

# Financing the Needs of the Indiana Highway System the Urban System

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## INTRODUCTION

Considering the needs for urban highway systems, I find two general categories: (1) maintenance—present services and additional services; and (2) capital improvements—major (arterial) and minor (residential).

I am going to review the needs in each of these two categories as they exist today in the city of Fort Wayne. I feel these needs are typical of most urban centers in the state of Indiana.

## MAINTENANCE NEEDS

### *Paved Streets Cost Less to Maintain*

In the city of Fort Wayne, we have 595 miles of streets of which 450 miles are paved and 145 miles are unpaved. Of the 145 unpaved miles, 100 miles are residential. In addition, we have 55 miles of state routes. Our cost of patching (materials and labor) is approximately \$600 per mile for paved streets and \$1,140 per mile for unpaved. This demonstrates the high cost of maintaining unpaved streets.

In addition, Fort Wayne has 154 miles of alleys, of which 84 miles are paved and 70 miles unpaved.

### *Impact of Inflation*

Inflation has made a major impact on everyday materials used in street maintenance activities. The following table shows typical maintenance material cost increases experienced in the operation of the Fort Wayne Street Department. You will note the increases per year vary from a low of 23% to a high of 45%.

|                       | 1972  | 1973  | 1974  | 1975  | Increase<br>Per Year |
|-----------------------|-------|-------|-------|-------|----------------------|
| Fuel oil/gallon       | 0.119 | 0.175 | 0.304 | 0.277 | 32%                  |
| Gasoline/gallon       | 0.195 | 0.215 | 0.40  | 0.375 | 23                   |
| Sweeper brooms/each   | 30.00 | 33.00 | 48.00 | 57.00 | 25                   |
| Asphalt cement/ton    | 30.00 | 54.00 | 62.00 | 85.00 | 45                   |
| Hot asphalt/ton       | 6.25  | 6.90  | 13.00 | 17.00 | 42                   |
| Asphalt base oil/gal. | 0.105 | 0.155 | 0.265 |       | 40                   |

### Summary of Maintenance Needs

Following is a summary of the annual maintenance needs for the city of Fort Wayne.

#### MAINTENANCE NEEDS

|  |           |                    |           |
|--|-----------|--------------------|-----------|
| Present Street Budget (breakdown as follows) \$1,500,000 |           |                    |           |
| Labor  | \$850,000 | Slurry seal 50 mi. | \$120,000 |
| Equipment repair   | \$100,000 | New equipment      | \$ 70,000 |
| Gas and oil  | \$ 50,000 | Miscellaneous      | \$ 60,000 |
| Materials  | \$250,000 |                    |           |

In addition to the present level of services provided by the street department, we feel the following areas need increased attention:

