

## **Chapter 3: Trends and Forecasts**

### **A. Population**

The Institute of Economic Advancement (IEA), University of Arkansas at Little Rock has projected Craighead County population to year 2030 using the Cohort-Component Population Projections. The population projections are not available for cities within the county.

The MPO, because of its limited resources, did not compile population projections for the cities in the study area. For the update of the plan in 2010, the MPO would develop demographic data, including population, at the Traffic Analysis Zones (TAZs) level for use in a traffic model.

Table 3-1 shows the projections done by IEA in February 2005. In the next twenty five years, the ratio of the population of age groups 0 – 19 is expected to increase from 28.24 percent in 2000 to 31.02 percent in 2030. This shows that Arkansas State University will continue to attract students from other areas of the state and elsewhere. There would be about a five percent decline in the 20 – 64 age group from 2000 to 2030. The data shows a gradual increase in the over 65 age group. The population of this group is projected to increase from 11.76 percent in 2000 to 14.04 percent in 2030. This trend is in line with the aging of population in the United States. The community would have to plan for the special transportation needs of the aging population.

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**TABLE 3-1: Population Projections by Age Group  
Craighead County**

Age Group	Census 2000		Year 2005		Year 2010		Year 2020		Year 2030	
	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total	Number	Percent Total
0 – 19	23,197	28.24	25,260	27.93	28,026	28.08	35,905	29.26	50,430	31.02
20 - 64	49,289	60.00	54,635	60.42	59,771	59.88	71,094	57.93	89,305	54.94
Over 65	9,662	11.76	10,532	11.65	12,020	12.04	15,721	12.81	22,823	14.04
Total	82,148	100.00	90,427	100.00	99,817	100.00	122,720	100.00	162,558	100.00

**Source:** Institute of Economic Advancement, University of Arkansas at Little Rock, February 2005

Although population projections by ethnicity are not available, the past trend shows Hispanic and Other ethnic groups would continue to grow in the community.

### **B. Employment**

The data showing employment projections is not currently available. However, the population composition in 2030 would require service industries to accommodate the needs of aging population. Health, educational and social sectors would be major economic generators in 2030.

**C. Land Use**

The Jonesboro Arkansas Comprehensive Plan predicted an additional 7,000 to 8,000 acres to serve the projected population and employment growth until the year 2020. The comprehensive plan projected Craighead County population to be 79,300 in 2000. The actual census population in 2000 was 82,148. The population forecast of the comprehensive plan is lower than the actual population which makes one assume employment and land use projections of the comprehensive plan would also be lower.

Currently, no data source is available for the projected land use and employment figures. In the 2010 plan update, the MPO would use available data.

**D. Traffic Analysis and Forecast**

To generate forecasted traffic volumes, the staff used the traffic count data from 1995 through 2003. The MPO staff substituted the missing data by either taking the average of the counts for two consecutive years or using the average of the counts for available years and substituting that average count for the missing years.

The MPO staff used the MPO Functional Classification Street Map for determining the level of service for each classification. However, for those streets which are in the traffic count data file but not on the MPO map, they are classified as collector streets. The attached map (page 3-6) shows the functional classification of streets within the MPO Study Area.

The Level of Service (LOS) is a qualitative measure describing operational conditions within a traffic stream based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience. In addition to travel volumes, roadway LOS is affected by conditions such as the number of access points, lane width, number of lanes, and percentage of large vehicles in the traffic. The conditions characterizing the roadway LOS are summarized in Table 3-2.

**TABLE 3-2: Level of Service (LOS)**

LOS A	Best operating condition is considered free flow. Users are unaffected by the presence of others
LOS B	Reasonably free-flowing conditions. Some influence by others.
LOS C	Constrained constant flow below speed limits. Additional attention required by drivers to maintain safe operation. Comfort level of the driver declines noticeably.
LOS D	Approaching unstable flow. High passing demand, limited passing capacity. An acceptable condition for arterial and collector roadways in the community.
LOS E	Unstable flow near capacity. LOS E often quickly changes to LOS F because of disturbances in traffic flow.
LOS F	Worst conditions with heavily congested flow, traffic demand exceeding capacity. Poor travel time, low comfort and convenience.

