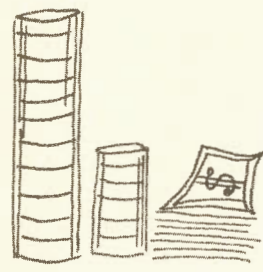


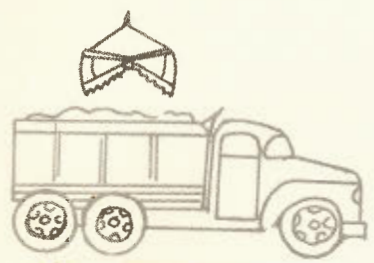
JOB 643 - OAKLAND Cal. - Reid - 9/20/66  
TRANSPORTATION

*Done  
10-17-68*

# Annual



# 1966



# Report

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**BOARD OF OAKLAND COUNTY ROAD COMMISSIONERS  
COUNTY OF OAKLAND  
PONTIAC, MICHIGAN**

**ANNUAL REPORT  
1966**

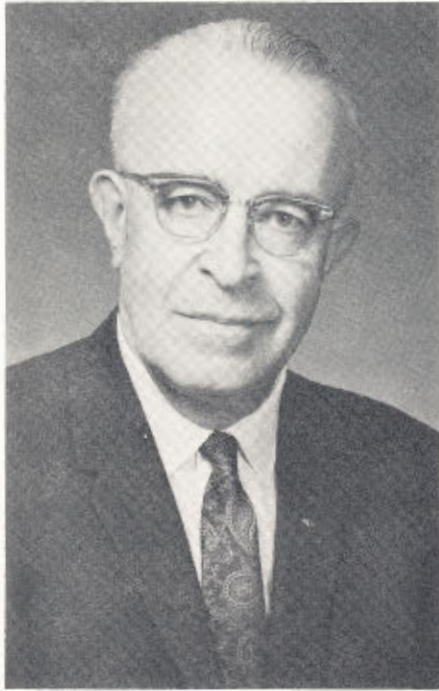
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**Table of Contents**

Commission .....	2
Departmental Representatives .....	4
Engineering Department .....	6
Maintenance Department .....	16
County Road Mileage Inventory .....	19
1966 Road Construction Program .....	20-21

Traffic Department .....	22
Administrative Departments .....	24
Financing .....	26
1967 Budget Year .....	32
1967 Proposed Construction Program .....	33





Sol D. Lomerson  
Vice-Chairman



Frazer W. Staman  
Chairman



Paul W. McGovern  
Commissioner

The Honorable Board of Supervisors  
of the County of Oakland  
Pontiac, Michigan

April 17, 1967

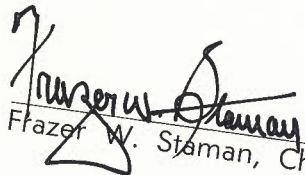
Gentlemen:


We are pleased to submit to your honorable body and to the people of Oakland County, our Annual Report for the fiscal year ending December 31, 1966.

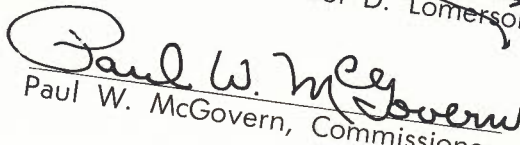
Combined in this report is a summary of our activities relating to the construction and maintenance of roads and bridges, of funds received and disbursed, and other information which will be of interest to you.

Respectfully submitted,

BOARD OF COUNTY ROAD COMMISSIONERS  
OF THE COUNTY OF OAKLAND, MICHIGAN

  
Frazer W. Staman, Chairman

  
Sol D. Lomerson, Vice-Chairman

  
Paul W. McGovern, Commissioner

# DEPARTMENTAL REPRESENTATIVES

Paul Van Roekel . . . . . County Highway Engineer

## ENGINEERING

William J. Fognini . . . . . Director of Engineering  
William R. Mercer . . . . . Assistant Director of Engineering  
David W. Hasse . . . . . Permit Engineer  
Brendan C. Daly . . . . . Plat Engineer  
Frank C. Beach . . . . . Planning Engineer  
Dennis A. Grylicki . . . . . Construction Engineer  
David B. Kahn . . . . . Right of Way and Contracts Engineer  
Jerome L. Kelly, Jr. . . . . Acting Design Engineer

## TRAFFIC

Robert W. Osgood . . . . . Traffic Engineer  
Richard J. Folkers . . . . . Assistant Traffic Engineer

## MAINTENANCE

Oscar D. Loomis . . . . . General Maintenance Supt.  
Richard L. Kincaid . . . . . Asst. to General Maintenance Supt.  
Robert W. Vincent . . . . . Supt. of Pontiac District  
Raymond F. Sherwood . . . . . Supt. of Milford District  
Edward M. Wright . . . . . Supt. of Davisburg District  
Clarence A. Page . . . . . Supt. of Lake Orion District  
Richard E. Hicks . . . . . Supt. of Equipment Repair  
Arthur E. Drow . . . . . Supt. of Traffic Signing  
Floyd H. McMillan . . . . . Asst. Supt. of Pontiac District  
George E. Keyser, Jr. . . . . Asst. Supt. of Pontiac District  
Kenneth T. Newbound . . . . . Asst. Supt. of Milford District  
Lyle L. Barrigar . . . . . Asst. Supt. of Davisburg District  
Cecil R. Bracken . . . . . Asst. Supt. of Lake Orion District  
Gail Bracken, Jr. . . . . Asst. Supt. of Equipment Repair  
Leonard Nickerson . . . . . Superintendent of Forestry

## LEGAL

Leroy W. McEntee . . . . . Assistant Corporation Counsel

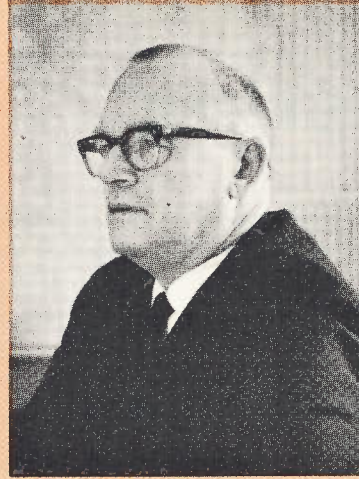
## ADMINISTRATIVE

Bernard D. Speace . . . . . Accounting Department Supervisor  
Audrey G. Ellixson . . . . . Purchasing Director  
Willard L. McRae . . . . . Personnel

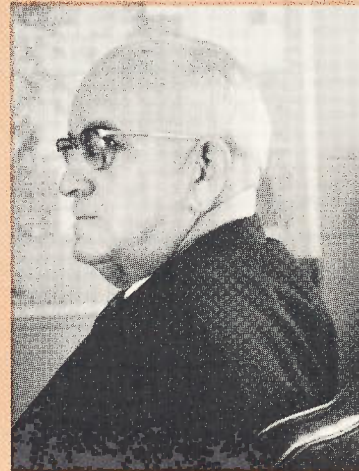




Paul Van Roekel  
County Highway Engineer



Robert W. Osgood  
Traffic Engineer



Oscar D. Loomis  
General Maintenance  
Superintendent



William J. Fognini  
Director of Engineering



# engineering

The Road Commission is responsible for nearly 2,500 miles of Oakland County roads. This is over 600 miles more than any other county road commission in the state of Michigan.

The Engineering Department administers their work on county roads through six divisions: Planning, Plats, Design, Construction, Right of Way and Contracts, and Permits. Each of the separate divisions cooperate to perform the primary function of serving the public through proper planning, designing, and constructing better roads.

Work in the Engineering Department was accomplished by 54 full-time employees. During the summer 20 additional temporary employees were hired. Half of our 14 Engineers are Registered Professional Civil Engineers.

During 1966 the increase in motor vehicle registration remained approximately equal to the increase in population. Over the past 6 years, motor vehicle registration increased nearly 40%, while the construction budget increased only 5%. Due to the rise in contract costs of nearly 25% over the previous year, the Road Commission is unable to keep pace with the ever increasing demands of the expanding population.

The Engineering Department, in cooperation with the Oakland County Planning Commission, prepared a new 1966 Oakland County road map. The map featured the first major change made in nearly 40 years with the addition of all township roads and city streets, and a new indexing of all major roads. The theme used on the front cover of the map was also used on the cover sheet of the 1966 Annual Report.

# department

## Planning Division

To facilitate better design, traffic operations and land use development, the Planning Division reviewed and recommended necessary changes on preliminary plans and construction programs as submitted by governmental and private agencies.

The Planning Division also prepared several studies and reports as required by statute or governmental regulations. Two of these were a Federal Scenic Enhancement Study and a Federal Location Study.

Our Commission has supported the Seven County Transportation and Land Use Study, a sub-study of the Detroit Metropolitan Area Regional Planning Commission. In addition to direct financial contributions the Planning Division spent many hours tabulating and preparing reports on existing conditions and facilities in Oakland County and attending innumerable meetings acting in an advisory capacity.

Another program of extreme importance undertaken in cooperation with the Inter-County Highway Commission of Southeastern Michigan, is the approval by all agencies of local government of a plan for the establishment and preservation of highway right of way in the six county area.

The adoption of the Inter-County Highway Plan by local governmental units and its inclusion in their master plan and zoning ordinances is a vital step in providing the necessary and proper setbacks needed to facilitate the Plan.

Usually the local building inspector is the initial, and sometimes the only, contact that the developer has with a public agency. His interest and authority are necessary ingredients for the preservation of right of way needed for present and future highway improvements. Adequate zoning requirements are the inspector's tool to accomplish these setbacks. For this reason every governmental unit and planning commission was contacted and requested to approve and adopt the Plan.

Some of the outstanding benefits from the Plan are:

Property values are retained or increased after highway improvements.

Savings to the taxpayer through lower right of way costs.

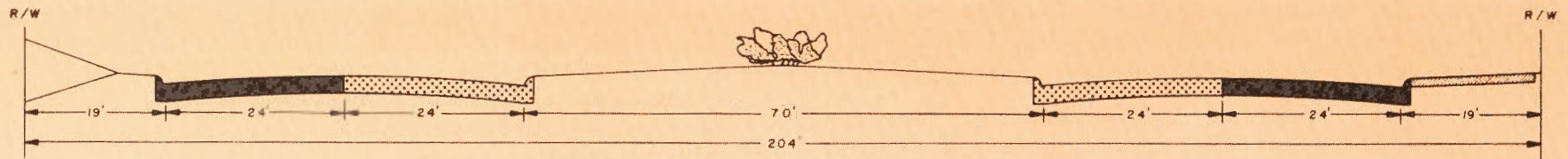
Conservation of resources by prevention of building demolition.