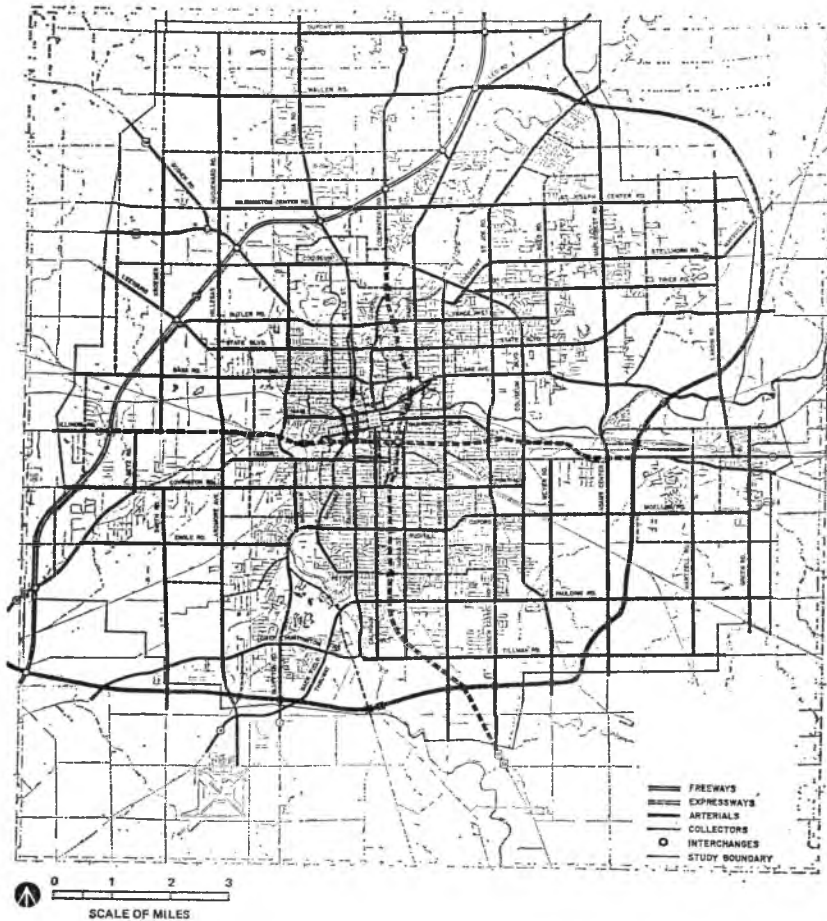
#### ADDITIONAL MAINTENANCE NEEDS

|  |             |
|--|-------------|
| 1. Crack sealing   | \$ 50,000   |
| 2. Increased sweeping program (weekly)   | 50,000      |
| 3. Resurfacing—maintain the 450 miles of paved streets                               | 400,000     |
| 4. Improvement of drainage-ditching-culverts   | 200,000     |
| 5. Guard rails   | 25,000      |
| 6. Sidewalk repair—135 miles x \$40,000 = \$5,400,000<br>(assuming ten-year program) | 540,000     |
| 7. Curb Repair—475 miles x \$30,000 = \$13,250,000<br>(assuming ten-year program)    | 1,325,000   |
| ADDITIONAL NEEDS   | \$2,590,000 |
| TOTAL ANNUAL MAINTENANCE NEEDS   | \$4,090,000 |

#### CAPITAL IMPROVEMENTS

##### Fort Wayne 1990 Master Transportation Plan

Before discussing the other category of needs—capital improvements—I feel it would be helpful to review the Fort Wayne area's 1990 Master Transportation Plan. Figure 1 is a copy of the plan as completed in 1971, ten years after it was started. At the time it was completed and adopted by the city (1972), it was felt to represent



**Fig. 1. Recommended 1990 Major Street and Highway System developed by the Fort Wayne-New Haven-Allen County Transportation Study.**

the answer to all the transportation needs. Upon review of Figure 1, it is noted the major elements of the plan are: north-south and east-west expressways; bypass connecting with I-69 south of the city and running east and north to I-69 on the city's north side; and a north-south-east-west grid system of arterial streets.

#### *Capital Improvement Program*

In 1971, the Three River Coordinating Council developed a capital improvement program which showed the total cost of the 1990 system was \$156,062,000. Table 3 shows a project cost versus financial resources

summary. Table 3 shows resources in the amount of \$185,653,000 were available or approximately \$30 million in excess of proposed cost.

Table 3—Project Costs Versus Financial Resources Summary.

| Period    | Responsibility |          |            |           | Total     |
|-----------|----------------|----------|------------|-----------|-----------|
|           | State          | County   | Fort Wayne | New Haven |           |
| First     | \$17,297       | \$ 6,923 | \$14,496   | \$ 59     | \$ 38,775 |
| 1971-1975 | (18,125)       | (12,589) | ( 7,097)   | (253)     | ( 38,064) |
| Second    | 29,438         | 317      | 12,599     | 176       | 42,530    |
| 1976-1980 | (19,932)       | (14,628) | ( 8,785)   | (289)     | ( 43,634) |
| Third     | 18,263         | 19,458   | 10,148     | 474       | 48,343    |
| 1981-1985 | (21,469)       | (16,791) | (10,618)   | (341)     | ( 49,219) |
| Fourth    | 509            | 24,473   | 1,198      | 234       | 26,414    |
| 1986-1990 | (22,562)       | (19,111) | (12,663)   | (400)     | ( 54,736) |
| Total     | 65,507         | 51,171   | 38,441     | 943       | 156,062   |
| 1971-1990 | (82,088)       | (63,119) | (39,163)   | (1,283)   | (185,653) |

