MAJOR STREET PLAN

The City of Trussville

Prepared for:

The City of Trussville
Trussville, Alabama

Prepared by:

SKIPPER
CONSULTING INC.

OCTOBER 2005

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INTRODUCTION

This report documents the major street plan element of the Comprehensive Plan prepared for the City of Trussville, Alabama. Both land use and the roadway system were analyzed in this study effort. The purposes of the transportation component are to assess the effectiveness of the existing roadway system, considering the present land uses and transportation network, and to develop a major Street plan that will mitigate current and future roadway deficiencies, increase mobility, support the Comprehensive Plan, and create a safe and efficient roadway system for the future.

Sources of information for the major street plan included the City of Trussville, the Alabama Department of Transportation, the Regional Planning Commission of Greater Birmingham, the KPS Group, Inc. and office files and field reconnaissance efforts of Skipper Consulting, Inc.

BACKGROUND

Trussville has approximately 12,900 inhabitants and is located east of Birmingham, Alabama. Over the past several decades, Trussville has experienced significant growth in both population and employment, resulting in subsequent traffic growth on the City's roadway network and increasing traffic congestion throughout the area. Trussville is located on three major regional roadways: U. S. Highway 11, Interstate Highway 59 and Interstate Highway 459. U. S. Highway 11 cross-section varies from two lanes to five lanes four lane median divided roadways. Interstate 59 and Interstate Highway 459 are four lane interstate highways.

To ensure that transportation plan meets the desires of the City of Trussville it was determined that the transportation plan should meet the following criteria:

- Meet the long range transportation need of the city;
- Encourage and accommodate traffic on the interstate, arterials and collectors while discouraging traffic on local and neighborhood streets;
- Provide access among all developed areas of Trussville;

- Improve overall accessibility to employment, education, public facilities, the Central Business district and other major activity centers;
- Provide for an orderly improvement and expansion of the roadway system at minimum cost as the need for improvement arises; and
- Minimize disruptions of existing and planned developments and established community patterns.

EXISTING TRANSPORTATION SYSTEM

Roadway Classifications and Descriptions

All transportation networks have some form of classification to categorize the hierarchy of movement in the system. The roadway network developed for the Trussville study area was based on the functional classification system prepared by the Alabama Department of Transportation. The components of this network are freeways, arterials, collectors and local streets. The distribution of mileage in these classifications for Trussville is as follows:

Classification	Mileage
Interstate	7 miles
Arterials	15 miles
Collector Roads	30 miles
Local Streets	90 miles
TOTAL	142 miles

Each type roadway provides separate and distinct traffic service functions and is best suited for accommodating particular demands. Their designs also vary in accordance with the characteristics of traffic to be served by the roadway. The following is a brief description of each roadway type.

- *Interstates* are divided highways with full control of access and grade separation at all intersections. The controlled access character of freeways results in high-lane capacities,

enabling these roadways to carry up to three times as much traffic per lane as arterials. Freeways move traffic at relatively high speeds.

- *Arterials* are important components of the total transportation system. They serve as feeders to the interstate system as well as major travelways between land use concentrations within the study area. Arterials are typically roadways with relatively high traffic volumes and traffic signals at major intersections. The primary function of arterials is moving traffic. Arterials provide a means for local travel and land access.

- *Collectors* provide both land service and traffic movement functions. Collectors serve as feeders between arterials as well as provide access to the local streets. Collectors are typically lower volume roadways that accommodate short distance trips.

- *Local Streets* sole function is to provide access to the land uses that are immediately adjacent to the roadways. These streets are not included in the computer network for this project.

Regional Access Routes

The Trussville area is served by two interstate highways (I-59 and I-459) and a U. S. highway (U. S. Highway 11). These highways offer both north-south and east-west regional access as well as access throughout the Trussville area.

Interstate Highway 59 traverses the City of Trussville from northeast to southwest. It is a four-lane controlled access interstate highway that bisects the study area I-59 has two interchanges located within the study area: Chalkville Mountain Road and Deerfoot Parkway. There is also a route interchange between I-59 and I-459 located within the study area.

Interstate Highway 459 extends along the western boundary of the City of Trussville in a north-south direction. I-459 is a controlled access interstate highway with a cross-section that ranges from four lanes to six lanes throughout the study area. I-459 has two interchanges located in the

Trussville area and the route interchange with I-59. The I-459 interchanges in the Trussville area are located at U.S. Highway 11 and at Derby Parkway. The Derby Parkway interchange is not within the Trussville city limits but it does provide access to the City of Trussville.

U.S Highway 11 varies is a principal arterial roadway that varies from two to five lanes throughout the study area. It is the major transportation spine through the City of Trussville and provides access to many of the commercial and residential areas in the City.

With the exception of the regional access routes, all other roadways in the Trussville network are either collector roadways or local roadways.

Planned Roadway Improvement Projects

The Birmingham area MPO's Long Range Transportation Plan was reviewed to determine any transportation projects that were currently planned for the Trussville area. The only project in the Trussville area included in the MPO's Long Range Transportation Plan is the construction of the Northern Beltline from the junction of Interstate 459 and Interstate 59 in Bessemer to the proposed Interstate 20 interchange at Dawson Street in Leeds.

