department of Transportation and 25% to Local Public Agencies.

These funds may be used in any funding category such as Federal Aid STP Group I, II, III, IV, Bridge Replacement, Hazard Elimination, or Rail Highway Protection and Crossing Funds, but only for the construction of a project.

13. Railroad Relocation Fund

The Federal Government funds 95% for projects involving the relocation of railroads within large cities. Funds are allocated for specific projects only.

14. Rail Highway Protection and Crossing Fund

The monies allocated from these funds are apportioned to Indiana for the installation and upgrading of rail highway protection warning devices and upgrading rail highway crossing surfaces. One-third is distributed to the Indiana Department of Transportation, and two-thirds to Local Public Agencies.

These funds are used for construction or reconstruction of minimal roadway approaches to railroad crossings, construction and reconstruction of railroad crossing surfaces, and the installation of railroad crossing signals or gates. However, the funds may not be used for railroad advance warning signs or pavement markings that are required by Indiana state law. The federal share is 90%.

15. National Highway System Funds

These funds are dedicated for maintenance, repair, reconstruction and construction of the National Highway System. Roads that are part of the National Highway System have been design by Congress. The design standards for these roads are held to a high standard than typical road designs.

ALTERNATIVE SOURCES:

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16. Annual License Excise Surtax

The County Council of any county may adopt an ordinance to impose an Annual License Excise Surtax on passenger vehicles, motorcycles, and trucks up to 11,000 pounds. The County Council must concurrently adopt a County Wheel Tax. The license surtax must be at the same rate for each vehicle, and cannot exceed 10% or be less than 2%, but must be more than $7.50.

The surtax is collected by each branch office of the Bureau of Motor Vehicles at the time registration fees are paid. The branch office

remits the surtax to the County Treasurer on or before the 10th day of each month.

Before the 20th day of each month, the County Auditor allocates the money amongst the county, and its cities and towns, using the same formulas as the Local Road and Street Account. Before the 25th of each month, the County Treasurer distributes to the county, cities and towns the money deposited in the County Surtax Fund during that month. Surtax revenues received are to be used for the construction, reconstruction, repair, or maintenance of streets and roads in the jurisdiction.

17. County Wheel Tax

A County Council may adopt an ordinance to impose an Annual Wheel Tax on buses, recreational vehicles, semitrailers, tractors, trailers, and trucks if they are not: a) used by the state or other political subdivision; b) subject to the Annual License Surtax; and c) operated by a religious or nonprofit youth organization for use to transport persons to services for the overall benefits of its members. The vehicles to be taxed must be registered in the county. In order to adopt the Wheel Tax, the County Council must concurrently adopt the Annual License Excise Surtax. The money generated from the County Wheel Tax may be used only for the construction, reconstruction, repair, or maintenance of roads and streets under its jurisdiction.

18. Tax Increment Financing

A Tax Increment Financing (TIF) district is established by declaration of an allocation area by a county, city, or town. The use of TIF requires the designation of such an area and the determination of a base assessment date. These must be approved by the local plan commission and the legislative body of the city, town, or county. The property tax rate for the allocation area remains the same until the base assessment date expires. However, any net increase in assessed valuation caused by construction and thus a higher property tax rate is segregated, and the incremental property tax collected in the allocation area may be used to finance the construction of infrastructure that will be affected by the development of the allocation area.

19. Thoroughfare Project Fund (I.C. 36-9-6.1)

The fiscal body of a unit that has adopted a thoroughfare plan under I.C. 36-7-4 may levy a tax of fifteen cents ($0.15) on each one hundred dollars ($100) of taxable property in the unit. The tax may be levied

annually, in the same way that other property taxes are levied. The taxes collected are deposited in a separate and continuing fund called the thoroughfare fund. Payments or transfers from this fund can only be made for work related to the Thoroughfare Plan.

Appendix 4

CPC Questions & Comments Summary

September 26 meeting

General Questions and Remarks:

- How were Purdue students calculated in the population projections?
- What does LOS mean?
- What do the numbers on the handout represent?
- Does the no build scenario include the US 231 relocation project?
- With the employment projections, were they spread over the whole economic spectrum or were more jobs added in the middle to lower class.
- Did we expect Purdue University to grow?
- Are the Klondike proposed super two lane improvement an urban or rural design.
- Why are more trucks using 9th Street south of South Street?
- What is INDOT doing at I-65 and SR 25?
- Housing density should determine where roads need to go.
- How will all of these projects be financed?
- Are there any plans for another major shopping mall.
- When will construction start on North 9th?
- When will construction start on Lindberg Road?
- A member thanked INDOT for installing the traffic signal at CR 600N at SR 43.

Improvement Questions:

- Address the problem of left turning vehicles on South Street from 18th to US 52.
- Widen US 52 to six lanes.
- Foresee problems with SR 25 south of the I-65 when the Hoosier Heartland is built.
- Improvements to Main Street at the Wabash National and Alcoa driveways.
- Will there be any improvements on Morehouse Road due to the close intersections at US 52 and Kalberer.
- What will happen to the McCormick intersection at Lindberg Road when US 231 is built?
- Are there any projects proposed for SR 26 west of US 231?
- Klondike road is narrow at US 52 and drivers are making a right turn lane where there is none.
- Will US 231 north of SR 26 be constructed as a super two lane or four lanes?
- Will a road be built for the Park over to SR 43?
- If US 231 is extend north, it would ruin the northern and western portion of West Lafayette.