Minimum of hardship and inconvenience to property owners or occupants.

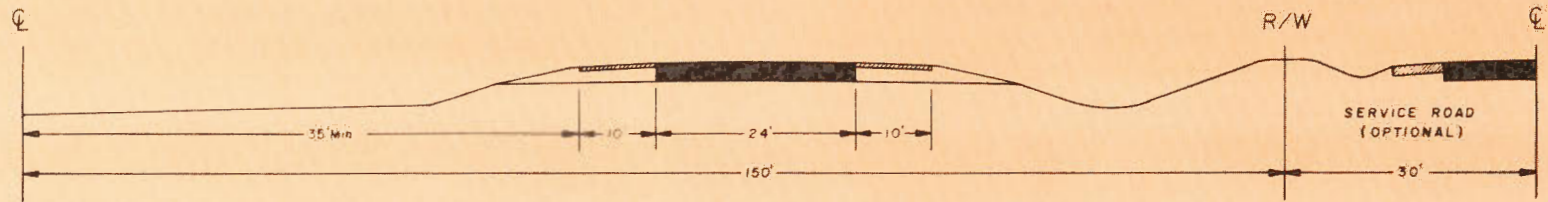
In coordination with, and as a supplement to, the Plan, a Thoroughfare Guideline Committee was established with the intent of standardizing roadway cross sections and nomenclature. This committee was composed of public and private urban planners and engineers. The following cross sections were agreed upon for the six county area.



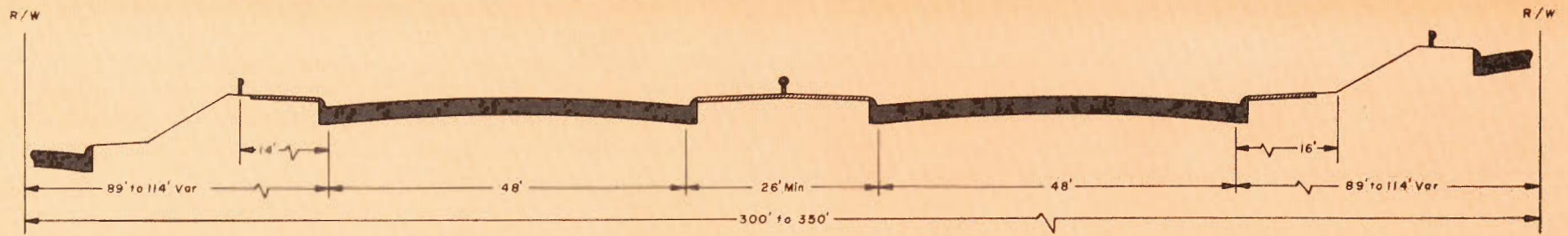
# Cross Section Standards



SUPER HIGHWAYS

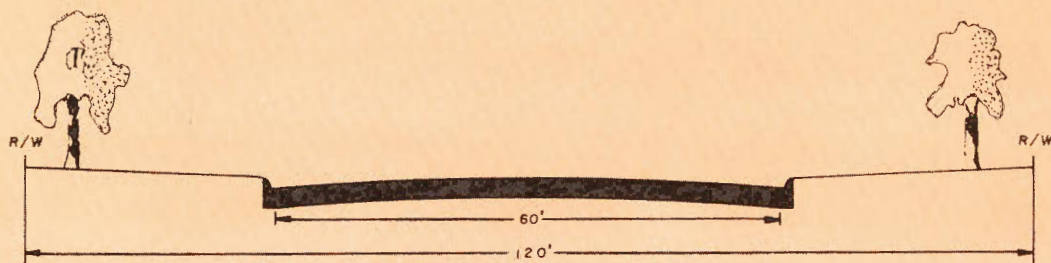


RURAL FREEWAY

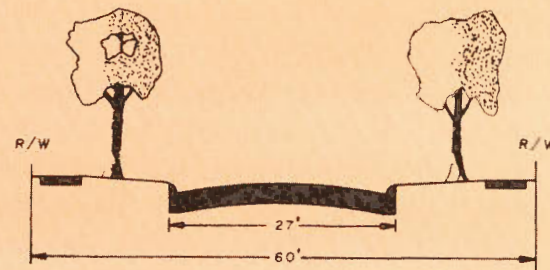


URBAN FREEWAY

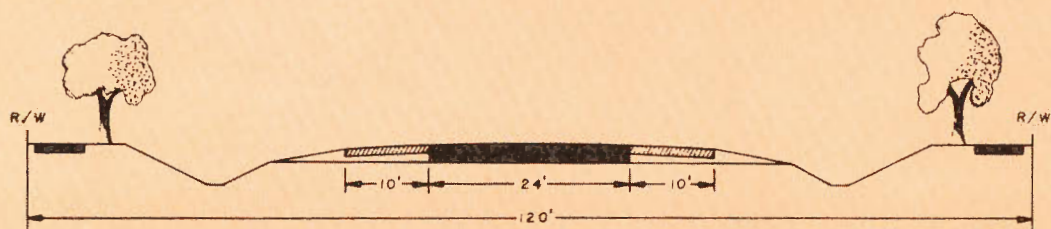
# For Inter-County Highways



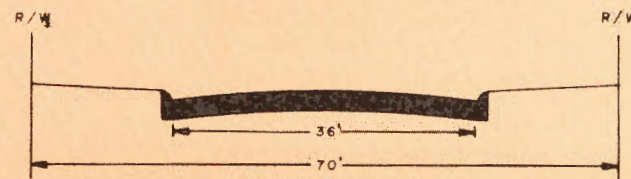
SECONDARY THOROUGHFARE



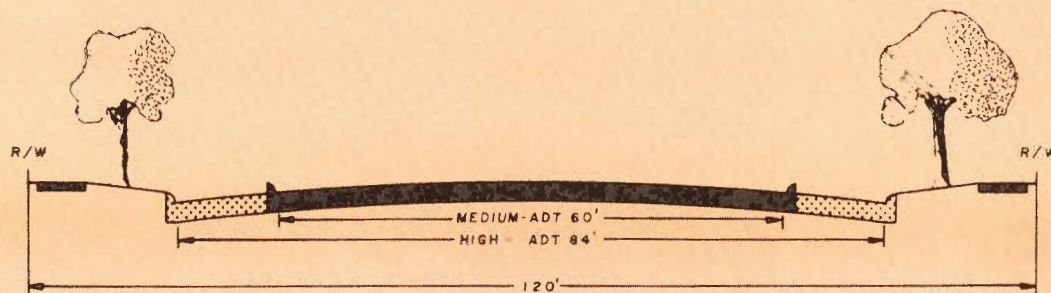
LOCAL SUBDIVISION



MAJOR THOROUGHFARE



INDUSTRIAL SUBDIVISION



MAJOR THOROUGHFARE



NEIGHBORHOOD  
COLLECTOR-DISTRIBUTOR



During the 1966 design Year, which extends from mid-1965 to mid-1966, the Design Division made a complete review of its methods and procedures. Efficiency has been increased by combining often-used details into "Standard Plans" used in design and construction. By adopting these and making them available for use by other government agencies and consulting firms, we have more uniform design and construction, and made people aware of what is desirable and required in county controlled right of way.

The Design Division updated commonly used symbols and abbreviations. Co-related to this, larger scale construction drawings were established as a standard, making them easier to read and interpret.

Another enlarged function performed by the Design Division is the detailed review of proposed construction by utilities in the right of way. This review enables the Road Commission to plan for future construction by proper planning and coordination. Thus, the Road Commission is able to properly locate others within the right of way and avoid costly relocations and loss of service.



**design  
and  
construction  
divisions**



The Construction Division administered the contract construction improvements on 21 miles of county roads. The primary and local cost of constructing these improvements was \$1,600,000 for 27 separate projects. The contract administration of each project consisted of the survey layout inspection for conformance with the plans and specifications, coordination of the necessary utility relocations and maintenance of local traffic. The documentation of contract quantities for payment is also essential.

To assure that the material incorporated in these 27 projects conformed to the specifications the Engineering Laboratory of the Construction Division conducted 800 aggregate gradation tests, 220 concrete beam-strength tests, and 150 bituminous tests.

Access to Oakland University and Oakland Community College-Auburn Hills was greatly improved by the construction work on projects. The relocation of Mt. Clemens Road provides a direct connection from a new University entrance to I-75. The reconstruction of Featherstone Road provides Oakland Community College with an improved access from Opdyke Road.

The completion in 1966 of the last of three projects on Avon Road has resulted in an additional east-west roadway paralleling Walton Boulevard between Rochester Road. This should result in some traffic relief on Walton Boulevard in this area.





## Right of Way Division

The photograph (left) illustrates a heavily traveled road in Oakland County with hazardous parking. It is badly in need of improvement to facilitate the rapid and safe movement of traffic.

In contrast the photograph (right) typifies a road that has been widened and improved, permitting high traffic volumes to move easily and safely in and through the area.

The adoption and enforcement of a future right of way plan, such as established by the Inter-County Highway Commission (see section on Planning) is a step toward a more desirable right of way program.

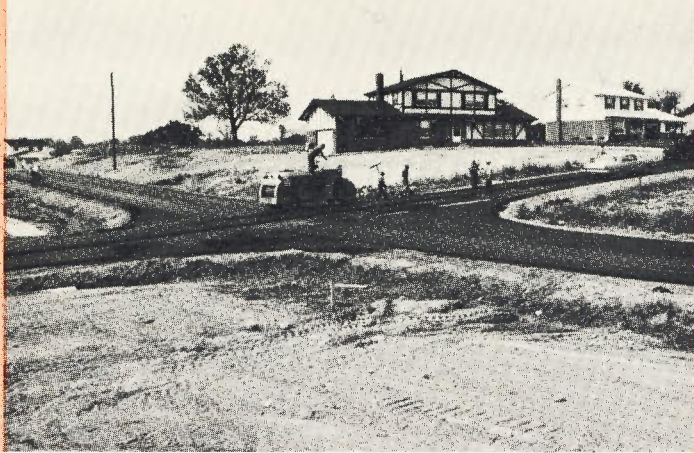
Far in advance of a road improvement program, engineers and planners are engaged in formulating plans to acquire right of way for constructing miles of concrete or asphalt pavement for the motoring public. The additional right of

way is not only needed to widen the new payment, but to provide enough room for the relocation of existing utilities and sidewalks.

