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# MIDLAND

SOCIO-ECONOMIC PROJECTIONS  
MIDLAND TRANSPORTATION STUDY

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## METROPOLITAN AREA TRANSPORTATION STUDY

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July 30, 1971

Mr. Sam F. Cryderman  
Engineer of Transportation Planning  
Transportation Planning Division

Dear Mr. Cryderman:

We are pleased to present this report on the socio-economic projections for the Midland Transportation Study Area. The main purpose of this report is not to list the projections, but to describe the methodology used to develop them so that a technically oriented person may reproduce the results of each study element. Such a report is required by the Federal Highway Administration in accordance with the guidelines established for Urban Transportation Planning Studies. These guidelines supplement the reporting classification that is discussed in the Highway Planning Manual (PPM), Volume 8, Chapter I, paragraph 5.

This report was prepared by Dennis Hill, project planner, under the supervision of Ralph Merrill, Unit Supervisor, Urban Planning Unit "B".

Respectfully submitted,

A handwritten signature in cursive script that reads "Robert S. Boatman".

Robert S. Boatman, Manager  
Planning Section  
Transportation Planning Division



ACKNOWLEDGMENTS

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## INTRODUCTION

The Michigan Department of State Highways, in conjunction with local participants, initiated the Midland Area Transportation Study in April of 1969. As part of the study, data pertaining to the socio-economic characteristics of the area residents was collected during the internal interviewing process. This data was needed to determine the relationships between the socio-economic characteristics of the local residents and the number and type of trips they made during the course of their everyday activities.

The study area was subdivided into 151 traffic analysis zones. The socio-economic data was coded to each zone so that traffic could be distributed among all zones.

To forecast future traffic volumes and patterns, it was necessary for the Department of State Highways and the local participants to project, at the traffic analysis zone level, all socio-economic characteristics of the local residents that were found to be influential in producing trips. The data was projected to 1980 and to 1995, although it is anticipated that only the 1995 data will be used as an input for future traffic forecasts. The socio-economic characteristics found to be significant in the Midland area were:

1. Population
2. Dwelling Units
3. Autos Available
4. Resident Labor Force
5. Geographic Employment by the following categories:
  - a. Manufacturing
  - b. Wholesale and Retail
  - c. Services
  - d. Government
  - e. Other
  - f. Total



## PURPOSE

The purpose of this report is to document the procedures and methodology used to obtain future socio-economic data for the Midland Area Transportation Study. All problems encountered and assumptions made are also documented. The forecasts are documented in sufficient detail to enable a technically oriented person to reproduce the results. This "benchmark" publication fulfills a requirement of the Federal Highway Administration in that it documents a significant phase of work undertaken during the process of conducting a transportation study.

Upon completion of the initial phases of the study, it will enter the continuing planning phase. During this phase, it will be necessary to continually monitor changes in the composition of the study area. If observed changes are not accurately reflected in the forecasts, it will be necessary to update the forecasts. This report will be a valuable "tool" in analyzing the cause for any inaccuracy of the forecasts. It will be an especially valuable tool for participants who were not involved in the initial forecasting process.

The general procedure was to project the needed data at the governmental unit level. The data was then distributed into traffic analysis zones using the governmental unit level projections as a control total. This report consists of four sections. Section I describes the area selected for the study, including the location of all governmental units and traffic analysis zones within the area. Section II outlines the methodology used to project the data at the governmental unit level. Section III describes the considerations and assumptions utilized to distribute the data into traffic analysis zones. Section IV contains tables presenting the 1980 and 1995 traffic analysis zonal data distributions.

SECTION I

STUDY AREA

The Midland Transportation Study Area envelops the area having a significant economic and/or traffic relationship to the City of Midland. The study area includes portions of Midland, Bay, and Saginaw Counties. It is made up of the following governmental units:

City of Midland  
City of Auburn  
Midland Township  
Williams Township  
Lincoln Township\*  
Larkin Township\*  
Beaver Township\*  
Homer Township\*  
Ingersoll Township\*  
Tittabawassee Township\*

The study area was subdivided into 151 traffic analysis zones. A map outlining the governmental unit and traffic analysis zone boundaries is included in the pocket on the inside of the back cover.

\* Only a portion of the township is included within the study area.

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## SECTION II

### METHODOLOGY

#### (Governmental Unit Level Forecasts)

Full use was made of all existing studies for the area. Unfortunately, there are very few existing forecasts available. The City of Midland is currently utilizing the services of Parkins/Rogers and Associates/Incorporated to prepare a Population and Economic Study. Portions of the study, including city population forecasts and county geographic employment forecasts, became available shortly after the preliminary forecasts for the Transportation Study were prepared. This presented an excellent opportunity to compare the results of the separate studies.

It was very difficult to select a projection methodology for the six townships that are only partially included within the study area. Other difficulties arose because the study area includes portions of three counties. The final methodology selected for forecasting the various socio-economic variables represents a realistic balance between available local resources, the relatively small size of the study area, and the sophistication of the forecasting methodology.

#### Population

After careful consideration, it was decided to use a variation of the trend line method for projecting population. The ratio or step-down method was considered and rejected because it was impractical for the study area which includes portions of three counties and six townships. The regression or least squares method was used with 1940, 1950, 1960,

and 1969 as the base for each governmental unit when possible. The population of the City of Midland and Midland Township were combined and projected together. This was necessary because of the annexations that have occurred in the past. The total population was divided between the two units by assuming that the population of Midland Township would continue to increase at its 1960-1969 ratio. Those townships that have only a portion of their area in the study area were also projected by using the least squares method. The total population of each of these townships was projected to 1969, 1980, and 1995 by using 1940, 1950, and 1960 as the base. The percent of the population within the study area was determined by using the 1969 Internal Address Summary data and the projected 1969 total population for each township. This percent was assumed to remain constant in the future.

This assumption could possibly cause some error in the projections for these townships. However, the error should be very small because the townships that have only a portion of their area within the study area accounted for only 3,877 people or 7.6 percent of the total study area population in 1969.

The results of the population projections are presented in Table 1.