December 5 meeting

General Questions and Remarks:

- How is capacity calculated?
- If the roads do not have any color shown, are they A or B level?
- The presentation urban map needs to include the Town of Dayton.
- No north-south road corridor was established or planned when SIA was built.
- What were the color differences on the improvement map.
- Are all of the improvements in the 2010 scenario included in the 2025 test?
- How close has actual development that has occurred compare to what older plans projected?
- Is the term collector a technical term?
- When will US 231 be opened?

Improvement Questions:

- Ninth Street north of Teal Road should widened.
- If 9th street is widened south of the Railroad tracks, it will be extremely difficult to cross 9th especially for grade school children.
- Yost Drive needs to be included.
- Are there any improvements proposed for the Airport?
- Are there any plans for another Airport besides the one at Purdue?

January 23 meeting

General Questions and Remarks:

- Will high-speed rail impact the airport?
- Are the most recent projects proposed added to the previous list?
- Did Yost Drive have any impact?
- What will happen to the homes along SR 26 if it were to become relocated US 231?
- Would relocated US 231 be limited access?

Improvement Questions:

- If CR 800S does become a state road, then there needs to be an interchange at I-65.
- All of the suggestions are good.

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CRISTINE M. KLIKA, Commissioner

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RECEIVED
APR 26 2001
THE AREA PLAN COMM
OF TIPPECANOE CO.

April 20, 2001

James D. Hawley, Executive Director
Tippecanoe County Area Plan Commission
20 North Third St.
Lafayette, IN 47901

Dear Mr. Hawley,

We have reviewed the April 1, 2001 draft of your 2025 Transportation Plan Update for the proposed state jurisdictional improvements .We note that you have made several of the plan revisions requested in our March 8, 2001 letter which compared the proposed transportation improvements to the INDOT 2000 to 2025 Transportation Plan. Let me summarize the revisions in the following categories:

A. Projects which are in agreement with INDOT Plan

----Planning Period 1999 to 2010

SR 25 Hoosier Heartland (I-1)	INDOT Project #466
SR 26 I-65 to CR550 East (I-5)	INDOT Project #89
SR 26 CR550 East to Wildcat Creek (I-6)	INDOT Project #475 (ATL will narrow to super 2 before bridge)
SR 43 I-65 to CR650 North (I-7)	INDOT Project #106
SR 43 CR650 North to SR225 (I-8)	INDOT Project #93
I-65 Interchange Improvements (I-9)	at SR43 (INDOT Project #94) and SR 26 (INDOT Project #95)
US231, Phase 1 (I-11)	Project Underway
US231, Phase 2 South River Rd to SR 26 (I-12)	INDOT Project #100
US231, Phase 3 SR 26 to US 52 (I-13)	INDOT Project #465

----Planning Period 2011 to 2025

SR 26 US52 to I-65 (I-17)	INDOT Project #141
US231 South of CR 500 South to County Line (I-25)	INDOT Project #480

B. Projects which may be in agreement with INDOT Plan but need more detail

----Planning Period 2011 to 2025

SR 26 Wildcat Creek to County Line (I-18)	INDOT Project #477 (Super 2 lane not 4 lane)
SR43 CR 725 North to County Line (I-20)	INDOT Project #107(2 Lane Rehabilitation not 4 lane)
I-65 South County Line to SR 43 (note not County Line north) (I-21)	INDOT Project #477

C. Projects not in agreement with INDOT Plan but are under study and should be shown in the illustrative list

----Planning Period 2011 to 2025

SR 26 Modified Interchange at US52 (I-16)	Study in Progress, not in INDOT Plan at this time
US 231 US52 to I-65 (I-22)	Study in Progress, not in INDOT Plan at this time
US 231 Interchange at I-65 (I-23)	Study in Progress, not in INDOT Plan at this time

D. Projects not in agreement with INDOT Plan and not under study and may be shown in the illustrative list as unfunded needs

----Planning Period 1999 to 2010

SR 25 Old Romney to US231 (I-2)	Roadway Segment Proposed for Relinquishment (not in INDOT Plan)
SR 25 SR25/231 to Teal Rd. (I-3)	Roadway Segment Proposed for Relinquishment (not in INDOT Plan)
SR 25 4th St. to 18th St. (I-4)	Roadway Segment Proposed for Relinquishment (not in INDOT Plan)

----Planning Period 2011 to 2025

SR 25 CR 375 to new US231 (I-15)	Not in INDOT Plan
US231A (?) I-65 to SR43 (I-24)	Not in INDOT Plan
SR 43 State Park Rd to I-65 (I-19)	Not in INDOT Plan

In accordance with FHWA transportation planning regulations, we wish the Area Plan Commission's Plan to show only the agreed upon state jurisdictional projects which are contained in INDOT's 2000 to 2025 Transportation Plan, if the MPO's fiscal constraint analysis is showing the projects to be paid for and developed by INDOT.

