

# **NOACA**

## **Technical Memorandum**

### REGIONAL ECONOMIC DATA

(Includes Data Considerations for Transportation Plan Update and Preliminary Analysis of Census 2000 Long Form Data)



The Northeast Ohio Areawide Coordinating Agency (NOACA) is a public Organization serving the counties of and municipalities & townships within Cuyahoga, Geauga, Lake, Lorain and Medina (covering an area with 2.1 million people). NOACA is the agency designated or recognized to perform the following functions:

- **Serve as the Metropolitan Planning Organization (MPO), with responsibility for comprehensive cooperative and continuous planning for highways, public transit, and bikeways, as defined in the Transportation Equity Act for the 21st Century.**
- **Perform continuous water quality, transportation-related air quality and other environmental planning functions.**
- **Administer the area clearinghouse function, which includes providing local government with the opportunity to review a wide variety of local or state applications for federal funds.**
- **Conduct transportation and environmental planning and related demographic, economic and land use research.**
- **Serve as an information center for transportation and environmental and related planning.**
- **At NOACA Governing Board direction, provide transportation and environmental planning assistance to the 172 units of local, general purpose government.**

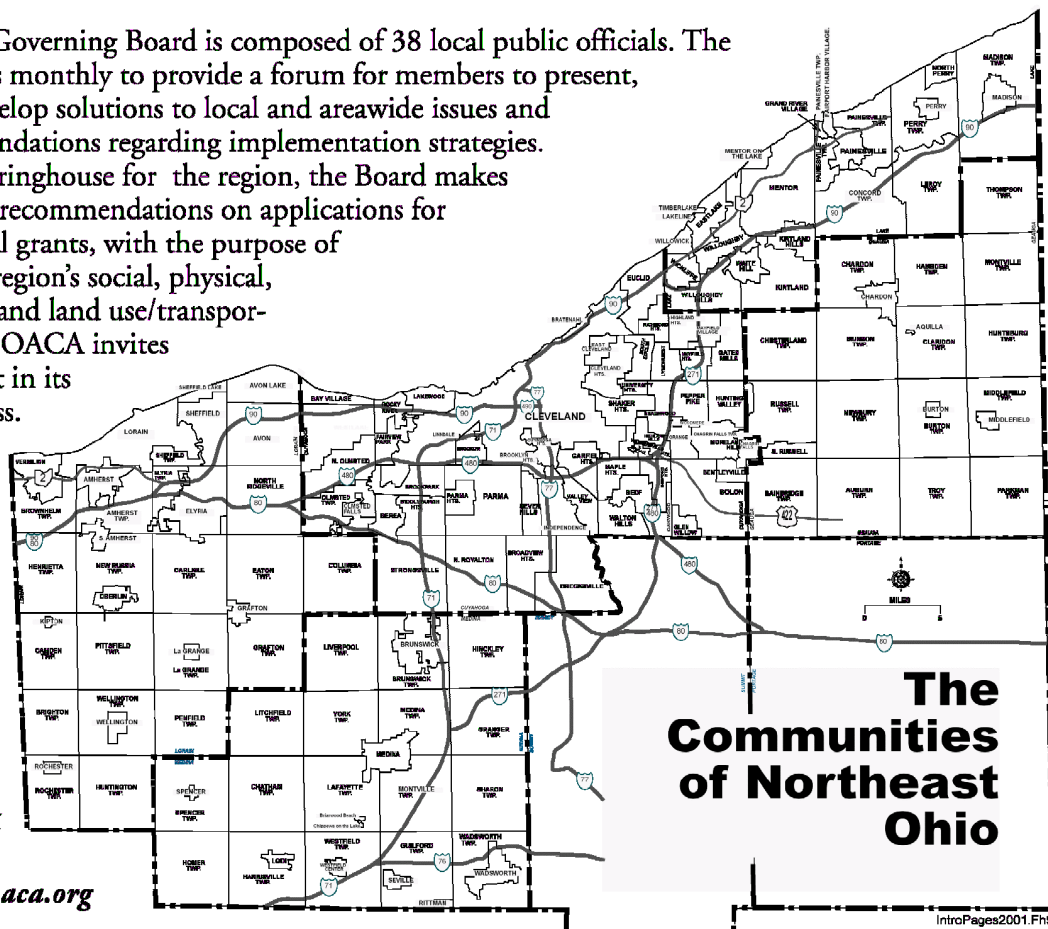
The NOACA Governing Board is composed of 38 local public officials. The Board convenes monthly to provide a forum for members to present, discuss and develop solutions to local and areawide issues and make recommendations regarding implementation strategies. As the area clearinghouse for the region, the Board makes comments and recommendations on applications for state and federal grants, with the purpose of enhancing the region's social, physical, environmental and land use/transportation fabric. NOACA invites you to take part in its planning process.