The Right of Way Division has the responsibility and authority for securing land to construct Oakland County's modern roads and highways. Permissive use rights must be acquired from the adjacent property owner prior to the commencing of construction. This permission may be for drainage, excavation or disposal, as required.

During 1966 the Right of Way Division has fulfilled this function on 25 road projects constructed in 1966 and programmed for construction in 1967. Title to seventy parcels of land was obtained and hundreds of property owners were contacted for permission to grade on their property due to construction limits beyond our right of way line.





## Plat Division

The Plat Division had an active year in 1966. It was second only to 1965 in construction costs for subdivision streets. It appears that due to economic conditions developers reduced their rate of submission of plats for approval during the later months. A total of 98 new plats were reviewed by the Plat Division of which, 60 were under the jurisdiction of the Board of County Road Commissioners.

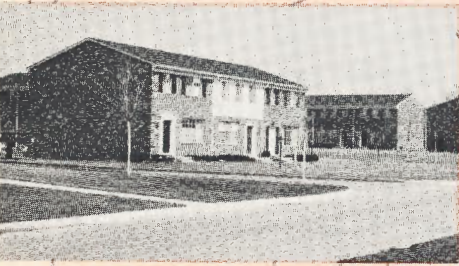
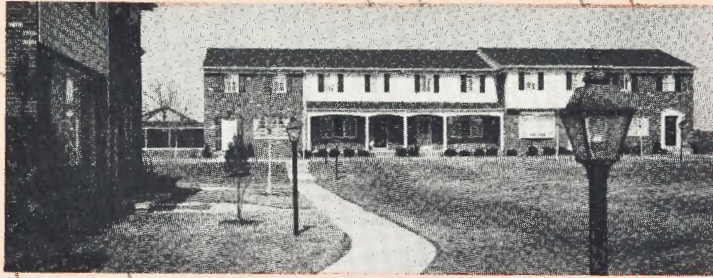
Preliminary street layout, final engineering plans, and the plats for 29 of the 60 new subdivisions were reviewed and approved for construction by the Plat Division. Of these, 31 plats border on existing county roads and required a review of the existing drainage facilities. The remaining 38 of the 98 new plats reviewed by the Plat Division were determined to be the responsibility of the various cities and villages within Oakland County. Construction costs for road drainage and road improvements in the 29 new subdivisions totaled \$1,814,500 and

created 18.54 miles of new roads. Of this number 12.09 miles were of concrete construction with integral curb and the remaining 6.45 miles were bituminous surface construction with concrete curb and gutter. The paving of over 12 miles of concrete roads in the subdivisions greatly increased the total concrete pavement mileage on the county local road system.

Several new policies were adopted by the Plat Division regarding: 1) Multiple Housing and Industrial Plats, and 2) Certification of Private Roads.

Due to the construction of more freeways, improved access roads, storm and sanitary sewer lines, and the availability of large open land sites, the development of Industrial Subdivisions and Multiple Housing Complexes increased at a faster rate than had previously been experienced. These developments, due to their size and relative locations created problems such as: adequate entrance and exit facilities, adequate parking and loading facilities, additional sight distance, internal traffic patterns,





and special pavement designs. These problems necessitated the adoption of additional platting procedures and specifications for this type of land use.

The Plat Division recommended the Board of County Road Commissioners adopt a new policy regarding these developments. On July 26, 1966, the Board formally passed a resolution pertaining to the review and approval of preliminary and final construction plans, as well as financial requirements, obligations, and the acceptance and platting of streets within these subdivisions. This addendum to our "Street Standards and Specifications and Procedures for Plat Development" kept our Commission abreast of the changing times.

The Board of County Road Commissioners on September 13, 1966, adopted a policy regarding privately platted streets that are used the year around. This policy required the property owners to deed adequate right of way, and deposit a nominal sum of money to be used on the roadway and drainage facilities. In return, the Board will assume jurisdiction and responsibility to maintain the road for public use. The administering of this policy was assigned to the Plat Division.



## Permits Division

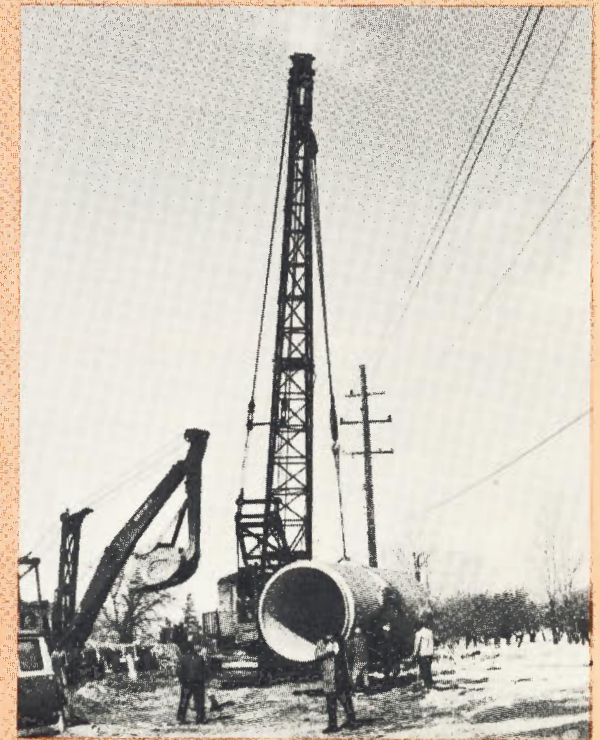
The protection of the traveling public and the rights of the public pertaining to road right of way is accomplished by requiring a permit for all operations within the right of way. This control assures the public that proper safety precautions will be maintained and restoration of existing facilities and conditions will be accomplished. The Permit Division issued and inspected 1446 permits during 1966.

A detailed plan of the proposed construction must be submitted with each application and approved before a permit is issued. The type of individual permit issued ranges from a request to install over a hundred miles of water main to installing a drive culvert.

A special type of permit which has been issued to school districts and local governmental units is for construction of pedestrian overpasses (see photo opposite). The elimination of dangerous pedestrian crossings has become increasingly popular at heavily traveled school crossings.

A more conventional type of construction, is depicted by the lower photograph of an 8 foot water main being installed on a county primary road. This particular project resulted in the complete reconstruction of almost two miles of concrete pavement.

The location of utility lines, both public and private, has become a very critical problem. Inadequate rights of way, plus increased demand for space within the same limits has forced the Road Commission to more elaborate review and control of this activity. To coordinate this problem all permit functions were combined under a separate department on January 1, 1967.





# maintenance department

The Maintenance Department, consisting of 332 employees, is responsible for the housekeeping of the roads, and streets under the jurisdiction of the Board. The Maintenance Department also maintains, by contract, the State Trunklines. The total mileage in both systems is over 2,700 miles (see sheet 19 for a breakdown by surface type and system).

The road system must be constantly checked on a year around basis. An around-the-clock check is instituted during the winter season when plowing and salting must be done constantly to restore and/or maintain traffic flow.

Approximately 50 inches of snow fell during the calendar year of 1966. The high cost of snow removal and ice control is due to a bare pavement policy.

The Maintenance Department constructed several Township Matching Projects. Among these were the Ramsey Road Bridge replacement (see photo, page 18); reconstruction of portions of Buell Road, Gunn Road, Glass Road and Sunningdale. A primary road project, a new culvert on Pontiac Trail west of Wixom Road, was also installed.

Extensive sealing and bituminous widening programs were carried on by the Maintenance Department in 1966. The bituminous widening was constructed at intersections where shoulders were constantly in need of blading and

gravel, and on many curves where shoulders were subject to excessive abuse.

Our Maintenance Office during 1966 received nearly 30,000 telephone requests for service. Of this, over 6,000 resulted in unscheduled repairs.

The operations of the Forestry Division consisting of tree trimming, tree removal, and tree planting, was extremely expensive. This was due to the increasing number of dead elm trees that must be removed because of Dutch Elm Disease.

The Weighmaster Division is responsible for checking and issuing permits for hauling of over-width, over-weight, over-height and over-length equipment on all roads in Oakland County. A total of 9,339 permits were issued during 1966. Also 38 permits were issued for the moving of buildings. There were 1,950 vehicles stopped and examined for possible violations. Tickets issued were for 214 warnings, 246 actual violations.



The accompanying pictures depict modifications made to a truck after it is received from the factory. The modifications are the mountings, fore, middle and aft of the appurtenances needed for year around maintenance.

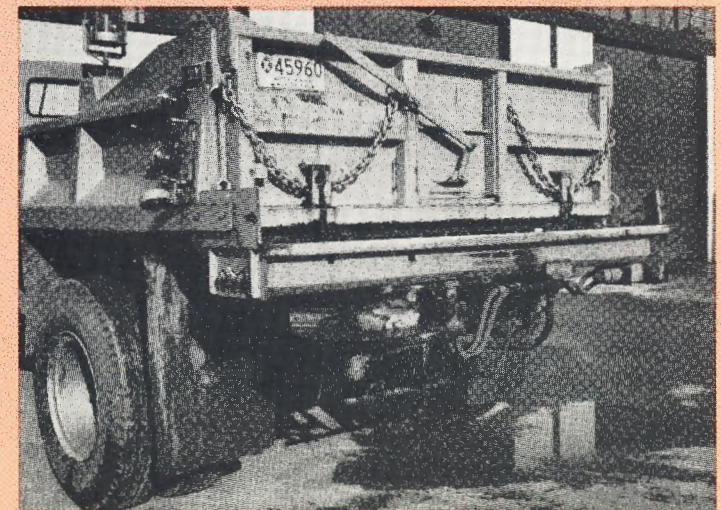
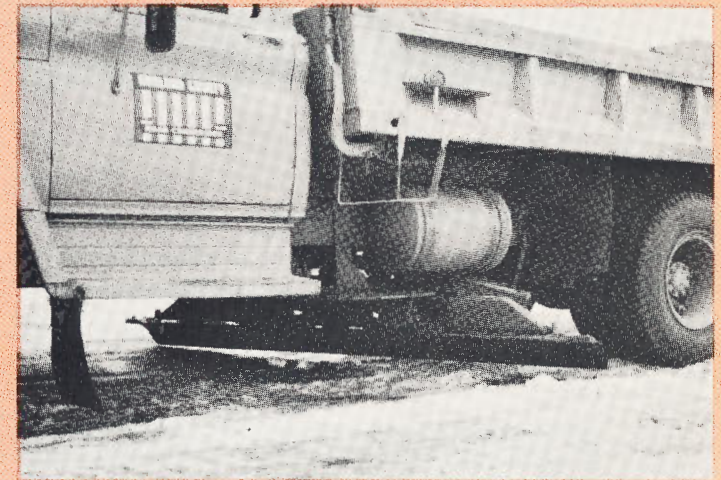
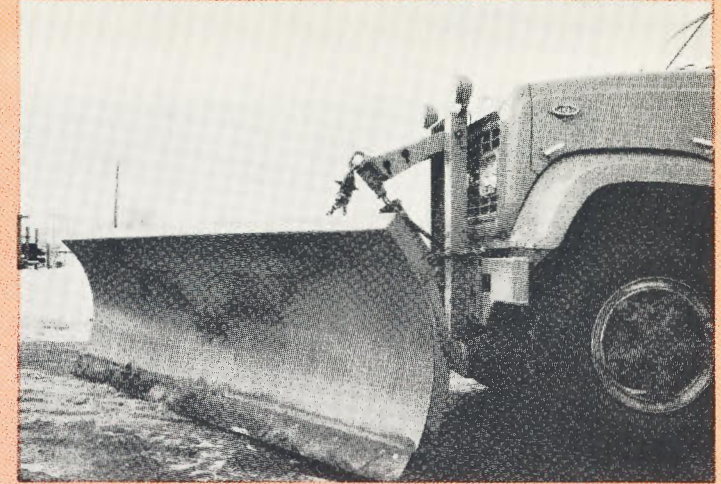
Hydraulic mountings on the front (top photograph) are constructed to provide the most rigid bracing possible and also to provide maneuverability of the plow. Despite elaborate fabrication, using heavy steel struts, many braces are bent when removing heavy snowfalls.

