

**MAUMELLE / OAK GROVE I-40**

**INTERCHANGE FEASIBILITY STUDY**

**UPDATE**

**Pulaski County, Arkansas**

**May 2003**

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Prepared by  
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in cooperation with the  
Federal Highway Administration

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## INTRODUCTION

In 1996 the *Maumelle/Oak Grove I-40 Interchange Feasibility Study* was conducted by the Arkansas State Highway and Transportation Department at the request of the City of Maumelle. It was adopted by the Arkansas Highway Commission by Minute Order 96-201. The study examined the feasibility of constructing a new road to connect the City of Maumelle to Interstate 40 (I-40) and the Oak Grove community to the east. Five new alternative route locations were studied. The recommended alternative was a two-lane route that extended from Carnahan Drive south and east across White Oak Bayou to I-40 at the former Morgan rest area, and then eastward to Highway 365 at Oak Grove Road. All alternatives assumed an at-grade crossing of the Union Pacific's railroad track at Oak Grove due to the proximity of the railroad to Highway 365.

At the request of the City of Maumelle, this update was authorized by the Arkansas Highway Commission by Minute Order 2002-171. The update documents the changing conditions in the area since publication of the *Maumelle/Oak Grove I-40 Interchange Feasibility Study* in 1996 and reviews the study's original recommendations for what is now referred to by the City of Maumelle as the proposed White Oak Boulevard.

## STUDY AREA GROWTH

The proposed facility would impact an area of northwest Pulaski County north of the Arkansas River and west of I-430 and I-40. East of I-40 in the northeastern part of this area along Highway 365 are the communities of Oak Grove and Crystal Hill in an unincorporated portion of Pulaski County. These communities have continued to grow at a modest pace since 1996 with no large-scale development occurring.

The City of Maumelle and a portion of the City of North Little Rock along Highway 100 (Maumelle Boulevard) are located in the southern and western parts of the study area. In contrast to the areas to the north and east across I-40, the City of Maumelle and adjacent western North Little Rock is one of the faster growing areas of the state.

Maumelle grew from 1,421 residents in 1980 to 10,557 in 2000 (643%), with Metroplan estimating a 2002 population of 11,761. New housing starts have occurred at a brisk pace, with single-family building permits averaging 250 units annually for the last seven years. Five new subdivisions went on the market in 2002 with 1,336 lots for sale. In addition to the single-family housing growth, 120 new apartments were being completed at the end of 2002 with another 168 units being planned in the City.

The Country Club of Arkansas subdivision is growing eastward along Country Club Parkway, which is being extended to serve new residential areas near the new municipal baseball complex. Future expansion of the subdivision is expected on an additional 155 acres to the northeast and another 120 acres has just been annexed. These new residential areas will extend along the length of the new Country Club Parkway extension to its approximate intersection with the proposed White Oak Boulevard.

Located to the north of the Country Club of Arkansas and east of Maumelle Boulevard along Murphy Drive is the City's industrial park. It has attracted manufacturing and distribution operations of substantial size. Table 1 lists the major employers that are located in the industrial park. The total employment represented by the employers with over one hundred employees has increased by approximately 1,100 since 1996. In addition, Scholastic Distribution Services plans to increase employment to over 500 during the next few years with daily trucks increasing to 80 by 2007. Industrial growth continued in early 2003 with Frostyaire of Arkansas, Inc. announcing a new facility that will attract up to 50 trucks a day to the west end of White Oak Boulevard. The purchase of land for this new industry and an additional firm expected to soon announce plans will help finance approximately 2,000 feet of the proposed roadway's western end. Due to the large and growing distribution operations in the industrial area, there is significant truck traffic into and out of the area on a daily basis.