Existing Traffic Volumes

Traffic volume, as indicated by traffic counts at various locations on the roadway network, reflect current travel patterns and how well the network is serving the travel demand. Traffic counts were collected throughout the study area by the City of Trussville. Existing daily traffic counts, which were conducted in 2005, are shown in Figure 1. As shown in Figure 1, the following is a summary of the maximum daily traffic volumes that occur on major roadways in the study area:

Interstate 59	54,700 vehicle per day
Interstate 459	57,300 vehicle per day
U.S. Highway 11	31,000 vehicle per day
Chalkville Mountain Road	41,000 vehicle per day
Deerfoot Parkway	13,500 vehicle per day
Chalkville Road	12,900 vehicle per day

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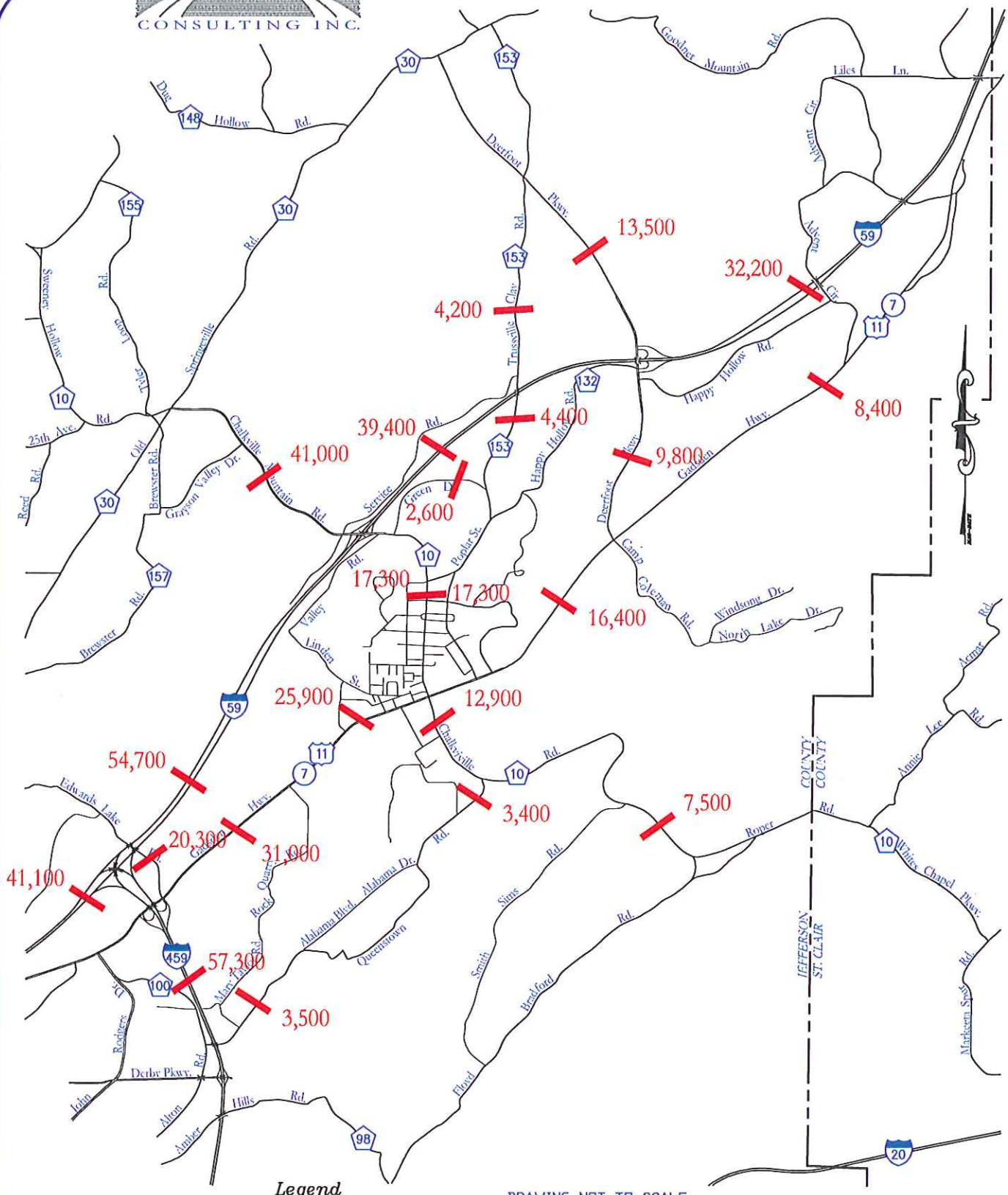

FIGURE 1
EXISTING DAILY TRAFFIC VOLUMES
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TRUSSVILLE, ALABAMA
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Roadway Capacity

Roadway networks are evaluated by comparing the traffic volumes along each facility to the facility's capacity. Roadway capacity is defined as the ability of the facility to accommodate traffic. Service flow volume is the level of traffic flow (vehicles per day) that can be accommodated at various levels of service. The current level of service scale, as developed by the Transportation Research Board in the *Highway Capacity Manual*, Sixth Edition, ranges from a level of service "A" to a level of service "F". Abbreviated definitions of each level of service are as follows:

Level of Service A	Free traffic flow (0% –35% of capacity)
Level of Service B	Stable traffic flow (35% –50% of capacity)
Level of Service C	Stable traffic flow (50% –62% of capacity)
Level of Service D	High-density stable traffic flow (62% –75% of capacity)
Level of Service E	Capacity level traffic flow (75% –100% of capacity)
Level of Service F	Forced or breakdown traffic flow (>100% of capacity)

As a general rule, the desired operation of a roadway should be no lower than level of service "C". Level of service "D" may be acceptable under certain circumstances. A level of service "E" or "F" is considered unacceptable.