The underbody scraper (middle photograph) is of more year around usefulness than the front plow. This device is used to scrape over 1,300 miles of gravel roads several times during the summer. In winter it is used for snow removal on all types of surfaces.

The spreader box (bottom photograph) used for salting completes the list of major attachments. To preserve the truck body, many fillets must be added. These fillets are positioned to reduce the salt collection in corners.

Completing the modification are steps, tool racks and an array of lights.

As indicated, much has to be done before a truck can be used on the road. The labor, material and equipment needed almost double the initial cost.



Improved service will be provided for the southeast part of Oakland County by the addition of a new maintenance garage in the city of Southfield. The building, constructed in 1966 will be ready for occupancy in early 1967.



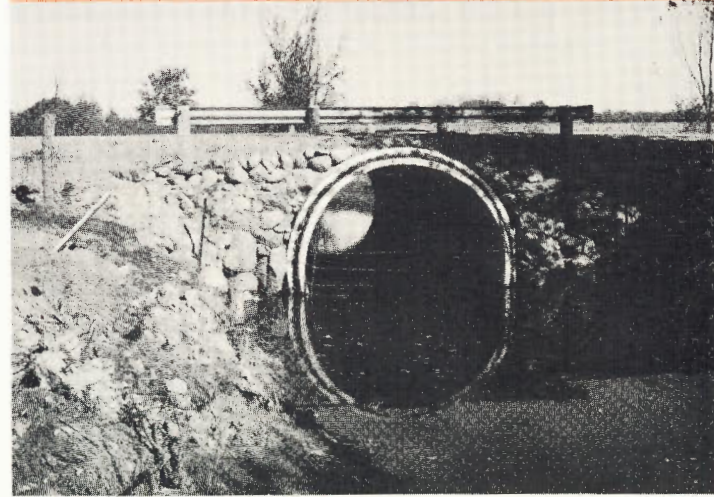




The spindle railings of yesteryear, which were once attractive on many of our bridges, have deteriorated to become dangerous as well as ugly eye sores. Twelve locations were improved at an average cost of \$1,000 each by replacement of the concrete railings with galvanized steel beam guard rail.



An eleven foot culvert pipe replaced a dangerous bridge on Ramsey Road; greatly enhancing the beauty and safety of the location. Many bridges and culverts in Oakland County are fast approaching or have reached this critical stage.





**STATE AND COUNTY ROAD MILEAGE  
IN  
OAKLAND COUNTY**

<u>STATE TRUNK LINE HIGHWAYS</u>	<u>MARCH 1, 1966</u>		<u>MARCH 1, 1965</u>	
	<u>Miles</u>	<u>Total Miles</u>	<u>Miles</u>	<u>Total Miles</u>
Two Lane Pavement	41.41		43.98	
Four or More Lanes of Pavement	82.27		63.13	
Freeways (Limited Access)	90.26		80.82	
Ramps	43.82		<u>43.23</u>	
		257.76		230.16
<u>PRIMARY COUNTY ROADS</u>				
Gravel Surface	125.66		123.90	
Surface Treated Gravel	186.21		189.74	
Mixed Bituminous—Gravel Base	114.78		110.83	
Mixed Bituminous—Concrete Base	230.45		231.52	
Cement Concrete	65.53		63.68	
Deep Strength Asphalt	2.08		<u>2.08</u>	
		724.71		721.75
<u>LOCAL COUNTY ROADS</u>				
Gravel Surface	1,377.53		1,389.03	
Surface Treated Gravel	23.13		23.13	
Mixed Bituminous—Gravel Base	324.43		312.48	
Cement Concrete	21.30		<u>9.21</u>	
		1,746.39		<u>1,733.85</u>
<b>TOTAL MILES</b>		<b>2,728.86</b>		<b>2,685.76</b>



## 1966 PRIMARY ROAD CONSTRUCTION

The following major projects were substantially completed during 1966 from County Road Commission Primary Road Construction Funds and Bond Funds.

<u>Project Number</u>	<u>Road Improved</u>	<u>Length Miles</u>	<u>Termini</u>	<u>Type of Construction</u>	<u>Contractor</u>	<u>Total Cost</u>
FA-583	Base Line	1.85	Orchard Lake Rd. to Grand River	60' concrete pavement with integral curb	Western Contracting Co. & Tony Angelo Cement Pav. Co.	\$1,060,000 (1) *
CW-585	Dequindre Road	2.0	10 Mile to 12 Mile Road	55' concrete pavement with curb and gutter	Tony Angelo Cement Pav. Co.	1,089,730 (2)
PR-586	Haggerty Road	2.0	12 Mile to 14 Mile Road	Reconstruct aggregate base	D. J. McQuestion & Sons	280,000 *
FA-591	Seymour Lake Road	2.7	M-15 to Sashabaw Road	Reconstruct aggregate base	O. E. Gooding and Co.	250,000 (3) *
PR-598	Walton-Williams Lake Road	---	Intersection at Dixie Hwy (US-10)	Widen to 4 lanes, concrete pavement with bituminous surface	Ann Arbor Const. Co.	36,434
CW-623	12 Mile	---	Intersection at John R Road	Widen to 5 lanes, concrete pavement	Lind Asphalt Pav. Co.	42,537 (4)
PR-640	Fish Lake Road	1.1	Fenton to Academy Road	Reconstruct aggregate base	Nagy Bros.	66,500 *
PR-643	Mt. Clemens Road	0.4	Mt. Clemens relocation to Oakland University	24' concrete pavement	Sterling Garrett Cont. Co. Inc.	180,000 *
PR-644	Mt. Clemens Road	0.3	Oakland University entrance	27' concrete pavement - boulevard	Sterling Garrett Cont. Co. Inc.	43,000 (5) *
CW-646	Lasher Road	---	Lasher at Winchester	Widen with aggregate base and bituminous aggregate surface	Stanley B. Jones, Contr.	15,444 (6)
SP-647	Pontiac Trail	---	West of Wixom Road	Replace bridge with multi-plate	Maintenance Department	17,739
PR-649	Hatchery-Airport Road	---	Intersection	Widen with aggregate base and place 44' bituminous aggregate surface with curb and gutter	Ann Arbor Const. Co.	38,022
PR-658	Andersonville-Airport Road	---	Intersection	Widen with concrete base course, place 44' bituminous concrete surface with curb and gutter	Ann Arbor Const. Co.	16,096
CW-676	11 Mile Road	0.4	Lafayette to Troy, Wilson to Edison Road	Widen to 5 lanes, concrete pavement with curb and gutter	Hartwell Const. Co.	29,565 (6)
CW-681	12 Mile Road	0.2	Telegraph - easterly	Widen with aggregate base and place 48' bituminous aggregate surface	Lind Asphalt Pav. Co.	30,000 (7) *