Parkins/Rogers and Associates/Incorporated used four methods of projecting population for the City of Midland. The four methods considered various rates of births, deaths, migrations and births from migrants. The consultant's 1995 city forecast ranged from a low of 50,988 to a high of 57,867 as compared to the Transportation Study forecast of 54,786. Because of the favorable comparisons, the forecast of 54,786 was chosen as the 1995 population for the City of Midland

Table 1

MIDLAND STUDY AREA  
Population Projections

AREA	1940	1950	1960	1969	1980	1990	1995
Midland City	10,329	14,285	27,779	34,764	43,056	50,876	54,786
Midland Township	3,442	5,320	2,268	2,789	3,449	4,049	4,349
Total	13,771	19,605	30,047	37,553	46,505	54,925	59,135
Williams Township	2,212	2,131	3,404	5,034	5,697	6,687	7,182
Auburn City	---	869	1,497	1,906	2,546	3,096	3,371
Homer Township*	1,467	2,196	3,304	2,728	3,395	4,001	4,305
Lincoln Township*	503	739	1,000	374	458	534	634
Larkin Township*	1,068	1,451	2,032	1,613	1,965	2,284	2,444
Beaver Township*	1,336	1,436	1,783	1,160	1,306	1,440	1,506
Tittabawassee Twp.*	1,883	2,378	3,150	536	635	725	770
Ingersoll Twp.*	1,551	1,589	1,937	192	217	229	239
Total Study	---	---	---	51,096	62,745	73,921	79,586

## Area Population

SOURCE: 1940, 1950, 1960 U.S. Department of Commerce, Bureau of the Census.  
1969 Internal Address Summary Data

Projection Method: Least Squares Base, 40, 50, 60, 69 - Midland City and Township Combined, & Williams Twp.  
60, 69 - Midland Township  
50, 60, 69 - City of Auburn  
40, 50, 60 - Remaining areas assuming constant 1969 ratio of study area population to total 1969 projected area population. (67.84% for Homer Twp., 20.78% for Lincoln Twp., 66.30% for Larkin Twp., 59.73% for Beaver Twp., 14.70% for Tittabawassee Twp., and 6.99% for Ingersoll Twp.)

\* The 1940, 50, and 60 population is that of the total township. The 1969, 80, and 95 population is for only that portion of the township that is in the study area.

All existing forecasts for the remaining governmental units were prepared in the early and mid 1960's and proved to be generally low when compared to 1970 census data. It was necessary to rely upon the judgment of local technicians as to the reliability of the forecast.

Dwelling Units (Occupied)

Recent historic dwelling unit (d.u.) trends for most of the governmental units could only be obtained for 1960 (Bureau of the Census) and for 1969 (Internal Interview Survey). The basic method used to project dwelling units for each governmental unit was to analyze the 1960 and 1969 number of occupied d.u.'s and the number of persons per d.u. (see Table 2). An analysis of this data indicates that the number of persons per d.u. has generally declined slightly or remained relatively constant for the governmental units from 1960 to 1969. This trend parallels the national trend as shown below:

<u>Year</u>	<u>Average Population Per Household</u>
1940	3.67
1950	3.37
1955	3.33
1960	3.33
1966	3.30

SOURCE: Current Population Reports. Population Characteristics; Household and Family Characteristics, March, 1966, U.S. Bureau of the Census.

The number of persons per d.u. is higher for the study area than for the nation. This can be attributed partly to the difference in

Table 2

## MIDLAND AREA

## OCCUPIED DWELLING UNIT TRENDS

Area	1960		1969	
	Dwelling Units	Population Per Dwelling Unit	Dwelling Units	Population Per Dwelling Unit
City of Midland	7,531	3.7	9,724	3.5
Midland Township	573	4.0	734	3.8
Williams Township	829	4.1	1,291	3.9
Auburn City	382	3.9	454	4.2
Homer Township*	824	4.0	699	3.9
Larkin Township*	500	4.1	393	4.1
Lincoln Township*	247	4.1	91	4.1
Tittabawassee Twp.*	843	3.8	132	4.1
Beaver Township*	419	4.3	283	4.1
Ingersoll Township*	508	3.8	51	3.9

SOURCE: 1960 Data, U.S. Department of Commerce, Bureau of the Census; 1969 data, Transportation Study Internal Interview data.

NOTES: \*These townships are only partially included within the study area. The 1960 population per d.u. rates were compiled using total township population and d.u. data. The 1969 rates were calculated using population and d.u. data for the portion of the township included in the study area.

the definition of a d.u. and the definition of a household. The trend toward a smaller number of persons per d.u. should, however, prevail in the study area.

The 1980 and 1995 number of persons per d.u. for each governmental unit in the study area was chosen assuming that a decreasing rate would prevail in the future. The number of persons per d.u. for the study area decreased from 3.63 in 1969 to 3.57 in 1980 and to 3.48 in 1995. The results of the population, dwelling unit, auto and resident labor force projections are summarized in Tables 3, 4, 5, and 6.

#### Autos Available

Since the invention of the automobile, a prevailing trend has been toward an increasing number of automobiles per person. The projection of autos available for each governmental unit within the study area assumes that this trend will continue in the future.

To determine the rate of increase of autos per person for the study area, it was necessary to utilize past vehicle registration trends for Midland and Bay Counties.

There are many disadvantages associated with using vehicle registration figures, however, it is the only source of past trends. A major disadvantage is that vehicle registration data is available only at the county level. A possible source of error in the data is due to the fact that a resident of the State of Michigan does not have to purchase his license plates in the county in which he resides. Another source of error is incorporated into the data because it is possible to transfer license plates from one vehicle to another.



Autos per person figures for Midland and Bay Counties were projected to 1980 and 1995 using the least squares or regression technique with 1940, 1950, 1960, and 1970 as the base. Autos per person data is available for each governmental unit within the study area for 1969 through the Transportation Study Internal Interview Summary data. The possibility of error associated with vehicle registration data was accounted for by using the 1969 internal address auto per person data for each governmental unit and assuming that it would increase proportionally to the projected county figures. Midland County autos per person projections were used to calculate increases for governmental units in the county while Bay County was used for units within it. This method resulted in a 98.9 percent increase in autos for the study area from 21,085 in 1969 to 41,945 in 1995.

#### Resident Labor Force

The resident labor force data does not give the physical place of employment, but the number of residents of each governmental unit that are employed. Projections assume that the 1969 resident labor force participation rate (employed resident labor force as a percent of total population) will remain constant in the future.

Data on historic labor force trends is available for the City of Midland. Data for most other areas is available only for 1969. The labor force participation rate for the city has remained relatively constant during the past thirty years (35.9 percent in 1940, 36.1 percent in 1950, 34.3 percent in 1960, and 36.5 percent in 1969).

