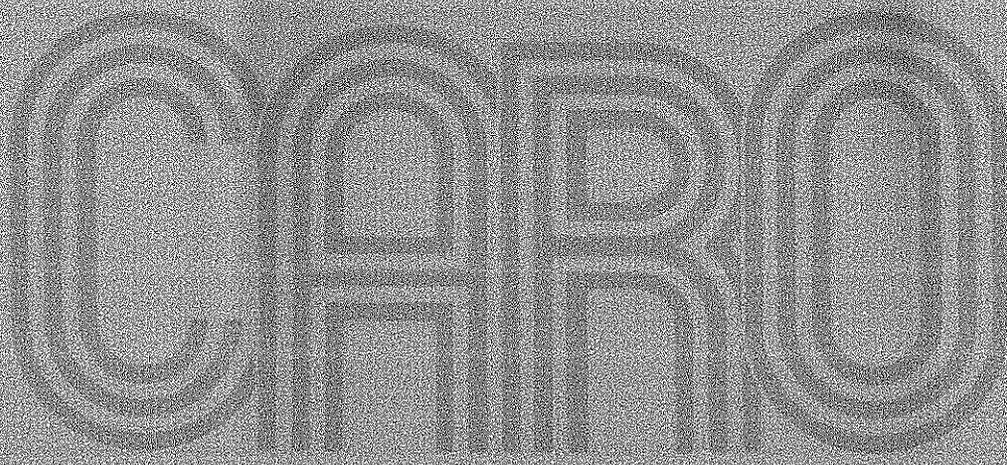


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**STATE HIGHWAY PLAN**

# CARRO

## STATE HIGHWAY PLAN

*Prepared by*

*Urban Planning Unit B*

*Office of Transportation Planning*

*Michigan Department of State Highways*

PHONES:  
673-2226  
673-3037

MEMBER OF MICHIGAN  
MUNICIPAL LEAGUE

# VILLAGE OF CARO

119 SOUTH STATE STREET

CARO, MICHIGAN

48723

April 9, 1968

PRESIDENT  
MAX LAWRENCE  
CLERK  
R. M. SMITH  
TREASURER  
JOHN DUNCAN  
SUPT. PUBLIC WORKS  
RALPH HARTMAN  
ATTORNEY  
ROLAND O. KERN

TRUSTEES:  
FRANK TURNER  
JOHN RILEY  
EDMUND SIELAND  
HARRY SCHUBEL  
CONRAD ENGLISH  
DONALD COLLING

Trustee Riley made a motion supported by Trustee English that the following resolution be adopted.

WHEREAS: The Planning Section of the Transportation Planning Division of the Michigan Department of State Highways has the responsibility of preparing, in cooperation with local officials, a highway plan, which represents the level of agreement attained on long-range planning objectives, and;

WHEREAS: The Caro Village Council and representatives of the Transportation Planning Division have cooperatively analyzed the prepared highway plan, now:

THEREFORE BE IT RESOLVED: That the plan entitled, "Caro State Highway Plan," as presented, is consistent with and compatible with the planning and development objectives of the Village of Caro, and;

BE IT FURTHER RESOLVED: That the said highway plan as cooperatively developed and presented herewith be approved for presentation to the Michigan Department of State Highways for programming.

Yeas: 5

Nays: 0

Abstaining: 0

Absent: 1

---

SHOPPING CENTER OF THE THUMB

---

Minutes of Caro Village Council Meeting

Held April 8th, 19 68.

R. H. Smith

Clerk or Secretary.

THE RIEGLE PRESS, FLINT, MICHIGAN

April 1, 1968

Resolution of the Village Planning Commission

To the Common Council

Village of Caro

WHEREAS: The Village of Caro has a Planning Commission "duly constituted according to existing planning enabling legislation," which Planning Commission has been given the responsibility for the preparation of a Master Plan for the Village, and;

WHEREAS: The Planning Commission, in pursuance of this delegated responsibility, has caused to be made comprehensive studies of existing conditions and development trends and, on the basis of these studies, made estimates of the future development of the community, part or parts of which have been adopted as elements of a Master Plan of community development, and;

WHEREAS: The Planning Section of the Transportation Planning Division of the Michigan Department of State Highways has the responsibility of preparing, in cooperation with local planners, a highway plan, which represents the level of agreement attained on long-range planning objectives, and;

WHEREAS: The Village Planning Commission and representatives of the Planning Section have cooperatively studied this problem and have prepared such a highway plan, now:

THEREFORE BE IT RESOLVED: That the plan entitled, "Caro State Highway Plan," as presented, is consistent and compatible with the planning and development objectives of the Village of Caro, and;

THEREFORE BE IT FURTHER RESOLVED: That the said highway plan as cooperatively developed and presented herewith be approved for presentation to the Department of State Highways for programming.

Yeas: 6

Nays: 0

Abstaining: 1

Absent: 2

Resolution Adopted.

James Keckler

President, Planning Commission

Letter of Transmittal

COMMISSION:

CHARLES H. HEWITT,  
Chairman  
WALLACE D. NUNN,  
Vice Chairman  
ARDALE W. FERGUSON  
RICHARD F. VANDER VEEN

STATE OF MICHIGAN



GEORGE ROMNEY, GOVERNOR

DEPARTMENT OF STATE HIGHWAYS

STEVENS T. MASON BLDG. LANSING, MICHIGAN 48926  
HENRIK E. STAFSETH, Director

September 23, 1968

Mr. E. A. Bellenbaum  
Engineer of Transportation Planning  
Transportation Planning Division

Dear Mr. Bellenbaum:

This study represents an evaluation of the state highway system in the Caro area and presents alternatives for the extension of M-24. Analysis of past and anticipated growth of the economy, population, land use and traffic indicate that changes in the village's highway system are necessary to accommodate this growth and improve highway service.

In addition to recommending methods to improve highway service and traffic circulation, this planning study should be of assistance in local planning decisions. Decisions that affect the social and physical environment are more likely to be positive and complementary when based upon a planned highway network.

Sincerely,

Robert S. Boatman, Director  
Planning Section



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## **Acknowledgments**

### **MICHIGAN STATE HIGHWAY COMMISSION**

Charles H. Hewitt, Chairman  
Wallace D. Nunn, Vice Chairman  
Richard F. Vander Veen

### **MICHIGAN DEPARTMENT OF STATE HIGHWAYS**

Henrik E. Stafseth, Director  
J. P. Woodford, Deputy Director

### **TRANSPORTATION PLANNING DIVISION**

E. A. Bellenbaum, Engineer of Transportation Planning  
Sam F. Cryderman, Assistant Engineer of Transportation Planning

### **PLANNING SECTION**

Robert S. Boatman, Director  
R. J. Lilly, Assistant Director

### **PREPARED BY URBAN PLANNING UNIT "B"**

Dale Eacker, Unit Head  
Robert Treichel, Assistant Unit Head  
John Kennedy, Project Planner

With the participation of:

**U. S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
BUREAU OF PUBLIC ROADS**

## Introduction

Formulation of a highway plan before highway construction of significant proportions takes place has been a requirement of the Michigan Department of State Highways for some time. In preparing a highway plan, the impact of land use, economics, population, traffic and local development objectives are analyzed and highway improvement recommendations developed to serve existing and future conditions. Adequacy of the state highway system is best assured through this approach to highway planning.

Improvements on M-24 have been contemplated for several years. This route connects with the Detroit metropolitan area and is used for long distance recreational travel as well as local intra- and inter-county travel. M-24 is presently routed into the Caro central business district via East Frank Street, terminating at M-81. An extension of M-24 from its termination at M-81 in Caro to M-138 is in the current construction program. A basic objective of this study is to recommend the best alternative for extension of M-24 through the Caro area. A considerable proportion of the traffic on M-24 is through. Moreover, M-81, which operates with two moving lanes, carries over 10,000 vehicles per day during most of the summer in the central business district. Generally, whenever traffic approaches 9,000 vehicles on a two lane operating facility, it becomes necessary to find ways of relieving congestion. Thus circulation improvement in the central business district is also a primary objective. A traffic survey was completed in the Caro area in June of 1966 to reveal travel patterns and traffic demand on state highways. Selection of a highway system will be based on results of the traffic survey and accepted planning principles and objectives.

## Study Area

Almer Township, Indianfields Township and the Village of Caro comprise the study area. These townships contain the largest urban population concentration in Tuscola County. This area would be most directly affected by highway planning decisions concerning M-24.

## Objectives and Planning Principles

### *Objectives:*

1. Create a state highway system as direct as reasonable and enable safe and efficient operation.
2. Evaluate local conditions and recommend corridor alignment for M-24.
3. Provide adequate service to existing and prospective commercial and industrial complexes.
4. Stimulate economic expansion by enabling low-cost transportation.

### *Principles:*

1. The system should be compatible with community development, such as urban renewal, street improvements, school operation, and recreation programs.
2. Avoid unnecessary disruption of residential areas and places of cultural importance.
3. Improve aesthetic appearance and provide protective buffers between incompatible land uses.