( ): Resources; Unit: \$1,000; Assume 70/30 matching ratio (federal-state/city-county).

Figure 2, from the Three Rivers Coordinating Council CIP, illustrates the division of forecasted financial resources. It shows \$82.1 million coming from state and federal funds which represents over \$4 million per year.

#### *Feasibility of the Plan Reviewed*

Shortly after the 1990 plan was adopted, the city began to have reservations about the overall feasibility. A study was felt necessary to determine the feasibility of utilizing one of the railroad right-of-ways (three of them cross Fort Wayne from east to west) as a route for the east-west expressway construction. In late 1972, a consultant was engaged to do a feasibility study on the east-west expressway.

In May 1973, the study was completed. Table 2 is a summary of the findings for five of the 13 alternative routings considered. Upon review of this, it is noted for the approximate nine miles of highway, the cost varied from a low of \$73 million to a high of \$88 million. This cost contrasted sharply with the 1971-1990 Master Plan estimate of \$27 million, less than one-third.

#### *Proposed Expressway Deleted*

In view of the high economic, social, and environmental cost of the east-west expressway, it was concluded by the city fathers it was unrealistic. It was felt the master plan should be revised and the

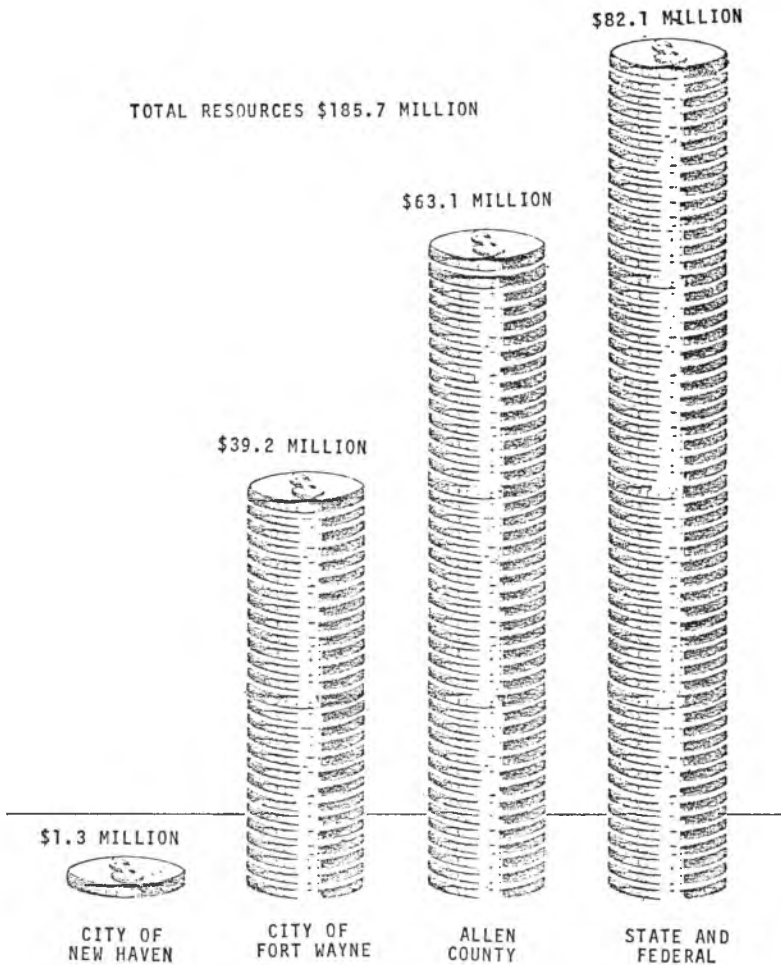


Fig. 2. Illustrative division of forecasted financial resources covering years 1971-1990 (in 1971 dollars) for construction, R.O.W., engineering and administration only.