The employed resident labor force of Midland City was also projected using the least squares method with 1940, 1950, 1960, and 1969 data as the base. This resulted in a 1980 resident labor force of 15,377 as

Table 3

## MIDLAND AREA TRANSPORTATION STUDY

Socio-Economic Data  
1969

	Total Population	Dwelling Units (Occupied)	Population Per Dwelling Unit	Autos	Autos Per Person	Autos Per Dwelling Unit	Resident Labor Force	Labor Force Participation Rate
City of Midland	34,014	9,724	3.5	14,904	.429	1.49	12,700	36.53
Midland Township	2,789	734	3.8	1,062	.381	1.45	955	34.24
Williams Township	5,034	1,291	4.1	2,520	.363	1.44	2,205	31.77
Auburn City	1,906	454	3.9					
Homer Township	2,728	699	4.1	1,115	.409	1.60	939	34.42
Larkin Township	1,613	393	4.1	633	.393	1.61	579	35.89
Lincoln Township	374	91	4.1	136	.364	1.49	109	29.15
Tittabawassee Township	536	132	4.1	214	.399	1.62	168	31.34
Beaver Township	1,160	283	4.1	420	.362	1.48	374	32.31
Ingersoll Township	192	51	3.9	81	.422	1.59	106	55.21
TOTAL	50,346	13,852	3.63	21,085	.413	1.52	18,135	35.71

SOURCE: Midland Transportation Study, Internal Address Summary Data

Table 4

## MIDLAND AREA TRANSPORTATION STUDY

Socio-Economic Data  
1980

	Total Population	Dwelling Units (Occupied)	Population Per Dwelling Unit	Autos	Autos Per Person	Autos Per Dwelling Unit	Resident Labor Force
City of Midland	43,056	12,408	3.5	19,978	.464	1.61	15,728
Midland Township	3,449	932	3.7	1,425	.413	1.53	1,181
Williams Township	5,697	1,499	3.8	3,404	.413	1.58	2,619
Auburn City	2,546	652	3.9	1,504	.443	1.63	1,169
Homer Township	3,395	918	3.7	837	.426	1.62	705
Larkin Township	1,965	517	3.8	181	.394	1.50	134
Lincoln Township	485	120	3.8	288	.454	1.70	199
Tittabawassee Twp.	635	169	3.8	538	.412	1.65	421
Beaver Township	1,306	327	4.0	96	.457	1.75	117
Ingersoll Township	211	55	3.8				
<b>TOTAL</b>	<b>62,745</b>	<b>17,597</b>	<b>3.57</b>	<b>28,251</b>	<b>.450</b>	<b>1.61</b>	<b>22,273</b>

Table 5

## MIDLAND AREA TRANSPORTATION STUDY

Socio-Economic Data  
1995

	Total Population	Dwelling Units (Occupied)	Population Per Dwelling Unit	Autos	Autos Per Person	Autos Per Dwelling Unit	Resident Labor Force
City of Midland	54,786	16,068	3.4	29,639	.541	1.84	20,013
Midland Township	4,349	1,292	3.4	2,092	.481	1.62	1,489
Williams Township	7,182	1,941	3.7	5,213	.494	1.84	3,353
Auburn City	3,371	887	3.8				
Homer Township	4,305	1,196	3.6	2,226	.517	1.86	1,482
Larkin Township	2,444	661	3.7	1,214	.497	1.84	877
Lincoln Township	634	171	3.7	291	.459	1.70	185
Tittabawassee Twp.	770	213	3.6	402	.522	1.89	241
Beaver Township	1,506	397	3.8	743	.493	1.87	487
Ingersoll Township	239	65	3.7	125	.533	1.92	131
TOTAL	79,586	22,874	3.48	41,945	.527	1.83	28,258

Table 6

MIDLAND AREA TRANSPORTATION STUDY

Percent Changes

	Population			Occupied Dwelling Units			Autos		
	69 - 80	80 - 95	69 - 95	69 - 80	80 - 95	69 - 95	69 - 80	80 - 95	69 - 95
City of Midland	23.85	27.24	57.59	27.60	29.50	65.24	34.05	48.36	98.87
Midland Township	23.66	26.09	55.93	26.98	38.63	76.02	34.18	46.81	96.99
Williams Township	13.17	26.07	42.67	16.11	29.49	50.35	35.08	53.14	106.87
Auburn City	33.58	32.40	76.86	43.61	36.04	95.38			
Homer Township	24.45	26.80	57.81	31.33	30.28	71.10	34.89	48.01	99.64
Larkin Township	21.82	24.38	51.52	31.55	27.85	68.19	32.23	45.04	91.78
Lincoln Township	29.68	30.72	69.52	31.87	42.50	87.91	33.09	60.77	113.97
Tittabawassee Twp.	18.47	21.26	43.66	28.03	26.04	61.37	34.58	39.58	87.75
Beaver Township	12.59	15.31	29.83	15.55	21.41	40.28	28.10	38.10	76.90
Ingersoll Township	9.90	13.27	24.48	7.84	18.18	27.45	18.52	30.21	54.32
<b>TOTAL</b>	<b>22.80</b>	<b>26.84</b>	<b>55.76</b>	<b>27.04</b>	<b>29.99</b>	<b>65.13</b>	<b>33.99</b>	<b>48.47</b>	<b>98.93</b>

-14-

	69 - 80	80 - 95	69 - 95
Population Per D.U.	- 1.65	- 2.52	- 4.13
Autos Per Person	8.96	17.11	27.60
Autos Per D.U.	5.92	13.66	20.39

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compared to 15,728 when assuming a constant 1969 labor force participation rate. Comparable figures for 1995 are 19,558 and 20,013, respectively. The similarity of the results indicates that it is reasonable to assume a constant labor force participation rate.

#### Geographic Employment (by Category)

Historic employment data for the governmental units that compose the study area is available only on a limited basis. Employment for 1969 was compiled by the City of Midland Planning Department on a traffic analysis zone level from data obtained from the Michigan Employment Security Commission (MESC). All employment not covered by the MESC data was estimated by the City Planning Department.

The first method used to project employment assumed that the ratio of study area population to study area employment in 1969 will remain stable through 1995. Using the 1980 and 1995 Transportation Study population forecasts, this method resulted in an employment figure of 27,944 in 1980 and 35,444 in 1995. The second method assumed that the ratio of study area resident labor force to geographic employment in 1969 will remain stable through 1995. This method resulted in similar projections. However, the similar results were expected because the resident labor force was projected assuming that its relationship to population (participation rate) would remain stable in the future.