The methodology used to evaluate roadway segment capacity in this project was a tabular analysis relating roadway classification, number of lanes, levels of service, and daily service volumes. The estimated 24-hour capacities of the facilities included in the area network are shown in Table 1. Figure 2 summarizes the roadway segments that are deficient.

TABLE 1
CITY OF TRUSSVILLE MAJOR STREET PLAN
ROADWAY CAPACITIES

FUNCTIONAL CLASSIFICATION	# OF LANES	CAPACITIES
Freeway	4	68,000
	6	102,000
	8	136,000
	10	170,000
Expressway	4	50,000
	6	75,000
	8	100,000
Divided Principal Arterial	2	22,000
	4	33,900
	6	50,000
	8	73,600
Undivided *Principal Arterial*	2	17,800
	4	31,000
	6	45,800
	8	63,100
Divided Minor Arterial	2	21,000
	4	31,900
	6	45,600
	8	N/A
Undivided Minor Arterial	2	17,800
	4	27,400
	6	N/A
	8	N/A
Divided Collector	2	20,800
	4	28,500
	6	42,000
Undivided Collector	2	16,600
	4	26,200
	6	38,700
One-way Principal Arterial	2	17,100
	3	25,600
	4	37,800
One-way Minor Arterial	2	14,100
	3	19,500
	4	26,000
One-way Collector	2	11,300
	3	15,600
	4	20,800
One-way Ramp	1	9,000
	2	18,000
	3	27,000

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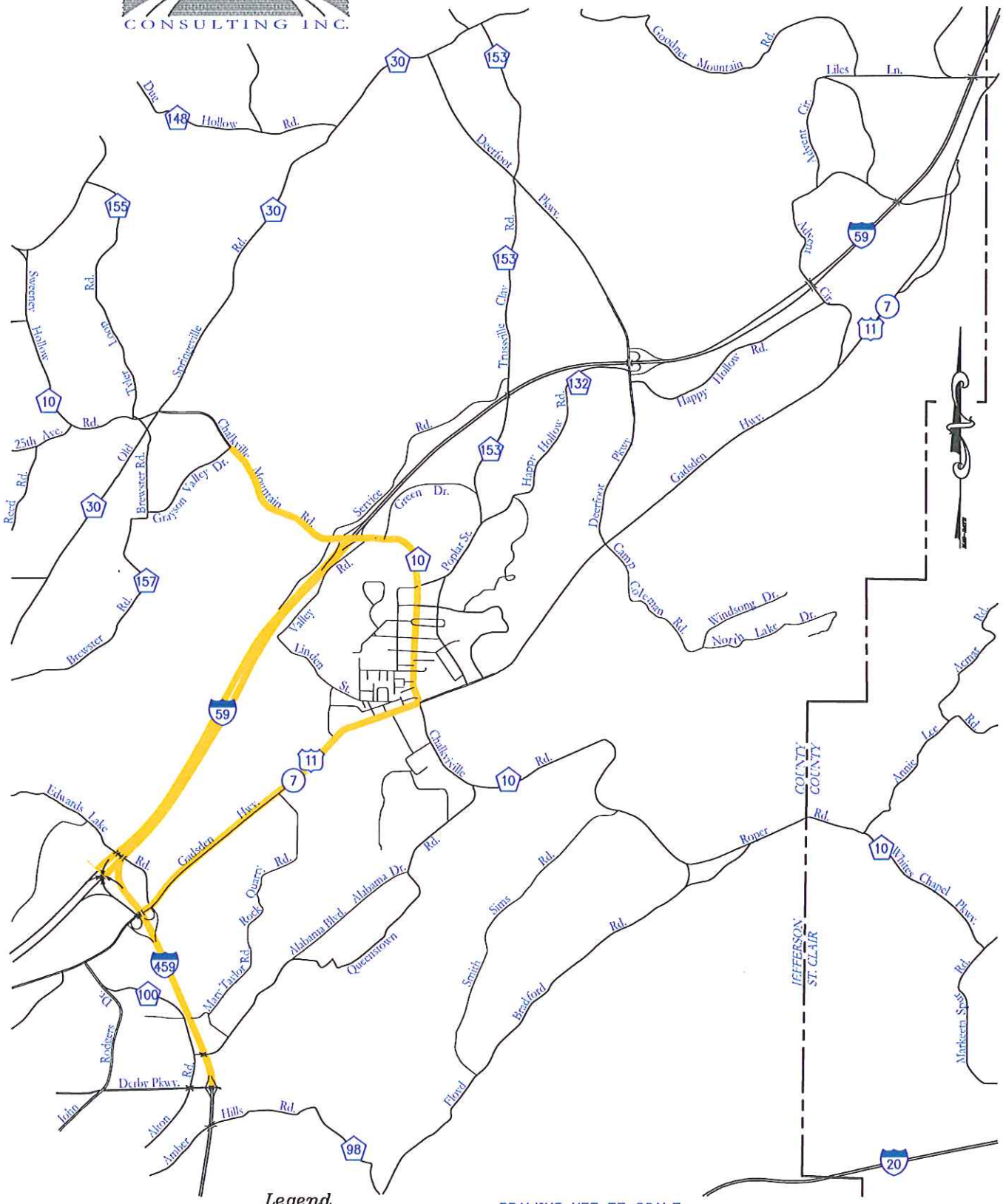

Legend

- 59 INTERSTATE
- 11 U.S. HIGHWAY
- 7 STATE ROUTE
- 10 COUNTY ROAD

DRAWING NOT TO SCALE

FIGURE 2

EXISTING DEFICIENT ROADWAY SEGMENTS

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LAND USE AND SOCIOECONOMIC DATA

The relationship between land use and a transportation system is used to determine the demand for travel on a roadway network. Each land use (residential, commercial, industrial, etc.) generates and attracts traffic depending on the nature of the development and the amount of land developed. In order to identify this demand for travel, inventories of existing land uses must be made. This information is used in conjunction with the physical location of the adjacent land uses, constraints on the roadway network, and other related factors to develop the interrelationship between land use and the transportation system.