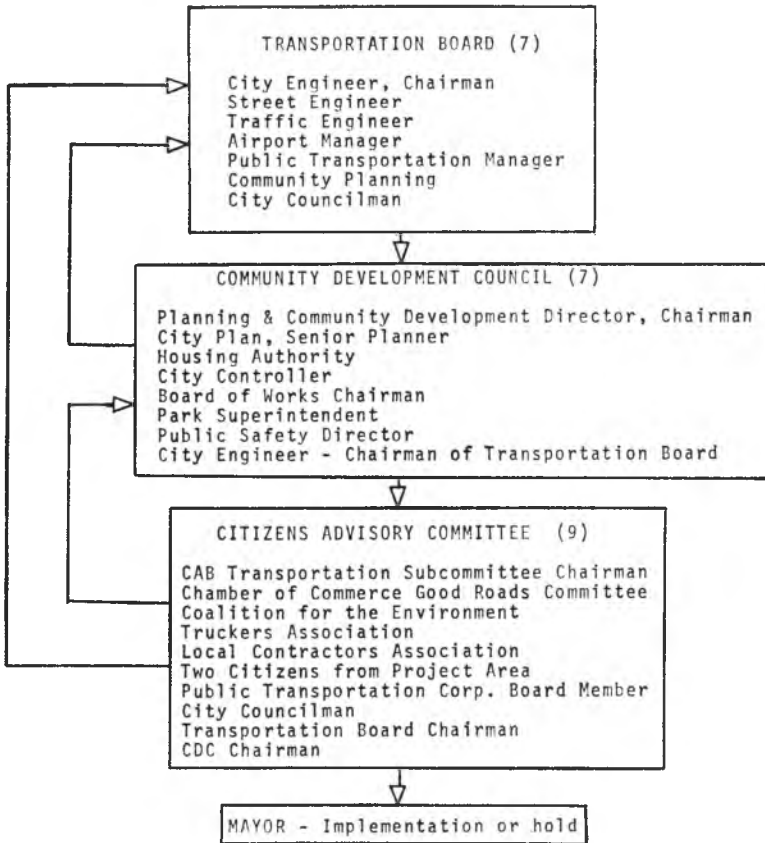
expressways deleted. It was quickly recognized however, this would place additional emphasis on the north-south-east-west grid system of arterials.

#### *Transportation Methodology*

Figure 3 shows the transportation methodology as created by Mayor Ivan A. Lebamoff to help solve transportation problems and gain citizen support.

Table 2—Preliminary Economic and Social Impact

| Alternative Highway Plan | Route Length (in miles) | Related Railroad Operating Plan | Population Displacement | Employment Displacement | Highway Construction Cost (in \$ millions) | Railroad Costs (in \$ millions) | Right-of-Way & Relocation Costs (in \$ millions) | Total Costs | Benefit-Costs Ratio |
|--------------------------|-------------------------|---------------------------------|-------------------------|-------------------------|--|---------------------------------|--|-------------|---------------------|
| More Promising           | B-2                     | —                               | 2700                    | 50-100                  | 57.5±3                                     | —                               | 15.9   | 73.4±4      | 1.45:1              |
|                          | C                       | III                             | 1100                    | 300-650                 | 67±5                                       | 11.7                            | 8.9  | 87.6±6      | 1.22:1              |
|                          | G                       | —                               | 1000                    | 300-650                 | 67±5                                       | —                               | 9.6  | 76.6±6      | 1.39:1              |
| Promising                | D                       | —                               | 2500                    | 250-550                 | 57±3                                       | —                               | 15.9   | 72.9±4      | 1.46:1              |
|                          | F                       | —                               | 2300                    | 1050-2600               | 57±3                                       | —                               | 21.6   | 78.6±6      | 1.36:1              |