\* Estimated Cost - Final cleanup in 1967

(1) 87% by Wayne County Road Commission and Federal Aid Secondary Funds

(2) 50% by cities and 25% by Macomb County Road Commission

(3) 50% by Federal Aid Secondary Funds

(4) 50% by Road Commission on 12 Mile Road

(5) 100% by Michigan Department of State Highways

(6) 50% by City

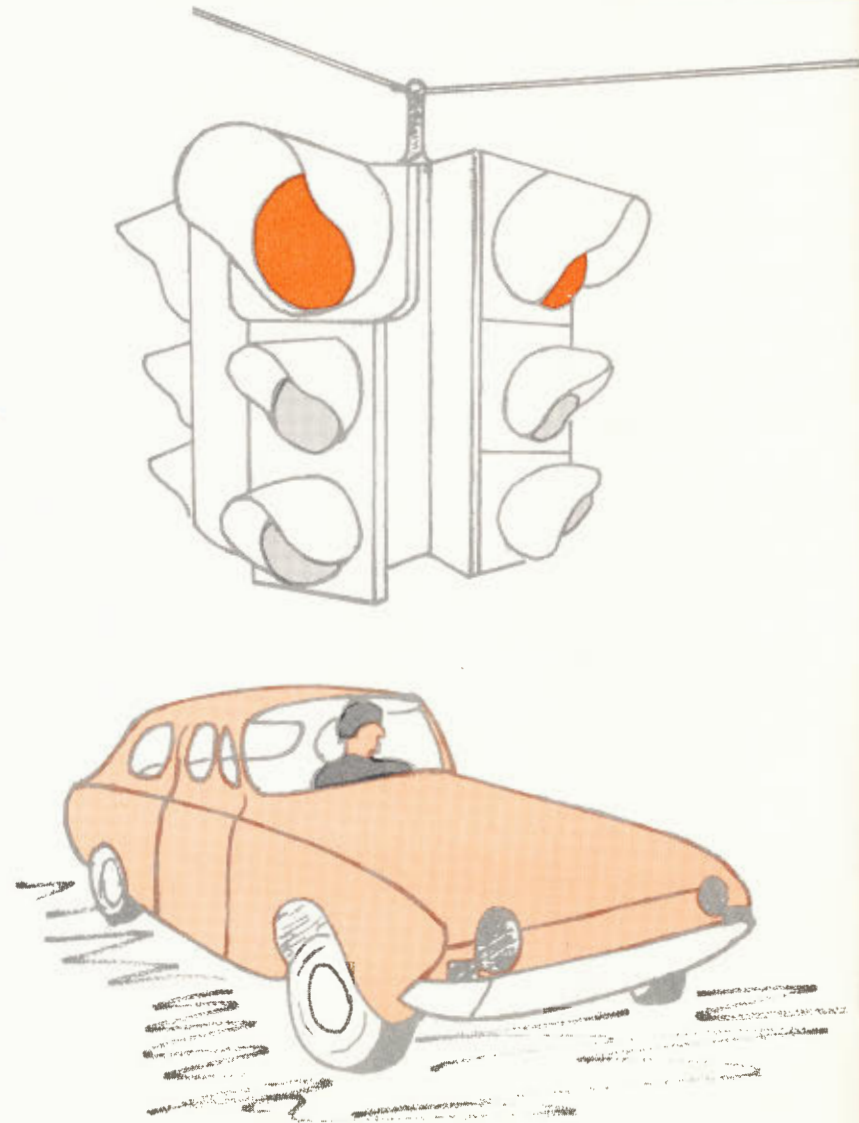
(7) \$20,000 by Developer

# traffic

The safe and efficient flow of traffic is of major importance. Inasmuch as traffic demand is increasing faster than our road improvement program, the Traffic Department has been required to spend large sums of money on complex signal systems. By tying together, by means of an electrical circuit, all the traffic signals on Southfield Road between I-696 (B.S.) and Fourteen Mile Road, and on Greenfield Road between Eight Mile and Eleven Mile Roads, additional traffic volumes are being handled. Without such a system, stagnation of traffic would result.

During the year, with installation of additional traffic control equipment, our Electrical Division was responsible for the operation of 434 electrical devices. This total includes 331 traffic signals and flashing beacon installations and 103 other electrical devices. Constant operation of these devices necessitated 271 emergency runs, which is a 58% increase over those made in 1965. In maintaining these numerous devices, it is interesting to note that 11,469 lamps were used. Also, a total of 64 installations were reconditioned by dismantling the signal head, cleaning, repainting and re-assembling.

A two-way communication system between 4 base stations and 106 mobile units facilitate the operation of our organization.







**department**

Through our Traffic Department, a program was initiated to place advance road name signs for all roads intersecting with our primary roads and hard-surfaced major local roads. This was completed during 1966 and initially required a total of 1502 advance road name signs. Due to new construction, an additional 37 signs were installed making a total of 1539 signs now along our roads to better advise the driver of approaching intersections. This program, in addition to our previously placing 260 lake name signs along our roadways, has brought many favorable comments from the traveling public.

Constantly changing travel patterns create the need for surveys of parking problems, proper speed zone determination, traffic signal installation and the proper lane striping of the pavement. Many studies were made either proving or disproving the necessity for corrective measures. We have 28 battery operated traffic counters which are used in conducting these studies.

The Traffic Department is responsible for establishing and properly signing detour routes on major constructor work. This is done for public and private utility construction as well as major construction work done by the Road Commission.

## Personnel

The Personnel Department is responsible for recruiting and supplying the different departments with adequate and qualified personnel. Employer-employee relations, and Public Relations, along with the pension plan, group life, hospital and surgical insurance, are also handled by the Personnel Department.

Our average employment for 1966 numbered approximately 447. Of this figure, 326 were hourly employees and 121 were engineering and administrative employees. The national shortage of trained professional and skilled manpower made it difficult to secure additional qualified employees. Even with increased recruiting efforts, we were incapable of meeting all requirements.

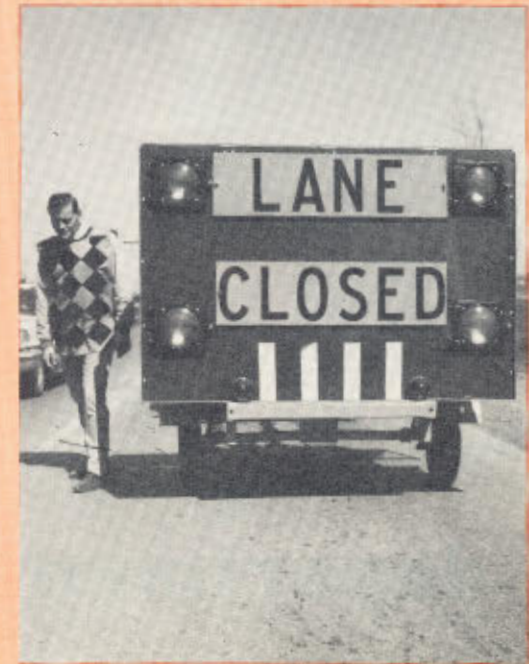


## administrative

## Safety

The Oakland County Road Commission employees support an active safety program. Many of the employees are working on the road almost every day. In order to help reduce accidents they are made more visible by wearing bright colored jackets, or when necessary, carrying flags to warn the public to travel at a lower speed.

Several additional improvements have been made in our Safety Program, one of which is a large, brightly lit flashing barricade. The barricade is placed several hundred feet in advance of the men working on the pavement. This barricade, due to its size, can be seen for a long distance even on heavily traveled roads thereby offering protection to the motorist and the workers.







## Purchasing

The Purchasing Department carried out the acquisition of nearly 1½ million dollars worth of materials, parts, supplies, office and shop equipment. In addition the cost of new road equipment amounted to nearly \$370,000. The majority of these purchases were made through the process of competitive, sealed bids. These bids were tailored to specifications which are the result of the combined experience of both our Maintenance Department and a cost analysis record kept by a private consulting firm on all equipment other than small tools.

# departments



## Accounting

The Accounting Department is staffed by three bookkeeping-machine operators, one typist, four clerks, the Time-keeper, Payroll Supervisor and Accountant. Its function is to keep detailed records on labor and equipment charges as well as cash received and disbursed. The monthly State Highway Maintenance and Non-Maintenance reports are compiled in this office. Invoices are prepared and paid by the Accounting Department.

Complete employment records are kept by the Payroll Division. They show each employees date of hire, hourly rate, sick days, and vacation. The authorized deductions for credit union, United Fund, and bonds are kept current.

# DISTRIBUTION OF 1966 MOTOR VEHICLE HIGHWAY FUNDS



**financing**



**33% Primary Road Construction**

**40% Primary Road Maintenance**

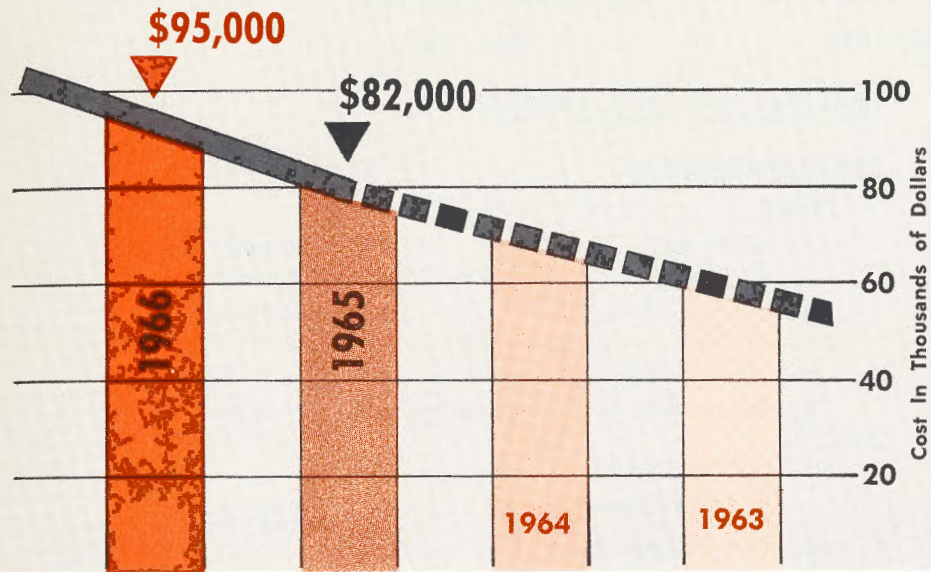
**9% Local Road Construction**

**18% Local Road Maintenance**

**Received Total**

**100% \$5,773,652.71**





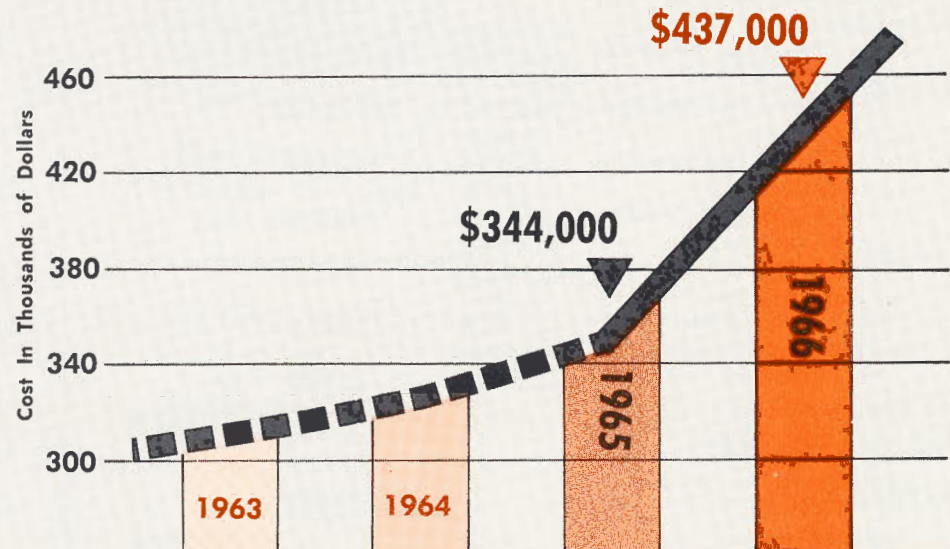
**TWO LANE BITUMINOUS PAVEMENT  
WITH OPEN DITCH**

During the past three years the contract construction cost of rebuilding bituminous roads has increased nearly 15% per year, or approximately 55% total. This is due to higher labor and material costs. If this trend continues the number of miles of roads rebuilt each year will decrease.

## Average Yearly Contract Construction Cost Per Mile

**FOUR LANE CONCRETE PAVEMENT  
WITH CONCRETE CURB**

Contract construction costs of rebuilding concrete pavements to 4 lanes with 5 lane intersections has increased due to higher labor and material costs. Projects of this type and complexities are constructed in the urban areas. The average cost has increased up to 30% over last year while the average construction funds available has decreased.