To catalog the land uses of the study area and to provide a means of quantifying the relationship of land use to transportation demand, the study area was divided into individual cells called traffic analysis zones (TAZ). A traffic analysis zone is defined as a subdivision of a study area of homogeneous land use within a distinct border for the compilation of land use and traffic generation data. A TAZ system developed by the study team was employed for this analysis. A total of 34 zones are included within the City of Trussville.

Each traffic analysis zone within the City of Trussville was inventoried to determine existing land uses within its boundary. The existing land use information was used to duplicate current travel demands and trends throughout the City of Trussville.

The future travel demands and trends were forecasts based on the land use plan that was developed for the City of Trussville. Other considerations included the density of development in each TAZ and the suitability of vacant land for development in each TAZ.

TRANSPORTATION MODELING PROCESS

Travel demand models are developed to predict future traffic on the street and highway system. The models are initially developed using existing land use data to duplicate travel for the base year. How well the model duplicates base year conditions is considered as an indication of how well it

will predict future travel. If the model cannot produce traffic volumes similar to those observed on existing streets and highways, then the model is reevaluated and adjustments are made. This adjustment or calibration process continues until the model is adequately simulating base year traffic conditions. The process of building and modifying the model to simulate base year travel is called calibration. After the model is calibrated, trip generation data is developed for the land use plan and input into the model to predict future travel demand.

NO BUILD ASSIGNMENT

The travel demand generated by the land use plan is assigned to the existing roadway network. The purpose of this step is to identify where future deficiencies might occur if no roadway improvements are undertaken. The future year no-build forecast traffic volumes are illustrated in Figure 3.As was discussed in the Existing Conditions section, the future year no-build forecast traffic volumes were compared with the roadway capacities to determine roadway segment levels of service. Roadways which show a projected volume/capacity (v/c) ratio of greater than 0.75 (Level of Service "E") should be considered deficient. Emphasis should be placed on those areas where the v/c ratio is greater than 1.00 (Level of Service "F"). Based on those ratios, the roadways estimated to be deficient are shown in Figure 4

TRANSPORTATION PLAN DEVELOPMENT

The Transportation Plan for Trussville, Alabama was developed in an effort to provide a guide for local and state officials to utilize to address existing traffic congestion, mitigate anticipated future year capacity deficiencies, improve mobility, increase safety and promote economic vitality. The Transportation Plan was developed as a result of public meetings, meetings with Trussville officials and the results of analyses that were performed by Skipper Consulting.

Various types of roadway improvements have been included in Trussville's Transportation Plan. The improvements include adding travel lanes to existing roadways and constructing new roadways. The Transportation Plan is described below and illustrated in Figure 5.

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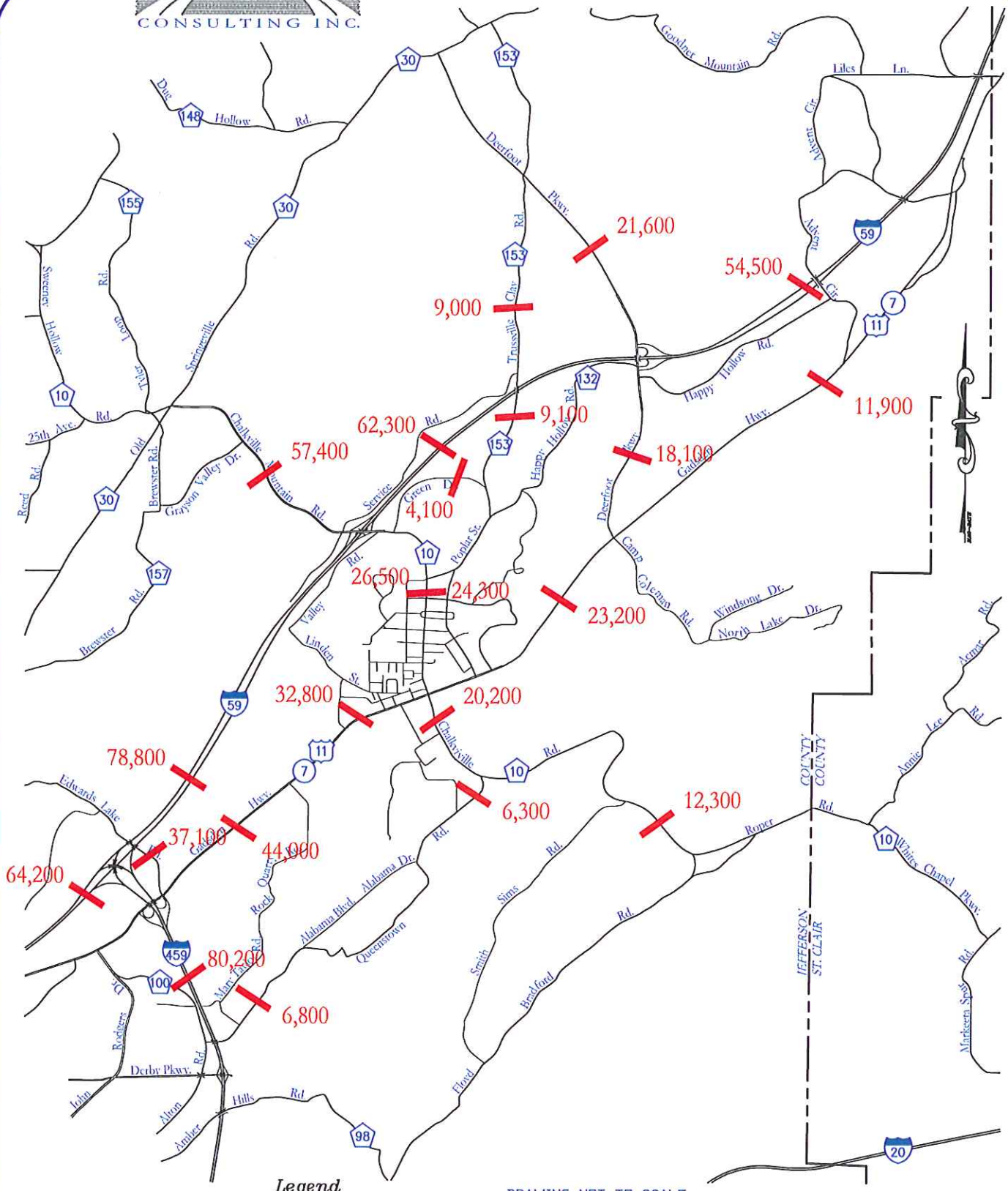