Parkins/Rogers and Associates/Incorporated projected Midland County geographic employment in their "Population and Economic Study" for the City of Midland. The economic section of the study included an analysis of the shift-share ability of the various employment categories, income sources, and historic county and state employment trends.

The report indicates that the total geographic employment of Midland County is expected to increase 21.38 percent from 1969 to 1980 and 55.16 percent from 1969 to 1995, or from 24,419 in 1969 to 29,640 in 1980 to 37,888 in 1995. Assuming the same percentage increase for the study area results in a 1980 employment figure of 27,216 and a 1995 figure of 34,789. This seems to be a valid assumption because the geographic employment of Midland County and the study area are very similar. The City of Midland accounts for approximately 90 percent of the total employment of the county and of the study area. Because of the similarity of the results of the two projection methods it was decided to use the study area employment forecast of 27,216 in 1980 and 34,789 in 1995.

The next step is to distribute the total projected geographic employment into various categories. The categories needed as an input to the trip generation model are: manufacturing, wholesale and retail trade, services, government, and other. To determine the percentage distribution of the total geographic employment among the five categories it was assumed that the 1980 and 1995 county percentages for each category would be similar to those for the study area. An analysis of the 1969 county and study area percentages in each category (see Table 7) indicated that they are similar, however, some differences are evident. Manufacturing, including chemicals, and services are very similar. The largest differences occur in the wholesale and retail trade category (13.38 percent for the county and 9.96 percent for the study area) and in the government category (4.01 percent for the county and 7.55 percent for the study area). The study area government category includes school

Table 7

## GEOGRAPHIC EMPLOYMENT TRENDS

	<u>MIDLAND COUNTY</u>									<u>TRANSPORTATION STUDY AREA 1969 MESC*</u>
	<u>1959</u>	<u>1962</u>	<u>1965</u>	<u>1968</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>(1995)</u>	<u>(1969)</u>	
Manufacturing	11,969	12,992	13,000	15,716	16,655	18,555	20,450	19,503	15,945	14,566
Chemical	11,103	12,295	12,092	13,703	15,062	16,350	17,600	16,975	13,813	13,390
Wholesale	192	312	268	240	308	338	378	358	249	2,233
Retail	1,547	1,653	2,000	2,437	3,570	4,476	5,684	5,080	2,531	1,698
Government	602	707	855	938	1,484	1,832	2,296	2,064	988	2,362
Service	1,111	1,351	1,718	2,122	3,446	4,466	5,826	5,146	2,242	1,568
Other	808	1,206	1,314	2,308	4,177	5,119	6,355	5,737	2,464	
Total	16,229	18,221	19,155	23,761	29,640	34,786	40,989	37,888	24,419	22,422
	<u>PERCENT OF TOTAL</u>									
	<u>1959</u>	<u>1962</u>	<u>1965</u>	<u>1968</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>(1995)</u>	<u>(1969)</u>	<u>1969*</u>
Manufacturing	73.75	71.30	67.87	66.15	56.19	53.34	49.89	51.48	65.30	64.97
Chemical	68.42	67.48	63.13	57.67	50.82	47.00	42.94	44.80	56.56	59.72
Wholesale	1.18	1.71	1.40	1.01	1.04	0.97	0.92	0.94	1.02	9.96
Retail	9.53	9.07	10.44	10.26	12.04	12.87	13.87	13.41	10.36	7.55
Government	3.71	3.88	4.46	3.95	5.01	5.27	5.60	5.45	4.05	10.53
Service	6.85	7.42	8.97	8.92	11.63	12.83	14.22	13.58	9.18	6.99
Other	4.98	6.62	6.86	9.71	14.09	14.72	15.50	15.14	10.09	
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

SOURCE: "Population and Economic Study For City of Midland, Michigan, January, 1971," Parkins Rogers and Associates, Calculations by Urban Planning Unit "B", Michigan Department of State Highways. (1969) and (1995) employment data was calculated assuming a constant annual increase from 1968 to 1980, and from 1990 to 2000.

\* MESC data as compiled by City of Midland Planning Department for Midland Transportation Study Area.



employees while the county government category includes only city employees. To account for the differences in the county and study area's percentage distributions among employment categories, it was assumed that the 1980 and 1995 study area percentages would change at the same rate as those for the county, but in proportion to the difference observed in 1969.

Using the wholesale and retail trade category as an example, the following formula was used:

$$\frac{12.38 \text{ (1969 county percentage)}}{14.35 \text{ (1995 county percentage)}} = \frac{9.96 \text{ (1969 study area percentage)}}{X}$$

Where X = 1995 study area percentage

Table 8 shows the projections for the various employment categories for 1980 and 1995.

There are some inherent assumptions that must be considered to properly qualify the employment projections. The major generator of past employment increases has been the manufacturing category which accounted for 65 percent of the total study area employment in 1969. By far, the most important employer in the study area is the Dow Chemical Corporation which accounted for 13,390 employees in 1969 or 91.93 percent of the total manufacturing industry. If the employment in the study area is to increase as projected, the major employer will probably continue to be the Dow Chemical Corporation, or possibly, a combination of expansion of existing industries and an influx of new industries. If the Dow Chemical Corporation continues to dominate the manufacturing category with 91.9 percent of the manufacturing employment, it will employ 13,989 people in 1980 and 16,377 people in 1995.

Although the employment of the Dow Chemical Corporation holds the key to future growth in the study area, it is very difficult to project

Table 8

MIDLAND TRANSPORTATION  
STUDY AREA GEOGRAPHIC EMPLOYMENT

<u>Category</u>	1969		1980		1995	
	<u>Percent of Total</u>	<u>Number</u>	<u>Percent of Total</u>	<u>Number</u>	<u>Percent of Total</u>	<u>Number</u>
Manufacturing	64.97	14,566	55.91	15,217	51.21	17,815
Wholesale & Retail	9.96	2,233	10.52	2,863	11.55	4,018
Services	10.53	2,362	13.45	3,660	15.58	5,420
Government	7.55	1,693	9.34	2,542	10.16	3,535
Other	6.99	1,568	10.78	2,934	11.50	4,001
TOTAL	100.00	22,422	100.00	27,216	100.00	34,789

future growth in the chemical industry. There are many factors that influence future growth potential.