TABLE 1  
Major Employers: Maumelle Industrial Park

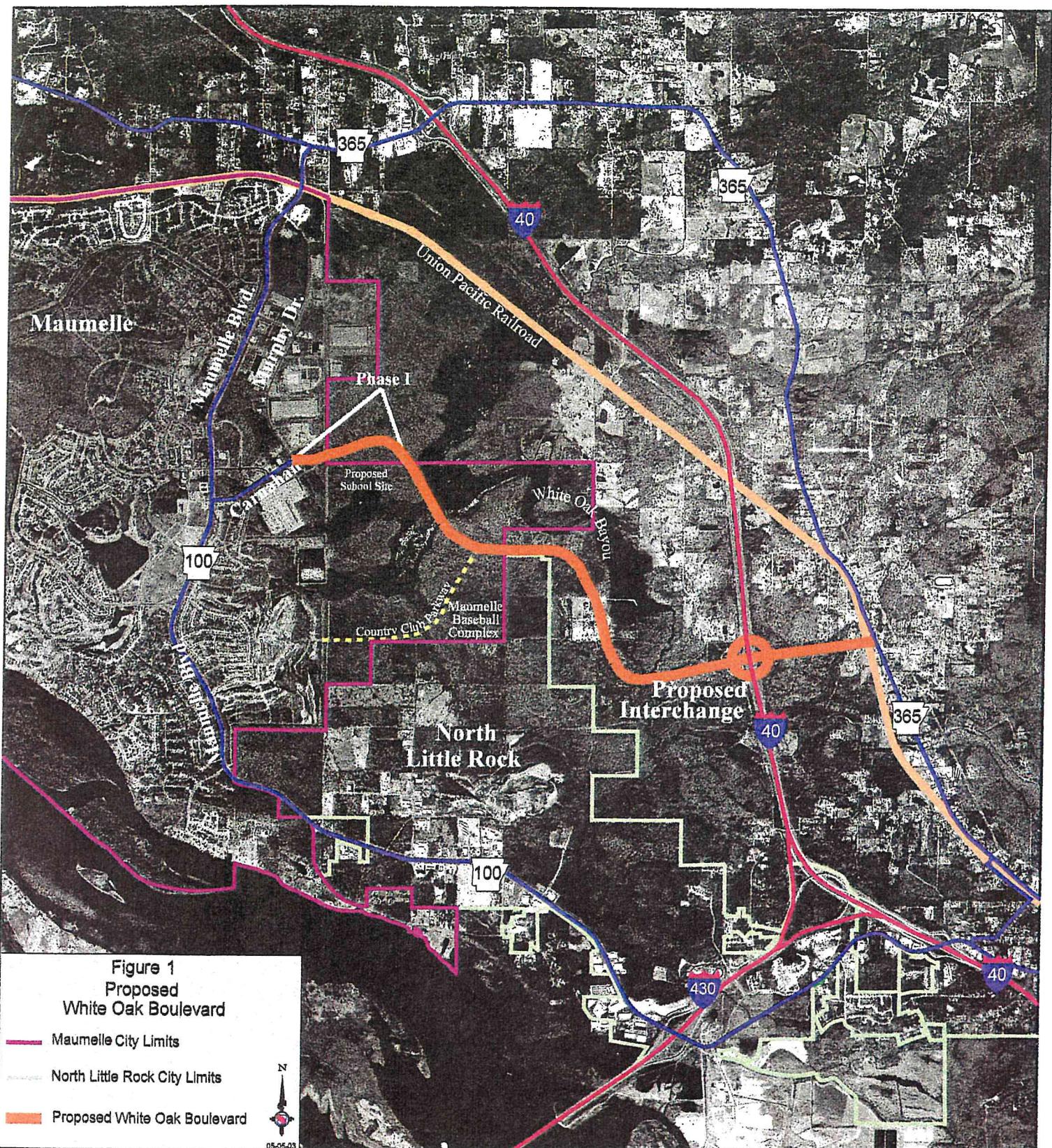
<u>COMPANY</u>	<u>EMPLOYMENT</u>
Molex	1,165
Target	800
Kimberly Clark	298
Windsor Door	274
Ace Hardware	230
Scholastic Distribution Services, Inc.	150
Cintas Corporation	165
Precision Systems and Space Division	128

The middle of the study area is a largely rural, undeveloped area which has I-40 and the Union Pacific Railroad mainline separating it from Oak Grove and Crystal Hill to the

northeast. Maumelle is expanding into this area from the west. Crossing through the center of this area is White Oak Bayou. The City of Maumelle has worked with the Corps of Engineers to preserve 223 acres of wetlands with a possible additional 220 acres to help mitigate the effects of the area's development.