Under the provisions of TEA-21, you may show the proposed state jurisdictional projects that INDOT has not agreed to as an illustrative list of transportation improvements and document the network benefits. **We would prefer the illustrative projects to be shown on a separate map in the MPO's Transportation Plan document to eliminate any confusion over which category a proposed improvement is in.** Illustrative projects have no official standing for transportation project development or air quality purposes until such time as a financing source has been identified and they have been formally amended into the plan by action of the MPO. The benefits of transportation improvements on the illustrative list will be considered by INDOT as the planning process moves forward and decisions are made on whether to accept the proposed improvements into the INDOT transportation plan.

We appreciate the opportunity to work with the Tippecanoe County Area Plan Commission on the development of the 2025 Transportation Plan Update. For additional information on the INDOT 2025 Transportation Plan, please contact Steve Smith of the Long-Range Transportation Planning Section. For other information on the cooperative INDOT/MPO Transportation Plan development process and the programming of specific transportation improvements, please contact Randy Walter of the Programming Section. For information on information pertaining to existing and proposed route transfer agreements, please contact Jamie Gallagher.

Sincerely,

Janice Osadczuk

Janice Osadczuk, Chief

Division of Environment, Planning and Engineering

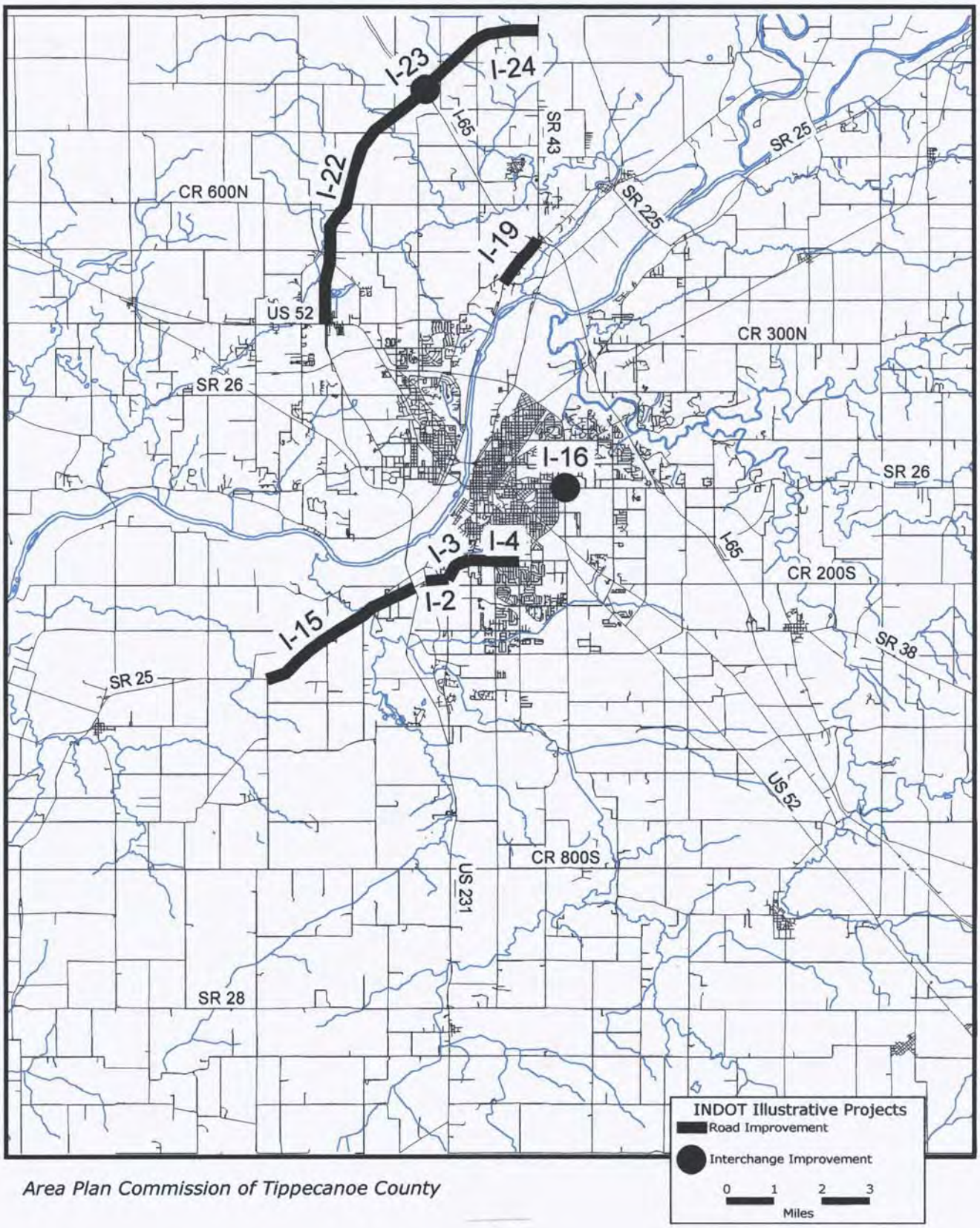
Cc: John Weaver

Randy Walter

Jamie Gallagher

Larry Heil, FHWA

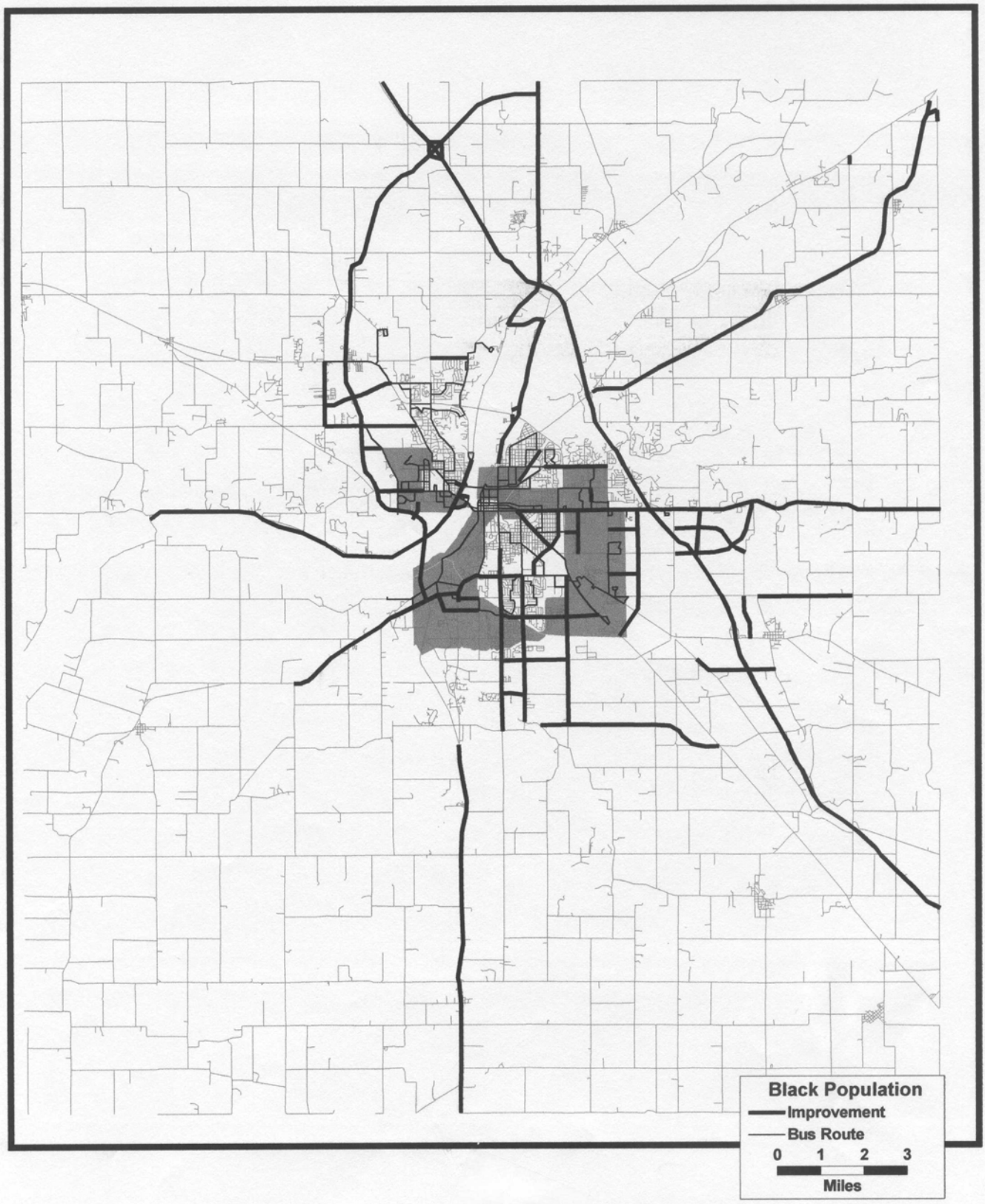
INDOT Illustrative Project List



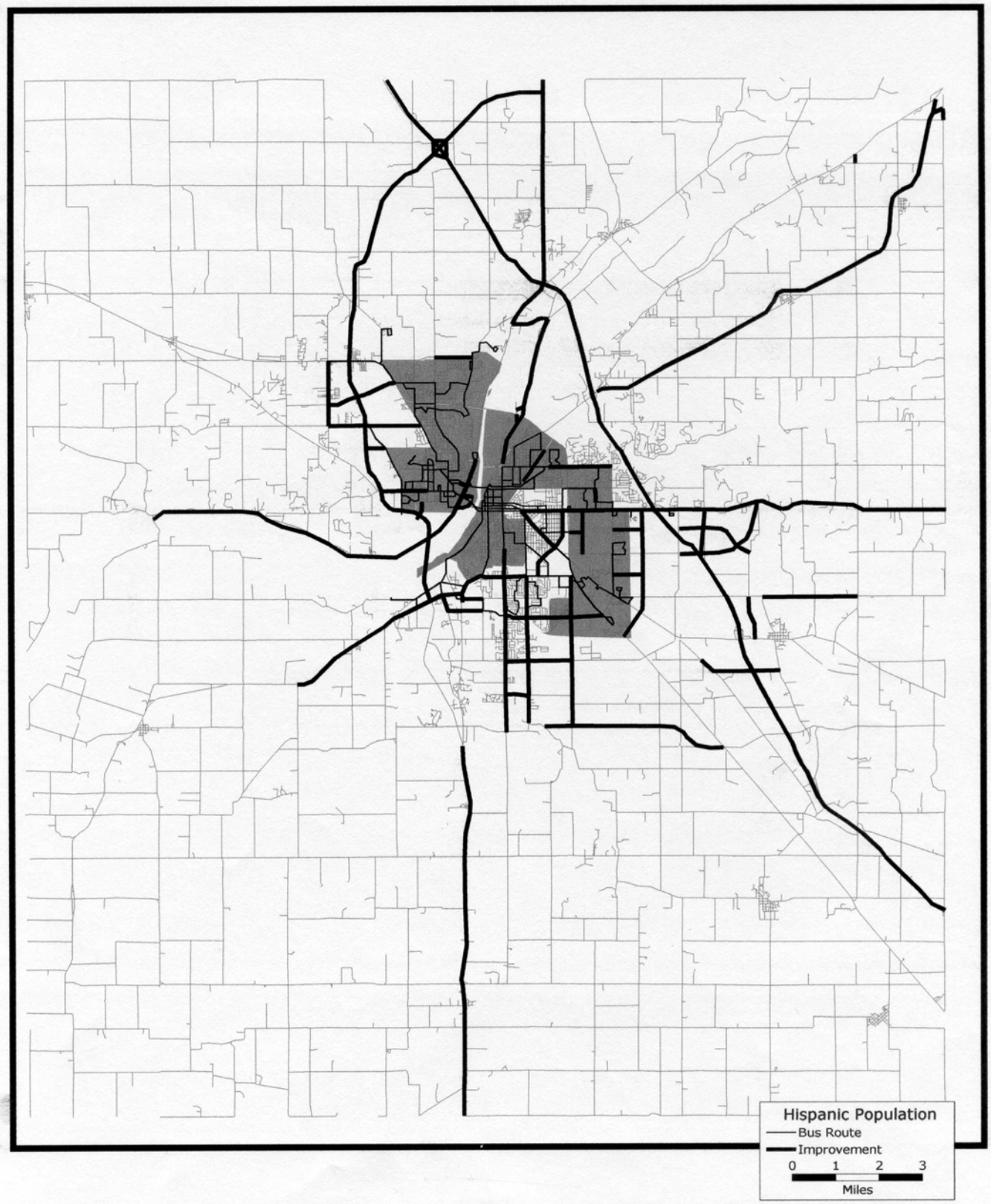
Area Plan Commission of Tippecanoe County

Appendix 5

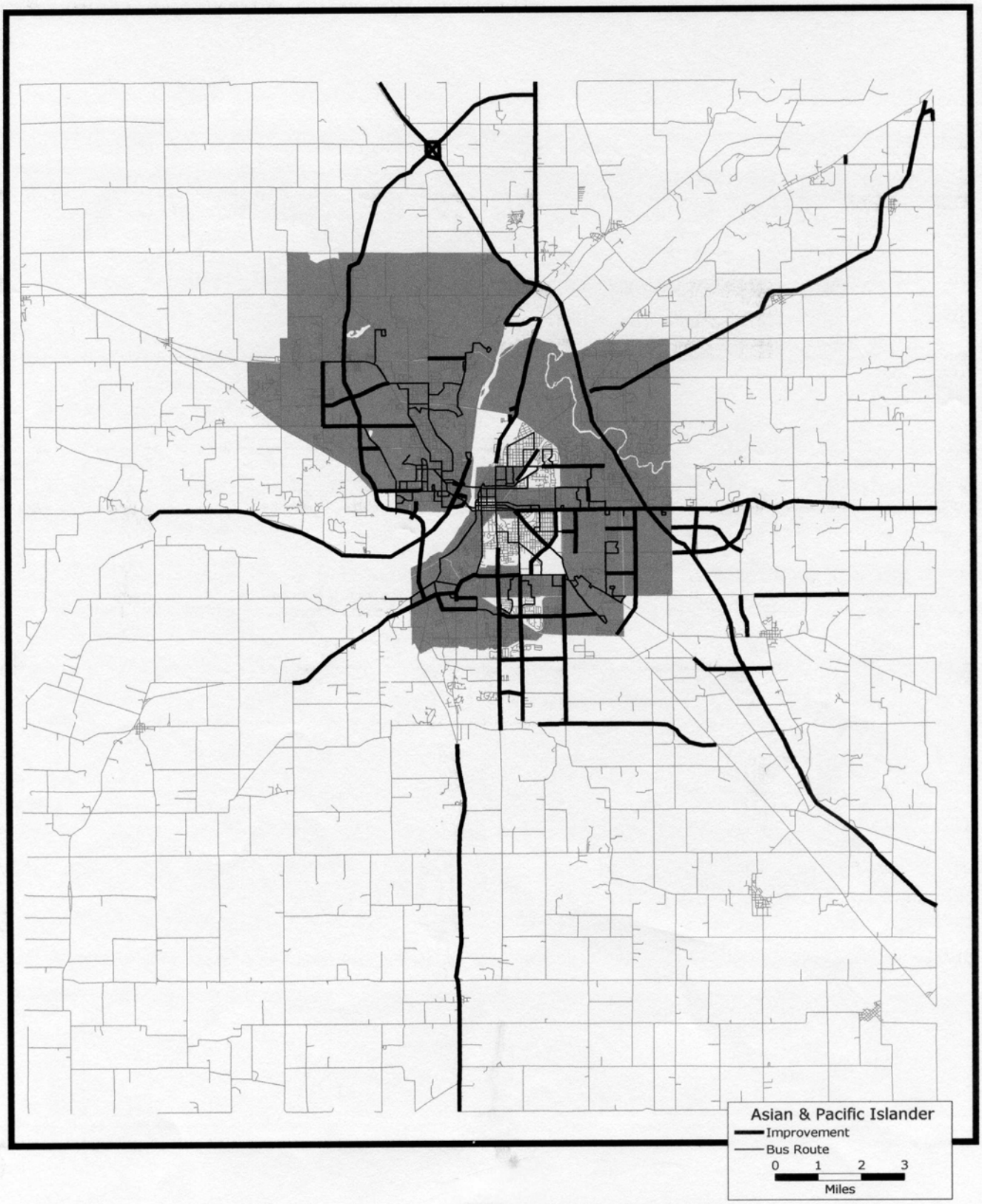
1990 Census Tracts having a higher than average Black Population of 2.02 percent