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FIGURE 3

NO-BUILD DAILY TRAFFIC VOLUMES

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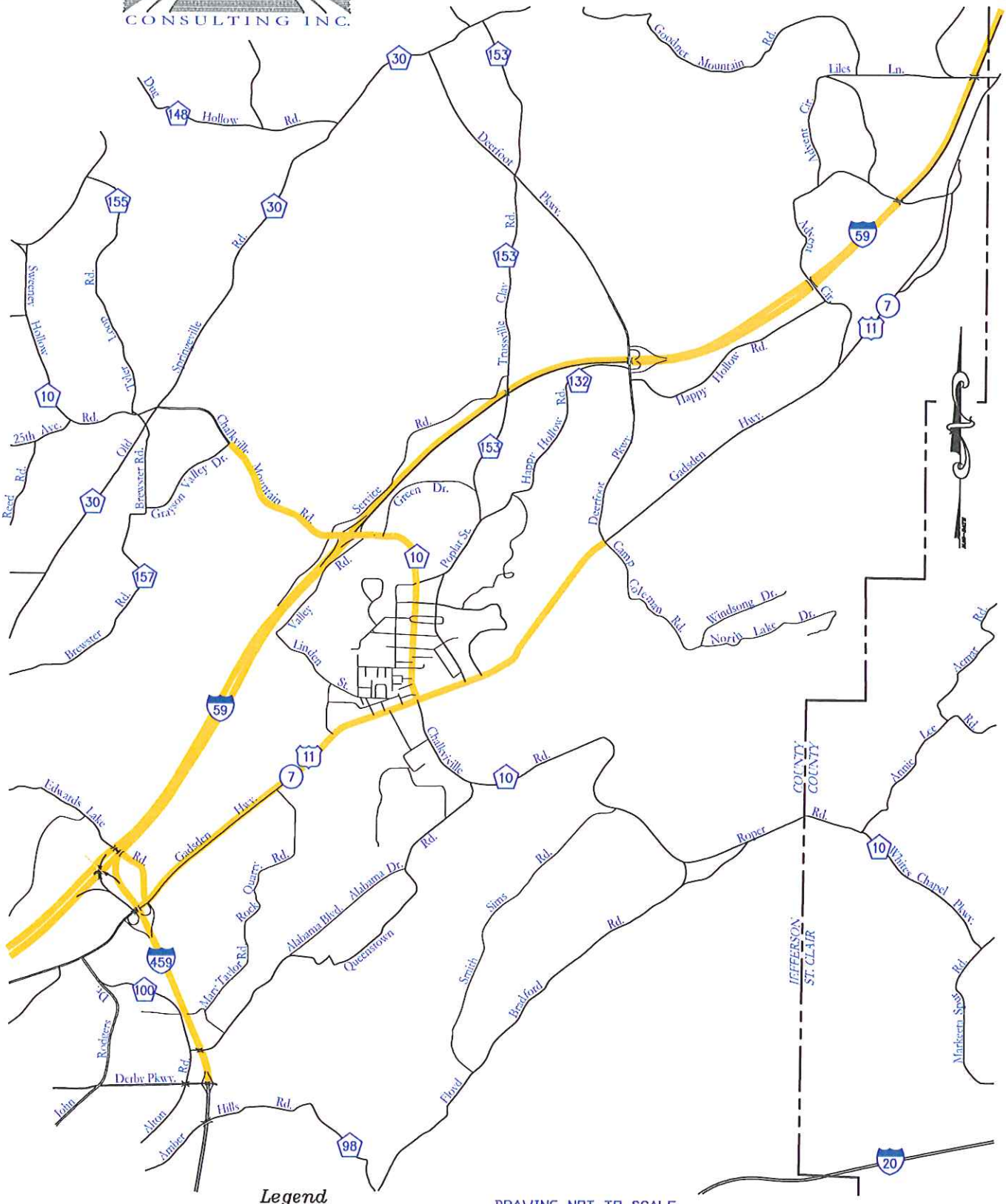