The future expansion of the Dow Chemical Corporation is not totally dependent upon the national growth of the chemical industry, but also upon the competitive position of the Midland division in relationship to the four other divisions that comprise the Corporation. The Midland division could, therefore, remain stable, expand, or even be entirely phased out over a long period of time. The following excerpts concerning the factors limiting Dow Chemical Corporation growth were taken from the "Population and Economic Study" as prepared by Parkins/Rogers and Associates/Incorporated:

"Most of the products produced and sold by the Midland division are not purchased by the ultimate consumer but rather by manufacturers who make the finished product. Most of the customers of the Midland division are market oriented and locate near the final consumer. For them, it is cheaper to have raw materials in bulk quantities shipped to them rather than ship the finished product a long distance. Thus, the cost of shipping these inputs will be one factor in determining from whom they purchase. Since Midland is located almost 150 miles north of the major transportation routes which flow between Detroit and Chicago this tends to work to its disadvantage. The cost of the raw materials to the Midland division of the Dow Chemical Corporation also is a factor in determining its competitive position. For example, hydro carbons used in the production of many of its products are cheaper on the West Coast than in Midland. These factors are causing a general trend for decentralization in the Chemical Industry as these suppliers of inputs are locating near their markets, the producer of the final products.

"Probably the biggest roadblock facing the Dow Chemical Corporation in Midland is the proposed atomic Power Plant. An application has been made for a permit to construct such a plant and hearings are presently being held. If this application is approved, then a second approval for operation of the plant will have to be obtained when it is finally constructed. This plant would produce nuclear power and replace the present fossil fuels being used such as coal, gas and oil. These sources of power are expensive

and in many instances in short supply. It would be very hard for a large operation like the Midland division to use fossil fuels and compete in the long run with another plant using atomic power. Thus, if any long term economic expansion in the Midland area is to emanate from the Dow Chemical Corporation, a nuclear power plant is almost a necessity. Even if it is approved, any advantage will only last for a short period of time as it is expected that competitors, either nationwide or abroad, will ultimately be using this source of power or will have to reduce their scope of operations considerably.

"Internally, the employees of the Midland division are becoming more technically oriented and less concentrated in production activity. Many production operations in the Chemical industry as in others are becoming mechanized. Thus, many bulk products are being replaced with specialized goods. At this point in time, it is estimated that the firm in Midland will be able to increase its output to meet its expected demand in the next five years without any significant increase in personnel. After that period any expansion will depend upon the solution of the above problems."

Because of the importance and the uncertainties involved it will be especially important to monitor changing trends in the growth and composition of the study area geographic employment. If changing trends render the projections invalid, it will not only be necessary to adjust the employment projections but to determine their impact on the overall growth of the area.

### SECTION III

#### TRAFFIC ANALYSIS ZONAL DISTRIBUTIONS

The projected governmental unit control total data served as the basis for distributing the required data into traffic analysis zones. The first step in distributing the data was to prepare a future land use plan utilizing the services of all available planners who were familiar with various facets of local growth. Sources used included the following:

Midland City Planning Department

Midland County Department of County Development

Bay County Regional Planning Commission

Parkins/Rogers and Associates/Inc., Planning Consultants -  
Midland City

Vilican-Leman & Assoc., Inc., Planning Consultants -  
Midland County

Raymond W. Mills & Assoc. Inc., Planning Consultants - Williams  
Township

Among the factors considered in developing the future land use plan were existing zoning regulations, utility service area policies, subdivision regulations, platted but undeveloped subdivisions, direction and extent of past growth, and topographic and soil characteristics which could limit or restrain man-made development. Among the more pertinent factors considered during the preparation of the future land use plan were:

### Dwelling Units and Population

Dwelling units were distributed by densities permitted by zoning regulations, local trends and proposed future land use districts. Within the City of Midland single family dwellings average 2.7 units per acre and multi-family 15 units per acre. The present city limits contain enough vacant land to house approximately 70 thousand people at the present density pattern. If the national trend of increasing multi-family dwellings prevails in Midland, holding capacity could increase to 85 thousand more or less. At present density standards, the city may be totally developed by the year 2000.

Residential growth in the Midland County portion of the study area is expected to fringe the Midland city limits. At present, utilities are not available within the study area outside of the Midland city limits. There is no set pattern of growth in the area. Development generally is scattered along major highways and county roads with very few recorded subdivisions.

Williams Township growth is predicted to be concentrated north and south of Midland Road; it will be possible to service this area with utilities in the future. Predominantly, the outlying areas are developed with half-acre lots or greater.

### Industrial Development

Major industrial activity is anticipated to develop south and east of the existing industrial complexes now located within the city. Future growth will spread into the southeastern portion of Williams Township. Approximately twelve square miles of vacant lands are either zoned

or proposed for industrial use. Industrial employment has been distributed on the basis of six workers per acre. Proposed industrial areas could house 46 thousand new employees. Much of the area is held by the two major chemical employers in the area with the Dow Corning Corporate Center under construction in Williams Township (intersection of U.S. 10 and M-47).

#### Commercial and Government Employment

Commercial and government employment opportunities are developing predominantly within the City of Midland and this trend is anticipated to continue. Some development may occur at various interchanges along the US-10 Freeway and distributions have been made on this assumption. Employment densities for retail establishments are based upon twenty-three employees per acre. Service businesses have twenty-five employees per acre and office services thirty-five employees per acre. Governmental employments have been distributed at thirty-five employees per acre and includes school employment (three separate school systems). All school systems, including Northwood Institute, and other large institutions were contacted to determine the direction and magnitude of their anticipated growth.

#### Resident Labor Force and Autos Available

Resident labor force and autos available data were first distributed into traffic analysis zones by assuming that the projected rates per person for each governmental unit would be constant for each zone within a particular unit. This distribution was then revised by analyzing 1969

traffic analysis zonal information as obtained through the internal interviewing process of the Transportation Study. All zones that had a resident labor force participation rate or an autos per person rate in 1969 that deviated significantly from the average for that particular governmental unit were treated separately. All zones that were estimated to change from a rural character in 1969 to an urban character in the future were also treated separately.