## Summary

Caro represents the largest concentration of workers within Tuscola County. A significant number of workers commute considerable distances to and from Caro. According to resident employment statistics, the largest number of Caro residents are employed in services, with wholesale and retail trade and manufacturing ranking second and third respectively. Between 1950 and 1960, these categories had very favorable growth rates. In 1950, most county residents were employed in extractives. This category declined substantially during the 1950-60 decade, reflecting in part, an agricultural to industrial transition. As a result of this transition, manufacturing is now the most important county resident employer, with services and extractives following in that order. Resident employment growth rates in Tuscola County were also very favorable during the 1950-60 decade.

Although Caro is not a large urban population concentration, it is the largest community in Tuscola County. More important, it is a regional market center which, despite its relatively small size, results in an intense amount of activity. The relatively high traffic counts on all state highways are evidence of this condition. It is anticipated that the Caro study area will continue to grow at a very favorable rate. Recent construction trends indicate that most new residential growth will occur to the north, northwest and east.

Results of the 1966 traffic survey show that routing additional traffic into the central business district would be very undesirable. Circulation within the central area of Caro must be improved and the capacity of M-81 increased.

## Recommendations

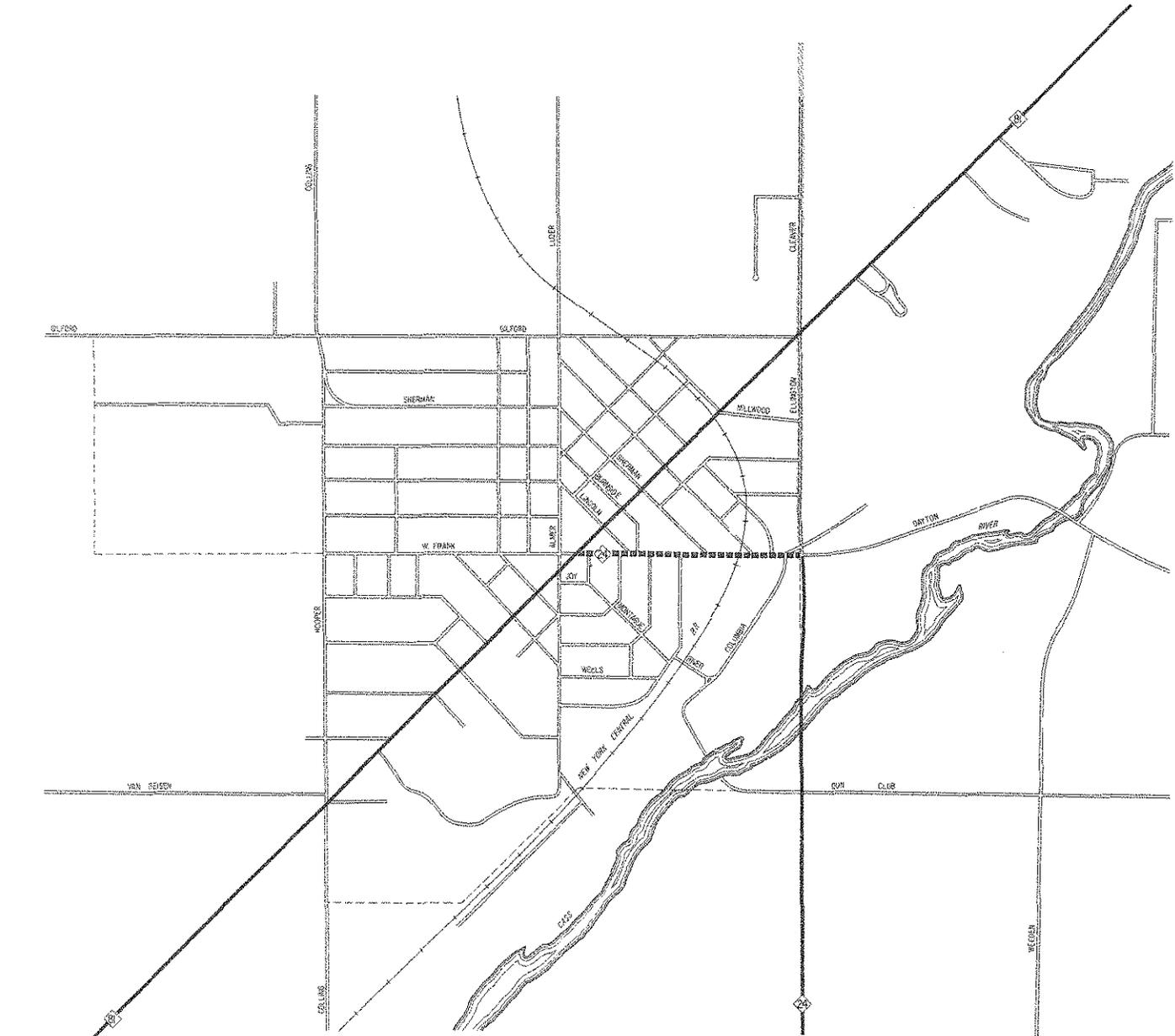
Travel patterns, accepted planning principles and objectives applied to existing and probable development show that:

1. M-24 should extend north on Ellington and Cleaver Roads (Alternative II).
2. The Department of State Highways should consider acquisition of adequate right-of-way at the Ellington and M-81 intersection.
3. Removal of parking on M-81, as recommended in Alternative II, should be the first step to increase capacity and improve access to the central business district. Studies should be initiated by the Traffic Division to determine timing of parking removal.
4. The next logical step to provide M-81 capacity in Caro beyond that of Alternative II would be provision of additional laneage on M-81. Right-of-way within the village limits on M-81 is 66 feet. Right-of-way north-east of Ellington Street on M-81 increases to 100 feet. Effects of the M-24 extension on traffic patterns and new developments such as possible local plans to implement a shopping mall should, however, be evaluated before widening M-81.
5. Existing M-24, from the Ellington and East Frank Street intersection to the M-81 and East Frank Street intersection, should be returned to local jurisdiction. It should, however, function as a local service route to the central business district.
6. The Village of Caro should improve parking facilities and pedestrian safety in the central business district by providing off-street parking.
7. Local officials of Caro, Almer Township and Indianfields Township should enforce commercial zoning restrictions that would insure stability of the central business district and traffic capacity on M-81 and M-24.

Alternative II, with parking removal on M-81, would serve travel demands, improve circulation within Caro and be compatible with existing and future development. The northerly routing of M-24 traffic would remove north-south through traffic from the central business district and off M-81 northeast where capacity should be conserved.

# CARO STATE HIGHWAY PLANNING STUDY

MAP 1



CARO RECOMMENDED STATE HIGHWAY SYSTEM

LEGEND

-  M-24 EXTENSION ( ALTERNATIVE II )
-  EXISTING STATE HIGHWAY
-  RETURN TO LOCAL JURISDICTION



## Inventory - Forecast

Causes of urban growth and factors creating demand on highways are important in determining highway system modifications. Economic oriented causes are the most influential in creating demand for transportation facilities because it is through these media marketable services flow and interact. Government is also an important influence on demand for highway transportation facilities. Land use plans implemented through government controls, such as zoning, can balance land use service with highway transportation facilities. Congested highways inhibit economic growth and inefficient land use arrangements contribute to congested highways. Thus, the land use arrangement and the highway system must be compatible and the integrity of the highway system assured.

Measurements of the economy, population, land use and government follow this interpretation. These are the available indicators that reveal many of the causes of urban growth and demand for highway transportation facilities.

## Economics

### *Place of Work and Employee Residence*

Table 1 indicates locations of employee residence and places of employment. According to the 1960 census, there were 12,918 employed residents in Tuscola County. Of this amount, 9,515 worked in the county and 3,403 outside the county. There were 2,446 employed residents in the study area, of whom 276 worked outside the county. Major places of employment outside the county were Flint, Saginaw, Saginaw County, Bay City and Genesee County, in that order. The number of workers commuting outside Tuscola County indicates the importance of M-24 and M-81 for regional transportation.



**Resident Labor Force  
Employment by Industry**

In addition to indicating the importance of different employment categories, resident employment also indicates employee residence. Table 2 indicates that the largest number of Caro residents are employed in services. Wholesale and retail trade and manufacturing rank second and third, in that order. Between 1950 and 1960, these categories had growth rates of 41.8, 21.2 and 17.0 percent, respectively.

Most county residents were employed in extractives in 1950, but this category declined substantially during the 1950-1960 decade and manufacturing emerged as the most important employer. Services and wholesale and retail trade, in conjunction with extractives, are the remaining significant employment categories within the county. Extractives was the only declining resident employment category in the county during the 1950-1960 decade, reflecting, in part, an agricultural to industrial transition. In most respects, resident employment has been very favorable in both the city and county.