**Source:** Florida Department of Transportation, Quality/Level of Service Handbook 2002

Table 3-3 shows LOS and generalized Annual Average Daily Volumes for Urbanized Areas. These generalized standards are adopted by the Florida Department of Transportation for general planning applications. Having no other standards available for Arkansas highways the Florida standards are adopted for analyzing the streets in the MPO area. The values shown are two-way annual average daily volumes for levels of service and are for the combined automobile and mix of traffic.

**TABLE 3-3: Generalized Annual Average Daily Volumes for Urbanized Areas**

Facility Type	Level of Service		
	C	D	E
<b>Freeway</b>			
4-lane	52,000	<b>67,200</b>	76,500
<b>Principal Arterial</b>			
5-lane	36,400	<b>37,500</b>	
4-lane	34,700	<b>35,700</b>	
3-lane	14,500	<b>17,200</b>	
2-lane	13,800	<b>16,400</b>	16,900
One-way	8,300	<b>13,100</b>	10,100
<b>Minor Arterial</b>			
5-lane	27,300	<b>34,400</b>	36,200
4-lane	26,000	<b>32,700</b>	34,500
3-lane	11,800	<b>16,200</b>	17,100
2-lane	11,200	<b>15,400</b>	16,300
One-way	6,700	<b>9,200</b>	9,800
<b>Collector</b>			
5-lane	22,800	<b>32,700</b>	34,600
4-lane	21,400	<b>31,100</b>	32,900
3-lane	9,600	<b>15,300</b>	16,400
2-lane	9,100	<b>14,600</b>	15,600
One-way	5,500	<b>8,800</b>	9,400

Source: Florida Department of Transportation, Quality/Level of Service Handbook 2002

The Linear Regression Model is applied to forecast the data for the years 2005, 2010, 2020, and 2030. Based on the forecasted Average Daily Traffic (ADT) and the capacity of the streets, the volumes to capacity (V/C) ratios are computed. The V/C is used to express the quality of traffic service on a segment of a road. A low ratio corresponds with a high level of service (LOS A or B), indicating relatively free-flowing traffic. A high V/C ratio (1.0 or higher) means conditions are congested (LOS E or F). V/C ranges are often used to define different levels of congestion. Four such ranges are listed in this Table 3-4.

**TABLE 3-4: Congestion Level**

Ratio	Capacity	Level of Service	Congestion
V/C less than 0.8	Below Capacity	A, B, or C	Little or no congestion
V/C between 0.8 and 1.0	Approaching Capacity	C, D, or E	Some intermittent congestion
V/C between 1.0 and 1.2	At capacity	E, or F	Moderate consistent congestion
V/C more than 1.2	Over capacity	F	Severe or persistent congestion

Source: Jonesboro MPO

The capacity of the roads is calculated based on the numbers of current lanes, or in the case of known improvements, the number of lanes to be constructed. The capacity figures for the Level of Service (LOS) D in Table 3-3 are used to estimate the capacity of the streets in the MPO area. This decision is taken to conserve the financial resources. There being no other dedicated funding available other than the federal funds, the competition for the funds is increasing.

Table 3-5 shows the facility type, number of lanes, and the segments of the streets where the volume to capacity ratio is 0.8 or higher in any one of the forecast years: 2005, 2010, 2020, and 2030. The volume to capacity ratios are calculated for the projected traffic on each segment compared to the theoretical capacity for those street as listed above in Table 3-3. This information would let the MPO and others agencies focus on the needed improvements of the streets to relieve or alleviate traffic congestion.