Adjacent to the wetland preserve is a proposed middle school site for 1,000 students on the proposed White Oak Boulevard just east of the intersection of Carnahan Drive and Murphy Drive. There is a proposal to eventually add a high school to the site which would double the size of the complex. Maumelle plans to use the funds from sale of the school land to complete Phase I of the proposed White Oak Boulevard as shown in Figure 1.

The portion of Highway 100 (Maumelle Boulevard) in North Little Rock remains a popular location for businesses related to the construction industry. Small strip commercial centers have also been constructed along this highway in the last six years and 350 apartments are under construction midway between Maumelle and I-430.



## AREA TRANSPORTATION SYSTEM

The study area is served by four major highway routes: I-40, I-430, Highway 365, and Highway 100 (Maumelle Boulevard). I-40 is a four-lane freeway which passes across the area from southeast to northwest providing a direct connection to North Little Rock and points east, including downtown Little Rock via I-30. I-40 to the northwest is a major cross-country route in addition to providing access to Conway, a rapidly growing city about 15 miles away with a 2002 population in excess of 45,000 (estimated by Metroplan). There have been several improvements to the road network in recent years.

I-430 is a six-lane freeway which approaches from the south across the Arkansas River and terminates at I-40 near the Crystal Hill community. It provides a direct connection to the fast growing northwestern part of Little Rock, points south, and another route to downtown Little Rock via I-630. The Highway 100 (Maumelle Boulevard) interchange on I-430 is the closest of Maumelle's Interstate entrances to Little Rock and therefore the most heavily used. The northbound exit to Highway 100 was widened and signalized recently to help accommodate the heavy flow. More recently, construction has started on widening of the Highway 100 across I-430 and construction of loop entrance ramps for both northbound and southbound traffic. The four-lane widening continues to the east through a new location section that straightens out a large curve. From that point, Highway 100 is programmed to be widened to four lanes to I-40.

From the east Highway 365 roughly parallels I-40 to the north until crossing over I-40 at the Morgan Interchange. Highway 365 then continues westward past the entrance to the City of Maumelle at Highway 100 and parallels I-40 all the way to the City of Conway. The

highway has two twelve-foot lanes and four-foot shoulders east of the interchange. Highway 365 was recently widened to four twelve-foot lanes and a continuous, two-way, left-turn lane with curb and gutter from Maumelle's northern entrance at the intersection with Highway 100 to the east side of the Morgan interchange. The widening included reconfiguration of the Highway 100/Highway 365 intersection to make the traffic flow from I-40 to Maumelle the through movement, thus eliminating a turn for Maumelle oriented traffic. Highway 365 traffic to and from the west must now turn at a signalized intersection at Highway 100.

Highway 100 (Maumelle Boulevard) loops around the western edge of the study area, westward from an interchange with I-430 then northward through Maumelle to Highway 365 just west of the I-40/Morgan Interchange. Maumelle Boulevard has four lanes and a median through which access is limited to significant street intersections and  $\frac{1}{4}$ -mile turnarounds. Inside the city limits of Maumelle direct curb cuts are not allowed. In the North Little Rock sections, minimum curb cut spacing is 300 feet.

Just south of the Highway 100/Highway 365 intersection, Highway 100 (Maumelle Boulevard) has an at-grade crossing of the Union Pacific Railroad's main line. The crossing is currently a single track, but the Union Pacific Railroad is planning to construct an additional track within the next 10 years to connect nearby sidings. A grade separation is programmed at this location with construction scheduled to begin in 2005.

One aspect of the road network in the study area is the lack of access between I-40 and Highway 365 although they are roughly parallel for several miles. In the southeast part of the study area, I-40 is reached from Highway 365 by a circuitous and hilly stretch of local roads across the Union Pacific Railroad's line and through the Crystal Hill community to the Crystal

Hill Road interchange, just east of the I-430/I-40 interchange. It is 6.8 miles from that interchange to the Morgan interchange via Highway 365. Oak Grove residents traveling toward North Little Rock often have the choice of waiting for a train to clear the crossing or traveling another 3.1 miles eastward to the next interchange at Military Road in Burns Park.