Table 2

**RESIDENT LABOR FORCE BY INDUSTRY**

GROUP	CARO					TUSCOLA COUNTY				
	1950	% of Total	1960	% of Total	% Change 1950-60	1950	% of Total	1960	% of Total	% Change 1950-60
Extractive	26	2.0	15	1.0	- 42.3	4,233	33.3	2,577	17.7	-39.1
Construction	119	9.0	66	4.6	- 44.5	618	4.9	669	4.6	+ 8.3
Manufacture	174	13.1	243	17.0	+ 40.0	2,523	19.8	4,060	27.9	+60.9
Wholesale and Retail Trade	314	23.7	303	21.2	- 3.5	1,738	13.7	2,401	16.5	+38.1
Trans., Comm., Utilities	102	7.7	120	8.4	+ 17.6	495	3.9	571	3.9	+15.4
Services	539	40.6	599	41.8	+ 11.1	2,144	16.9	3,195	21.9	+49.0
Other	17	1.3	46	3.2	+170.6	362	2.8	392	2.7	+ 8.3
Total Employment	1,291	97.4	1,392	97.2	+ 7.8	12,113	95.3	13,865	95.1	+14.5
Unemployment	35	2.6	40	2.8	+ 14.3	603	4.7	709	4.9	+17.6
Total Labor Force	1,326	100.0	1,432	100.0	+ 8.0	12,716	100.0	14,574	100.0	+14.6

SOURCE: United States Department of Commerce, Bureau of the Census

## Population

Population in the Caro study area is not large — 8,860 total residents in 1960. Most population growth as indicated in Table 3 occurred in the portion of the study area outside of Caro. During the 1940-1950 decade, Indianfields Township and Almer Township population increased 35.9 and 27.8 percent respectively. Between 1950 and 1960, Indianfields Township and Almer Township population increased 14.3 and 24.8 percent respectively. Caro's population for these periods increased 12.8 and 2.0 percent. With the exception of Almer Township, neither the Village of Caro nor Indianfields Township exceeded the State of Michigan's growth rate during the 1950-1960 decade. The institutional in-patient population of the Caro State Hospital represented 1,737 of Indianfields' 3,360 residents in 1960 and explains why the majority of land development occurred in Almer Township. The lower rate of population increase during

the 1950-1960 decade in both the village and townships probably reflects a slowing down of the farm-to-city migration trends in this area.

Population growth in Tuscola County during the 1950-1960 decade is unlike many agriculture counties which have continued to lose population or show very little growth. The population increase of Tuscola County may in part be explained by residents finding employment in nearby counties.

Future population in the study area as indicated in Table 3 is expected to be approximately 12,600 by 1990. This estimate was derived by the least squares projection technique. Although the projected 1990 population is not a large urban population, it represents a significant increase over the existing population.

Table 3

### POPULATION INVENTORY AND FORECAST

	Caro	Almer Township	Indianfields Township **	Study Area	Tuscola County	Michigan
1940	3,070	1,231	2,166	6,467	35,694	5,256,106
1950	3,464	1,573	2,943	7,980	38,258	6,371,766
1960	3,534	1,963	3,363	8,860	43,305	7,823,194
1990	4,284	3,053	5,218	12,555	53,344	11,233,000*
	<b>Percentage Change</b>					
1940-50	12.8	27.8	35.9	23.4	7.2	21.2
1950-60	2.0	24.8	14.3	11.0	13.2	22.8
1960-90	21.2	55.5	55.1	41.7	23.2	43.6

SOURCE: United States Department of Commerce, Bureau of the Census

\* Michigan Projection by Dr. David Goldberg, The University of Michigan Population Studies Center. Other projections by Urban Planning Unit, Michigan Department of State Highways 1966.

\*\* Includes State Hospital Resident Patients.

## Land Use

Land use tabulations for 1959 were obtained from the 1960 Caro master plan. Acreages for each category are shown in Table 4. These tabulations include only land uses within the Village of Caro. Field survey indicated a considerable amount of developed land exists beyond the village limits. Map 2 shows the 1966 land use pattern within and outside the village limits.

Several distinct residential areas exist, especially north of State Street (M-81). Platted subdivision trends from 1959 through 1966, also shown on Map 2, indicate the direction of residential development. Land north of Gilford Road and the area west of Hooper Street has undergone the majority of platting and a considerable amount of land in these subdivisions has been developed. The new elementary and high school west of Hooper Street will increase the attractiveness of these areas. Within the planning period, most of the vacant land north of Gilford Road between Cleaver and Colling Road will probably be developed. A considerable amount of residential development should also occur west of the new schools between M-81 and Gilford Road. Existing and expected development in these areas is an important consideration in the location of M-24 as this development will become part of the existing neighborhood structure north of M-81.

The majority of commercial land use is adjacent to M-81 near the East Frank Street (existing M-24) and M-81 intersection. The area northeast of this intersection comprises most of the central business district. It is the largest traffic generator in the study area. Existing commercial development indicates the major direction of growth is northeast of the central business district. Very little vacant land exists within the central business district. This fact, in conjunction with M-81 and M-24 travel patterns, explains the northeastward development trend and the high traffic volumes on this section of highway.

The Caro State Hospital occupies a large amount of land in the study area. In addition, this institution represents a significant employment center and traffic generator.

The remaining categories of land use shown in Table 4 do not occupy large amounts of land or generate large traffic volumes. Most uses in the industrial category are small and dispersed. Schools are an important consideration in location of state highways. Location of major highways close to these facilities is normally considered undesirable unless bus transportation is important for upper grade transportation.

Table 4

### 1959 LAND USE

	ACRES
One and Two Family Residential	225.7
Multiple Family Residential	1.0
Commercial	28.3
Light Industry	20.0
Heavy Industry	15.5
Public Open Space	38.5
Public School	3.2
Public Buildings	6.6
Churches and Institutions	5.4
Streets and Alleys	123.0
Railroad	18.6
Cass River	8.2
Vacant and Agricultural	188.3
	<u>682.3</u>

SOURCE: Caro Master Plan

## *Proposed Land Use Plan*

Map 3 represents the land use plan proposed for Caro in 1960. Although the plan has not been officially adopted, parts of the plan are being followed. Of particular significance in the plan are the commercial area proposed near Ellington Street and M-81 and the industrial area proposed south of East Frank Street and west of M-24. These proposed areas are well located with respect to rail service, water service and highway transportation service provided by M-81 and M-24. Much of the existing industrial land use in Caro is contained within the industrial areas proposed in the land use plan. Part of the proposed commercial area near Ellington and M-81 is also developed commercially.

The proposed mall in the central business district would change state highway routing, however, it probably will be considerable time before this proposal is given serious consideration by local officials. A major drawback of the mall concept is the difficulty in providing adequate circulation to carry the high M-81 and M-24 traffic volumes to and around the mall.

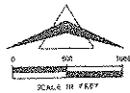
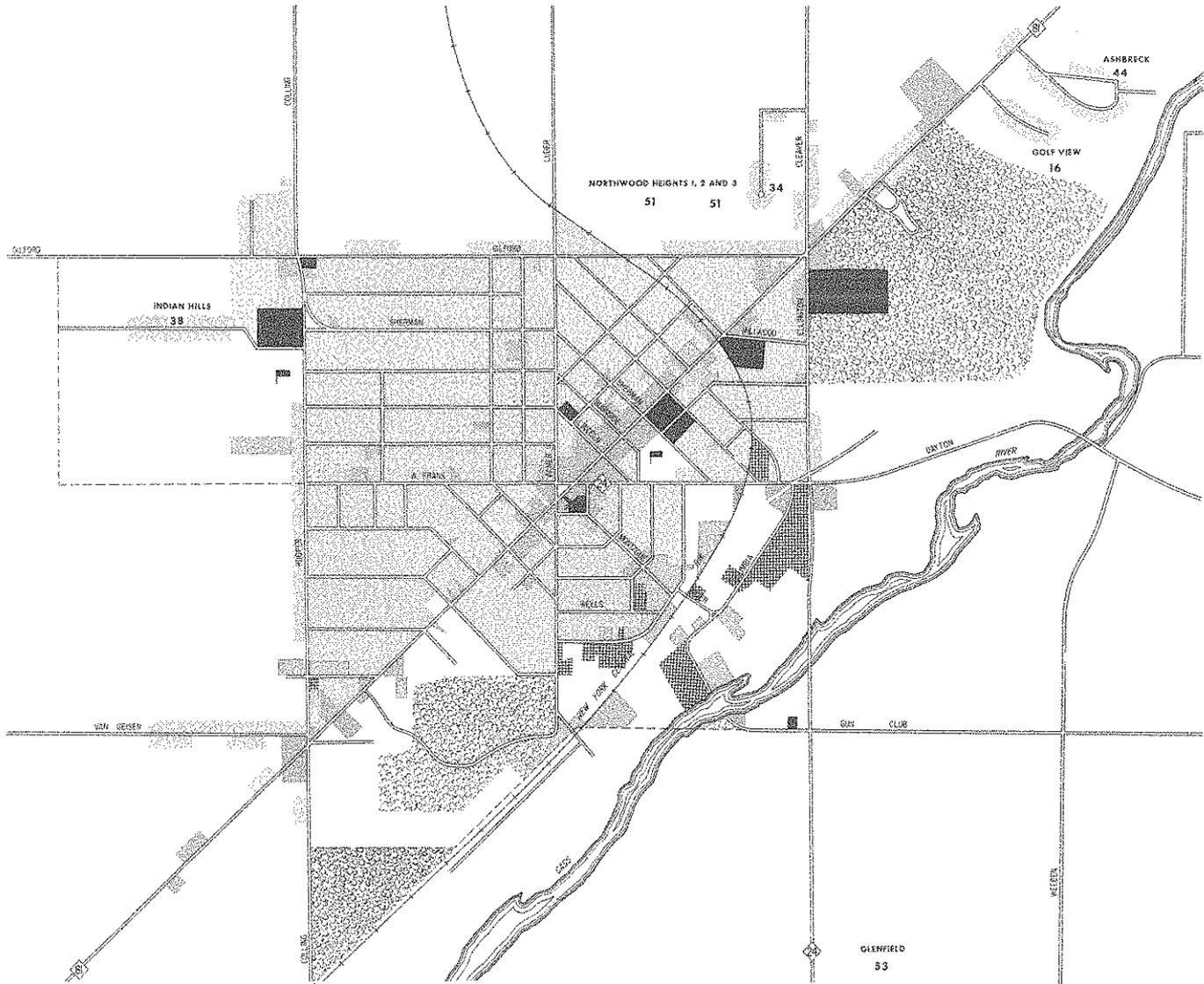
### *Proposed Off-Street Parking Plan*