**TABLE 3-5: Volume to Capacity Ratios**

Road	Location	Facility Type and Lanes	Volume to Capacity Ratio In			
			2005	2010	2020	2030
<b>US 63</b>	Brown Lane – Longview Drive	F – 4	0.45	0.53	0.70	0.87
<b>US 49 (Stadium)</b>	Apache Drive – Race Street	PA – 5	0.68	0.78	0.98	1.18
	Sun Avenue – Dayton Avenue	PA – 5	0.77	0.91	1.17	1.44
	Highland Drive – King Street	PA – 5	0.77	0.91	1.17	1.44
	Nettleton Avenue – Stallings Lane	PA – 5	0.79	0.95	1.29	1.62
	Stallings Lane – Aggie Drive	PA – 5	0.85	1.00	1.32	1.64
	Aggie Drive – Johnson Avenue	PA – 4	0.66	0.76	0.97	1.18
<b>US 49 (Johnson Avenue)</b>	Jewell Drive – Stadium Boulevard	PA – 5	0.68	0.78	0.98	1.18
	AR 35 (Pleasant Grove Road) – AR 35 (Old Greensboro Road)	PA – 5	0.57	0.67	0.87	1.07
	CR 701 (Clinton School Road) – CR 702 (Shipley Lane)	PA – 5	0.67	0.87	1.27	1.67
<b>AR 1 (Stadium Boulevard)</b>	Lawson Road - Caraway Road	PA – 3	0.55	0.60	0.71	0.82
	Planters Drive – Orval Orlan Drive	PA – 3	1.00	1.18	1.55	1.91
<b>AR 18 (Southwest Drive)</b>	North of Haywood Drive	MA – 5	0.53	0.62	0.79	0.97
<b>AR 18</b>	CR 919 – CR 655	PA – 2	0.59	0.65	0.77	0.90
<b>AR 18 (Highland Drive)</b>	East of Church Street	MA – 5	0.70	0.77	0.92	1.06
<b>Caraway Road</b>	North of Aaron Avenue	C – 2	0.75	0.90	1.21	1.52
	Forest Home Road – Nettleton Avenue	C – 5	0.76	0.83	0.98	1.12
	UP RR – BNSF Railroad	C – 5	0.55	0.63	0.78	0.93
	Danner Avenue – Shelton Street	C – 2	0.43	0.53	0.73	0.92
<b>Harrisburg Road (AR 1 Business)</b>	In front of Memorial Park Cemetery	C – 2	0.51	0.58	0.72	0.86
<b>Main Street</b>	North of Hurricane Drive	C – 5	0.64	0.72	0.87	1.02
	Poplar Avenue – Elm Avenue	C – 4	0.51	0.57	0.69	0.81
<b>Main – Union Streets</b>	Jefferson Ave. – Jackson Ave.	C – 2 (1W)	0.77	0.84	0.98	1.12
	North of Huntington Avenue	C – 2 (1W)	0.81	0.85	0.82	0.99
	North of Cate Avenue	C – 2 (1W)	0.89	0.86	0.79	0.72
<b>Culberhouse Street</b>	North of Sartin Drive	C – 2	0.49	0.62	0.87	1.12
<b>Nettleton Avenue</b>	Vine Street – Frierson Street	MA – 3	0.82	0.86	0.93	1.01
<b>AR 226</b>	East of Friendly Hope Drive	C – 2	0.34	0.46	0.71	0.96
<b>Washington Avenue</b>	East of Church Street	MA – 3	0.72	0.83	1.05	1.26
<b>Bridge Street</b>	South of Johnson Avenue	C – 2	0.59	0.67	0.85	1.02
<b>Church Street</b>	Elms Avenue – Cherry Avenue	C - 2	0.46	0.55	0.73	0.91

**TABLE 3-5: Volume to Capacity Ratios (continued)**

<b>Race Street</b>	East of Fair Park Boulevard	C – 4	0.36	0.49	0.74	1.00
	West of Needham Street	C – 4	0.32	0.42	0.61	0.81

Abbreviations: F: Freeway PA: Principal Arterial MA: Minor Arterial C: Collector 1W: One Way

Source: MPO Traffic Forecast 2005

The above traffic forecast is based on the assumption of uniform growth on the basis of previous trends. However, the rate of growth, land use patterns and technologies change over time. The MPO will revise its assumptions based on any significant changes for future updating of the Long Range Transportation Plan.

The traffic forecast is based on the Annual Average Daily Traffic (AADT) counts. Being the average, the counts are lower than the peak traffic that occurs during rush hours in a day. Also, the counts are taken on mid-block segments on various roads and not at intersections. The capacity of a road is influenced by the capacity at an intersection. These short-comings are inherent in forecasting based on AADT. In the next update of the Long Range Transportation Plan, the MPO would use a travel demand model for better forecasting of traffic.