# DISTRIBUTION OF 1966 MOTOR VEHICLE HIGHWAY FUNDS



**financing**



**33% Primary Road Construction**

**40% Primary Road Maintenance**

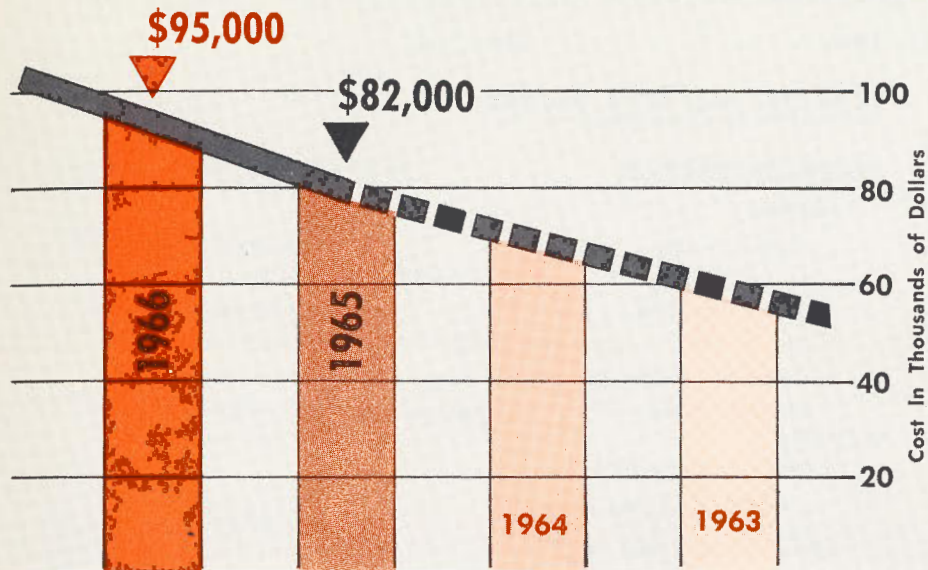
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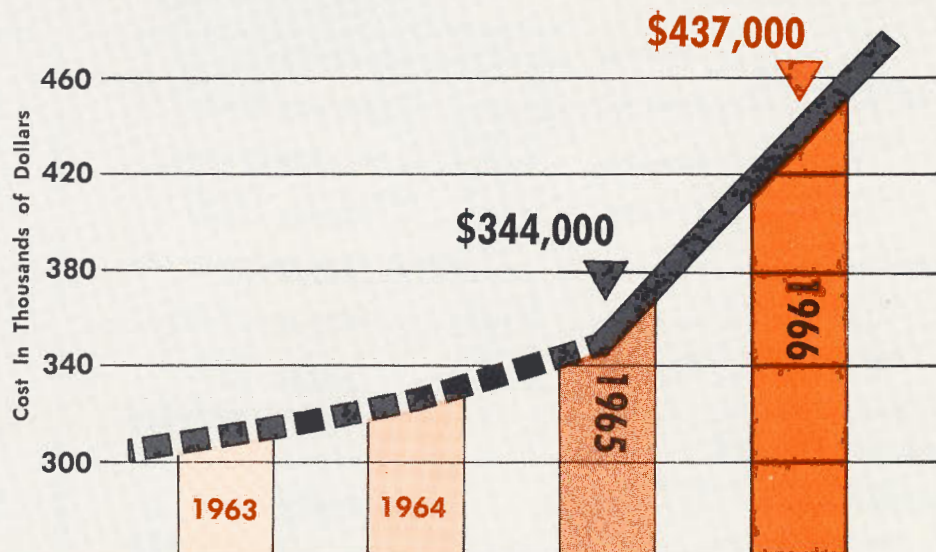
### TWO LANE BITUMINOUS PAVEMENT WITH OPEN DITCH

During the past three years the contract construction cost of rebuilding bituminous roads has increased nearly 15% per year, or approximately 55% total. This is due to higher labor and material costs. If this trend continues the number of miles of roads rebuilt each year will decrease.

## Average Yearly Contract Construction Cost Per Mile

### FOUR LANE CONCRETE PAVEMENT WITH CONCRETE CURB

Contract construction costs of rebuilding concrete pavements to 4 lanes with 5 lane intersections has increased due to higher labor and material costs. Projects of this type and complexities are constructed in the urban areas. The average cost has increased up to 30% over last year while the average construction funds available has decreased.



# DISTRIBUTION OF 1966 MOTOR VEHICLE HIGHWAY FUNDS



**financing**

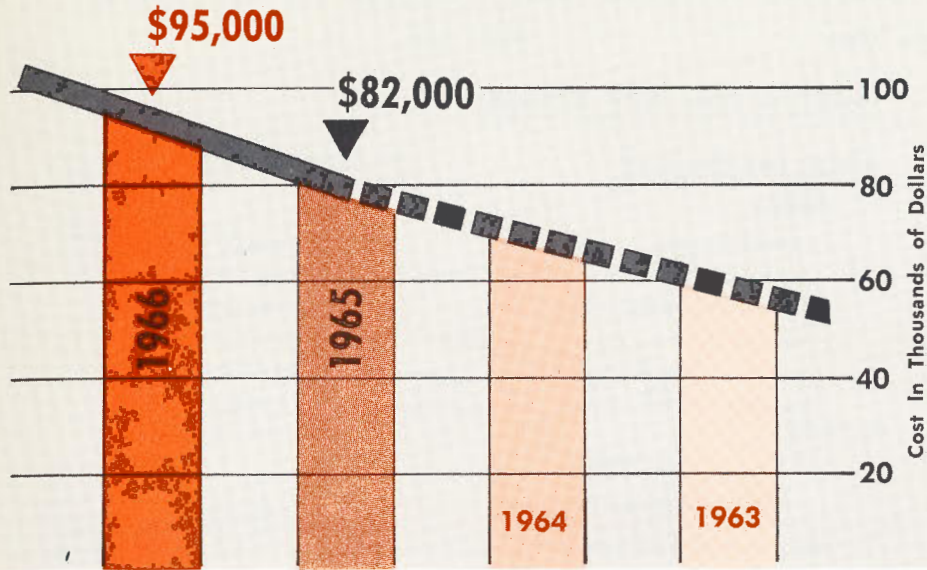


- 33% Primary Road Construction**
- 40% Primary Road Maintenance**
- 9% Local Road Construction**
- 18% Local Road Maintenance**

**Received Total**

**100% \$5,773,652.71**





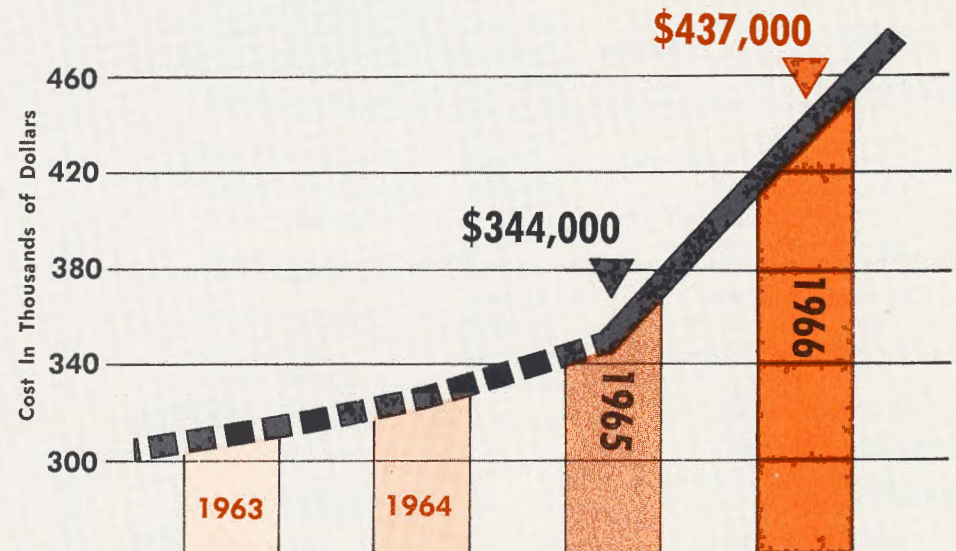
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Contract construction costs of rebuilding concrete pavements to 4 lanes with 5 lane intersections has increased due to higher labor and material costs. Projects of this type and complexities are constructed in the urban areas. The average cost has increased up to 30% over last year while the average construction funds available has decreased.



# BALANCE SHEET

December 31, 1966

## ASSETS:

### General Operating Fund

County Treasurer's Cash Account	78,524.42	
Imprest Cash—Office	150.00	
Payroll Bank Account	2,500.00	
Revolving Bank Account	126,850.49	
Accounts Receivable		
State Trunkline Maintenance	284,627.67	
State Highway Dept.—Other	52,924.26	
Due on County Road Agreements	154,404.13	
Sundry Accounts Receivable	58,706.35	
Work Orders in Progress	16,413.89	
Inventories:		
Equipment Materials and Parts	86,054.41	
Road Materials	252,667.11	
Prepaid Expenses	89,530.03	
Deferred Expense—F.A.S.	236,855.38	
<b>Total General Operating Fund</b>		<b>1,440,208.94</b>

### Fixed Asset Fund

Land & Improvements		435,187.99
Buildings	1,399,656.10	
Less: Reserve for Depreciation	211,544.03	1,188,112.07
Equipment—Road	2,963,113.20	
Less: Reserve for Depreciation	1,602,918.49	1,270,194.71
Equipment—Shop	106,992.50	
Less: Reserve for Depreciation	65,804.38	41,183.12
Equipment—Office	110,397.83	
Less: Reserve for Depreciation	77,218.74	33,179.14
Equipment—Engineers	9,556.78	
Less: Reserve for Depreciation	6,321.00	3,235.78
Equipment—Brine Well	33,034.81	
Less: Reserve for Depreciation	21,469.48	16,565.33
Depletable Assets—Gravel Pits	75,964.64	
Less: Reserve for Depletion	70,032.36	5,932.28
<b>Total Fixed Assets</b>		<b>2,993,595.42</b>

### Long Term Debt Fund

Amount to be Provided for the Retirement of Bonds	6,148,750.00
<b>Total Long Term Fund</b>	<b>6,148,750.00</b>