The North Belt Freeway is planned to extend from the northern end of I-430 to Highway 67 at the newly opened Highway 440 south of Jacksonville. This freeway is proposed to have an interchange just under a mile to the north of I-40 at Highway 365. Although the North Belt interchange at Highway 365 would help the Oak Grove community with access to I-40, there will still be approximately six miles between the I-40/Morgan interchange and the proposed Highway 365 interchange via either I-40 and North Belt or Highway 365. An approved alignment for the North Belt Freeway and a schedule for its construction have not been established.

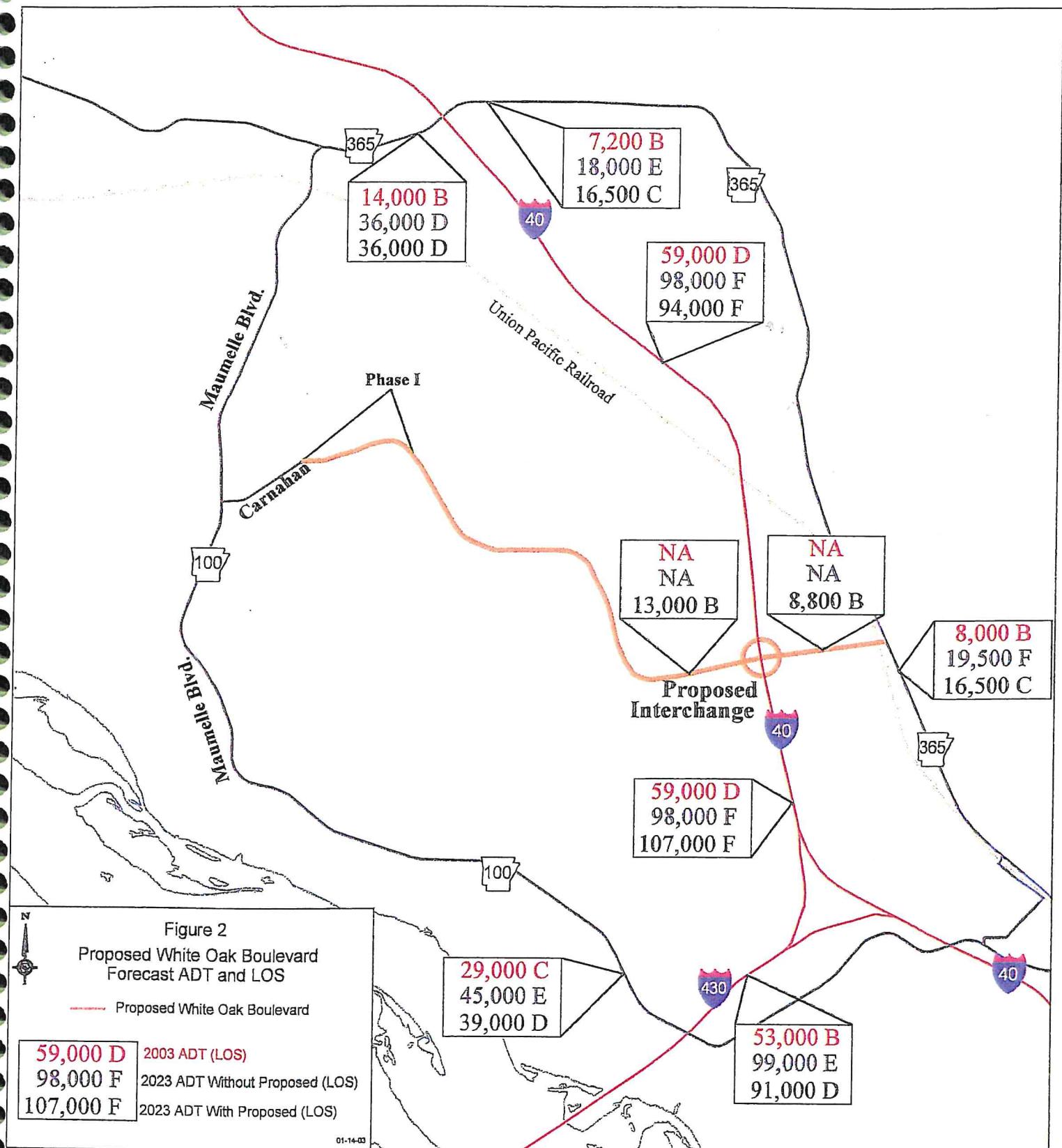
## TRAFFIC OPERATIONS

Traffic volumes in the area continue to grow as Maumelle develops. Table 2 below compares current traffic volumes to those in the 1996 study at key locations near the Interstate system. It is clear that growth in the area has accelerated as the previous 2020 forecasts have been exceeded or likely will be soon. This rapid growth is straining the capability of the existing road network. The ability of roadways to accommodate traffic is gauged by an estimated Level of Service (LOS) with A being the best with free flow traffic and LOS F the worst with stop-and-go traffic. In urban areas, a LOS D is considered acceptable. See the Appendix for additional explanation. Figure 2 shows the existing and forecast traffic and LOS at the locations included in Table 2.

TABLE 2  
ESTIMATED AVERAGE DAILY TRAFFIC (ADT)

<u>Location</u>	<u>1996 Study Estimates</u>		<u>Current Estimate</u>	
	<u>1995</u>	<u>2020</u>	<u>2003</u>	<u>2023</u>
Highway 100 (Maumelle Boulevard) west of I-430	16,000	31,000	29,000	45,000
Highway 365: west of I-40	11,000	16,000	14,000	36,000
Highway 365: east of I-40	6,300	6,900	7,200	18,000
Highway 365: south of Oak Grove Road	5,000	8,100	8,000	19,500

The high-type design of Highway 100 west of I-430 enables traffic to move at an acceptable LOS C with the current volume of 29,000 vehicles per day. However, the large volume of turning vehicles at the I-430 interchange produces significant queuing during peak traffic periods. The construction of two loop ramps now underway is designed to decrease