**Fig. 3. Methodology for solving transportation problems.**

It consists of a three-tier group—the first being the Transportation Board made up of seven members, the second being the Community Development Council (CDC) of seven members, and the third being the Citizen's Advisory Committee (CAC) of nine members. The normal flow of projects is from the Transportation Board to the CDC to the CAC and then to the mayor. However, projects may be sent back to any one group for additional study or comment. To date, some 18 projects have gone through this process, and those implemented have received community support.

#### *Summary of Master Plan*

Following is a summary of the 1990 Master Plan cost with updated costs.

## 1990 MASTER PLAN COSTS

|  | 1971  | 1975<br>10%/Year | 1975<br>Adjusted | Per Year to<br>Accomplish<br>by 1990 |
|--|-------|------------------|------------------|--------------------------------------|
| Millions of Dollars                          |       |                  |                  |                                      |
| Present Plan                                 | \$156 | \$234            | \$300            | \$20                                 |
| Suggested Revised Plan<br>Without Expressway | 100   | 150              | 160              | 10.6                                 |

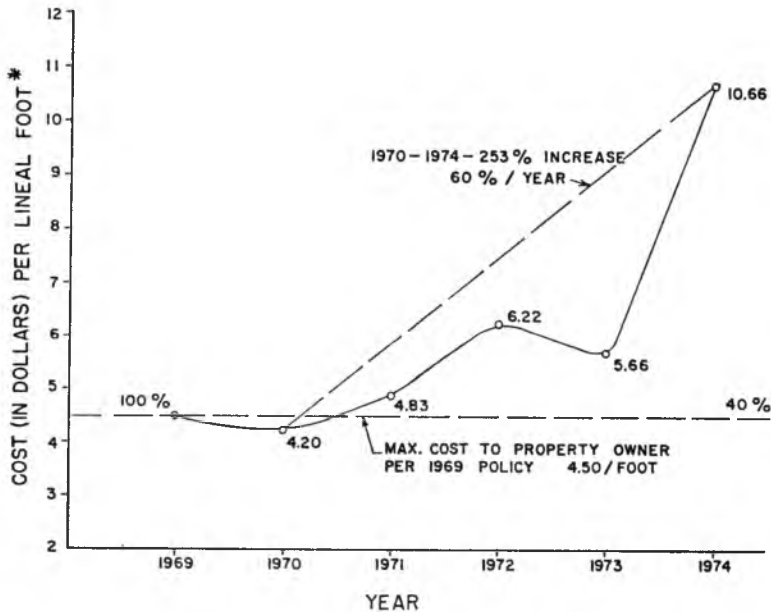


Fig. 4. Unit construction costs for five feet wide, five inches thick concrete walks for the period 1970-1974 (costs based on average of bids received for that year).

The present plan, with the expressways, was estimated to cost in 1971, \$156 million. Adding a 10% per year inflation factor, this is adjusted to \$234 million. In adjusting it further to allow for more accurate estimates, it comes to \$300 million.

Assuming the plan is to be accomplished by the year 1990, this would require an expenditure of \$20 million per year based on the present plan, or \$10.6 million per year based on the revised plan—without the expressways.