SECTION IV

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SOCIO-ECONOMIC DATA  
MIDLAND AREA - 1980

<u>ZONE</u>	<u>DWELLING UNIT</u>	<u>POPULATION</u>	<u>AUTOMOBILES</u>	<u>RESIDENT LABOR FORCE</u>
1	10	35	16	13
2				
3				
4				
5				
6	36	126	58	46
7	15	53	24	19
8	62	217	100	79
9	58	203	93	74
10	103	361	166	132
11	93	326	148	119
12	114	399	183	146
13	73	256	117	93
14				
15	105	367	169	134
16	136	476	219	174
17	103	361	166	132
18	36	126	58	46
19	279	977	449	367
20	147	515	237	188
21	178	623	287	227
22	65	228	105	83
23	81	81	130	29
24				
25	115	403	185	147

<u>ZONE</u>	<u>DWELLING UNIT</u>	<u>POPULATION</u>	<u>AUTOMOBILES</u>	<u>RESIDENT LABOR FORCE</u>
26	60	210	97	77
27				
28	35	123	56	45
29				
30				
31				
32	25	88	40	32
33	25	88	40	32
34				
35				
36	26	91	42	33
37	357	1,250	575	457
38	138	483	222	176
39	40	140	64	51
40	96	336	156	123
41				
42	206	721	332	263
43	222	777	357	284
44	197	690	317	252
45	119	417	188	152
46	227	794	365	290
47	36	126	58	46
48	6	21	7	8
49	86	301	138	110
50	70	245	113	89

<u>ZONE</u>	<u>DWELLING UNIT</u>	<u>POPULATION</u>	<u>AUTOMOBILES</u>	<u>RESIDENT LABOR FORCE</u>
51	150	525	242	192
52	346	1,211	557	442
53	430	1,505	692	550
54	326	1,141	525	417
55	297	1,039	478	380
56	300	1,050	483	384
57				
58	238	833	383	304
59				
60	107	374	172	137
61				
62	410	1,435	660	524
63	351	1,229	565	449
64	252	882	406	322
65	401	1,404	646	513
66	331	1,158	533	423
67	95	333	153	122
68	308	1,078	496	393
69	13	48	20	16
70	370	1,295	596	473
71	572	2,002	921	731
72	664	2,324	1,069	850
73	42	147	68	54
74	486	1,701	554	621
75	516	1,806	831	660

<u>ZONE</u>	<u>DWELLING UNIT</u>	<u>POPULATION</u>	<u>AUTOMOBILES</u>	<u>RESIDENT LABOR FORCE</u>	
76	11	38	18	14	
77*	18	63	29	23	*Northwood Ins't. 1,250
78	88	326	148	112	
79	99	366	161	126	
80	23	87	35	25	
81	54	205	81	60	
82	142	539	225	183	
83	106	403	171	145	
84	61	232	99	83	
85	108	410	175	147	
86	71	269	115	97	
87	81	315	133	108	
88	62	248	102	80	
89	134	536	221	173	
90	89	345	143	111	
91	103	399	166	128	
92	149	563	234	192	
93	80	303	126	97	
94	18	68	28	22	
95	59	224	93	71	
96	140	541	221	171	
97	262	1,017	414	323	
98	135	513	213	163	
99	97	369	153	117	
100	333	1,232	529	410	

<u>ZONE</u>	<u>DWELLING UNITS</u>	<u>POPULATION</u>	<u>AUTOMOBILES</u>	<u>RESIDENT LABOR FORCE</u>
101	130	494	205	160
102	140	532	221	169
103	293	1,143	463	363
104	113	436	178	138
105	21	80	33	25
106	91	346	149	110
107	47	179	74	57
108	43	163	68	52
109	75	285	123	90
110	23	87	38	28
111				
112	99	376	156	119
113	21	80	33	25
114	34	129	58	40
115	103	392	178	170
116	14	53	25	29
117	26	91	42	33
118	39	144	60	49
119				
120	308	1,078	496	394
121	166	581	267	212
122				
123	280	980	451	358
124	89	312	143	114
125				

<u>ZONE</u>	<u>DWELLING UNIT</u>	<u>POPULATION</u>	<u>AUTOMOBILES</u>	<u>RESIDENT LABOR FORCE</u>
126	12	42	19	15
127	240	840	386	307
128				
129	161	596	246	204
130				
131				
132				
133				
134				
135				
136				
137	71	249	114	91
138	25	88	40	32
139	220	814	337	297
140	71	263	109	90
141	61	226	93	77
142	86	318	135	109
143	284	1,051	441	360
144				
145	5	16	8	5
146	71	263	116	91
147	71	263	116	91
148	183	677	298	233
149	37	130	60	47
150	241	844	388	308
151	306	1,132	499	390
	17,720	63,330	28,206	22,513

SOCIO-ECONOMIC DATA

MIDLAND - 1995

<u>ZONE</u>	<u>DWELLING UNIT</u>	<u>POPULATION</u>	<u>AUTOMOBILES</u>	<u>RESIDENT LABOR FORCE</u>
1	10	34	18	12
2				
3				
4				
5				
6	36	122	66	44
7	15	51	28	19
8	62	211	114	77
9	58	197	107	72
10	103	350	190	128
11	93	316	171	115
12	114	388	210	142
13	73	248	134	91
14				
15	105	357	193	130
16	136	462	250	169
17	103	350	190	128
18	36	122	66	45
19	279	949	513	347
20	147	500	270	183
21	178	605	328	221
22	65	221	120	81
23				
24				
25	115	391	212	143



<u>ZONE</u>	<u>DWELLING UNIT</u>	<u>POPULATION</u>	<u>AUTOMOBILES</u>	<u>RESIDENT LABOR FORCE</u>
26	30	102	55	37
27				
28				
29				
30				
31				
32				
33	15	51	28	19
34				
35				
36				
37	457	1,554	840	568
38	138	469	254	171
39	40	136	74	50
40	96	326	177	119
41				
42	206	700	379	256
43	222	755	408	276
44	197	670	362	245
45	119	405	219	148
46	227	772	418	282
47	36	122	66	45
48	6	20	11	7
49	86	292	158	107
50	70	238	129	87

<u>ZONE</u>	<u>DWELLING UNIT</u>	<u>POPULATION</u>	<u>AUTOMOBILES</u>	<u>RESIDENT LABOR FORCE</u>
51	150	510	276	186
52	346	1,176	637	429
53	430	1,462	791	534
54	326	1,108	600	408
55	297	1,010	546	369
56	300	1,020	552	373
57				
58	238	809	438	296
59				
60	107	364	197	133
61				
62	410	1,394	754	509
63	351	1,193	646	436
64	252	857	464	313
65	401	1,363	738	498
66	331	1,125	609	411
67	242	823	445	301
68	308	1,047	567	382
69	33	112	53	39
70	682	2,319	1,259	847
71	1,966	6,684	3,617	2,442
72	1,354	4,604	2,491	1,682
73	42	143	77	52
74	1,408	4,787	2,590	1,749
75	516	1,754	949	641