The Caro Village Planning Commission and Public Works Department recently inventoried parking spaces and prepared an off-street parking plan. According to the inventory, a total of 710 spaces exists in the central business district including all on-street and off-street spaces. M-81 (State Street) provides 101 of these spaces and, of the total parking spaces, only 216 are off-street spaces. These figures, in conjunction with traffic and pedestrian conditions on M-81, indicate a definite need for increased off-street parking facilities.

Proposed lots in the parking plan are well located with respect to service from M-81, east Frank Street and access to shopping facilities. If implemented, the parking program would help circulation in the central business district and reduce pedestrian and automobile conflicts.

# CARO STATE HIGHWAY PLANNING STUDY

MAP 2



EXISTING LAND USE AND PLATTED SUBDIVISION TRENDS

**LEGEND**

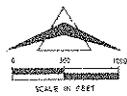
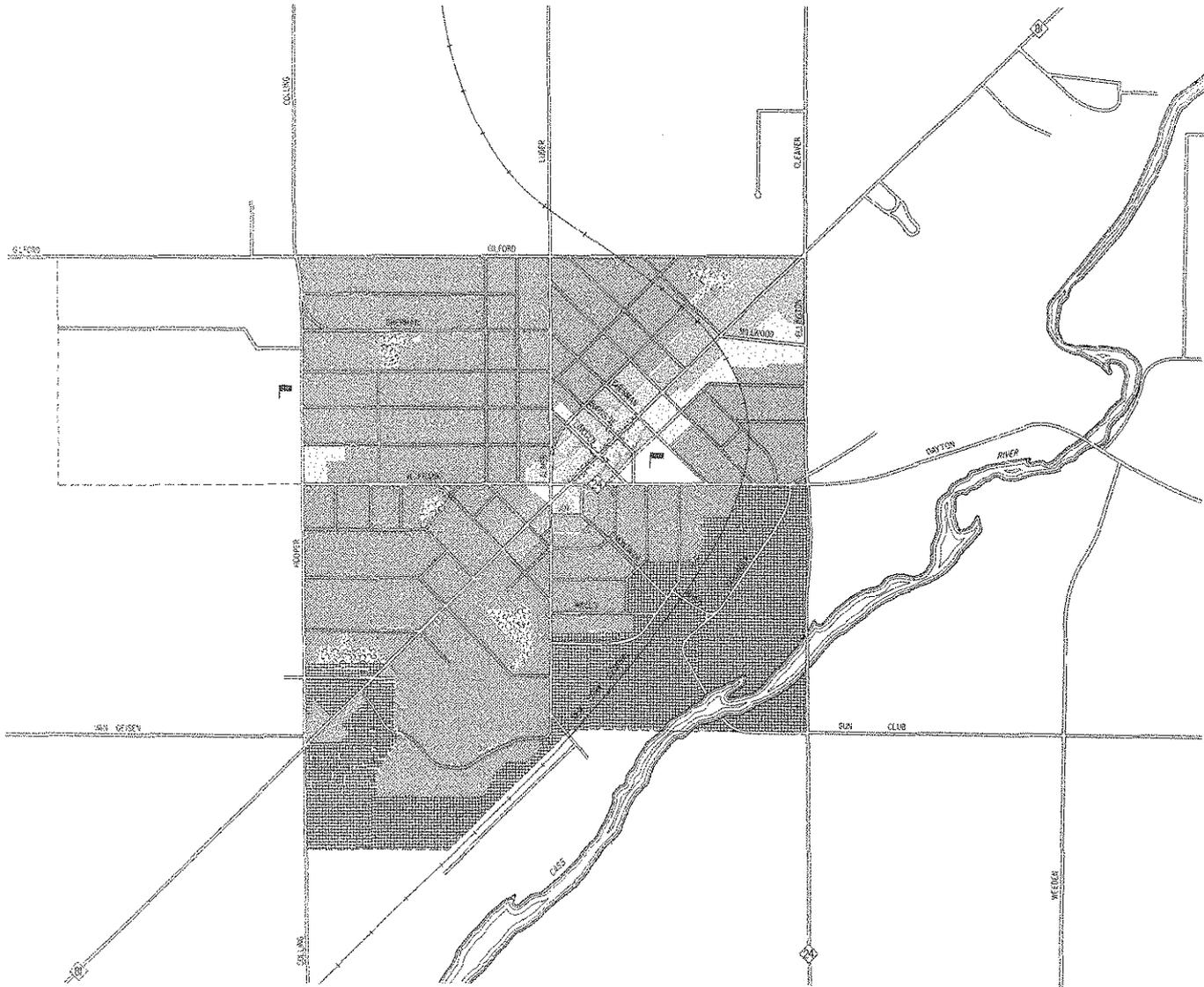
-  SINGLE FAMILY RESIDENTIAL
-  MULTIPLE-FAMILY RESIDENTIAL
-  COMMERCIAL
-  LIGHT INDUSTRY
-  HEAVY INDUSTRY
-  PUBLIC SCHOOL & PLAYGROUND
-  CHURCHES & INSTITUTIONAL
-  PUBLIC BUILDINGS
-  PUBLIC OPEN SPACE
- 00 1950-1966 PLATTED SUBDIVISIONS

SOURCE: CARO MASTER PLAN

PREPARED BY URBAN PLANNING UNIT, MICHIGAN DEPARTMENT OF STATE HIGHWAYS

# CARO STATE HIGHWAY PLANNING STUDY

MAP 3



### PROPOSED LAND USE PLAN

#### LEGEND

-  SINGLE-FAMILY RESIDENTIAL
-  MULTIPLE-FAMILY RESIDENTIAL
-  SHOPPING CENTER COMMERCIAL
-  PAVING
-  NON-SHOPPING CENTER COMMERCIAL
-  INDUSTRIAL
-  PUBLIC & QUASI-PUBLIC
-  PUBLIC SCHOOL
-  PUBLIC OPEN SPACE

SOURCE: CARO MASTER PLAN

PREPARED BY URBAN PLANNING UNIT, MICHIGAN DEPARTMENT OF STATE HIGHWAYS

## Major Thoroughfare Plan

Map 4 shows Caro's proposed thoroughfare plan. The plan, with some exceptions, indicates a highway network basically the same as the existing system. Gilford Road is proposed a through street. If the long-range plan on Map 12 were implemented and fully developed, use of Gilford Road as a through street would be a good proposal. The long-range and short-range plans have not, however, been officially adopted: Residential development is occurring north of Gilford and west of Hooper Street, and it appears that Gilford should act as a collector rather than a through or major street. Further support to this conclusion is given by the location of the new elementary and high school off Hooper Street, just south of Gilford Road. This location is attracting development west and north. Many school children will have to cross Gilford Road and Hooper Street to attend school. Moreover, as a through street, Gilford Road would tend to divide the existing neighborhood development.

Although East Frank Street, from Elling-

ton Street to M-81 (part of existing M-24), is proposed as a secondary street, traffic counts and development indicate it should be a major street. This is especially true when consideration is given to the commercialization of the M-81/East Frank Street intersection. Consideration should also be given to the service provided the central business district by this section of existing M-24.