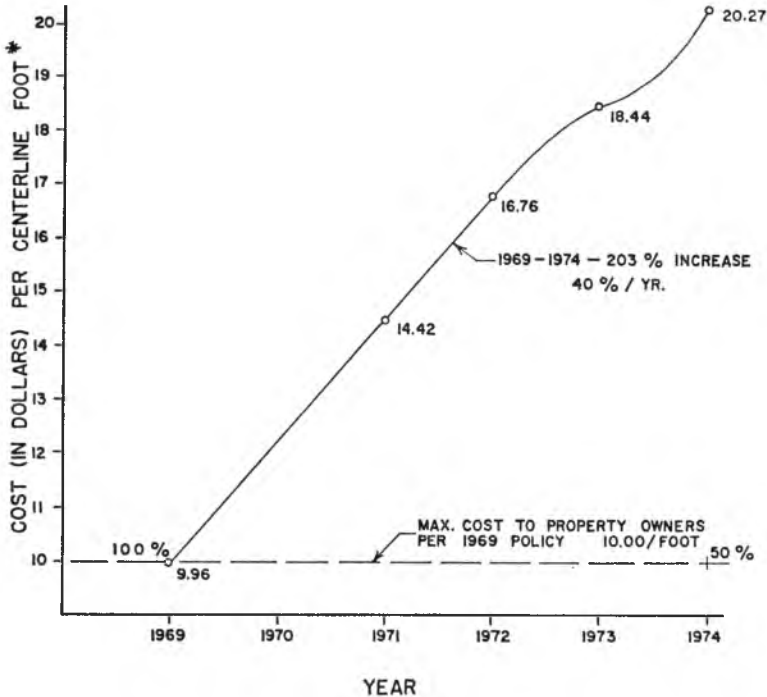


Fig. 5. Unit construction costs for alleys for the period 1969-1974 (costs based on average of bids received that year).

### *Inflation Increases Project Costs*

If projects totaling less than \$16.0 million per year are accomplished, the inflation factor will increase the overall master plan cost faster than the amount of construction. Consequently, it required \$16 million per year to maintain status quo.

Figure 4 shows the construction cost increases for concrete walk between 1970 and 1974.

Figure 5 shows the alley construction costs between 1969 and 1974.

Figure 6 shows the residential street construction cost increases between 1969 and 1974.

It is noted in that five-year period, costs increased 250%, or 50% per year.

### *Summary of Capital Improvements*

Following is a summary of the capital improvement needs.

## CAPITAL IMPROVEMENTS

## MINOR (RESIDENTIAL)

|   |             |             |
|---|-------------|-------------|
| 1. Residential streets, 100 miles, \$32 million<br>(assume 50% assessment and ten-year<br>program ..... | \$1,600,000 |             |
| 2. Alleys, 70 miles, \$7 million (assume 50%<br>assessment and ten-year program) .....                  | 350,000     |             |
|   | <hr/>       |             |
| Total Minor .....   |             | \$1,950,000 |

## MAJOR (ARTERIAL)

|  |             |                    |
|--|-------------|--------------------|
| 1. Three Rivers Coordinating Council five-<br>year CIP (1974-79)<br>City share \$17.7 million $\div$ 5 = ..... | \$3,500,000 |                    |
| 2. Deficiency of FHWA funds based on<br>allocation of \$1.1 million/year<br>52.7 — 5.5 = 47.2 $\div$ 5 = ..... | 9,400,000   |                    |
| 3. Railroad grade crossing improvements—<br>five-year program .....  | 500,000     |                    |
| Total Major .....  |             | \$13,400,000       |
| Total Capital Improvements .....   |             | <hr/> \$15,350,000 |

*Overall Summary of Improvements*

An overall summary of needs for both maintenance and capital improvements appear as follows:

## NEEDS

|                           |                 |              |
|---------------------------|-----------------|--------------|
|                           | <i>Per Year</i> |              |
| 1. Maintenance .....      | \$ 4,090,000    |              |
| 2. Capital Improvements   |                 |              |
| Minor (Residential) ..... | 1,950,000       |              |
| Major (Arterial) .....    | 13,400,000      |              |
|                           | <hr/>           |              |
| Total Needs .....         |                 | \$19,440,000 |

A projection of the revenues shows:

## REVENUES

|                      |              |                   |
|----------------------|--------------|-------------------|
| MVH Fund .....       | \$ 1,700,000 |                   |
| L R & S .....        | 1,300,000    |                   |
|                      | <hr/>        |                   |
| Total Revenues ..... |              | \$ 3,000,000      |
| Shortage .....       |              | \$16,440,000/year |