**TOTAL ASSETS**

**\$10,582,554.36**

## LIABILITIES AND FUND EQUITIES:

### General Operating Fund

Liabilities	
Accounts Payable	396,891.83
Accrued Liabilities	61,059.44
Advances—Townships & Others	2,356.09
Advances—Matching Funds by Townships	121,557.77
Advances—Deposits by Subdivision & Contractors	590,010.96
Emergency Advance—Motor Vehicle Highway Funds	400,000.00
Available Operating Funds	
County Road Commission Funds	—131,667.15
<b>Total Operating Liabilities &amp; Equities</b>	<b>1,440,203.94</b>

### Fixed Asset Fund

Plant & Equipment Equity	2,993,595.42
--------------------------	--------------

### Long Term Debt Fund

Farmington-Brighton Expressway	76,250.00
Northwestern Expressway	922,500.00
County Highway Bonds	5,150,000.00
<b>Total Long Term Debt Fund</b>	<b>6,148,750.00</b>

**TOTAL LIABILITIES AND FUND EQUITIES**

**\$10,582,554.36**



# SUMMARY OF RECEIPTS AND EXPENDITURES

Year 1966

## COUNTY HIGHWAY RECEIPTS

### Revenue Receipts

State Funds—Motor Vehicle Highway Funds	5,773,652.71 ✓
Federal Aid Secondary Funds	101,859.44 ✓
Other Federal Funds—Bridge Construction	9,247.71 ✓
County Raised Revenues	682,086.22 ✓
Miscellaneous Receipts	35,908.12 ✓
<b>Total Revenue Receipts</b>	<b>6,602,754.20</b>

**TOTAL HIGHWAY RECEIPTS 6,602,754.20**

## COUNTY HIGHWAY EXPENDITURES

Construction	2,348,392.51
Maintenance	3,510,533.91
Equipment Account	122,607.27
Interest	160,887.50
Administration	550,033.22
<b>Total Revenue Receipts</b>	<b>6,692,454.41</b>

## NON-OPERATING EXPENDITURES

Capital Outlay	158,311.71
Gain or Loss on Disposal of Equipment	-9,137.03
Long Term Debt Payments	330,000.00
<b>Total Non-Operating Expenditures</b>	<b>479,174.68</b>
<b>TOTAL HIGHWAY EXPENDITURES</b>	<b>7,171,629.09</b>
Decrease in Available Operating Funds	-568,874.89

**GRAND TOTAL \$6,602,754.20**

# COUNTY HIGHWAY RECEIPTS

Year 1966

## REVENUE RECEIPTS

### State Funds—

Motor Vehicle Highway Funds	
Engineering Services	
Primary Road Fund	4,080.00
Local Road Fund	920.00
<b>Total Engineering Service</b>	<b>5,000.00</b>

### County Primary Road Fund

Amount of Allocation	4,706,225.73
Less: Optional Transfer	-385,738.77
Net for Primary Roads	4,320,486.96

### County Local Road Fund

Amount of Allocation	1,062,426.98
Add: Optional Transfer	385,738.77
Net for Local Roads	1,448,165.75

**Total Motor Vehicle Highway Funds 5,773,652.71**

### Federal Funds

Federal Aid Secondary	101,859.44
A.P.W.—Housing & Home Finance Agency	9,247.71
<b>Total Federal Funds</b>	<b>111,107.15</b>

### County Raised Revenue

Township Contributions	418,718.47
Other Contributions	263,367.75
<b>Total County Raised Revenues</b>	<b>682,086.22</b>

### Miscellaneous Receipts

Salvage Sales	1,616.43
Interest Earned	21,259.53
Permit Fees	9,346.00
Sundry Refunds	3,121.16
Sale of Maps & Plans	565.00
<b>Total Miscellaneous</b>	<b>35,908.12</b>

**TOTAL REVENUE RECEIPTS \$6,602,754.20**

# SUMMARY OF RECEIPTS AND EXPENDITURES

Year 1966

## COUNTY HIGHWAY RECEIPTS

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**TOTAL HIGHWAY RECEIPTS** **6,602,754.20**

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# COUNTY HIGHWAY RECEIPTS

Year 1966

## REVENUE RECEIPTS

State Funds—		
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Engineering Services		
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Net for Local Roads		<u>1,448,165.75</u>
<b>Total Motor Vehicle Highway Funds</b>		<b><u>5,773,652.71</u></b>
Federal Funds		
Federal Aid Secondary		101,859.44
A.P.W.—Housing & Home Finance Agency		<u>9,247.71</u>
<b>Total Federal Funds</b>		<b>111,107.15</b>
County Raised Revenue		
Township Contributions		418,718.47
Other Contributions		<u>263,367.75</u>
<b>Total County Raised Revenues</b>		<b><u>682,086.22</u></b>
Miscellaneous Receipts		
Salvage Sales		1,616.43
Interest Earned		21,259.53
Permit Fees		9,346.00
Sundry Refunds		3,121.16
Sale of Maps & Plans		<u>565.00</u>
<b>Total Miscellaneous</b>		<b><u>35,908.12</u></b>

**TOTAL REVENUE RECEIPTS** **\$6,602,754.20**



# COUNTY HIGHWAY EXPENDITURES

Year 1966

	<u>Primary Road System</u>	<u>Local Road System</u>	
<b><u>OPERATING EXPENDITURES</u></b>			
Construction (All Costs Except Administration)			
Roads—County Road Fund	1,402,146.48	926,909.85	
Bridges	<u>19,336.18</u>	<u>                    </u>	
<b>Total Construction Expense</b>	<b>1,421,482.66</b>	<b>926,909.85</b>	<b>2,348,392.51</b>
Maintenance (All Costs Except Administration)			
General Maintenance—Roads	1,659,066.00	1,033,742.04	
General Maintenance—Structures	11,561.01		
Snow & Ice Control, Snow Fence	378,575.77	131,864.48	
Traffic Control	224,791.67	29,996.00	
Maintenance Agreements	<u>39,207.14</u>	<u>                    </u>	
<b>Total Maintenance Expenditures</b>	<b>2,313,201.59</b>	<b>1,195,602.52</b>	<b>3,508,804.11</b>
Roadside Parks & Motor Parkways			
Construction & Maintenance	<u>1,729.80</u>		
<b>Total Roadside Parks Expenditures</b>	<b>1,729.80</b>		<b>1,729.80</b>
Equipment Account			
Direct Expense	785,152.89		
Indirect & Storage Expense	373,198.15		
Operating Expense	<u>100,274.37</u>	<u>                    </u>	
<b>Total Equipment Expense</b>	<b>1,258,625.41</b>		
Credits to Equipment Account			
Equipment Rental		<u>-1,136,018.14</u>	
Net Equipment Account Expense			<b>122,607.27</b>
Interest Expense—Primary Roads			<b>160,887.50</b>

# COUNTY HIGHWAY EXPENDITURES

Year 1966

	<u>Primary Road System</u>	<u>Local Road System</u>	
<b><u>OPERATING EXPENDITURES—Continued</u></b>			
Administrative Expense			623,635.85
Credits to Administrative Expense			
Handling Charges on Material Sold	10,555.64		
Overhead—State Trunkline Maint.	50,129.92		
Purchase Discounts	6,503.59		
Plat Fees	<u>6,413.48</u>		
Total Credits to Administrative Expense			<u>-73,602.63</u>
Net Administrative Expense			<b>550,033.22</b>
Administrative Proration			
Primary System	411,984.51		
Local System	<u>138,048.71</u>		
<b>TOTAL OPERATING EXPENDITURES</b>			<b>\$6,692,454.41</b>
<b>NON-EXPENSE DEBITS</b>			
Capital Outlay			
Land & Improvements	66,284.49		
Buildings	132,445.31		
Equipment	<u>421,383.39</u>		
<b>Total Capital Outlay</b>			<b>620,113.19</b>
Less: Non-Revenue Credits			
Equipment Retirements	38,826.55		
Depreciation Depletion	<u>422,974.93</u>		
<b>Total Non-Revenue Credits</b>			<b>-461,801.48</b>
NET CAPITAL OUTLAY EXPENDITURES			158,311.71
Gain on Disposal of Equipment			-9,137.03
Long Term Debt Payments			
Roads (Primary)	225,000.00		
Expressway Bonds			
Farmington-Brighton Expressway	15,000.00		
Northwestern Expressway	<u>90,000.00</u>		
<b>Total Long Term Debt Payments</b>			<b>330,000.00</b>
<b>TOTAL NON-EXPENSE DEBITS</b>			<b>479,174.68</b>
<b>TOTAL EXPENDITURES</b>			<b>7,171,629.09</b>
Decrease in Available Operating Funds			<b>-568,874.89</b>
<b>TOTAL EXPENDITURES AND FUND EQUITY ADJUSTMENT</b>			<b>\$6,602,754.20</b>

# STATEMENT OF LOCAL ROAD CONSTRUCTION

Year 1966

<u>Project</u>	<u>Road</u>	<u>Amount</u>	<u>Motor Vehicle Highway Funds</u>	<u>Townships and Other Contributions</u>
TM-564	Oakley Park Road	11,235.38	5,320.88	5,914.50 Commerce
TM-565	Drahner Road	3,531.74	1,768.12	1,763.62 Oxford
TM-569	Eleven Mile Road	49,476.35	22,534.63	26,941.72 Farmington
TM-613	Avon Road	118,082.65	64,208.83	53,873.82 Avon
TM-614	Walnut Lake Road	3,977.84	2,427.95	1,549.89 West Bloomfield
TM-618	West Glass Road	24,178.94	16,178.94	8,000.00 Brandon
TM-621	Maceday Lake Road	58,516.23	34,504.34	24,011.89 Waterford
TM-622	Featherstone Road	23,691.53	11,279.16	12,412.37 Oakland Comm. College
TM-624	Six Local Roads	5,285.68	2,642.84	2,642.84 Milford
TM-625	Judah Lake Road	260.92	130.46	130.46 Orion
TM-626	Gregory Road	6,016.57	3,008.28	3,008.29 Orion
TM-627	Dutton Road	28,435.42	15,617.60	12,817.82 Avon
TM-630	Drahner Road	32,157.20	17,605.37	14,551.83 Oxford
TM-631	Waldon Road	48,123.39	24,218.18	21,505.21 Independence
TM-636	Eastways Road	72,113.52	38,614.37	2,400.00 Clarkston
T -637	Sunningdale Street	6,857.06	134.80	33,499.15 Bloomfield Hills
TM-639	Nine Mile at Gill Roads	32,254.21	18,454.21	6,991.86 Bloomfield
TM-645	Nine Mile Road	38,513.91	20,280.91	13,800.00 Bert L. Smokler Co.
TM-660	Bass Lake Road	77,464.03	42,057.98	18,233.00 Farmington (City)
TM-661-662	Cedar Island Road & Oxbow Lake Road	61,006.12	36,256.31	35,406.05 Commerce
TM-663	Granger Road	11,080.06	6,080.06	24,749.81 White Lake
TM-664	West Maple Road	16,813.91	8,258.20	5,000.00 Mickelson Corp.
TM-665	McCoy Road	12,479.89	6,328.89	8,555.71 Commerce
TM-666	Avon Road	36,048.95	17,583.77	6,151.00 Commerce
TM-667	Fish Lake Road	13,188.40	6,517.23	18,465.18 Avon
TM-668	Featherstone Road	17,094.76	8,226.82	6,671.17 Holly
TM-669	Drake Road	6,323.18	3,161.59	8,867.94 Oakland Comm. College
TM-671	Tienken Road	13,251.33	9,335.99	3,161.59 Farmington
TM-673	Gregory Road	10,049.33	5,169.35	3,915.34 Avon
TM-674	Bald Mt. Road	3,000.00	1,650.00	4,879.98 Orion
TM-675	Joslyn Road	55,488.52	32,429.85	1,650.00 Orion
TM-677	Colonial Hills Sub.	378.25	189.12	23,058.67 Orion
TM-678	Gunn Road	3,099.63	1,549.81	189.13 Bloomfield
TM-679	Buell Road	13,682.66	6,841.33	1,549.82 Oakland
TM-683	Ramsey Road Bridge	11,686.32	7,686.32	6,841.33 Oakland
TM-684	Garner, Pearson, W. Maple	1,765.97	882.98	4,000.00 Brandon
<b>TOTAL LOCAL ROAD CONSTRUCTION</b>		<b>926,909.85</b>	<b>498,865.87</b>	<b>428,043.98</b>