Feel free to participate, to ask questions and to learn more about areawide planning. For more information, call:

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<p>5) Performing Organization Name &amp; Address    <b>Northeast Ohio Areawide Coordinating Agency</b>  <b>1299 Superior Avenue, Cleveland, OH 44114-3204</b>  <b>Phone: (216) 241-2414 FAX: (216) 621-3024 Web site: www.noaca.org</b></p>	<p>6) Project Task No.    <b>6154 (FY 2002)</b></p>
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<p>12) Abstracts  <b>This technical memorandum contains demographic data prepared for two purposes. The section on Data Considerations for the Plan Update was prepared in March 2002 regarding the Framework for Action 2025 Transportation Plan Update. Also a brief preliminary analysis of the Census 2000 Long Form data was prepared in June and is included as part of this technical memorandum.</b></p>	
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## REGIONAL ECONOMICS RELATED DATA

(Includes Data Considerations for the Plan Update and Preliminary  
Analysis of Census 2000 Long Form Data)

June 2002

Prepared by

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## **Abstract**

The information contained in this technical memorandum was created during Fiscal Year 2002 for NOACA staff consideration. The first section contains information prepared in March 2002 regarding the *Framework for Action 2025* Transportation Plan Update. The second part of this memorandum contains a preliminary analysis of the Census 2000 Long Form data that was prepared in June 2002.

### **Data Considerations for the Plan Update**

This section of the memorandum offers an assessment of the feasibility of assembling data inputs for the Travel Demand Model (TDM) for use in the Plan Update. It will review the input requirements for the TDM and efforts needed to develop a new set of inputs. The memorandum also references a more technical review of population forecast accuracy.

### **Preliminary Analysis of Census 2000 Long Form Data**

Given the release of limited data from the “long form” of Census 2000, the following information is simply a review of some transportation related items at the county level. Cleveland is included because of its obvious influence on the Cuyahoga County number, and having included it, where possible, a “Cuyahoga less Cleveland” number has been computed. A brief demographic analysis for each of the five counties is contained in this memorandum.

## **Data Considerations for Plan Update**

This memorandum offers an assessment of the feasibility of assembling data inputs for the Travel Demand Model (TDM) for use in the Plan Update. It will review the input requirements for the TDM and efforts needed to develop a new set of inputs. The memorandum will also reference a more technical review of population forecast accuracy.

The input variables required for the TDM are of two basic types: employment characteristics and demographic characteristics. The former include employment in three categories: basic, retail and service. The latter include seven variables and include: total population, household population, household size, number of households, number of workers, household income, and school enrollment.

For input to the TDM, the above variables must be allocated to TAZs, which are aggregations of city blocks. Employment variables are allocated to the zone of employment, while demographic characteristics are allocated to zone of residence. In the existing plan, i.e., Framework For Action 2025, the planning region was divided into 1,003 TAZs. In the intervening period, NOACA Tech Support staff evaluated the TAZ configuration and model outputs and, in anticipation of Census 2000 products, determined a finer delineation of TAZ boundaries was warranted. As a result, the present TAZ file contains 1,300 zones.

At present the only Census 2000 product released is Summary File 1 (SF1), which contains population and housing unit counts down to the block level. While these data could be converted into a TAZ file, they would account for only four (total and household population, number of households, and household size) of the ten variables required for the TDM. The remaining variables must await delivery of the Census Transportation Planning Package (CTPP), which is due in Spring 2003.

In conclusion, it is clearly impossible to construct a new input file for the Plan Update based upon Census 2000. A second consideration then would be to evaluate the present forecasts and allocations to determine if revisions are necessary. At present, it is possible to evaluate population projections at the county and community level, while employment forecasts are limited to county level. Below is a summary of a more extensive such evaluation.