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- 59 INTERSTATE
- 11 U.S. HIGHWAY
- 7 STATE ROUTE
- 10 COUNTY ROAD

DRAWING NOT TO SCALE

FIGURE 4

NO-BUILD DEFICIENT ROADWAY SEGMENTS

TRUSSVILLE COMP. PLAN

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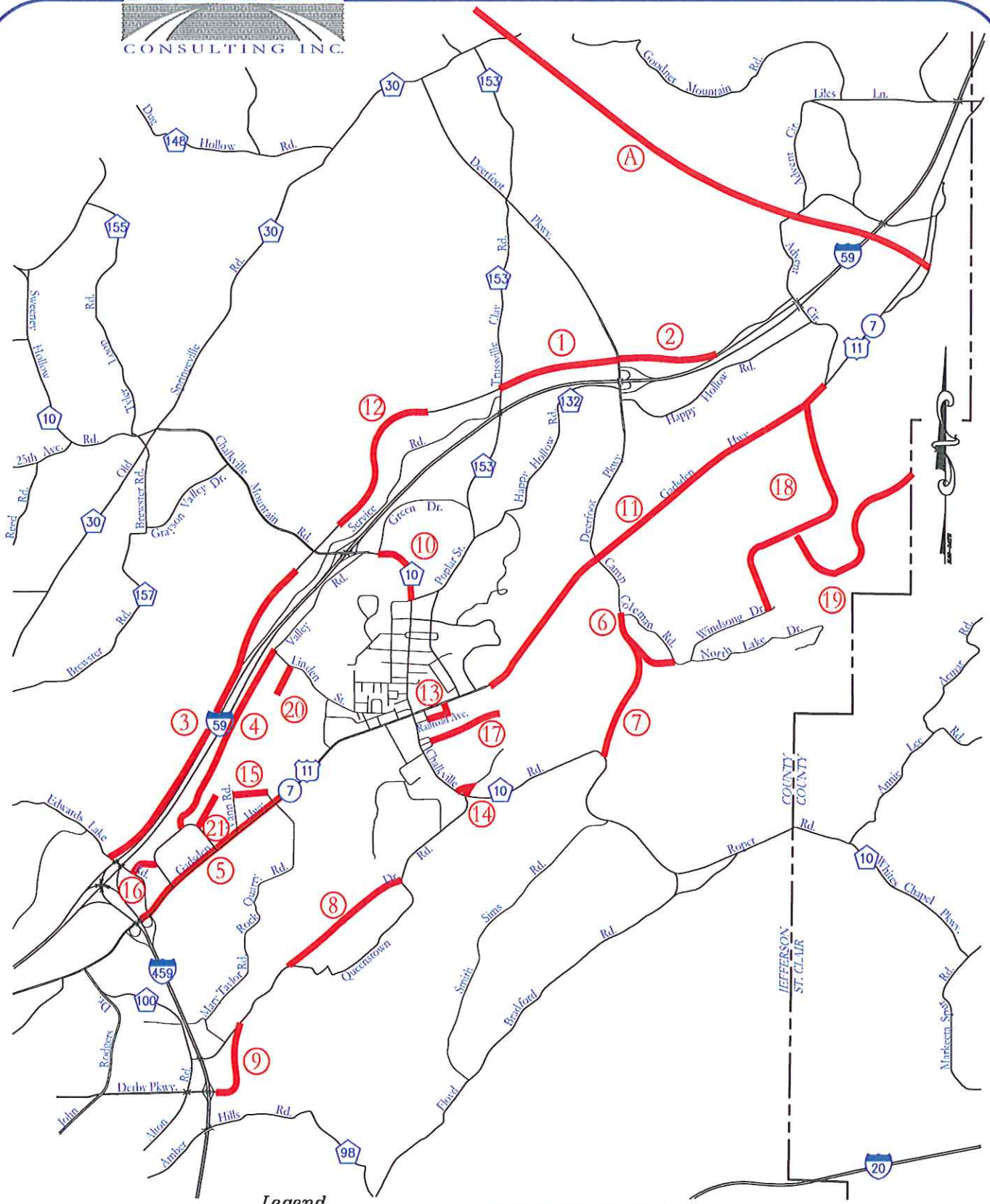

FIGURE 5
MAJOR STREET PLAN
TRUSSVILLE COMPERHENSIVE PLAN
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1. Construct a connector road from Deerfoot Parkway to Trussville-Clay Road.
2. Extend Arrowhead Lane to Deerfoot Parkway.
3. Complete the connection from Chalkville Road to Edwards Lake Road.
4. Construct a connector road from Valley Road to Roosevelt Drive.
5. Widen U.S. Highway 11 to six lanes between Interstate 459 and Tutwiller Drive.
6. Realign Camp Coleman Road.
7. Construct a connector road between Camp Coleman Road and Roper Road.
8. Construct a connector road between Alabama Boulevard and Alabama Drive.
9. Realign Queenstown Road.
10. Widen Chalkville Mountain Road to three Lanes between Poplar Street and Green Drive.
11. Widen U.S. Highway 11 from Cahaba River to Mary Munger Road.
12. Construct a connector road between Trussville-Clay Road and Chalkville Road.
13. Extend Railroad Avenue from its current end to City Hall Drive.
14. Construct a connector road between Roper Road and Still Oaks subdivision.
15. Construct a connector road between Vann Road and Mary Taylor Circle.
16. Construct a connector road from Roosevelt Drive to Edwards Lake Road.
17. Extend Beechnut Street to Trussville Springs.
18. Extend Bethune Parkway from Windsong Drive to U. S. Highway 11.
19. Construct a connector road from Bethune Parkway to Carrington.
20. Construct a connector road from Linden Street to Pine Crest.
21. Construct a connector road from Tutwiller Drive to Roosevelt Drive.