## CASH BUDGET FOR 1967

### REVENUE

	<u>1964</u> <u>(Actual)</u>	<u>1965</u> <u>(Actual)</u>	<u>1966</u> <u>(Actual)</u>	<u>1967</u> <u>(Estimated)</u>
	\$	\$	\$	\$
<b><u>MOTOR VEHICLE HIGHWAY FUNDS</u></b>				
Engineering	5,000	5,000	5,000	5,000
Primary Roads	4,098,789	4,398,812	4,706,226	5,000,000
Local Roads	<u>940,849</u>	<u>1,001,863</u>	<u>1,062,427</u>	<u>1,120,000</u>
<b>Total</b>	<b>5,044,638</b>	<b>5,405,675</b>	<b>5,773,653</b>	<b>6,125,000</b>
 <b><u>OTHER REVENUE</u></b>				
Participation by Cities & Adjacent Counties	330,996	422,153	399,447	470,000
Interest Earned	144,323	60,573	21,259	5,000
State Maintenance Contract	764,823	923,378 (13 mo.)	771,609	1,000,000
A.P.W. Federal Funds	256,500	9,590	9,348	
Matching Projects, Townships	334,614	262,644	235,294	350,000
Calcium Chloride	121,387	123,422	126,131	130,000
Escrow Funds	707,861	393,599	342,689	507,000
Miscellaneous	<u>375,685</u>	<u>398,409</u>	<u>535,288</u>	<u>400,000</u>
<b>Total Other Revenue</b>	<b>3,036,189</b>	<b>2,593,768</b>	<b>2,440,465</b>	<b>2,862,000</b>
<b>TOTAL REVENUE</b>	<b>\$8,080,836</b>	<b>\$7,999,443</b>	<b>\$8,214,118</b>	<b>\$8,987,000</b>

### EXPENDITURES

<b><u>CONSTRUCTION</u></b>				
Federal Aid Projects (County Share)			276,319	30,000
Primary Road Contracts & Right of Way	548,970	1,996,354	1,476,459	1,245,000
Local Road Contracts & Right of Way	466,315	736,995	782,216	900,000
Bridge Construction (A.P.W. Projects)	337,681	9,553		
Bond Payments	<u>490,700</u>	<u>487,488</u>	<u>490,000</u>	<u>385,000</u>
<b>Total</b>	<b>\$1,843,666</b>	<b>\$3,230,390</b>	<b>\$3,025,882</b>	<b>\$2,665,000</b>
 <b><u>OTHER EXPENDITURES</u></b>				
Material, Supplies & Parts	964,248	1,334,310	1,221,403	1,260,000
Payroll, Hourly	2,023,408	2,275,582	2,368,910	2,500,000
Distributive Expense, Pension, Insurance	595,433	730,906	850,388	896,000
Capital Outlay	320,447	352,403	354,333	359,000
Administrative Expense	706,433	775,531	896,696	900,000
Escrow Funds & Miscellaneous	<u>517,428</u>	<u>374,811</u>	<u>405,000</u>	<u>405,000</u>
<b>Total Other Expenditures</b>	<b>\$5,127,397</b>	<b>\$5,843,543</b>	<b>\$6,018,528</b>	<b>\$6,320,000</b>
<b>TOTAL EXPENDITURES</b>	<b>\$6,971,063</b>	<b>\$9,073,933</b>	<b>\$9,055,243</b>	<b>\$8,985,000</b>

1967

PROPOSED CONSTRUCTION, PRIMARY ROADS

Funds for these projects are derived almost entirely from Oakland County's share of the Motor Vehicle Highway Funds.

<u>Project Number</u>	<u>Road To Be Improved</u>	<u>Length Miles</u>	<u>Termini</u>	<u>Type of Construction</u>	<u>Estimated Total Cost</u>
BU-634 (B)	Southfield Garage	0.3	Franklin and I-696	Pave building site and road with bituminous aggregate surfacing	12,000
CWB-546	Rochester	0.5	14 Mile to north Clawson City Line	48' concrete pavement with integral curb	280,000 (1)
CWB-582	Greenfield	1.0	8 Mile to 9 Mile	Widen to 6 lanes-divided roadway with integral curb	750,000 (3)
PR-640	Fish Lake	1.0	Fenton to Academy	22' bituminous aggregate surfacing	25,000
PR-641	Orchard Lake	0.7	8 Mile to I-96	24' concrete pavement	250,000
SP-657	Mill Street	---	Village of Ortonville	Replace bridge with corrugated metal culvert	35,000
BU-672A	Rattalee Lake	0.3	Dixie Hwy. @ Rattalee Lake Road	Reconstruct building site and road with aggregate base course	90,000
BU-672B	Davisburg Garage	---	Dixie Hwy. @ Rattalee Lake Road	Maintenance storage garage, 90' x 220'	350,000
PR-680	Elizabeth Lake	0.5	Telegraph to Josephine	Widen to 5 lanes - concrete pavement with curb and gutter	120,000 (2)
PR-690	Haggerty	2.0	12 Mile to 14 Mile	22' bituminous aggregate surfacing	50,000
FA-691	Seymour Lake	2.7	M-15 to Sashabaw	22' bituminous aggregate surfacing	65,000 (4)
CW-692	12 Mile	---	Evergreen	Widen intersection to 5 lanes - concrete pavement	100,000 (5)
CW-703	Big Beaver	0.5	Coolidge east 1/2 mile	Widen to 5 lanes - concrete pavement with integral curb, south side	202,000 (6)

- (1) 25% by City
- (2) \$18,000 by Developer
- (3) 50% by Cities
- (4) 50% by Federal Aid Secondary Funds
- (5) 50% by Road Commission on 12 Mile
- (6) 82% Assessment by City



# 1967

## PROPOSED CONSTRUCTION, LOCAL ROADS

These local road construction projects are in the process of being set up as matching projects or have already been approved. Each township will pay 50% of the total final cost and the Road Commission will pay the other 50% from road funds budgeted for matching purposes. Several more projects will be added by May 15, 1967, as other townships submit projects and their share of the funds.

<u>Project Number</u>	<u>Road To Be Improved</u>	<u>Township</u>	<u>Length Miles</u>	<u>Termini</u>	<u>Type of Construction</u>	<u>Estimated Total Cost</u>
SL-635	Winkler Mill	Avon	---	@ Stoney Creek	Reconstruct Bridge	15,000
TM-639	Nine Mile, Gill Road	Farmington	0.5	Nine Mile from Gill Rd. west 1500' Gill Rd. from Nine Mile Rd. to existing pavement.	Reconstruct aggregate base and place 20' bituminous aggregate surface	58,500
TM-660	Bass Lake Road	Commerce	1.2	Sleeth Road to Benstein Road	Reconstruct aggregate base	101,000
TM-669	Drake	Farmington	1.0	Grand River to 11 Mile	Reconstruct aggregate base	80,000
TM-671	Tienken	Avon	0.9	Livernois east to exist. Pavement	Reconstruct aggregate base	111,000
TM-674	Bald Mountain	Orion	0.1	Silver Bell northerly 310'	20' bituminous aggregate surface	10,150
TM-675	Joslyn	Orion	1.2	Clarkston to Heights	Reconstruct aggregate base	83,800
TM-701	Square Lake	Bloomfield	1.2	Eastways to Adams	Reconstruct aggregate base	126,000
TM-702	Tienken	Avon	---	Rochester Intersection	Widen with aggregate base and 44' bituminous aggregate surface	12,500
TM-704	Maceday Lake	Waterford	1.1	Williams Lake to Nelsey	22' bituminous aggregate surface	22,500
TM-705	Bass Lake	Commerce	1.2	Sleeth to Benstein	22' bituminous aggregate surface	22,600
TM-706	Oxbow Lake	White Lake	0.2	Exist. Pav't. to 100' s. of curve	20' bituminous aggregate surface	3,800
TM-707	Cedar Island	White Lake	0.7	Orleana to Round Lake	22' bituminous aggregate surface	15,600
TM-708	Tienken	Avon	0.9	Livernois east to exist. pavement	22' bituminous aggregate surface	21,200
TM-709	Joslyn	Orion	1.2	Clarkston to Heights	22' bituminous aggregate surface	36,000
TM-711	Sleeth	Commerce	2.1	Wixom to Bass Lake Road	Reconstruct aggregate base	147,600
T-712	Watkins Boulevard	Highland	0.3	Milford west to High School	Reconstruct boulevard aggregate base and place two 22' bituminous aggregate surfaces	27,000 (1)
TM-713	Eston	Independence	0.5	Clarkston to Algonquin	Reconstruct aggregate base and place 22' bituminous aggregate surface	37,000
TM-714	11 Mile	Farmington	0.5	Orchard Lake to Powers	Reconstruct aggregate base	145,000
TM-714	Powers	Farmington	1.0	10 Mile to 11 Mile	Reconstruct aggregate base	

(1) Local School District to pay 100%