Through traffic volumes are not high enough to warrant the proposed bypass for M-81 southwest (see Long-Range Land Use Map on page 32). Removal of parking, in conjunction with the recommendation for M-24, should achieve adequate capacity. In addition, the origin-destination survey revealed very few trips on M-81 southwest would use the proposed bypass connecting to M-24 south of Caro. The greatest percentage of trips on M-81 southwest were oriented northeast and southwest. The majority of these trips, 73.3 percent, terminated in Caro. The location of villages in the Huron-Tuscola County area also explains the northeast and southwest traffic movement of M-81 southwest.



## 1966 Traffic Survey 24 Hour ADT

To identify travel patterns and obtain demand on local and state highways, the Department of State Highways conducted a modified origin-destination traffic survey in the Caro area on June 21, 1966. Interview stations were set up on M-81 southwest, Gilford Road and M-24 south of Frank Street. A Sunday station was also set up on M-81 northeast to identify weekend recreation-oriented travel patterns. Traffic counters were placed at all important intersections as well as at interview stations. The survey is outlined in the following section. Map 5 graphically shows the distribution of terminal and through traffic as determined from the survey.

### **M-81 Northeast (Sunday)**

The percentage of through traffic \* on M-81 (62.0 percent or 6,644 trips) increases substantially on weekends. This was anticipated, because M-24 and M-81 northeast were expected to serve traffic from the Detroit metropolitan area to the northern Thumb Area. Approximately 87 percent of M-81 through traffic could be classified as state highway traffic. \*\* The major attractor, with exception of Caro, was Caseville with approximately 695 trips to or from the Detroit metropolitan area. Total through traffic into Huron County exceeded 1,600 trips.

Terminal traffic \*\*\* represented 4,072 trips (38.0 percent) on M-81 northeast. The amount that could be classified as local traffic \*\*\*\* was 67.4 percent.

Major attractors, other than Caro, were Cass City and Caseville. Including through trips, these areas accounted for approximately 1,212 and 1,110 trips, respectively.

### **M-81 Northeast (Tuesday)**

M-81 traffic changes significantly in volume between weekends and weekdays (Sunday, 10,716 average daily trips compared to 8,512 average daily trips Tuesday). Through traffic changed from 62.0 percent to 38.2 percent respectively. Through traffic having both origins and destinations within Tuscola County was 12.1 percent.

Although terminal traffic (5,260 trips) was considerably greater in volume than through traffic, approximately 55.6 percent of the total traffic on M-81 northeast had one trip end outside Tuscola County, illustrating the regional importance of M-81 on weekdays as well as weekends.

### **M-81 Southwest (Tuesday)**

M-81 southwest carries substantially less traffic than M-81 northeast. Of the total 5,255 trips, 26.7 percent was through, 16.0 percent of which was local traffic. Traffic having origins or destinations within Tuscola County comprised 62.5 percent of the terminal trips.

Other than Caro, Vassar and the state hospital were the major attractors within Tuscola County. Saginaw County contained the major attractors outside Tuscola County.

### **M-24 (Tuesday)**

Of the total traffic on M-24, 1,381 trips (35.7 percent) were through. Of this amount, 26.8 percent could be classified as local, having origins and destinations within Tuscola County. The amount of through traffic is considerably higher on weekends, as the Sunday survey results

reveal. Major M-24 through traffic attractors were in the Detroit metropolitan area, Cass City and Caseville. Very few M-24 through trips had origins or destinations west of Caro.

M-24 terminal traffic (2,487 trips) represents 64.3 percent of the total. Of this amount, 73.6 percent could be classified as local traffic. Major terminal traffic attractors were Saginaw County, the state Hospital and Vassar. A considerable amount of terminal traffic also involved the study area and the remainder of Tuscola County.

### **Gilford Road (Tuesday) Through and Terminal Traffic**

Gilford Road had much less traffic than each of the other routes. Of the total 2,623 trips, 21.5 percent was through traffic and to areas within Tuscola County

Terminal traffic comprised 78.5 percent of the total traffic on Gilford Road, with 84.4 percent of this amount local traffic.

Major traffic attractors were Fairgrove and Unionville. Caro was the other terminal for most of the Fairgrove and Unionville trips. The Detroit metropolitan area accounted for only one of these trips.

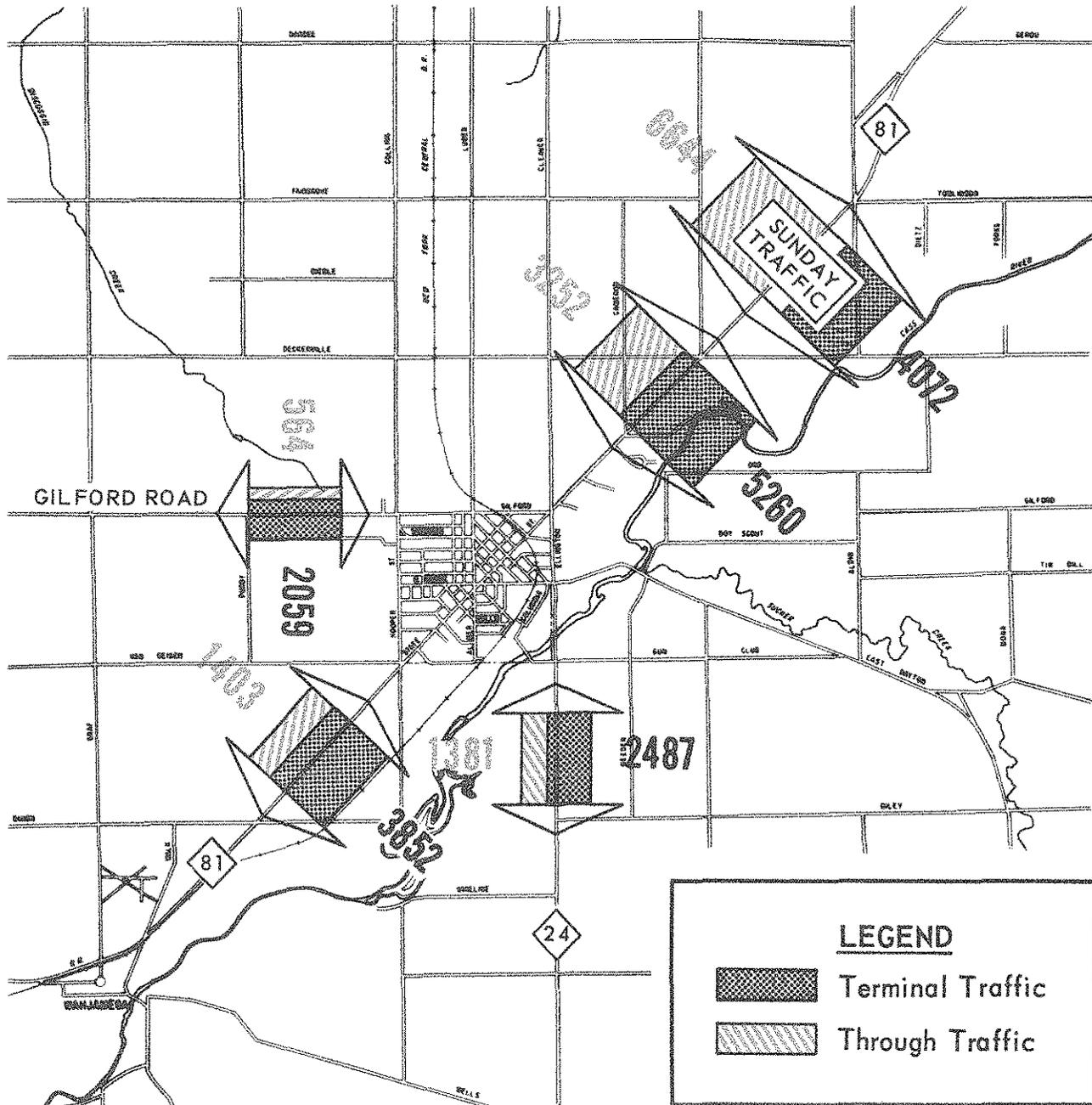
\* Through traffic is traffic having both trip ends outside the study area.

\*\* State highway traffic is traffic having one or both trip ends outside Tuscola County.

\*\*\* Terminal traffic is traffic having one or both trip ends within the study area.

\*\*\*\* Local traffic is traffic having both trip ends within Tuscola County.

# MAP 5



## TERMINAL AND THROUGH TRAFFIC 1966

Source: Transportation Survey and Analysis Section,  
Michigan Department of State Highways

Prepared by Urban Planning Unit,  
Michigan Department of State Highways

## 1990 Traffic Projections and Assignments

Alternative locations for M-24 were based on 1966 traffic and land use patterns. These alternatives are described in detail, along with the advantages and disadvantages of each, following the considerations in selecting alternatives section of this study.