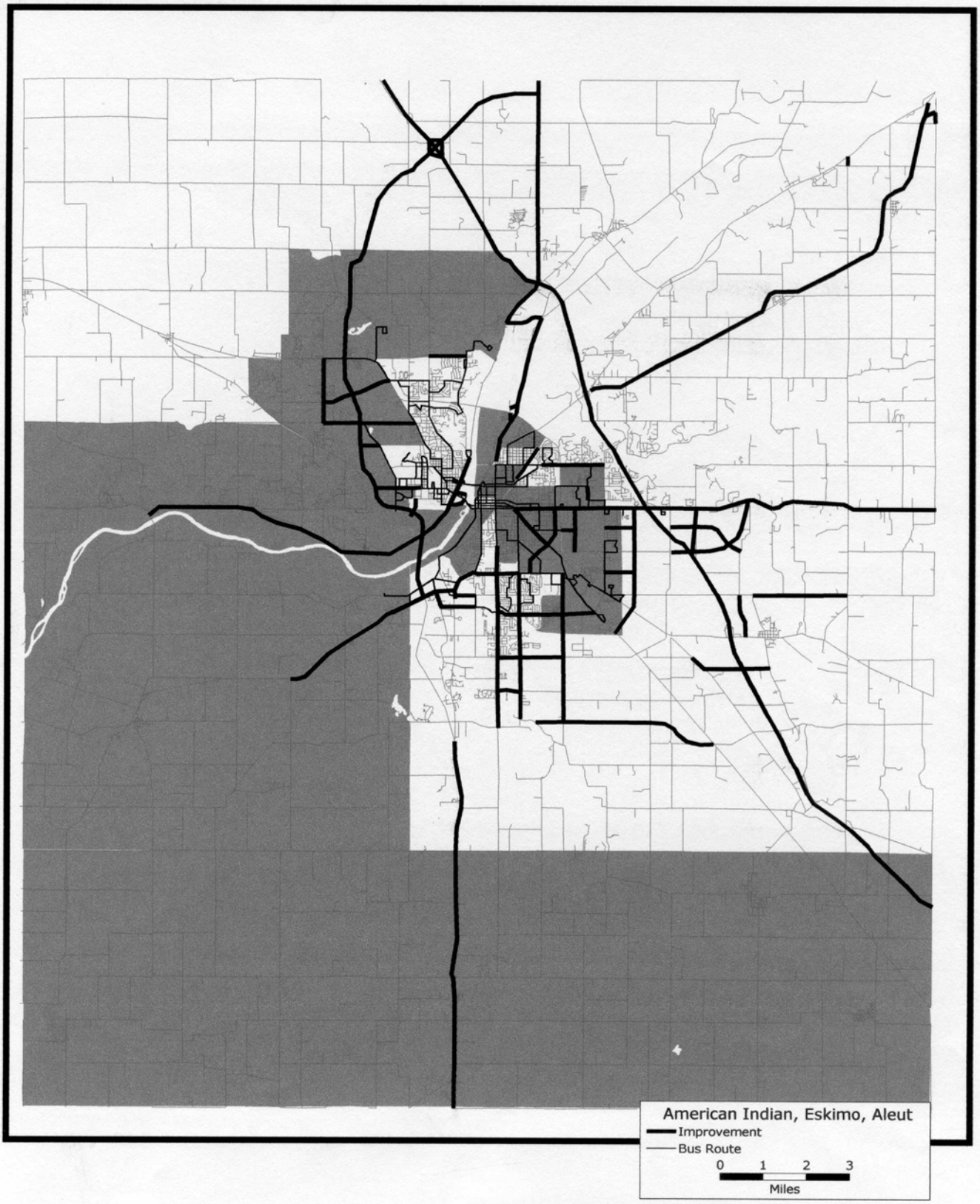
1990 Census Tracts having a higher than average Hispanic Population of 1.70 percent