The following project is listed in the Birmingham area MPO's Long Range Transportation Plan; therefore, it was included in the City of Trussville's Major Street Plan.

A. Construct a four lane controlled access facility from the junction of Interstate 459 and Interstate 59 in Bessemer to the proposed Interstate 20 interchange at Dawson Street in Leeds (Northern Beltline).

The travel demand generated by the land use plan was assigned to the roadway network that included the projects outlined in the Transportation Plan using the travel demand model. The purpose of this assignment is to determine the benefit of the Transportation Plan. The future traffic assigned to assigned to network that included the Transportation Plan is illustrated in Figure 6. The traffic assigned to the roadway network was compared with roadway capacities that are represented by the Transportation Plan. The Transportation Plan was reviewed to determine which facilities would have a projected volume/capacity (v/c) ratio of greater than 0.75 (Level of Service "E"). As was the case in the review of the no-build network, roadways with a volume/capacity (v/c) ratio of greater than 0.75 (Level of Service "E") should be considered deficient. Based on those ratios, the roadway segments that were deficient are illustrated in Figure 7.

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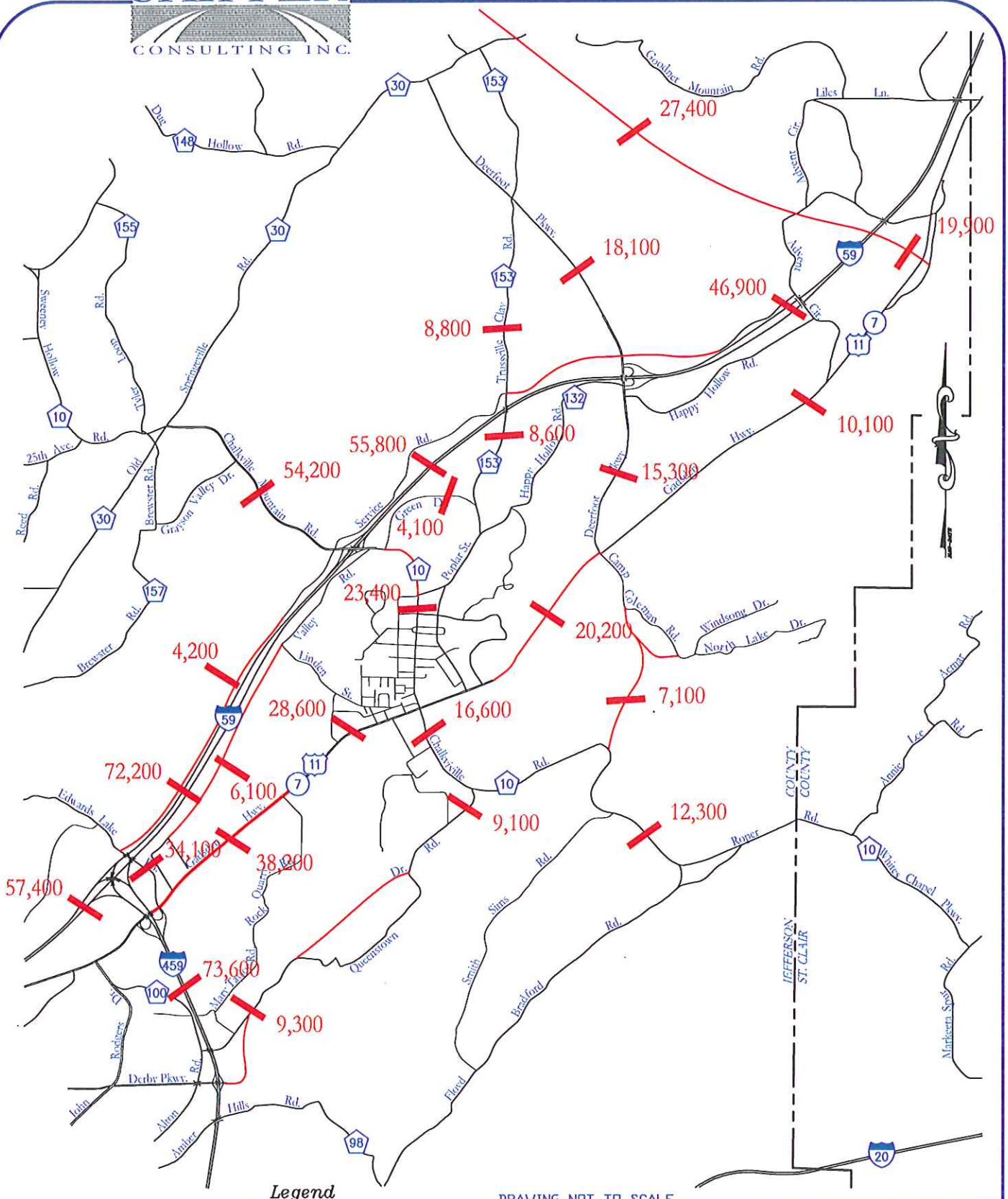