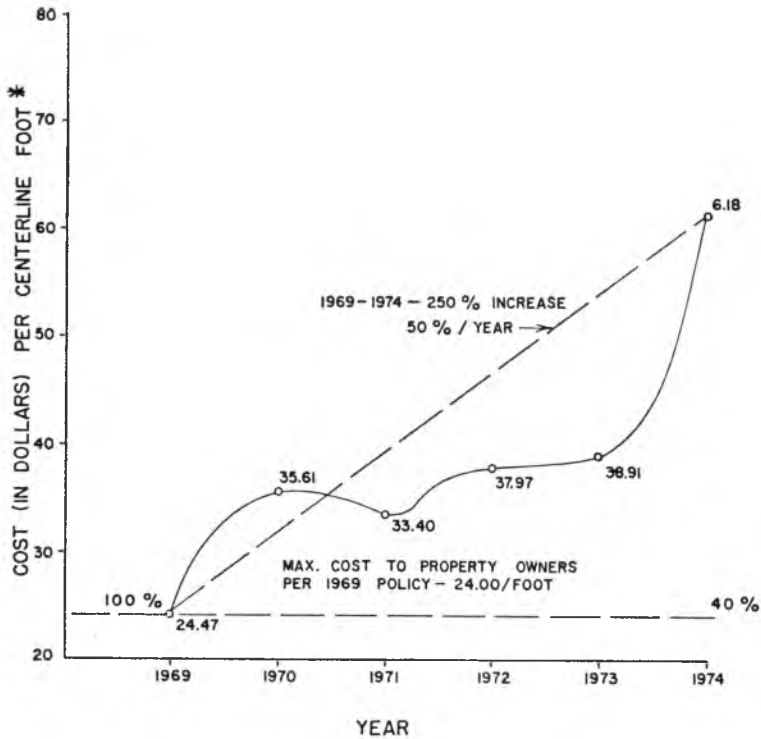


Fig. 6. Unit construction costs for residential streets consisting of 27 feet wide pavement with curb and gutter for the period 1969-1974 (costs based on average bids received that year).

From this it is seen a shortage exists of over \$16 million per year. These figures may not be exact, however they are representative of the serious shortage cities face. The needs are approximately six times the revenues.

The city of Fort Wayne has utilized revenue sharing funds to help fill the difference between needs and revenues. A \$3.75 million general obligation bond issue is also being used to make up the shortages.

Below is an article appearing in the March issue of the *Public Works* magazine on the Hobson Road project in Fort Wayne. This project was the first FAU project in the state of Indiana and exemplifies what needs to be done on Fort Wayne's arterial system to satisfy the transportation demands.

## CONCLUSIONS

In conclusion, urban centers are faced with what seems to be the impossible—increasing maintenance and construction costs, compounded by social and ecological problems.

We are trying to solve these problems in several directions. Some solutions are to: optimize mass transit, amend transportation plan to fully utilize existing facilities, develop a realistic and obtainable plan, gain public support and acceptance of the plan, investigate methods to improve efficiency and cut cost for maintenance activities, and develop projects that are a total improvement and answer the needs of the citizens.

With needs six times greater than revenues, it is obvious cities are in *deep trouble*. The cities need financial help, not only to implement master transportation plans but to adequately maintain existing systems.

## ARTERIAL STREET IMPROVEMENTS INCLUDE MORE THAN THE PAVEMENT (Public Works, March 1975)

For years, Fort Wayne, Indiana, included only the bare necessities when constructing new pavements on arterial streets—pavement, curb and gutter, and storm drainage. With the help of Federal Aid Urban funds, however, the city has adopted a new approach which includes the necessary amenities to the project such as sidewalks, street lighting with underground wiring, relocation and/or consolidation of overhead utility lines, landscaping, and trees. Additionally, curb ramps to accommodate bicycles and wheel chairs were included. This new approach was adopted for the Hobson Road/Vance Avenue project.