the amount of turning conflicts at the interchange and increase traffic flow. However, the forecast of 45,000 vehicles per day in 2023 is expected to have the highway to the west of the interchange operating at a LOS E.

Highway 365 west of I-40 at the Morgan interchange currently operates at a LOS B due to the recent improvements and an average daily traffic volume (ADT) of 14,000. However, the LOS is forecast to decrease to LOS D with 36,000 vehicles per day by 2023.

The 1996 study stated that, “existing and planned facilities can adequately address forecasted traffic. However, if forecast growth has even a moderate increase, additional access to the area will be needed.” Traffic growth on the highways entering Maumelle has clearly exceeded the forecasts in the 1996 study.

## PROPOSED ROADWAY

Since the publication of the 1996 study, the City of Maumelle has been working with land owners in the area to refine the alignment of White Oak Boulevard and ensure that the corridor is preserved as recommended in the 1996 study. The City of Maumelle is financing the portion of the proposed roadway west of White Oak Bayou through the sale of land on the eastern edge of the industrial park. In addition, efforts are underway to develop a local financing mechanism for construction of the remainder of the proposed roadway. The corridor still follows the proposed general alignment in the Maumelle and North Little Rock Master Street Plans from the intersection of Carnahan Drive and Murphy Drive in Maumelle, to a proposed I-40 interchange at the closed Morgan Rest Area, and on to the intersection of Highway 365 and Oak Grove Road.

The year 2023 traffic forecast for the proposed roadway is 13,000 vehicles per day west of I-40 and 8,800 vehicles per day east of I-40. Traffic forecast for the proposed roadway will primarily provide relief to the Highway 100/I-430 interchange. Given the large amount of undevelopable land along the corridor and with some access management, a two-lane roadway should operate at a high LOS. However, the potential for a high percentage of large trucks and additional growth indicates the need to obtain sufficient right-of-way for a future four-lane facility. Presently, the City of Maumelle is planning to obtain a 90-foot corridor with a 15-foot easement on each side.