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FIGURE 6
FUTURE DAILY TRAFFIC VOLUMES
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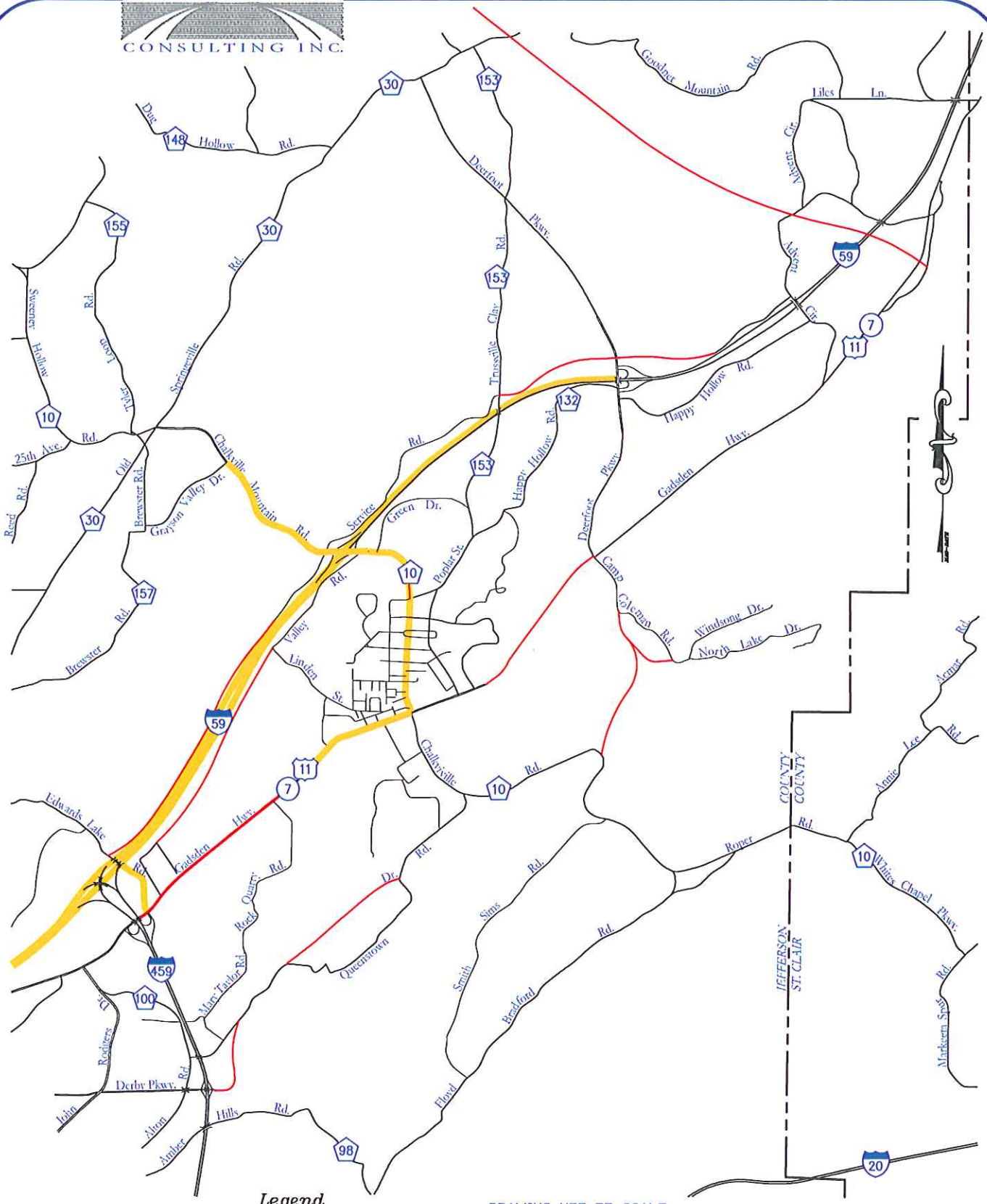

Legend

- 59 INTERSTATE
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DRAWING NOT TO SCALE

FIGURE 7

FUTURE DEFICIENT ROADWAY SEGMENTS

TRUSSVILLE COMPERHENSIVE PLAN

TRUSSVILLE, ALABAMA

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Access Management

The success of the Major Street Plan relies on the City's ability to protect current and future capacities of the roadway network. Access management can benefit roadside properties throughout the City of Trussville by promoting safety and improving roadway capacities. If approached properly, access management can enhance property values while safeguarding past and future public investments in the infrastructure. Access management techniques developed for Trussville should incorporate the following strategies to retrofit current roadway corridors and in planning new projects:

- Separate conflict points – distance between major intersections and driveways should be regulated. As a general rule, driveways should not be located within the area of influence of intersections.
- Restrict turning movements at unsignalized driveways and intersections – the use of full directional unsignalized streets and driveways should be limited. Full movement intersections should serve multiple developments through joint use driveways or cross access easements. If frontage roads area available, all driveways should access the frontage roads. Access to the main line should only be permitted at intersections of public roadways.
- Establish design standards – design standards that address access spacing, the length of turn lanes and tapers and driveway dimensions should be developed for application throughout the corridor.
- Traffic signal spacing – signals should only be installed when appropriate studies indicate their spacing and interconnection can be accomplished without significant impacts on the corridor capacity.
- Turn lanes – left and right turn lanes should be required for all public streets and major access points to adjacent land uses.
- Shared driveways/inter-parcel access – joint use driveways should be required to reduce the proliferation of driveways and to preserve the capacity of the corridor.
- Pedestrian/bicycle planning – specific needs of pedestrian and bicyclist movements should be addressed. Traffic signals should be designed and timed to accommodate pedestrians in those areas of significant activity.

CONCLUSIONS

This report summarized the results of a study performed for the transportation system of the City of Trussville. The conditions summarized included traffic analysis for existing, future conditions and recommendations for roadway improvements that would help correct current and future transportation deficiencies. It is virtually impossible to eliminate all transportation deficiencies that may occur in a city but the recommendations in this report will help relieve existing and future traffic congestion, improve mobility, improve traffic safety and increase the opportunity for economic vitality.