To illustrate the impact of the three possible alternatives on traffic volumes in Caro, 1990 traffic was assigned to each alternative. Alternative I is essentially the existing system except that Ellington Street would be constructed to state highway standards north of East Frank Street. Presently, M-24 traffic is signed to this route as well as East Frank, so a choice to the central business district or to M-81 northeast is available. This alternative has been included primarily to show the M-24 through traffic demand.

The 1990 traffic projections show high traffic volumes on M-81 in the central business district on all three alternatives. If the 18,400 ADT on M-81 is reached by 1990, perhaps one-way pairs or a bypass will have to be considered to provide capacity because provision of more than four lanes on M-81 in the central business

district does not appear feasible.

More traffic would use M-81 northeast of Ellington and on Gilford Road by not extending service northward on Cleaver Road. Capacity on M-81 should be conserved and heavy traffic in the Gilford Road residential area is not desirable. Much of the M-24 through traffic movement presently using M-81 northeast and Gilford Road would use Alternative II, thereby conserving capacity on M-81 northeast of Ellington and not disrupting the Gilford Road residential area.

Alternative III shown on Map 8 consists of extending M-24 north on Ellington to M-81 then west on Gilford Road to M-138. With this alternative, projected traffic volumes are slightly lower on East Frank and on M-81 in the central business district than with Alternatives I and II. Volumes are also lower on Cleaver Road. They are much higher, however, on Gilford Road than with Alternative II. Although Alternative III improves service to state highway traffic, it would place more traffic on Gilford Road which passes through a residential area.







## Conclusions of the 1966 Traffic Survey and 1990 Traffic Projections

Travel patterns show M-81 northeast carries the majority of state highway traffic in the Caro area. In conjunction with M-24, M-81 also carries the majority of long distance travel. Existing traffic volumes on M-81 are high in the central business district.

A very significant amount of M-81 northeast traffic was through (6,644 trips or 62.0 percent Sunday; 3,252 trips or 38.2 percent Tuesday). The majority of this movement used M-24 and Ellington to reach M-81 northeast, then county systems to attractions north and northeast of Caro. Some also used M-24 (East Frank) to reach M-81, inhibiting circulation in the central business district.

Very little M-24 traffic had terminals west of Caro. Almost all M-24 and M-81 northeast traffic had trip ends north of Bay Port (Caseville over 600 trips) and areas northeast of Caro.

Gilford Road carried 2,623 trips, most of which were local.

The relatively high volume of terminal traffic on all routes indicates Caro is an important regional market place. Almost 75 percent of the traffic on M-81 southwest was terminal and the majority of through traffic was destined northeast and southwest. Very little practical circulation improvement would result by attempting to bypass M-81 southwest through traffic as was indicated in the master plan for Caro.

The results of the 1966 traffic survey and 1990 traffic projections show that capacity on M-81 will soon need to be increased, especially in the central business district. Circulation improvement in the state highway system can best be achieved by routing M-24 through traffic north on Ellington and Cleaver Road. Removal of parking would also provide additional capacity on M-81 in the central business district.

## Considerations in Recommending an Alternative

1. Some M-24 through traffic is entering the Caro central business district inhibiting circulation.
2. State highway traffic is using a local street (Ellington) to reach M-81 northeast.
3. Traffic volumes on M-81 in the central business district and on M-81 northeast of the Ellington/M-81 intersection exceed 8,500 vehicles per day. These traffic volumes persist throughout late spring, summer and early fall. Conserving capacity on M-81 is an important consideration.
4. On-street parking exists on both sides of M-81 in the central business district of Caro. As a result, less than two moving lanes are available to accommodate high traffic volumes.
5. The majority of through traffic is carried by M-24 and M-81 northeast. The predominant movement was between areas south of Caro and areas north of Caro.
6. Locations for M-24 in Caro are limited because of existing development and travel patterns.

## Alternate Locations for Extending M-24 and Methods of Improving Circulation Within Caro

In addition to the three locations for M-24 analyzed in this report, West Frank, Hooper Street and Gilford Road routes were also considered possible alternatives, but rejected because of obvious shortcomings. A detailed review of land use indicates an elementary school, junior high, high school, hospital and numerous residences and trees are located adjacent to these streets which, in addition to three 90-degree turns, preclude consideration of these alternatives. The advantages and disadvantages of the remaining feasible alternatives are outlined in the following section.

### Alternative 1

Extend M-24 north on Ellington to M-81 and remove parking from M-81. The East Frank section of M-24 would be returned to local jurisdiction.

#### Advantages:

1. M-24 through traffic with a northeasterly terminal and M-81 northeast through traffic with a southerly terminal via M-24 would not enter the central business district of Caro, because traffic would be routed via Ellington. As a result, congestion would be relieved to some extent in the central business district.
2. Ellington as part of M-24 would achieve greater flexibility in the local and state highway system, as the through movement on M-24 and M-81 northeast would have better service.
3. Service to major travel desires would be improved at minimum cost.
4. The extension of M-24 north on Elling-

ton would be compatible with the major thoroughfare plan for Caro.

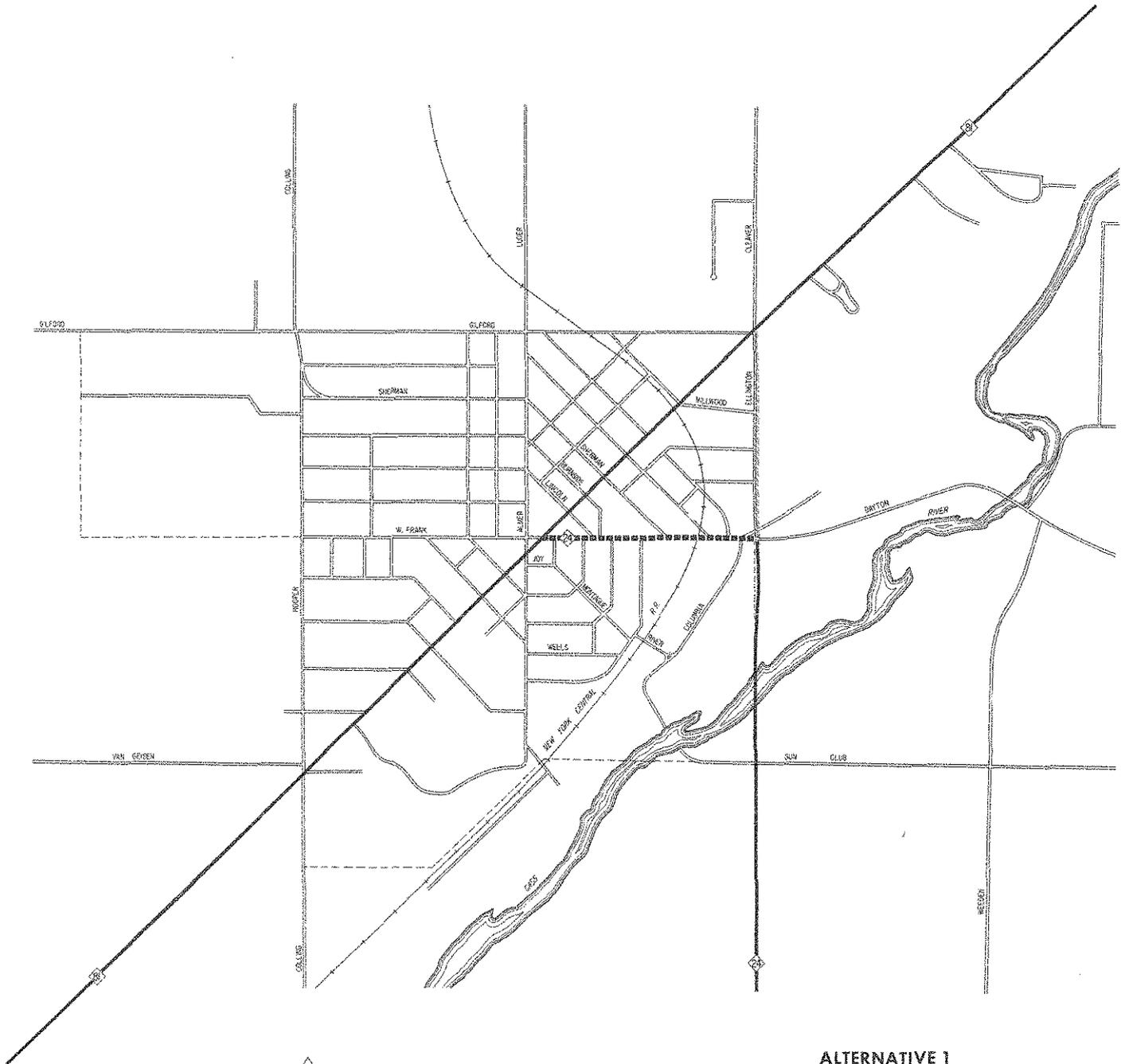
5. Neighborhood development trends would not be disrupted.