The proposed location for an interchange on I-40 at the closed Morgan Rest Area is still available. No alterations to the Interstate Highway System have been made to alter the

original evaluation that spacing is adequate between the proposed interchange and the adjacent interchanges at I-430 and at Highway 365.

At just under 4 miles in length, the proposed roadway's estimated construction cost is now \$17 million, including the interchange with I-40, assuming that it is built as an arterial with two 12-foot lanes and eight-foot shoulders.

## SUMMARY

Since the 1996 publication of the *Maumelle/Oak Grove I-40 Interchange Feasibility Study*, growth has accelerated in the Maumelle area:

- Residential growth has remained steady with over 1,300 lots now on the market and additional neighborhoods and apartments under construction and in the planning stage.
- The Maumelle Industrial Park has continued to grow with more than 1,100 additional employees since 1996 and two additional companies expected to announce new facilities soon.
- A new middle school is planned for the west end of proposed White Oak Boulevard.
- Highway 100 (Maumelle Boulevard) in North Little Rock between Maumelle and I-430 continues to attract construction-related businesses with retail and residential growth beginning.
- Traffic growth has accelerated and exceeded previous forecasts.

Several projects have advanced that are necessary to maximize the functioning of the existing road network before additional Interstate access should be considered.

- Highway 365 at the Morgan interchange has been widened to four lanes and the Highway 365/Highway 100 intersection has been redesigned to improve traffic flow into northern Maumelle.
- A railroad grade separation on Highway 100 at the Union Pacific Railroad in north Maumelle has been scheduled for construction beginning in 2005.

- The northbound I-430 exit ramp at Highway 100 has been signalized and widened to two lanes.
- Construction has begun on the redesigned Highway 100/I-430 interchange including two loop entrance ramps and the widening of Highway 100 to the east along Crystal Hill Road.

The 1996 study stated that, “existing and planned facilities can adequately address forecasted traffic. However, if forecast growth has even a moderate increase, additional access to the area will be needed.” Since that statement was written, growth has accelerated and it can no longer be stated that planned facilities alone can adequately address forecast traffic despite continuing improvements to the area’s roadway network. The City of Maumelle continues to actively pursue development of the large area between the City and I-40.

Given the significant amount of development planning that is occurring in the area east of Maumelle, local jurisdictions should continue to pursue local funding options for the construction of White Oak Boulevard and conceptual approval from the Federal Highway Administration for a break in access along I-40.

## APPENDIX A

### Levels of Service (LOS)

#### **Two-lane Highway**

**LOS A** - LOS A represents traffic flow where motorists are able to travel at their desired speed. Passing is rarely affected and drivers are delayed no more than 35% of the time by slower drivers.

**LOS B** - Traffic speeds in LOS B drop and drivers are delayed up to 50% of the time by other drivers.

**LOS C** - At LOS C, speeds are slower than at LOS B. Although traffic flow is stable, it is susceptible to congestion due to turning traffic and slow-moving vehicles. Drivers may be delayed up to 65% of the time by slower drivers.

**LOS D** - LOS D describes unstable flow and passing becomes extremely difficult. Motorists are delayed nearly 80% of the time by slower drivers.

**LOS E** - At LOS E passing becomes nearly impossible and speeds can drop dramatically.

**LOS F** - LOS F represents heavily congested flow where traffic demand exceeds capacity and speeds are highly variable.

#### **Multi-Lane Highway**

**LOS A** - LOS A represents free flow conditions where individual users are unaffected by the presence of others in the traffic stream.

**LOS B** - Traffic flow in LOS B is stable, but other users in the traffic stream are noticeable.

**LOS C** - At LOS C, maneuverability begins to be significantly affected by other vehicles.

**LOS D** - LOS D represents dense but stable flow where speed and maneuverability are severely restricted.

**LOS E** - Traffic volumes approach peak capacity for given operating conditions at LOS E; speeds are low and operation at this level is unstable.

**LOS F** - Minor interruptions in the traffic stream will cause breakdown in the flow and deterioration to LOS F, which is characterized by forced flow operation at low speeds and an unstable stop-and-go traffic stream.