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<u>ZONE</u>	<u>DWELLING UNIT</u>	<u>POPULATION</u>	<u>AUTOMOBILES</u>	<u>RESIDENT LABOR FORCE</u>	
76	154	524	283	191	
77*	18	61	33	22	*Northwood Ins't. 2,000
78	98	353	182	121	
79	138	497	257	171	
80	33	122	56	36	
81	74	274	126	80	
82	184	681	330	228	
83	127	470	234	169	
84	81	298	149	107	
85	129	477	237	171	
86	112	407	200	145	
87	111	415	206	143	
88	74	281	138	91	
89	152	578	284	187	
90	99	371	184	119	
91	113	423	210	135	
92	209	745	361	254	
93	116	416	205	135	
94	23	85	42	27	
95	66	244	121	78	
96	190	714	349	228	
97	369	1,395	679	444	
98	210	777	386	247	
99	157	581	289	185	
100	396	1,432	747	473	

<u>ZONE</u>	<u>DWELLING UNIT</u>	<u>POPULATION</u>	<u>AUTOMOBILES</u>	<u>RESIDENT LABOR FORCE</u>
101	175	648	322	206
102	200	740	368	235
103	376	1,429	692	454
104	193	725	355	231
105	36	133	66	42
106	101	369	188	117
107	57	211	105	67
108	48	178	88	57
109	85	310	159	98
110	15	54	28	17
111				
112	99	366	182	116
113	21	78	39	25
114	39	140	74	44
115	137	499	261	211
116	19	70	36	39
117	26	88	48	32
118	39	133	63	46
119				
120	308	1,047	567	382
121	166	564	305	206
122				
123	428	1,455	788	532
124	105	357	193	130
125				

<u>ZONE</u>	<u>DWELLING UNIT</u>	<u>POPULATION</u>	<u>AUTOMOBILES</u>	<u>RESIDENT LABOR FORCE</u>
126	12	41	22	15
127	240	816	442	298
128				
129	211	717	342	245
130				
131				
132				
133				
134				
135				
136				
137	71	241	131	88
138	25	85	46	31
139	270	918	437	314
140	121	411	196	141
141	111	377	180	129
142	116	404	200	137
143	369	1,274	621	437
144				
145	5	17	8	6
146	81	292	151	101
147	81	292	151	101
148	265	954	493	328
149	37	126	68	46
150	241	819	443	299
151	388	1,397	722	481
	23,021	79,924	42,146	28,404

## GEOGRAPHIC EMPLOYMENT

MIDLAND AREA - 1980

<u>ZONE</u>	<u>MANUF.</u>	<u>W/RETAIL</u>	<u>SERV.</u>	<u>GOV'T</u>	<u>OTHER</u>	<u>TOTAL</u>
1		128	54			182
2		17	10		5	32
3		56	34	150	23	263
4		42	67		34	143
5		31	1		16	48
6		79	60		1	140
7		37	26			63
8			35		8	43
9					1	1
10			19			19
11			135	94		229
12		3				3
13	0					0
14	71	11	1		58	141
15		1				1
16		7	2	87	4	100
17		16	4	83	30	133
18		21	14		24	59
19		9	28	20	11	68
20						0
21		14	42			56
22			42			42
23		6		38	13	57
24						0

<u>ZONE</u>	<u>MANUF.</u>	<u>W/RETAIL</u>	<u>SERV.</u>	<u>GOV'T</u>	<u>OTHER</u>	<u>TOTAL</u>
25			33			33
26		8	9	100	4	121
27		152	4	10	17	183
28		14	32	19		65
29		72	51		138	261
30	78	161	34	210	21	504
31	100	138	5		118	361
32		8	8			16
33		46	9			55
34	7	12				19
35		24			50	74
36			18		11	29
37		2	2		1	5
38			12	15	24	51
39				26		26
40		3	54			57
41		157	109			266
42			6		5	11
43					3	3
44						0
45		8	20	31		59
46			18			18
47			81			81
48				100		100
49			1,105	30		1,135
50		8	70	15		93

<u>ZONE</u>	<u>MANUF.</u>	<u>W/RETAIL</u>	<u>SERV.</u>	<u>GOV'T</u>	<u>OTHER</u>	<u>TOTAL</u>
51		23	13			36
52		15	17			32
53					1	1
54			2	93		95
55				10	3	13
56					1	1
57				180		180
58		42	10			52
59		240	120		34	394
60	127	52	69		3	251
61	2,100				6	2,106
62			12			12
63		1	16	6	10	33
64		4	11		4	19
65			17		3	20
66				28		28
67						0
68					3	3
69					5	5
70						0
71				81		81
72		231	276	103	30	640
73		351	6		33	390
74		107	80	30	38	255
75		42	151	25	7	225



<u>ZONE</u>	<u>MANUF.</u>	<u>W/RETAIL</u>	<u>SERV.</u>	<u>GOV'T</u>	<u>OTHER</u>	<u>TOTAL</u>
76				468		468
77			225			225
78		26	1		4	31
79		3			10	13
80		23			33	56
81						0
82					53	53
83		14	3		9	23
84		3			1	4
85						0
86	60					60
87						0
88						0
89						0
90		1				1
91		2				2
92			5			5
93	200				6	206
94						0
95			33		2	35
96	60	4	1	20		85
97		47	36	85	9	177
98	66	3			8	77
99						0
100		9	1	1	7	18

<u>ZONE</u>	<u>MANUF.</u>	<u>W/RETAIL</u>	<u>SERV.</u>	<u>GOV'T</u>	<u>OTHER</u>	<u>TOTAL</u>
101			6	24		30
102		19	4		1	24
103		30	12		7	49
104		18		6		24
105						0
106						0
107		20			1	21
108		4				4
109						0
110						0
111	1,000				57	1,057
112		5	164			169
113					10	10
114						0
115		3	1	20		24
116						0
117					5	5
118						0
119						0
120	24	3	4		17	48
121		2				2
122	33				133	266
123						0
124		6	88			94
125	158	29			93	280