#### Disadvantages:

1. Several homes on Ellington would have to be acquired for right-of-way.
2. Circulation within the central business district would not be improved to the extent possible with Alternative II.
3. Additional capacity would soon have to be provided on M-81 northeast to accommodate the M-24 and M-81 northeast through movement.
4. Travel desires would not be served as well as with Alternative II.

# CARO STATE HIGHWAY PLANNING STUDY

MAP 9



### ALTERNATIVE 1

#### LEGEND

- PROPOSED M-24 EXTENSION
- RETURN TO LOCAL JURISDICTION
- EXISTING STATE HIGHWAY

## Alternative 2 Recommended System

Extend M-24 on Ellington to M-81 and north on Cleaver Road connecting to M-25. Parking would be removed from M-81 and the East Frank section of existing M-24 returned to local jurisdiction.

### *Advantages:*

1. Traffic congestion in the central business district would be relieved by the removal of M-24 through traffic.
2. Ellington and Cleaver, as part of M-24, would provide optimum flexibility in the local and state highway system.
3. Major travel desires would have optimum service.
4. Existing neighborhood development trends would not be disrupted.
5. The extension of M-24 on Ellington and Cleaver would be compatible with local development plans.
6. Turning movements at the Ellington/M-81 intersection and M-81/East Frank intersection would be reduced substantially.
7. Ellington, as part of M-24, would conform to Caro's thoroughfare plan.

### *Disadvantages:*

1. Several homes on Ellington would have to be acquired for right-of-way.

## Alternative 3

Extend M-24 north on Ellington to M-81 and west on Gilford Road to M-138. The East Frank section of existing M-24 would be returned to local jurisdiction and parking removed from M-81.

### *Advantages:*

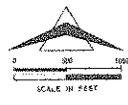
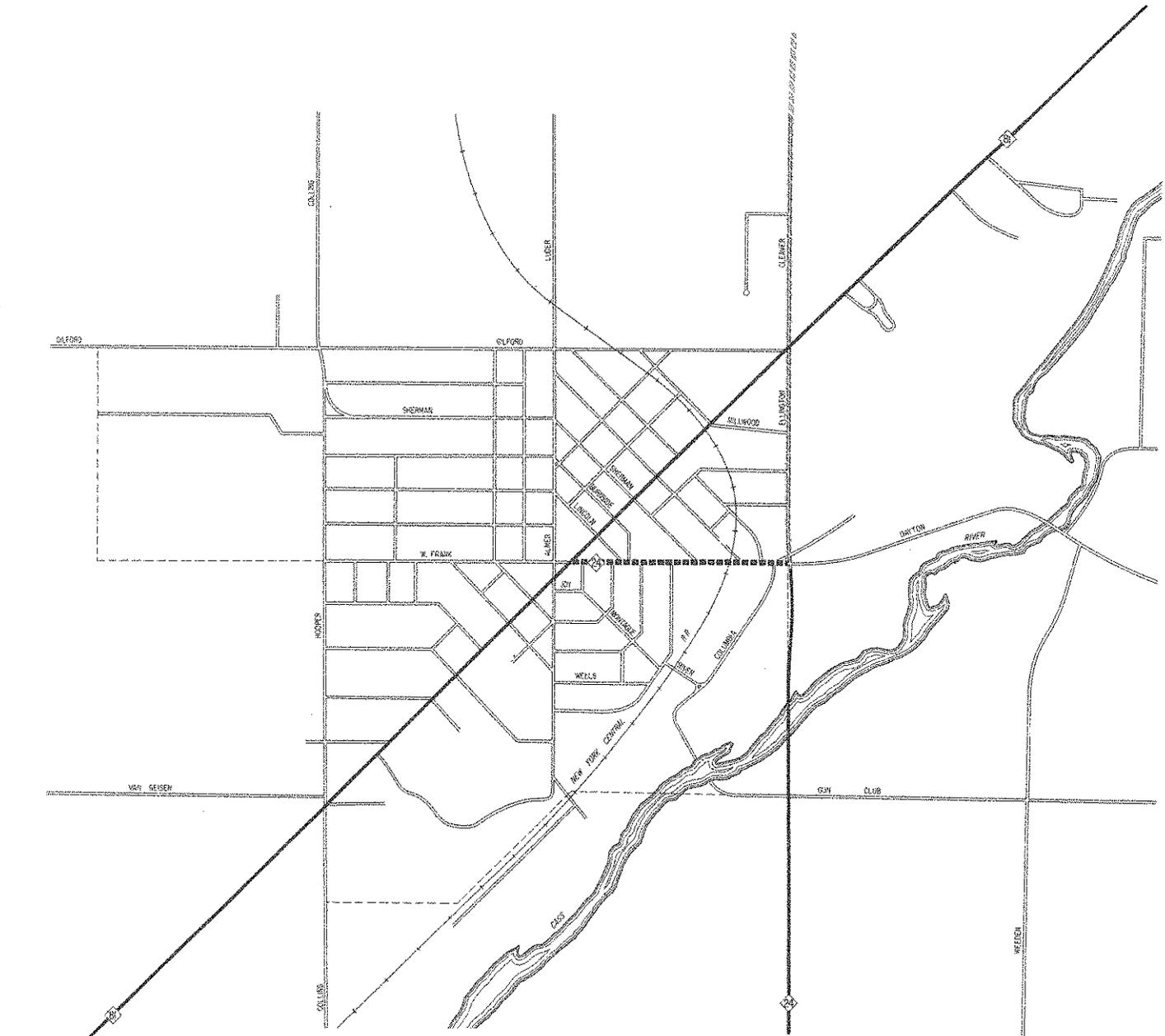
1. Congestion would be relieved in the central business district.
2. Service to major travel desires would be improved to an extent.

### *Disadvantages:*

1. A westerly extension of M-24 on Gilford Road to M-138 would not serve travel desires as well as Alternative II.
2. Gilford Road, as part of M-24, would traverse a residential area, presenting safety hazards to school children and disrupting living amenities.
3. Turning movements onto Gilford Road from M-81 and M-24 would be difficult.
4. Gilford Road, as an extension of M-24, would disrupt the existing neighborhood development trends occurring north of Gilford Road and west of Hooper Street.

# CARO STATE HIGHWAY PLANNING STUDY

MAP 10



### ALTERNATIVE II

#### LEGEND

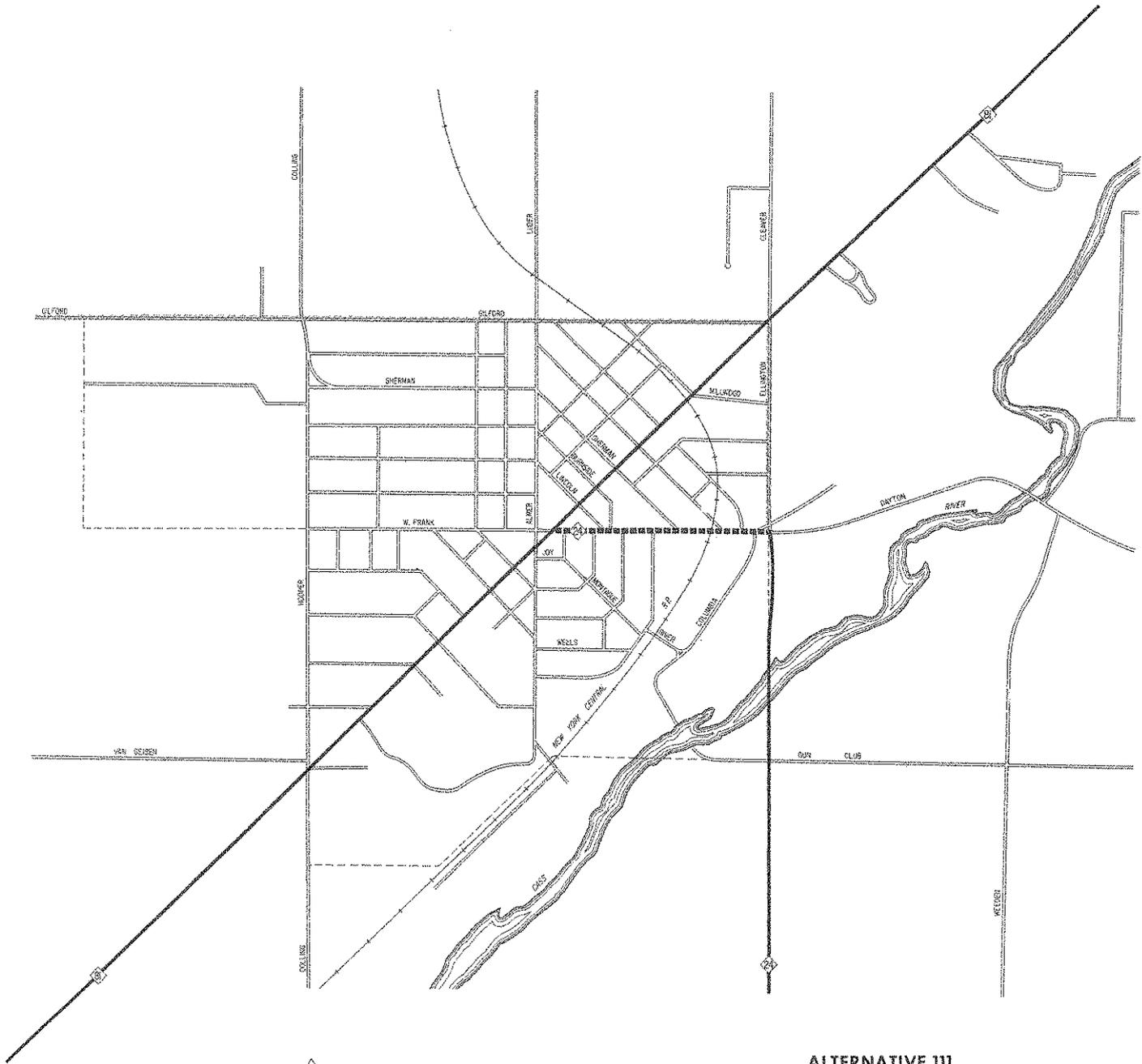
- PROPOSED M-24 EXTENSION
- RETURN TO LOCAL JURISDICTION
- EXISTING STATE HIGHWAY