Hobson Road consisted of an 18-foot deteriorated asphalt pavement full of chuck holes. Side ditches handled drainage but not without numerous pockets and flooding conditions. The improvement included a 54-foot wide concrete pavement, six-inch vertical curbs (four-foot mountable median, two 12-foot inside and two 13-foot outside lanes), storm sewers to accommodate drainage areas, street lighting with underground wiring and breakaway poles, five-foot wide concrete sidewalks with curb ramps, sodding, and trees.

It is the policy in Fort Wayne that sidewalks are constructed with the property owners participating in the cost. To obtain property owner support of the project, and agreement to participate in the cost of the sidewalks, a meeting was held in the immediate neighborhood. Letters were mailed to each property owner from the mayor explaining that the project was planned and inviting them to participate in the meeting.

Engineering plans were available to show what was proposed and questions were answered regarding specific details. The mayor explained that the proposed project was to be financed with federal funds, and if the sidewalks were included as part of the project, they would also receive partial federal funding. The mayor agreed to pass on to the property owners this benefit and reduce their assessment. It was pointed out that this procedure would realize a savings over the cost of the sidewalks if they were constructed independently or at a later date. As a result, the majority of the people signed petitions that were circulated during the meeting.

#### *Rerouting Overhead Utilities*

Overhead electric and telephone lines occupied each side of the street. During the public meeting, the property owners asked if these ugly lines could be removed during the construction of the project. The mayor and Board of Works agreed to pursue this request with the utility companies. The Board of Works asked the utility companies to develop plans for vacating the right-of-way, either by undergrounding or rerouting. Alternative plans and cost estimates were reviewed before a compromise was reached. For approximately half of the project, the street was vacated by rerouting electric lines and undergrounding telephone lines. On the balance of the street, a common pole line was constructed in a neat and symmetrical manner.

The engineering plans and design for this \$800,000 improvement were completed by the city engineering department, utilizing the standards of the Indiana State Highway Commission. Consistent with policy established by the state, bids were received and contracts awarded through the Indiana State Highway Commission. Construction engineering and inspection were provided by Fort Wayne.

The project was bid in June 1973, and represented the first Federal Aid Urban project in the state of Indiana. Construction began in August and was impeded because of bad weather and numerous gas, water, telephone and electric utility relocation problems. Construction was completed in the spring of 1974 and the project opened in August of 1974.

Two additional projects were planned on the south side of Fort Wayne (Anthony and Tillman/Anthony intersection.) A similar approach was utilized on each of these projects with individual letters being sent by the mayor to each property owner, inviting them to participate in a meeting in the immediate neighborhood. The entire project was explained and engineering drawings were available for property owners' examination. The mayor again offered property owners

the benefit of reduced assessments by inclusion of the sidewalks as part of the overall project, utilizing federal funds. On both projects, petitions were circulated and sufficient property owners signed to support the inclusion of the walks as part of the project. The projects are now under construction and should be completed in mid-1975.

Fort Wayne has adopted this new concept of installing sidewalks, street lighting, curb ramps, curbs, storm drainage, landscaping, and trees for all new arterial street improvements. Bicycle trails, as a combination with the sidewalk or separate, are being considered on future projects.

With this type of procedure, the projects represent a total improvement for the street resulting in a higher degree of benefit and property owner satisfaction. Further, it avoids costly installations at a later date. The Federal Highway Administration is complimented for their farsightedness in recognizing that these amenities—storm drainage, curb, sidewalks, street lighting, curb ramps, and landscaping are as much of a street improvement as the pavement itself.

The degree of satisfaction of the property owners was measured by observing the number of people who appeared at the final hearing on the assessment roll for the sidewalks on Hobson Road. Of the 120 property owners involved, only three appeared with any questions or concerns regarding the project, and even these did not question the value of their share of the participation. In this day and age of hearing only from those who are dissatisfied, we feel the turnout demonstrates the success of Fort Wayne's new approach for arterial street improvements.