1990 Census Tracts having a higher than average Asian and Pacific Islander Population of 3.39 percent

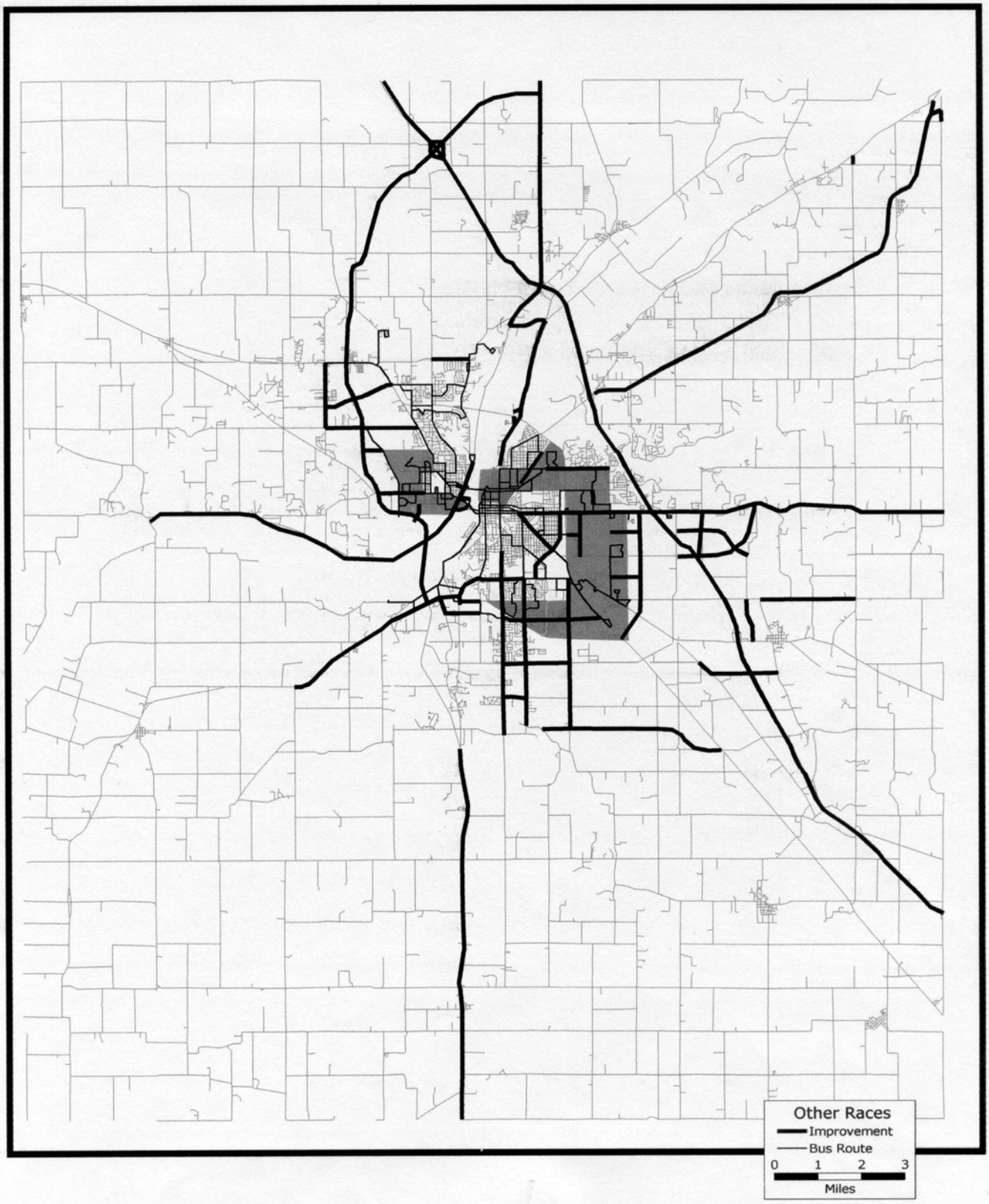


1990 Census Tracts having a higher than average American Indian, Eskimo, and Aleut Population of 0.24 percent

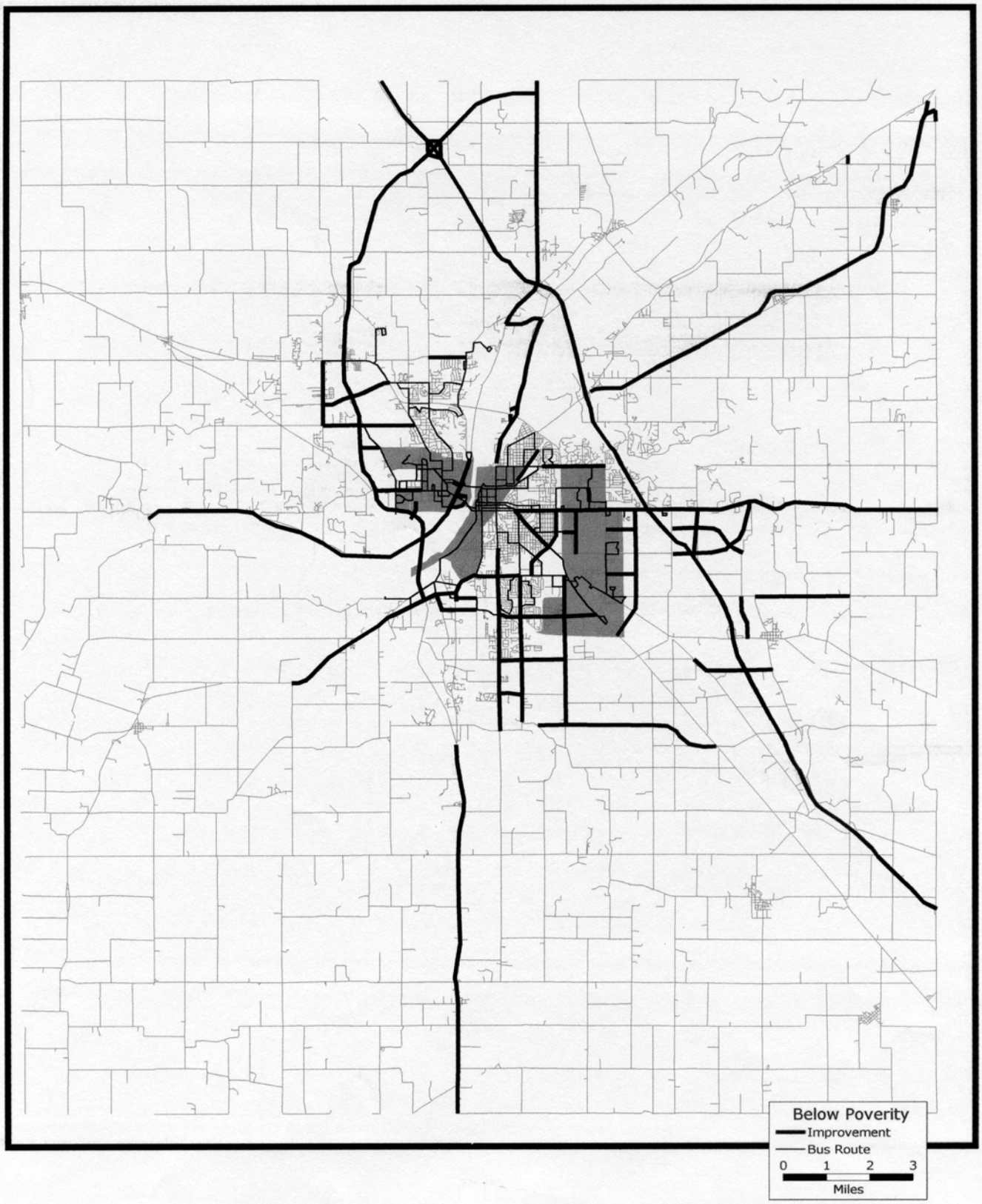


Other Races

1990 Census Tracts having a higher than average Population of 0.61 percent



Ratio of Income in 1989 to Poverty Level, 1990 Census



Title VI
file

INDIANA DEPARTMENT OF TRANSPORTATION
Multi-Modal Division
100 North Senate Avenue
Room N901
Indianapolis, Indiana 46204
(317) 232-1495 *Fax: (317) 232-1499*

FRANK O'BANNON, Governor
CRISTINE M. KLIKA, Commissioner

Writer's Direct Line

RECEIVED
JUN 23 2000
THE AREA PLAN COMM.
OF TIPPECANOE CO.

June 21, 2000

Mr. James D. Hawley
Executive Director
Area Plan Commission
20 North 3rd Street
Lafayette, IN 47901-1209

Dear Mr. Hawley;

The Indiana Department of Transportation, Public Transit Section, has completed its review of the Title VI program submitted by the Greater Lafayette Area Transportation and Development Study. This submission is required pursuant to Title VI of the Civil Rights Act of 1964 and the FTA Circular 4702.1, "Title VI Program Guidelines for FTA recipients" dated May 26, 1988; and Part II, Section 12(B) of the INDOT Agreement.

Based upon our review, we have approved your program as of June 30, 2000. This approval expires June 30, 2003. An update should be forwarded to this office by May 31, 2003, 30 days prior to the expiration date. If major changes occur prior to your expiration date, an update must be submitted. The INDOT may request additional information, if necessary.

Thanks for your cooperation, and if your have any questions or concerns, feel free to contact me at (317) 232-1482.

Sincerely,

Stephanie Belch
Transit Planner
Public Transit Section