Table 1 provides an evaluation of regional and county population projections. As shown, the largest error occurred in Medina County where the census count exceeded the forecast by almost 8,000, or five percent. The most accurate forecast was for Lorain County where the forecast was almost 3,000 (one percent) above the census figure. In total, the regional forecast was 36,000 less than the enumeration.

Table 1  
Evaluation of County Projections: 2000

County	Census	Census	Forecast	Forecast - Census	
	1990	2000	2000	Number	Percent
Cuyahoga	1,412,140	1,393,845	1,373,000	-20,845	-1.5
Geauga	81,129	90,895	87,900	-2,995	-3.3
Lake	215,499	227,511	220,300	-7,211	-3.2
Lorain	271,126	284,664	287,400	2,736	1.0
Medina	122,354	151,095	143,200	-7,895	-5.2
NOACA	2,102,248	2,148,010	2,111,800	-36,210	-1.7

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Forecasts rounded to nearest 100.

Table 2 provides an evaluation of community allocations within county. For example, for the 59 communities in Cuyahoga County, on average the forecast missed the census count by 1,142 (whether positive or negative), which equaled 20.6 percent (plus or minus). Of the 59 communities, population was over allocated for 27, and under allocated for 32. Across the region, population was over allocated to 59 percent of the communities.

Table 2  
Evaluation of Allocations by County

County	Number of Communities	MSE	MSPE	Number	Number
				Over Allocated	Under Allocated
Cuyahoga	59	1,142	20.6	27	32
Geauga	20	295	8.9	6	14
Lake	23	847	18.5	7	16
Lorain	34	1,321	17.0	18	16
Medina	26	847	15.2	8	18
NOACA	162	1,092	20.3	66	96

Finally, evaluation of forecasted county level employment is shown in Table 3. Clearly these forecasts did not anticipate the decade long expansion that started in the early 1990s. For the region, the employment forecast was nine percent (121,000) below the reported figure for 1999. Each county was under projected, Medina by 16 percent and Lake by two percent. Further evaluation of the employment forecasts must await the CTPP which, as noted, is approximately one year away.

Table 3  
Employment Forecast Evaluation\*

	Employment 1999		Forecast - Actual	
	Reported	Forecast	Number	Percent
Cuyahoga	975.2	886.5	-88.7	-9.1
Geauga	46.2	41.5	-4.7	-10.1
Lake	123.4	121.4	-2.0	-1.6
Lorain	130.0	115.7	-14.3	-11.0
Medina	70.3	59.1	-11.2	-15.9
NOACA	1,345.2	1,224.2	-121.0	-9.0

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\* numbers in thousands

### Conclusion

The fundamental conclusion from this evaluation suggests little could be gained from an attempt to update or modify the existing forecast values. The primary geographic area for data inputs to the TDM is the TAZ. Absent precise updates, i.e., census 2000 data, at this level, there seems little reason to expend resources now for an effort that can begin in earnest in one year.

## **Preliminary Analysis of Census 2000 Long Form Data**

Given the release of limited data from the “long form” of Census 2000, the following is a brief review of some transportation related items at the county level. Table 1 displays information taken from the website of the Ohio Department of Development and is included at the end of this narrative. Cleveland is included because of its obvious influence on the Cuyahoga County number, and having included it, where possible, a “Cuyahoga less Cleveland” number has been computed.

First is a look at household change from 1990 to 2000. Medina County, with a 31 percent increase over the decade, clearly led the region. Of interest also is the five percent decline in Cleveland households. While the city did experience a much publicized construction boom, it also had a less publicized demolition program.

Note also the continued decline in household size in all jurisdictions. Bear in mind, if the regional decline continues, simple extrapolation tells us that by the Census of 4070, household size will be 0.00.

Vehicles per household continues to be a suburban phenomenon. Of the counties, only Cuyahoga had a majority of households with one or fewer vehicles, although note the Cleveland influence on this number. Geauga leads the “three +” category with 27 percent, while Cleveland has an almost equal percentage of households (25) with no vehicles available.

The next item examines the construction of the region’s housing stock and thus is really a chronology of regional development. Overall, a quarter of the region’s housing stock was constructed prior to World War II. Interestingly, half of that number is in Cleveland and coincidentally half of Cleveland’s housing stock was constructed prior to WW II.