SOURCE: URBAN PLANNING UNIT, MICHIGAN DEPARTMENT OF STATE HIGHWAYS

PREPARED BY URBAN PLANNING UNIT, MICHIGAN DEPARTMENT OF STATE HIGHWAYS

# CARO STATE HIGHWAY PLANNING STUDY

MAP 11



### ALTERNATIVE 111

#### LEGEND

-  PROPOSED M-24 EXTENSION
-  RETURN TO LOCAL JURISDICTION
-  EXISTING STATE HIGHWAY

Effects of M-24  
Alternatives and  
Major Considerations  
in Recommending  
Alternative 2

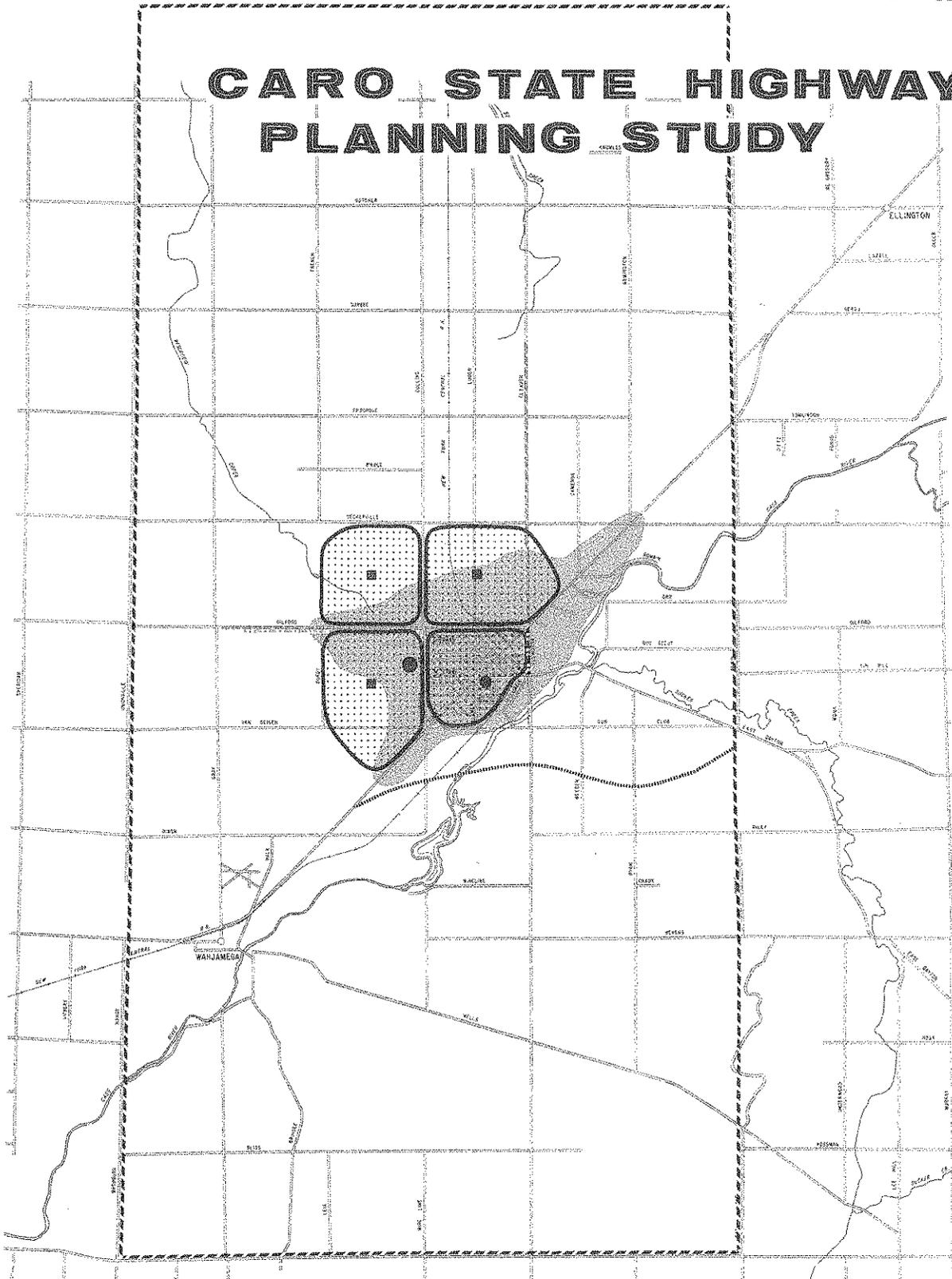
To further illustrate effects that M-24 alternatives have on development, they have been located on existing and probable future development on Map 12. The neighborhood boundaries indicate the ideal long-range arrangement as shown in the master plan.

Proposals III and IV would disrupt development and involve complicated turning movements.\* Although proposal III appears feasible, development has already occurred across Gilford Road and Hooper Street. Thus, at least until the proposed neighborhood arrangement is achieved, it would present hazards to school children and combine state high-way traffic with neighborhood traffic. Alternative II would provide the best service and have the least undesirable effect, because traffic would not be routed into existing and future residential areas and M-24 and M-81 northeast through traffic would not enter the central business district of Caro. In addition, much of the through movement now using M-24 and M-81 northeast

would use Alternative II to terminals north and south of Caro reducing traffic on M-81 northeast. Service to recreational traffic, which comprises a large proportion of the through traffic movement, would be provided by northerly extension of M-24 to M-25. Removal of parking on M-81, in conjunction with the reduction of through traffic in the central business district, would greatly improve access thereby providing better service to terminal traffic. Additional capacity on M-81 in the central business district will eventually have to be provided. This would depend upon the amount of future development and traffic increases in the Caro market area. The Planning Section recommends provision of additional capacity on M-81, in the central business district beyond that of Alternative II, be provided when and if additional capacity is needed.

\* Proposal IV, as discussed previously, was not given consideration as a feasible alternative. It has been shown on the map, however, to more fully reveal its disadvantages.

# CARO STATE HIGHWAY PLANNING STUDY



## EFFECTS OF M-24 ALTERNATIVES ON LONG-RANGE LAND USE PLAN

### LEGEND

- |           |                               |           |                      |
|-----------|-------------------------------|-----------|----------------------|
| —         | ALTERNATIVE I                 | - - - - - | M-81 BYPASS          |
| - - - - - | ALTERNATIVE II                | ●         | EXISTING ELEMENTARY  |
| · · · · · | ALTERNATIVE III               | ●         | EXISTING HIGH SCHOOL |
| - · - · - | ALTERNATIVE IV                | ■         | PROPOSED ELEMENTARY  |
| · · · · · | RESIDENTIAL                   | - - - - - | STUDY AREA BOUNDARY  |
| ▨         | PROBABLE 1990 GROWTH BOUNDARY |           |                      |

## 1967 State Highway Sufficiency Ratings

### M-81

From M-24 to West City Limits = Surface  
Critical  
Capacity 10 of 30  
Total Rating 42

From M-24 to East City Limits = Surface  
Critical  
Capacity 10 of 30  
Total Rating 42

From East City Limits (Ellington) to  
Colwood Road = Surface Critical  
Capacity 30 of 30  
Total Rating 36

### M-24

From South City Limits to M-46 = No  
Critical Deficiencies  
Capacity 30 of 30  
Total Rating 84

From South City Limits to Frank Street =  
No Critical Deficiencies  
Capacity 30 of 30  
Total Rating 67

From Frank Street Intersection to M-81 =  
Safety Critical  
Capacity 30 of 30  
Total Rating 83

*SOURCE: Michigan Department of State  
Highways, Programming Section*