LIBRARY  
michigan department of  
state highways  
LANSING

<u>ZONE</u>	<u>MANUF.</u>	<u>W/RETAIL</u>	<u>SERV.</u>	<u>GOV'T</u>	<u>OTHER</u>	<u>TOTAL</u>
126		10	1	60	20	91
127	62	34	3	65	112	276
128	1,500				191	1,691
129	525		6	30	686	1,247
130*	1,320				40	1,360
131	400					400
132	2,087				302	2,389
133	160		1		100	260
134	1,850		6		62	1,918
135	3,100					3,100
136	99					99
137						0
138	30					30
139		14			35	49
140		3			1	4
141		20			4	24
142				80		80
143				55		55
144						0
145					3	3
146					2	2
147						0
148		3	5	39	2	49

\*Nuclear  
Info  
Center  
50,000  
Yearly  
Visitors

<u>ZONE</u>	<u>MANUF.</u>	<u>W/RETAIL</u>	<u>SERV.</u>	<u>GOV'T</u>	<u>OTHER</u>	<u>TOTAL</u>
149		120			4	124
150		2				2
151				19	3	22
	15,217	2,863	3,660	2,560	2,934	27,229

GEOGRAPHIC EMPLOYMENT

MIDLAND AREA - 1995

<u>ZONE</u>	<u>MANUF.</u>	<u>W/RETAIL</u>	<u>SERV.</u>	<u>GOV'T</u>	<u>OTHER</u>	<u>TOTAL</u>
1		128	54			182
2		17	10		5	32
3		56	75	200	23	354
4		42	67		34	143
5		31	1		16	48
6		79	60		11	150
7		37	26			63
8			35		8	43
9					1	1
10			19			19
11			135	94		229
12		3				3
13						0
14	71	11	1		58	141
15		1		127		128
16		7	47	83	4	141
17		16	49	20	30	115
18		21	59		24	104
19		9	73		11	93
20						0
21		14	42			56
22			42			42
23		6		118	13	137
24						0

<u>ZONE</u>	<u>MANUF.</u>	<u>W/RETAIL</u>	<u>SERV.</u>	<u>GOV'T</u>	<u>OTHER</u>	<u>TOTAL</u>
25			33			33
26		8	54	297	4	363
27		152	4	10	17	183
28		14	77	19	30	140
29		72	51		138	261
30	98	161	34	210	21	524
31	100	138	5		118	361
32		8	53		20	81
33		46	54			100
34	7	12			22	41
35		24			50	74
36			18		60	78
37		2	2		31	35
38		75	12	15	24	126
39				26		26
40		3	54			57
41		157	161		15	333
42			6		3	9
43						0
44						0
45		8	20	31		59
46			18			18
47			81			81
48				100	50	150
49			1,770	30		1,800
50		8	70	15		93

<u>ZONE</u>	<u>MANUF.</u>	<u>W/RETAIL</u>	<u>SERV.</u>	<u>GOV'T</u>	<u>OTHER</u>	<u>TOTAL</u>	<u>DOW</u>
51		23	13			36	
52		15	17			32	
53					1	1	
54			2	93		95	
55				10	3	13	
56					1	1	
57				180		180	
58		42	10			52	
59		440	167		34	641	
60	127	52	69		3	251	
61	3,300				6	3,306	3,300
62		10	12			22	
63		1	16	6	10	33	
64		4	11		4	19	
65			17		13	30	
66				28		28	
67						0	
68					3	3	
69		50		30	15	95	
70						0	
71				81		81	
72		531	451	103	60	1,145	
73		351	6		63	420	
74		107	150	30	38	325	
75		442	238	125	37	842	

<u>ZONE</u>	<u>MANUF.</u>	<u>W/RETAIL</u>	<u>SERV.</u>	<u>GOV'T</u>	<u>OTHER</u>	<u>TOTAL</u>	<u>DOW</u>
76				775		775	
77			488			488	
78		26	1		4	31	
79		3			10	13	
80		23			33	56	
81						0	
82				36	53	89	
83		14	3	10	29	56	
84		3			4	7	
85						0	
86	60					60	60
87						0	
88					10	10	
89						0	
90		1				1	
91		2				2	
92			5			5	
93	200				6	206	200
94						0	
95			33		2	35	
96	60	4	1	30		95	
97		47	36	105	20	208	
98	66	3			18	87	
99						0	
100		9	1		27	37	



<u>ZONE</u>	<u>MANUF.</u>	<u>W/RETAIL</u>	<u>SERV.</u>	<u>GOV'T</u>	<u>OTHER</u>	<u>TOTAL</u>	<u>DOW</u>
101			6	48		54	
102		19	4		21	44	
103		30	12		47	89	
104		18			23	41	
105						0	
106				16	1	17	
107		20			10	30	
108		4			14	18	
109						0	
110						0	
111	1,800				107	1,907	1,800
112		5	164		32	201	
113					10	10	
114						0	
115		3	1	20	35	59	
116						0	
117	5				5	10	5
118						0	
119	25					25	25
120	234	3	4		57	298	25
121		2				2	
122	33				333	366	
123						0	
124	56	88				144	
125	144	29			193	366	

<u>ZONE</u>	<u>MANUF.</u>	<u>W/RETAIL</u>	<u>SERV.</u>	<u>GOV'T</u>	<u>OTHER</u>	<u>TOTAL</u>	<u>DOW</u>
126		10	1	60	220	291	
127	398	34	3	65	212	712	50
128	1,700				191	1,891	1,700 D.C.
129	548		6	55	75	684	548
130*	1,320				40	1,360	*Nuclear Info. 1,320 Center 50,000+ Yearly Visitors Expected
131	400					400	400
132	2,087				502	2,589	2,087
133	220		1		190	411	220
134	1,850		6		162	2,018	1,850
135	3,100					3,100	3,100
136	99					99	99
137						0	
138	330					330	330
139		14			135	149	
140		3			1	4	
141		70			23	93	
142				150		150	
143				102		102	
144						0	
145					3	3	
146					2	2	
147						0	
148		3	5	39	2	49	

<u>ZONE</u>	<u>MANUF.</u>	<u>W/RETAIL</u>	<u>SERV.</u>	<u>GOV'T</u>	<u>OTHER</u>	<u>TOTAL</u>	<u>DOW</u>
149		120			4	124	
150						0	
151		22		29	3	54	
	18,382	4,018	5,420	3,535	4,001	35,362	17,119*

\* DOW employment includes DOW CORNING employment.