Cuyahoga County, outside Cleveland, contains one-third of the region’s pre-WW II housing. In the 1940 – 1959 period, fundamentally post-WW II, three-quarters of the region’s housing construction occurred in Cuyahoga County, while Lake and Lorain Counties constructed over 25 percent of their housing units. Note also that by the end of this period, over 80 percent of Cleveland’s housing had been constructed.

In the 1960 – 1980 period, the four outlying counties built roughly one-third of their housing. There was a clear downturn in construction in the 1980 – 89 period, a result of the double recessions of the early 1980s. The economic expansion of the 1990s brought a construction boom that in Medina County that produced one-fourth of the county’s existing housing stock. The retrospect is as follows: regional population peaked in 1970; since then it declined 172,429 or 7.4 percent while the number of households in the region has increased by 268,235 or 29.4 percent. The increase by county is: Cuyahoga – 21 percent, Geauga – 51 percent, Lake – 43 percent, Lorain – 39 percent, Medina – 61 percent.

TABLE 1

	Cuyahoga		Geauga		Lake		Lorain		Medina		Region		Cleveland		Cuyahoga minus Cleveland	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
HOUSEHOLDS: 2000	571,457		31,630		89,700		105,836		54,542		853,165		190,638		380,819	
HOUSEHOLDS: 1990	563,243		26,906		80,421		96,064		41,792		808,426		199,787		363,456	
Percent Change 1990 - 2000	1.5		17.6		11.5		10.2		30.5		5.5		-4.6		4.8	
HH SIZE: 2000	2.39		2.84		2.50		2.61		2.74		2.47		2.44			
HH SIZE: 1990	2.46		2.98		2.65		2.76		2.90		2.56		2.48			
OWNER OCCUPIED UNITS	360,980	63.2	27,574	87.2	69,521	77.5	78,481	74.2	44,316	81.3	580,872	68.1	92,535	48.5	268,445	
VEHICLES AVAILABLE:																
none	78,005	13.7	2,182	6.9	4,300	4.8	6,967	6.6	2,189	4.0	93,643	11.0	46,841	24.6	31,164	8.2
one	228,746	40.0	6,620	20.9	28,664	32.0	33,256	31.4	12,954	23.8	310,240	36.4	83,755	43.9	144,991	38.1
two	197,395	34.5	14,157	44.8	38,917	43.4	44,042	41.6	25,204	46.2	319,715	37.5	46,198	24.2	151,197	39.7
three +	67,311	11.8	8,671	27.4	17,819	19.9	21,571	20.4	14,195	26.0	129,567	15.2	13,839	7.3	53,472	14.0
YEAR STRUCTURE BUILT:																
1990 - 2000	35,237	5.7	6,239	19.0	12,419	13.2	14,663	13.2	14,392	25.3	82,950	9.1	5,308	2.5	29,929	7.5
1980 -1989	33,571	5.4	4,246	12.9	10,429	11.2	8,137	7.3	6,761	11.9	63,144	6.9	4,103	1.9	29,468	7.3
1970 - 1979	64,007	10.4	6,294	19.2	17,579	18.8	20,796	18.7	13,465	23.7	122,141	13.4	11,504	5.3	52,503	13.1
1960 - 1969	94,706	15.4	4,441	13.5	15,854	17.0	18,414	16.5	5,938	10.5	139,353	15.3	19,392	9.0	75,314	18.8
1940 - 1959	211,636	34.3	6,591	20.1	26,621	28.5	29,345	26.3	8,478	14.9	282,671	31.0	69,185	32.1	142,451	35.5
1939 or earlier	177,746	28.8	4,994	15.2	10,585	11.3	20,013	18.0	7,759	13.7	221,097	24.3	106,352	49.3	71,394	17.8
RESIDENCE IN 1995:																
Population 5+	1,303,066		84,836		213,646		264,988		140,512		2,007,048		439,641		863,425	
Same House	776,767	59.6	57,313	67.6	133,353	62.4	157,396	59.4	84,399	60.1	1,209,228	60.2	245,503	55.8	531,264	61.5
YEAR HOUSEHOLDER MOVED INTO UNIT:																
1995 - 2000	247,941	43.4	11,155	36.4	35,844	40.0	44,433	42.0	23,288	42.7	362,661	42.5	91,758	48.2	156,183	41.0
1990 - 1994	87,651	15.3	5,918	18.7	15,543	17.3	17,644	16.7	10,176	18.7	136,932	16.0	27,629	14.5	60,022	15.8
1980 - 1989	87,790	15.4	6,236	19.7	15,630	17.4	16,211	15.3	9,286	17.0	135,153	15.8	25,019	13.1	62,771	16.5
1970 - 1979	64,589	11.3	4,473	14.1	10,738	12.0	12,989	12.3	7,171	13.1	99,960	11.7	18,857	9.9	45,732	12.0
1969 or earlier	83,486	14.6	3,848	12.2	11,945	13.3	14,559	13.8	4,621	8.5	118,459	13.9	27,370	14.4	56,116	14.7
JOURNEY TO WORK:																
Number Workers:	622,876	100.0	44,499	100.0	116,830	100.0	132,895	100.0	76,548	100.0	993,648		175,727	100.0	447,149	100.0
car,truck,van - alone	490,729	78.8	36,634	82.3	102,111	87.4	112,207	84.4	66,567	87.0	808,248	81.3	119,174	67.8	371,555	83.1
car,truck,van - carpool	56,570	9.1	4,229	9.5	8,999	7.7	12,379	9.3	5,382	7.0	87,559	8.8	23,666	13.5	32,904	7.4
pub tran	38,910	6.2	435	1.0	1,069	0.9	1,047	0.8	505	0.7	41,966	4.2	21,092	12.0	17,818	4.0
walked	15,661	2.5	554	1.2	1,517	1.3	3,228	2.4	781	1.0	21,741	2.2	7,080	4.0	8,581	1.9
other	4,752	0.8	258	0.6	568	0.5	1,075	0.8	538	0.7	7,191	0.7	1,837	1.0	2,915	0.7
wk at home	16,254	2.6	2,389	5.4	2,566	2.2	2,959	2.2	2,775	3.6	26,943	2.7	2,878	1.6	13,376	3.0
MEAN TRAVEL TIME TO WORK (minutes)																
1990	22.4		25.6		21.4		20.9		24.5				22.5			
2000	24.4		27.0		22.9		22.8		26.4				25.8			
Percent Change 1990 - 2000	8.9		5.5		7.0		9.1		7.8				14.7			
MEDIAN HOUSE VALUE	\$113,800		\$182,400		\$127,900		\$115,100		\$144,400				\$72,100			
MEDIAN HH INCOME	\$39,168		\$60,200		\$48,763		\$45,042		\$55,811				\$25,928			
PER CAPITA INCOME	\$22,272		\$27,944		\$23,160		\$21,054		\$24,251				\$14,291			

Source: Ohio Department of Development, Office of Strategic Research  
 "Ohio's Census 2000 Summary File 3 Data"

The next two items look at mobility, in the form of residence in 1995 and year the householder moved into the housing unit. Clearly the most stable part of the region is Geauga County where two-thirds of the population lives in the same house as in 1995. (Possibly, it is assuming this figure is weighted by the Amish population.) Across the region, 60 percent report the same residence as in 1995.

Just over 40 percent of the region moved into its present house in the past five years. Again, Geauga County at 36 percent is significantly lower than the remaining counties. It is interesting to compare movement into housing in the 1990-2000 period with construction over that time frame. Note that Medina County built 25 percent of its housing in 1990 – 2000, and 61 percent of its residents moved into their units in that period. In contrast, Cuyahoga County constructed only 6 percent of its housing in this time, yet 59 percent of its residents moved into their present units. Clearly, mobility is a function of more than simply new construction.

The Journey to Work data show some expected geographic distinctions. Regionally, 81 percent of workers commuted alone, 9 percent were in a carpool and 4 percent used transit. As might be expected, the latter two categories are higher, and the first is lower, in Cleveland. The highest SOV use is in Lake and Medina Counties at 87 percent. It is interesting to observe that Geauga County has a higher transit use ( one percent) than either Lake (.9 percent) or Lorain (.8 percent), both of which have more extensive systems. (Having stated that, caution should be taken. Given the closeness of the numbers, this may be sampling error.)

The travel time data show an increase in all areas of the region, with Cleveland, amazingly enough, showing the largest increase, 14.7 percent. Subsequent data releases showing place of work may shed light on this finding.

Finally the last three lines provide some wealth/income numbers.

For those who are interested, a summary file of the data is available at <http://www.odod.state.oh.us/osr/data.htm>